Sustaining Implementation or Implementing Sustainability?

Understanding the Sustainability of Community-based Public Health Programmes.

This thesis is submitted by

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I certify that all material in this thesis which is not my own work has been identified and that no unchanged or acknowledged material has previously been submitted and approved for the award of a degree by this or any other University

Abstract

Although it is now recognised that the way a public health programme is implemented affects its outcomes, there is little agreement on what successful implementation means, and there is a paucity of information on how these programmes are sustained. In this thesis, I investigate the implementation processes of these programmes and how they are sustained. The thesis is developed from a synthesis of the findings from four linked studies; a systematic review, an observational study, an interview study and an analysis of secondary questionnaires from a school-based peer-to-peer smoking prevention programme called the ASSIST.

I conclude that the implementation of community-based public health programmes is characterised by interactive stages of the implementation process, namely, 1) pre-implementation activities, 2) the process of adopting the programme, 3) the actual implementation, 4) any necessary adaptations to the programme and 5) sustainability. These stages influence each other and they feedback onto the process. In addition, the process of implementation is influenced by its social-cultural environment, and it is characterised by nine aspects namely; adaptation, participant responsiveness, fidelity, dose received/delivered, quality of delivery, programme differentiation, reach, theory, and programme design.

However, the sustainability of the programme is not only an end-stage or an outcome of the implementation proces, it is also a process in itself and it evolves when mechanisms of sustainability interact with a progressing process of implementation. The mechanisms of sustainability are attributes of the intervention namely; Credibility, Simplicity, Marketability, Contextualisability, and justifiability of the intervention, plus a consistency of these attributes. In sustained programmes, these mechanisms interact with progressing stages of implementation and this results in the emergence of a typology of sustainability namely; 1) potential sustainability (present at trial and during the adoption stage), 2) foundational sustainability (emergent

during adoption and implementation), 3) operational sustainability (emergent during implementation and adaptation) and 4) actual sustainability (the end product). The mechanisms are interactive, e.g. *marketability* enhances *contextualisability,* while *simplicity* and *credibility* supports *justifiability* and *justifiability* enhances the ultimate *sustainability* status of the programme. At the same time, the attributes are most crucial at varying stages, so *credibility and simplicity* are crucial at adoption while *contextualisability and marketability* are most important during *implementation. Justifiability* is crucial for maintaining the *implementation*, but like all other theories, it is also required throughout the entire process (*consistency).* These findings represent a new conceptualisation of implementation and sustainability, and they could contribute to the development of a potential general theory of implementation and sustainability.

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Finally, I am grateful to the University of Exeter Medical School for funding this project.

Dedication

This thesis is dedicated to my mom Iness Mtawali Hara because she never got a chance to see what became of her dreams about her otherwise "lazy" daughter. On her death, and as a child, I promised my dad that I was going to write a book about her life. I haven't yet, but if I never make good on that promise, then this makes her part of my written work forever. The thesis is also dedicated to my son Vyachi and my parents in law Alice and Harold. These special people have shaped my life in unimaginable ways, without ever meeting me.

Finally, it is the ultimate showpiece for one Estone Hara's lifelong fatherly efforts towards my success, and I know it will be his new badge of honour. I could not have achieved this without the unwavering support of my husband Ammie, and my sister Leah. Only they know how much of their own time and effort they have sacrificed just so I could complete this. I hope it will inspire my children Hezey, Callista, and Amelia, and littlest sibling Eliezer.

Conference presentations of this work

This work was presented to the following conferences

1. 3rd Biennial Australasian Implementation Conference, Melbourne Exhibition Centre Melbourne Australia 4 -5th October 2016
2. Nordic Implementation Conference, Radisson Blu Scandinavian Hotel, Amager Boulevard 70 Copenhagen 28th – 30th May 2018

It was also accepted for presentation to:

3. Australian Implementation Conference Melbourne Exhibition Centre Melbourne Australia 22-24 October 2018

Abbreviations

ASSIST	A Stop Smoking In Schools Trial
AIDED	Assess Innovate Devolve Engage Devolve
AMSTAR	A Measurement Tool to Assess Systematic Reviews
CBPR	Community Based Participatory Research
CI	Complex Interventions
CQC	Care Quality Commission
DI Ltd	DECIPher Impact Ltd
CAMHS	Child and Adolescent Mental Health Services
CFIR	Consolidated Framework for Implementation Research
DoI	Diffusion of Innovation Theory
DSF	Dynamic Sustainability Framework
ENTREQ	Enhancing Transparency in Reporting the Synthesis of Qualitative Research
EF	Ecological Framework
HH	Harriet Hunt (Second reviewer)
LA	Local Authority
MRC	Medical Research Council
MeSH	Medical Subject Headings
NHS	National Health Service (UK)
PI	Principal Investigator

PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-analyses
PTs	Programme Theories
PSAT	Programme Sustainability Assessment Tool
PARiHS	Promoting Action Research Implementation in Health Services
PRECEDE-PROCEED	Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation-Policy, Regulatory, and Organisational Constructs in Educational and Environmental Development
RCT	Randomised Controlled Trial
RE-AIM	Reach, Effectiveness, Adoption Implementation, and Maintenance
TH	Thandiwe Hara (Researcher)
NPT	Normalisation Process Theory
K2A	Knowledge to Action Model
KT	Knowledge Transfer
UEMS REC	University of Exeter Medical School Research Ethics Committee

Key Definitions

Implementation

In this thesis, implementation refers to the structures, resources and the processes through which delivery of public health programmes is achieved, as well as the "quantity and quality of what is delivered" (Moore et al. 2014).

Sustainability

This refers to the ongoing implementation of evidence-based programme for at least 2 years after the original research that leads to them has ended.

Aspects of implementation

This refers to the defining features of a successful process of implementing public health programmes.

Stages of Implementation

Disctinct processes, or a set or activities which may be part of the continuum of a wider process of implementation.

Public Health programmes

I adopt the broad definition of Public health as the science and art of preventing disease, prolonging life, and promoting health through the organised efforts of society (Acheson 1988), but I limit this definition to refer to those programmes that:

a) Focus on the prevention of ill health or promotion of good health.

b) Target populations or groups of people rather than individuals.

c) Take place in community settings or in places of habitual or current ordinary residence (e.g. care homes or prisons) or of occupation (e.g. Schools or work places) rather than in treatment or acute settings.

Programme Implementers

This refers to the people who are tasked with delivering the programme e.g. the trainers. There are two types of implementers in the programme at the centre of this thesis (the ASSIST). These are: the trainers who train the children as peer supporters, and the children themselves since after this training they go on to implement anti-smoking messages to their peers. Therefore, the trained children have the dual role as programme participants, and as programme implementers (see programme participants below). However, in the ASSIST trial, these children are called peer supporters, so in this thesis, this term is generally maintained when referring to these children.

Programme Participants

This refers to the people who take part in the programme or who receive programme activities. In this project, the participants were the children who attended the peer education training to become peer trainers. (Also see implementers above).

Programme Beneficiaries

This refers to the population that is meant to benefit from the programme. In this programme the beneficiaries were the peers among whom peer supporters were supposed to implement anti-smoking conversations. This distinction may be specific to the ASSIST programme in that in other programmes, the programme participants are usually the same as the programme beneficiaries (see participants above)

Reflective note 1

I start this project with the excitement of someone a mission. I am, after all, about to start the journey that would fulfil one of my dreams. I come on the back of a first class MSc in Public Health, so I am super confident. At the first supervisory meeting, the supervisors are reassuring. We go through the paperwork, a learning expectations document, a training needs assessment form, lone working practices etc. We also cover a lot of ground on where the project might head and how.

I am comfortable with the conversations, and I am very engaged until it gets conceptual. At this point, we are talking fidelity, adherence, adaptation, measures, indicators, effectiveness, efficacy, process evaluation and so on, until I am no longer sure that I am on the same page as the supervisors or of my grip of the subject. From this point, I tactfully let my supervisors do all the talking. I adopt the posture of someone who is engaged and keen not to miss a word by taking notes furiously, nodding, and verbally agreeing with things a lot. My supervisors do not seem to have noticed this.

However, as I listen, I notice that they too are not on the same page with each other. They offer different perspectives on most of the terminology. By the end of the meeting, they have not agreed on the terminology but they all appear to be impressed with me, but I am very worried. I tell myself that rather than ask many questions and appear ill prepared, I will just go and work it outin the literature. The literature though, turns out to be worse! It too is not singing from the same sheet on terminology. That pretty much sets the tone and the nature of the beast for the rest of the project for me!

Lesson 1

There is no such thing as knowing nothing. Knowing that you do not know, is knowing a lot!

Chapter 1   Introduction

1.1 Introduction

In this PhD project, I set out to investigate two areas of implementation science. The first is the character of the implementation process of community-based public health programmes, and the second is how those programmes are sustained.

Until the mid to late 1980s the primary concern of the field of programme evaluation was the accurate measurement of programme outcomes (Greenberg et al. 2005). Although this was useful in experimental environments, it did not improve the understanding of how outcomes are achieved in non-experimental or community-based environments where contextual issues influence delivery. (Greenberg et al. 2005; Pawson and Tilley 1997). In part response to this challenge, "the field has moved away from traditional method driven evaluations towards the development and application of theory-driven ones" (Greenberg et al. 2005). It is now recognised that improving health services is influenced by both the process of implementing the innovative practices and the practices selected for implementation (Aarons and Palinkas 2007; Greenhalgh et al. 2004).

However, there is very little agreement on what constitutes successful implementation or how that can be determined. The unresolved issues include how to conceptualise, operationalise, and evaluate it and a lack consensus on its core constructs. (Chaudoir, Dugan, and Barr 2013; Durlak and DuPre 2008; Rychetnik et al. 2002). Moreover, there is concern that the commonly insignificant or modest outcomes from large public health programme intervention trials may be attributable to one or more of the following: poorly implemented interventions, poorly designed or theorised interventions, or inadequately evaluated interventions (Hawe, Shiell, and Riley 2004).

Further, although an understanding of programme implementation is only useful if the implementation is sustained, the literature pays much less

attention to what happens to programmes once they are implemented (Aarons and Palinkas 2007). It is against this background that in this thesis, I am concerned with 1) the implementation process of community-based public health programmes, and 2) how those programmes are sustained.

1.2 Research questions

The overarching PhD research questions are:

1. What is the nature and character of the processes that make successfully implemented community-based public health programmes?
2. With reference to a school-based public health programme, how is sustainability achieved over time?

These questions are answered through a series of linked investigations, called Studies I, II, III, and IV, which are presented in Chapter 4, 6, 7and 8. All four studies contribute to the understanding of these research questions plus to meeting the thesis objectives listed in section 1.3. To reduce confusion between the PhD questions and various study-specific questions in the four studies, the above two overarching questions will hereafter be called PhD questions 1 or 2. The study-specific questions and objectives are reported within each study.

1.3 Objectives

This thesis has three objectives. The first is to understand the character of the processes of successful implementation in community-based public health programmes. This objective is met through the systematic review of reviews (Study I), and its findings are supplemented by interviews with key implementers of a school-based public health programme (Study II see Chapter 6) and observations of the implementation process (Study III see Chapter 7).

The second objective relates to PhD research question 2, i.e. to understand the sustainability of a school-based smoking prevention programme called A Stop Smoking in Schools Trial commonly known as the ASSIST programme.

This programme was chosen because it has been running for more than five years and it has been implemented widely in British schools, i.e. it has been sustained. This objective is met through interviewing implementers, observing the implementation process of the programme, and analysing the feedback forms of the children participating in the programme.

The final objective is to provide an explanatory narrative of the relationships between the implementation processes identified in Study I (Chapter 4), and the factors that I found to contribute to the sustainability of the programme in Studies II, III and IV (Chapters 6, 7and 8). This objective is met through a consolidation of the findings, and developing mechanisms of sustainability including proposing how these may lead to a general theory of implementation and sustainability. This objective is met in Chapters 9 and 10.

1.4 Structure of the thesis

Chapter 2

In Chapter 2, I provide the background literature review. I give a brief history of the studies of implementation and sustainability, tracing early works from diffusion studies to contemporary studies in implementation science and evidence-based public health. I also critically assess emerging debates on the sustainability of public health programmes and, and I locate this thesis in the literature.

Chapter 3

In this Chapter, I outline the methodological principles of this thesis, covering its ontological and epistemological assumptions, how the data were collected, analysed and integrated. I also explain the appropriateness of the triangulation strategy (systematic review, interviews, observations and questionnaire analysis) that I used in the project, and I acknowledge weaknesses and how I dealt with ethical issues.

Chapter 4

I report on Study I, the review of reviews of implementation studies, and I explain how that study shaped the focus of the remaining studies II, III and IV.

Chapter 5

This is a brief introduction of the ASSIST programme, which is the case study at the centre of studies II, III and IV.

Chapter 6, 7 and 8

In these chapters I report on the conduct, the methods, the findings, the discussions and the conclusions of Studies II, III and IV, i.e. the interview study with key individuals along the implementation chain, the observations of the implementation of the programme and the analyses of feedback forms from the participating children.

Chapter 9

In Chapter 9, I respond to the research questions by consolidating the findings of all the studies, and from that, I identify six mechanisms of sustainability. I then develop a conceptual illustration of how the interaction between the mechanisms and a progressing process of implementation process leads to a typology of sustainability. Therefore, this chapter is the showpiece of the contribution to knowledge that I have made in this thesis.

Chapter 10

In this chapter, I discuss the findings of the entire project and I highlight the implications of those findings to public health and implementation science. I also suggest how the work could develop towards a general theory of implementation and sustainability including areas that may need further research.

Chapter 11

This is the concluding chapter of the thesis.

Reflective notes

As well as the thesis, I tell the story of my journey through this project. This story has been extracted from a reflexive diary that I kept throughout the process. It summarises my thoughts at various points in the journey and what I learnt. These thoughts are not part of the thesis and they can be read independent of it but they are inserted as pre-chapter interludes, at what I hope may be some welcome break points from reading the thesis itself.

Reflective note 2

As I continue the journey, I read some primers on "how to complete a PhD". From these, I conclude that the best advice is the one that said "write early and write often." In any case, the literature isn't going to change much during my study period, so it makes a lot of sense to write early. Therefore, as I am familiarising myself with it, I am also reviewing and writing the literature review for the thesis. I even draw up a table of contents to guide my writing. During the many random sessions in which I and my fellow students Becky and Harriet compare notes, and moan to each other about our progress, I proudly show off my table of contents. My friends are impressed, if envious. I feel in control. By the time I complete writing up the studies, the review is also finished, so I combine the study reports with what I feel is an impressive literature review. However, I have some niggling doubts such as; have I missed out other important literature? Have I gone over the top on historical analysis? Have I offered enough critique? But I dismiss these doubts one by one, and I remain impressed with it.

However, my supervisor's feedback, raises almost each and every one of the issues that I just willfully dismissed. As I write this piece, neither the envy-inducing table of contents nor the self-reviewed 'impressive literature review' have made it to the final show. Reluctantly, I accept that the literature review that was part of the "write early and write often" strategy was not fit for purpose. As I press the delete button on the thousands of words that I was once proud of, I can't help but ask the question: has this "write early write often" strategy ever worked for anyone? As I stare at the now blank spaces, I am partly sad to see my work go, partly angry at the wasted effort, partly demoralised at having to do it again, and wholly unimpressed with this piece of advice. Just then, another lesson in 'nothingness' dawns on me.

Lesson 2

Write early and write often still. There is no such a thing as "reading or writing for nothing" in your own field…

Chapter 2   Background Literature

2.1 Introduction

A growing but still young body of research and discussion has developed around the science of dissemination and implementation (Aarons, Hurlburt, and Horwitz 2011). Dearing and Kee (2012), distinguish three connected concepts, namely diffusion, dissemination, and implementation science. They describe diffusion as the process through which an innovation is communicated through certain channels over time among members of a social system, while dissemination is "what sponsors of innovations do to reach and affect the decisions of potential adopters." Implementation science, on the other hand, is the study of what happens after the adoption of an intervention occurs. This PhD research project focusses on how adopted public health programmes are implemented and what happens to them in the longer term (i.e. their sustainability), so it is in the territory of implementation science. However, effective dissemination improves the chances that an evidence-based programme will be adopted and implemented. Once implementation is initiated, the programme relies on mechanisms such as diffusion to achieve population-level scale. Therefore, implementation is part of the diffusion-dissemination-implementation continuum (Nilsen 2015).

In this chapter, I attempt to navigate some background literature around this continuum. However, it is necessary to clarify in advance that in the upcoming Study I, (Chapter 4), I used the Systematic Review of literature to answer some of the research questions of this PhD project. While both this chapter and the Systematic Review are reviews of the literature, the difference is that in the Systematic Review, I use the literature as a tool for answering a specific set of study questions. In this chapter, I use the literature to offer some background information on the subject and to engage with implementation science debates in a general fashion. The purpose of this chapter is to support the reader with grasping the broad issues that are necessary for understanding the context in which this thesis is located.

The chapter has five sections. Section 2.2 briefly touches on the historical links between early diffusion studies and contemporary implementation science, and the challenges involved in the process of dissemination. It is followed by section 2.3, which offers broad coverage of the key debates in implementation science such as conceptual challenges, the fidelity versus adaptation debate, and measures of implementation. Section 2.4 covers models, frameworks, and theory-driven evaluations. Section 2.5 covers contemporary theories of implementation. Section 2.6 is specific to the second concern of this PhD project, namely the sustainability of public health programmes. The section also covers conceptual challenges, frameworks, gaps in knowledge and measures of sustainability. Section 2.7 concludes the chapter.

2.2 Historical background

2.2.1 Classic theories: The Diffusion of Innovations theory and implementation science

Investigations into how ideas spread in practice go as far back as the diffusion studies of the 1900s. Dearing and Kee (2012) trace them back to the works of Gabriel Tarde (Tarde 1962) and George Simmel (Simmel and Wolff 1964) . They consider Tarde as the forerunner of the idea that diffusion is the means through which cultures change and progress in macro social systems. Simmel, on the other hand, is credited with pioneering the understanding of how social network positions affect what individuals do in reaction to innovations and when. Therefore, taken together, Tarde and Simmel's work cover both how social networks can influence individuals to adopt new ideas and how the individuals in the social systems themselves can influence what other people within their social relationships adopt.

In the 1940s, Ryan and Gross (1943) demonstrated the practical application of the diffusion theory by applying it to how communities in the American State of Iowa adopted hybrid seed. It was in this context that Everett Rogers developed his seminal work, the Diffusion of Innovations Theory (DoI), (Rogers 1962). Rogers synthesised a range of diffusion studies from different

fields, and he developed a model of a social process of diffusion that people go through before using or adopting a new idea. He defined innovations as ideas or practices that farmers perceived as new, while diffusion was about the spread of those innovations among individuals, largely by imitating influential individuals who had endorsed or already adopted the ideas. Therefore, interventions aimed to spread ideas via those influential opinion leaders, and diffusion research mapped the social networks and the adoption decisions of targeted individuals (Greenhalgh et al. 2004).

In his work to provide clarity on theories, frameworks and models of implementation, Nilsen (2015) identifies the DoI as belonging to the category of classic theories of implementation. This category includes other general theories, which describe change mechanisms and explain how change occurs, such as social cognitive theories, theories concerning cognitive processes and decision-making, social networks theories, social capital theories, communities of practice, professional theories and organisational theories. Thus, existing theories of implementation are typically interdisciplinary, having been developed in fields like sociology, psychology, or organisation theory. Some authors are optimistic that a general theory of implementation is necessary and possible, e.g. May (2013), while others are sceptical of the necessity or the practicality of such a theory, e.g. Durlak and DuPre (2008).

In principle, the DoI theory convincingly explains how ideas permeate societies in a variety of fields that range from population health to development studies and economics, and it is applicable at various levels, from individuals to societies, organisations, and communities. However, the theory's application to socially or politically embedded problems like health is complex. For example in Public Health, formal evidence may need to be adopted by policymakers first, before it is pushed onto society. In addition, the process of the social adoption of knowledge may be induced and maintained by legal enforcement (e.g. outlawing smoking in public buildings), rather than by members of the public voluntarily imitating influential members of their community.

Further, a commonly cited weakness of the original DoI theory is that it addresses a one-way mode of knowledge transfer, i.e. from the knowledge producers to the knowledge users. In practice, most knowledge is spread through a two-way exchange between the producers and the users. This critical point is noted in Roger's later publications (Rogers 2010). However, he argues that perceptions of this weakness in the theory are partly a result of years of scholars placing needless limitations on the scope, the definitions, and the methods of understanding the concept of diffusion. Therefore, his updated conceptualisation of the theory depicts it as encompassing a convergence of different types of diffusion, so that both the simple type of diffusion in which knowledge is transferred from one person to another and the complex one in which the participants exchange information to reach a mutual understanding is compatible with the theory. The later description of knowledge diffusion is more akin to how knowledge is established in public health.

However, despite the long history going back to the 1900s, "it was not until 1969, that scholars from fields like public health began to look at diffusion research more seriously (Dearing and Kee 2012). Therefore, studies of diffusion or implementation specific to public health are a relatively new phenomenon. Regardless, the DoI is considered the single most influential theory in the broader field of knowledge utilisation of which implementation science is a part (Nilsen 2015). Thus, it narrates the mechanisms through which interventions are taken up, and knowledge is disseminated.

2.2.2 Dissemination

Unlike the seemingly uncontrollable mode in which ideas diffuse, "the process of dissemination is concerned with the conscious effort of spreading new knowledge, ideas, policies and practices to target audiences or the public at large" (Green et al. 2009). However, at the population level, the influential players of the diffusion of knowledge process are not always individuals. They include policymakers and special interest groups such as charities, professional membership bodies, and commercial and civil society

groups. Therefore, dissemination efforts target these influential mediators as well as the public as the end users of the knowledge.

Some of the key influencers of dissemination work include Weiss and Bucuvalas (1980), who showed that there were many factors other than the availability of sound evidence that affects decision making in policy. Weiss's work demonstrated that the links between evidence of effectiveness (e.g. research evidence) and the adoption of programmes at policy level were weak. Moreover, where evidence influenced policy, it did not do so as the catalyst but rather, through a convoluted process of practical learning over time.

Further, one of the key concerns of disseminated knowledge is that its implementation tends to deviate from the intended use, and it may even take new forms (Green et al. 2009). This discrepancy raises effectiveness and ethical questions about whether the intended programme outcomes for such programmes can ever be achieved, and if not, whether implementing them is ethical or worthwhile. Therefore, new approaches are needed to accelerate the rate at which existing and emergent knowledge can be implemented in health-related settings around the world (Chaudoir, Dugan, and Barr 2013) but also on how they can effectively be put into practice, i.e. implemented. This thesis is concerned with how successful implementation and sustainability of community based public health programmes can be achieved. The next section will cover the key issues around the concept of implementation.

2.3 Implementation: Some key concerns

a) Conceptual issues

Although the lessons learned from the studies of implementation in other fields can be applied to public health, it is still not clear how well they translate to settings with different historical origins and customs like public health (Aarons, Hurlburt, and Horwitz 2011). Therefore, debates around the implementation of public health programmes start with basic questions around terminology and conceptual definitions before moving on to more

complicated queries such as the means with which we can improve or measure implementation. Consequently, one of the primary concerns is the variation in terminology and the lack of consensus on what key concepts refer to and this includes the term implementation (Rychetnik et al. 2002; Shelton, Cooper, and Stirman 2018; Proctor et al. 2015; Proctor et al. 2011).

In its guidance for process evaluation for complex interventions, the Medical Research Council (MRC) defines implementation as "the structures, the resources and the processes through which delivery is achieved, as well as the quantity and quality of what is delivered" (Moore et al. 2015). However, they also note that when implementation is described in this way, it refers to both the delivery of a programme during the evaluation, (i.e. the trial period) and that during post-evaluation, (i.e. the scale-up period). Therefore, it addresses the questions of 'what' and 'when.' However, the MRC clarify that their guidance refers to evaluation during the trial period.

The Durlak and DuPre (2008) review also refers to the trial period, but for them, implementation is also about what a program consists of when it is delivered in a particular setting. By introducing the concept of "setting," this definition extends the boundaries of the concept from being about "what" has been delivered and "when," to include "where" it has been delivered, i.e. the programme's context. In public health programmes, contextual adaptability and external validity are as important as the fidelity of implementation and internal validity (Green 2008). The definition proposed by Linnan and Steckler (2002) also alludes to the issue of context, and it extends the boundary further to the idea of fidelity or degree of implementation. For them, implementation is a combination of *reach* (who participated), *dose* (what the programme implementers delivered), *dose received* (what the participants received) and *fidelity* (the quality of the intervention delivered).

The "setting" or "context" debate is a key principle of theory-driven implementation science, which is often informed by realist philosophy. Thus, it extends the boundary from where to include "to whom" the programme has been delivered. The argument is that the choices that programme recipients

make about the programme should be of material consideration in evaluation (Pawson and Tilley 1997). The assumption is that interventions do not work simply for being what they are, but it is the interpretations of their subjects that produce results. In addition, the contextual environments of the recipients and the interventions influence those interpretations. Therefore, programmes work by introducing new ideas and resources into an existing set of social relationships. Consequently, "a crucial task of evaluation is to include investigations of the extent to which these pre-existing structures enable or disable the intended mechanisms for change" (Pawson and Tilley 1997: 70).

Other definitions of implementation are more pragmatic for example, "to carry out, to accomplish, to fulfil, or to give practical effect to a plan" (Lane 1983). However, Lane also note that the reference to a plan introduces practical questions such as: what if only a part of the plan is implemented? At what point does a programme qualify as having been sufficiently or insufficiently implemented? What is non-implementation? Is it the failure to achieve programme goals? Or is it programme malfunctioning? Or the bringing up of unintended outcomes? Or the accomplishment of dysfunctional goals?. "It seems then that the concept of implementation belongs to a set of concepts which are characterised by a surface clarity but at the same time comprise problematic deep structures" (Lane 1983).

Granted these seemingly endless questions and the associated variety of possible answers, it is necessary for researchers to clarify what implementation means in their studies. In this thesis, I am concerned with implementation in the post-trial period rather than during it. However, I acknowledge that many of the concepts and issues that apply to implementation during a trial also apply to post-trial implementation. In addition, the implementation literature is not organised around such a distinction. For example, concepts such as *fidelity*, or *participant engagement* apply to both, so that they may be discussed on their broad meanings. However, other concepts, e.g. evaluation, have different purposes and so they may have different meanings depending on whether they are applied to

a trial or a post-trial programme. This means that in a thesis like this, such a distinction may be confusing or unhelpful. Therefore, the distinction is given with the intention of giving the reader clarity about the referent of the thesis, rather than to serve as a strict limitation of meaning.

Against this background, I adopt both the MRC's definition of implementation and the wider dimensions of implementation, which have been identified in the definitions of the authors discussed in this section. Therefore, in this thesis, implementation refers to the structures, resources and processes through which delivery is achieved, and the quantity and quality of what is delivered (Moore et al. 2014). I also add the realist concern of "to who," "where," and "how." These extra dimensions of implementation, lead on to the next debate in implementation science, namely fidelity versus adaptation.

b)   Fidelity versus adaptation

Evidence suggests that if an innovation is adapted to the local context, it is more likely to be successfully implemented and routinised (Greenhalgh et al. 2004). At the same time, without the highest level of fidelity to the original research, positive results are less likely to be replicated (Greenberg 2005). However, fidelity levels do not reach 100%, and several surveys and larger studies of diffusion indicate that providers frequently modify programmes during implementation (Durlak and DuPre 2008). Therefore, it is unrealistic to oppose adaptation categorically, even for the best of conceptual or empirical reasons (Ringwalt et al. 2003). This means that a certain level of adaptation in community-based public health programmes is inevitable (Moore et al. 2015; Rogers 2003)

Chambers, Glasgow, and Stange (2013) go further to argue against the assumption that programme adaptation is counterproductive. As part of this argument, they dismiss two phenomena namely, "programme drift" and "voltage drop." In programme drift, the expected effect of an intervention is presumed to decrease over time as practitioners adapt the delivery of the intervention, while in 'voltage drop,' the programme's effect is presumed to decrease as testing moves from efficacy to effectiveness and dissemination

and implementation research. They also reject the assumption that interventions "can be optimally constructed in the early stages of development and testing process (i.e. during the trial), and independent of their contexts" or that quality assurance is about avoiding deviation from set protocols (Chambers, Glasgow, and Stange 2013).

Instead, they argue that the most compelling evidence on the maximal benefit of any intervention can only be realised through ongoing development evaluation and refinement in diverse population systems. Consequently, for them, the implementation process is about identifying the best way of implementing the protocol by making the correct adaptations according to the contexts rather than through implementing faithfully to the trial version of the programme. Hawe, Shiell, and Riley (2004) also argue that interventions which are made more responsive to their local contexts will potentially be more effective. This means there is some agreement in the literature, that "adaptation is not only common, it is also important to the outcomes of the intervention"(Durlak and DuPre 2008). At the same time, there are substantial unresolved empirical tensions relating to the nature of fidelity and the need for adaptation (Moore et al. 2015).

Therefore, since adaptation has both a negative and a positive effect on implementation outcomes, it is difficult to ascertain what levels of adaptation achieve what and when. Durlak and DuPre (2008) conclude that more research to identify the core components of programmes that are related to positive outcomes will help to determine which programme features should be executed with fidelity and which ones can be modified to suit conditions. The need to determine levels of fidelity or adaptation represents the next key concern of implementation science, the measures of the implementation process.

c)   Measures of implementation

The conceptual and the terminological challenges that were discussed in section 2.3a) plus other factors such as the diversity in types of interventions, types of communities involved, and types of contexts in which these

programmes are implemented, all complicate efforts to develop standard ways of measuring the processes of implementation. The literature acknowledges a general paucity of reliable or validated measures (Shelton, Cooper, and Stirman 2018; Durlak and DuPre 2008). However, Chaudoir, Dugan, and Barr (2013) cast doubt on the idea that a standard measurement method which can apply to all types of intervention could ever be achieved.

In their review Proctor et al. (2011) report that studies of implementation use a wide variety of approaches to measuring how well a new mental health treatment program or service is implemented, with some using client or patient level outcomes, others using the targets of the implementation, and others assessing outcomes in terms of improvement in process of care. Similarly, Rychetnik et al. (2002) identify multi-dimensional approaches for evaluating outcomes research. These include the strength of evidence, determined by a combination of the study design, methodological quality, statistical precision, the magnitude of the measured effects, and the relevance of the measured effects to the implementation context. They suggest that this approach could be expanded to consider issues of intervention theory, intervention implementation, and monitoring in the evaluation process. However, Chaudoir, Dugan, and Barr (2013) note that these measurement challenges stem from a heterogeneity across theories and frameworks that guide implementation (refer to section 2.4). Durlak and DuPre (2008) suggest that one of the ways of addressing these measurement challenges is to increase the capacity of researchers to conceptualise and measure constructs that are thought to affect implementation outcomes.

d)   Gaps in knowledge

The prospects for improving and sustaining successful public health interventions require the identification of the key components of the interventions that are effective, for whom, and under what conditions (Linnan and Steckler 2002). Thus, the measurement and interpretation of evidence depends on the availability of adequate information on interventions and their contexts (Rychetnik et al. 2002). However, Linnan and Steckler (2002) note

that only a limited number of studies disentangle the factors that ensure successful outcomes, characterise the failure to achieve success, or attempt to document the steps involved in achieving successful implementation of an intervention. In addition, the majority of prevention research studies do not include implementation as a component of their evaluation. Durlak and DuPre (2008) note that 68.5 per cent of the programs in their study were described too broadly to be replicated and very few included measurement of treatment fidelity.

In their review, Mowbray et al. (2003) found that most articles lacked detail about how their fidelity criteria were derived. For McIntyre et al. (2007), only 35 per cent of the school-based intervention studies that they reviewed provided an operational definition of their intervention either by description or by reference to a manual and only 15 per cent systematically measured and reported levels of treatment integrity. Similarly, Rychetnik et al. (2002) found that none of the 17 checklists that they say are in common use to assess the quality of evidence for a public health intervention contains details on how the differential effect of context (however defined) could be taken into account.

Therefore, the key challenge of knowledge advancement in this field lies in both these deficits of information, and in the "the emergence of a variety of evaluation and other types of implementation theories models and frameworks" (Nilsen 2015). At the same time, the models, frameworks and theories of implementation are also indicative of knowledge advancement towards achieving standardised and reliable ways of measuring implementation.

2.4 Models, frameworks, and theory-driven evaluations

There is such a plethora of theoretical approaches to implementation that some researchers have complained that it is difficult to choose which one to use (Nilsen 2015). The work of Nilsen is a notable effort to support researchers with how to navigate implementation models, frameworks, and theories.

a) Implementation Models

In his review, Nilsen identifies three aims and five categories of theoretical approaches to implementation science. The first aim is to "describe and/or guide the process of translating research into practice. This is a key aim of the approach that falls into the category he calls "process models." The second aim is to understand and explain what influences implementation outcomes. This is a typical aim of the approaches that fall into one of three categories, namely determinant frameworks, classic theories, and implementation theories. The final aim is to evaluate implementation, and this is the central aim of the fifth and final category called evaluation frameworks." (Nilsen 2015).

Figure1 illustrates the relationship between the aims and the categories. The three aims are represented in the second tier of the figure, and the categories are indicated under their respective aim.

Figure 1: The three aims and categories of the theoretical approaches in implementation science. Adapted from Nilsen (2015)
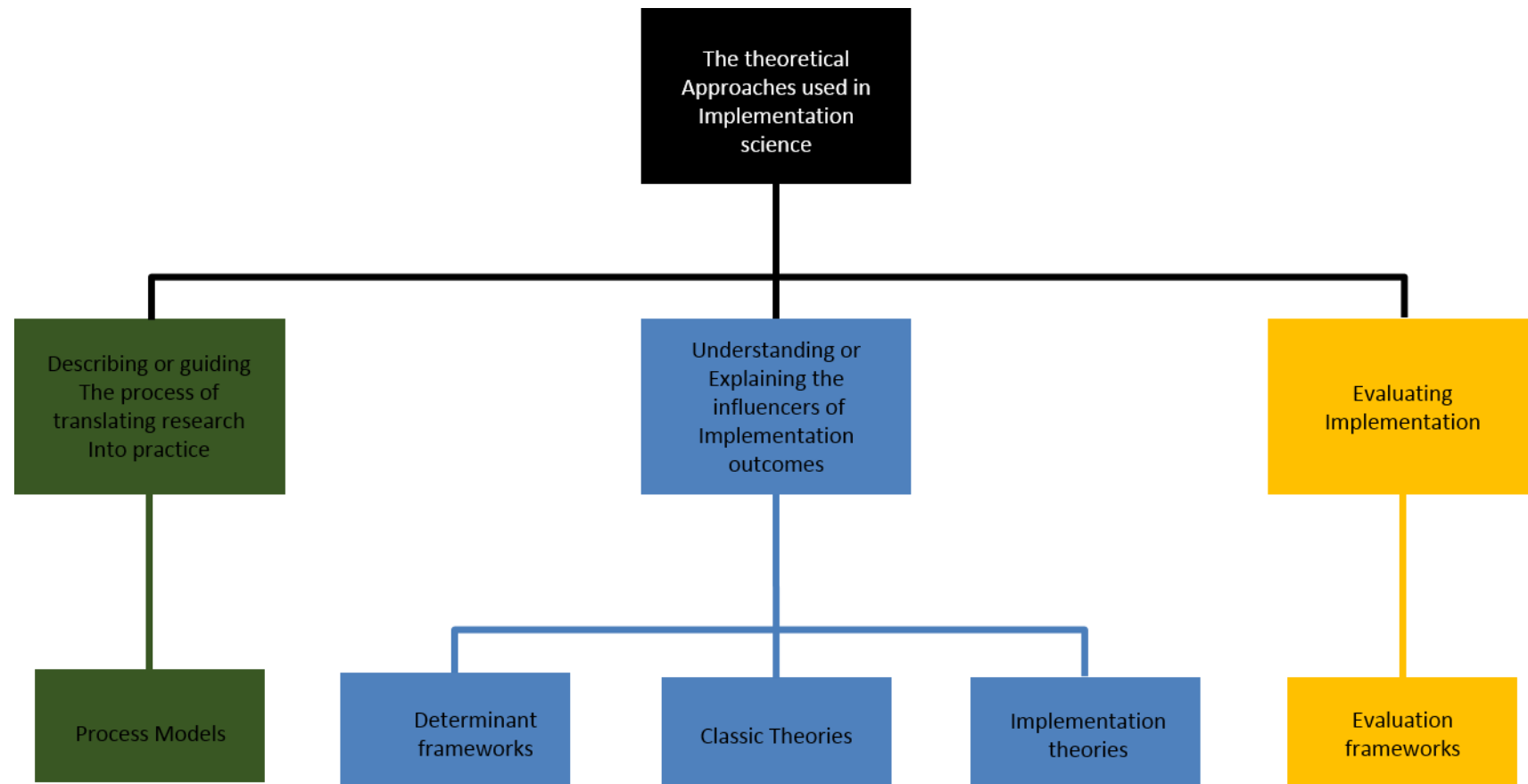
Process models specify the steps, stages, or phases of the process of translating knowledge to practice. The majority of the models that Nilsen identify in their paper either relate to the process of translating general research knowledge into practice, or are specific to health care such as nursing. However, the Knowledge-to-Action (K2A) model developed by Wilson et al. (2011) is specific to public health. In this model, Wilson and colleagues aim to describe the high-level processes, which are necessary to move knowledge from discovery into action in public health. The model recognises the temporal sequence of events, so they identify three phases namely; research, translation, and institutionalisation. Within these phases, there are crucial points such as deciding to translate the knowledge, transforming it into actionable products, developing appropriate supporting structures for it, and disseminating it to potential adopters.

As is acknowledged by Wilson and colleagues, and it is noted by Nilsen, that this model is descriptive of the process of implementation but it is not causal, or theoretically predictive of outcomes. Therefore, researchers and implementers can use it to organise and coordinate the process of implementing public health programmes. However, it is not useful for determining what factors influence successful implementation, or how the identified processes influence outcomes.

Many of the models that Nilsen identifies are from inter-disciplinary backgrounds, e.g. psychology or organisational theory and management. In addition, they are situated in the context of large formal institutions, e.g. hospitals. However, as will be explained in the study specific-research questions of Study I, (see section 4.2), this thesis also aims to find out whether there is a process of successful implementation that is specific to community-based public health programmes. The findings will be presented in section 4.6.1.

b) Determinant Frameworks
Determinant frameworks go further than the descriptive aims of implementation models in that they aim to understand and/or explain the

influencers of implementation outcomes through, for example, predicting them, or interpreting them retrospectively (Nilsen 2015). The frameworks can also specify relationships between some types of determinants.

Nilsen and colleagues identify a variety of determinant frameworks, most of which cover clinical organisational settings, but also education psychology, general diffusion, and dissemination of knowledge and behaviour change. Three of the most relevant models to community-based public health programmes from their list are; the Promoting Action Research Implementation in Health Services (PARiHS) framework developed by Rycroft-Malone (2004), the ecological framework by Durlak and DuPre (2008) and the Consolidated Framework for Implementation Research (CFIR) by Damschroder (2009).

In the PARiHS framework, successful research implementation is a function of the relationships among three elements namely, evidence, context, and facilitation. The dynamic relationship between these elements is that Implementation (SI) is a function (f) of the nature and type of evidence (E), the qualities of the context (C) in which the evidence is being introduced, and the way the process is facilitated (F); $SI = f(E, C, F)$. The proposal is that for implementation of evidence to be successful, there needs to be clarity about the nature of the evidence being used, the quality of context, and the type of facilitation needed to ensure a successful change process (Rycroft-Malone 2010)

For the Ecological Framework, (Durlak and DuPre 2008), the idea is that implementation is influenced by variables present in five categories namely: innovations, providers, communities, the prevention delivery system (e.g., features related to organisational capacity) and the prevention support system (e.g., training and technical assistance). In certain optimal conditions, the variables in these five categories interact and lead to effective implementation.

The third determinant framework, the CFIR, is an overarching typology made up of constructs from 19 key implementation theories and frameworks

(Damschroder et al. 2009). These constructs were identified from their frameworks using criteria such as the strength of their conceptual or empirical support for influence on implementation, their consistency in definitions, or their potential for measurement. Here, the factors that influence the success of implementation are located in five domains. The first is the process by which implementation is accomplished. The second is the characteristics of the intervention. The third is the inner setting (e.g. the structure of the organisation). The fourth is the outer setting, which is the structural political and cultural context in which the intervention is delivered. The fifth is the characteristics of individuals involved with the intervention or thr implementation the process.

One of the study-specific research questions of the upcoming Systematic Review Chapter 4 was to find out whether the factors that the Systematic Review had found to influence successful implementation of community-based public health programmes were reflected in existing implementation frameworks (see study-specific research questions in section 4.2). This question was achieved by mapping the findings of the Systematic Review onto the CFIR. I chose the CFIR because it consolidates constructs from 19 key implementation frameworks, which means that it is more likely to capture important constructs than a single framework. Therefore, the CFIR and the findings to this question are discussed in more detail in section 4.6.2

All three frameworks, the PARiHS, the Ecological Frameworks and the CFIR, are similar in that they identify the domains in which the variables that support successful implementation are located. The identified domains include in some form, the context, the intervention, the support, and the resource systems around the intervention. Thus, researchers and implementers can use these frameworks to understand what areas to pay attention to, to enhance the outcomes of their implementation.

However, these frameworks are not adequate for explaining how the variables in the identified domains work to achieve which types of implementation outcomes, also known as *causal mechanisms*. In addition,

the multi-disciplinary approach of these frameworks poses some challenges on how to apply them to particular situations. Damschroder et al. (2009) note that not all of the constructs of the CFIR are relevant to every situation, so researchers or implementers may need to make choices of what is relevant to their case. Therefore, there is no definitive or standard way of prioritising the constructs either within or between frameworks. For example, are the characteristics of the individuals in the CFIR more important than, or just as important as the inner setting of the organisation? or are they more important or just as important as the quality of facilitation in the PARiHS framework? In addition, how does one affect the role of the other? The different assumptions of individual constructs in the same or in different frameworks highlight the different assumptions that the frameworks have, and so they have implication on how they can be used (Nilsen 2015). However, these challenges withstanding, these frameworks provide a base from which theory development and verification about what works, when and where across multiple contexts can take place (Damschroder et al. 2009).

c) Evaluation frameworks

This category includes frameworks whose key purpose is to evaluate implementation. Unlike the determinant frameworks, which are concerned with successful implementation, evaluation frameworks identify the aspects of implementation that ought to be evaluated to assess the implementation. Two frameworks that are relevant to community-based public health programmes are the Reach, Effectiveness, Adoption Implementation, and Maintenance (RE-AIM) framework developed by Glasgow, Vogt, and Boles (1999) and the Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation-Policy, Regulatory, and Organisational Constructs in Educational and Environmental Development (PRECEDE-PROCEED) (Green and Kreuter 2005).

Researchers and implementers can use these frameworks as structures against which they can assess the quality of what they have implemented. However, just like the determinant frameworks, evaluation frameworks do not explain the causal mechanisms of successful implementation. This though, is

the gap that Nilsen's final category of theories and another methodological approach called theory-driven evaluation, try to address.

d) Theory-driven evaluations

While the evaluation frameworks focus on identifying what aspects of implementation, ought to be evaluated, theory-driven evaluations aim to understand how a programme worked, for whom, and where. As will be explained in Chapter 3, this PhD thesis is informed by realist philosophy. Therefore, the theory-driven approaches which are underpinned by the critical realism philosophy of Bhaskar (2013), commonly known as realist evaluations, are of particular interest. Their proponents include Bickman (1987), Weiss (1995), Chen and Rossi (1992) and Pawson and Tilley (1997).

Realist approaches characterise the environments in which community interventions are implemented as inherently complex. In this approach, the social world can be categorised into three domains. The *actual*, which in implementation science terms, we can say is the intervention, the *real*, e.g. the *causal mechanisms,* and the *empirical*, i.e. the change that we can observe, i.e. the programme outcomes (Bhaskar 2013; Pawson and Tilley 1997; Lacouture et al. 2015). Central to the realist approach is the idea that the contextual environment in which community programmes are implemented is home to hidden, but real *causal mechanisms*, which have observable effects on programme outcomes (Pawson 2013).

Inspired by Bhaskar's depiction of the social world, Pawson and Tilley's realist evaluation work is concerned with uncovering the *mechanisms* through which an intervention is expected to produce its effects in particular contexts*,* and how they produce *outcomes.* In realist terms, it allows researchers to identify what are called Programme Theories (PTs) and these include identifying what interventions work, when, for who and where. Thus, unlike general theories of implementation, Programme Theories are potential explanations which are localised to the programme, and they aim to explain how a programme is intended to achieve the outcomes.

Pawson and Tilley (1997) go further, and link the roles of the programme participants to the programme's forces of causality. For them, it is not programmes which "work" as such, but people co-operating and choosing to make them work. Thus, programmes work *through* their subjects' *liabilities.* In advocating for realist approaches to evaluation, Pawson and Tilley note some weaknesses of experimental methodologies that may overlook the "liabilities" "powers" and "potentialities" of the programme's subjects, while seeking to explain their behaviour. In this thesis, I subscribe to critical realist philosophy, particularly its emphasis on taking into account the contexts in which interventions are implemented. However, although the thesis is not a typical realist project that seeks to explain why, how and when a particular intervention works, it is informed by the approach, and it is used to develop retrospective explanations of some of the findings of the studies. More details on this are explained in Chapter 3.

2.5 Contemporary Theories

a) Theories of implementation

Granted the developments in programme theories, one of the reasons why it is difficult to understand and explain how and why the implementation of evidence-based programmes succeed or fail on a general level, is that there is no overarching theory of implementation. This limits the potential to identify factors that predict the likelihood of implementation success or to develop strategies for more successful implementation (Nilsen 2015). The Diffusion of Innovations theory (DoI) discussed in section 2.2.1 is considered the single most influential theory in the broader field of knowledge utilisation of which implementation science is a part (Nilsen 2015). However, "it seems unlikely that there will ever be a grand implementation theory since implementation is too multifaceted and complex a phenomenon to allow for universal explanations" (Nilsen 2015).

The lack of a general theory of implementation means that a variety of interdisciplinary theories such as social cognitive theories, theories concerning cognitive processes and decision-making processes, networks

theories, communities of practice theories, and organisational theories can all be used to explain implementation in some fashion (Nilsen 2015). For example, on the basis of the critical realist philosophical approach to knowledge that I have taken in this thesis, the theory of Social Reflexivity (Archer 2007) is used to understand some of children's responses to the programme, while in chapter 10, the results of this thesis are understood in light of, and presented as extending the general theory of implementation (May 2013).

b) The Theory of Social Reflexivity

The theory of social reflexivity by Archer (2007) links individual thought and action to explain how individuals may arrive at decisions to take certain actions. Archer notes that reflexivity (or conversations with oneself) is the regular exercise of mental ability that is shared by all normal people. Thus, individuals consider themselves in relation to their social contexts through the reflexivity process. In doing so, they become active agents who can exercise some governance in their lives, as opposed to being passive agents, to whom things happen. However, being an active agent depends on the fact that individuals develop and define the ultimate concerns on which they act. Therefore, each person seeks to develop a concrete course of action (known in the theory as projects) to realise that concern.

In terms of process, Archer argues that the subjective power of reflexivity mediates the role that objective structural and cultural powers play in influencing social outcomes. As a result, each social action that an individual takes is the visible manifestation of what were previously projects of that individual's reflexivity. This means that social actions cannot take place without the prior reflexive processes. Consequently, every human attempt to pursue a social project entails two sets of causal powers: *an individual's own,* and those pertaining to part of what she calls *natural reality.* The outcome depends on the relationship between these two set*s* of causal powers. Therefore, once the causal powers of *structural* or *cultural* properties in natural reality are activated, they will obstruct or facilitate an individual's project to varying degrees.

At the same time, inner deliberations about such obstructions and facilitations are governed by our own fallible descriptions. Therefore, people often have both the capacity to sabotage what is in their own interests by engaging in inappropriate action, or by circumventing positive activities.

Therefore, Archer's theory supports the understanding of the processes that lead individuals to be involved or not in an intervention (whether as implementers or as recipients) or how they engage in certain health behaviours or not. This can help us understand how we can influence the adoption of interventions, change of behaviour, or how we can improve participant engagement. However, the theory's focus on individuals means it has a limited potential for predicting or understanding collective behaviours such as low rates of uptake of an intervention by teams or organisations and these are relevant to outcomes of implementation.

c) The Normalisation Process Theory

While Social Reflexivity theory supports an understanding of individuals in an implementation environment, Carl May's Normalisation Process Theory (NPT) (May et al. 2009) accounts for implementation through analysing the social (or collective) production and organisation of work (i.e. implementation), the process of making practices into routine elements of everyday life, and of sustaining embedded practice into their social contexts (integration).

The key components of the NPT are coherence, cognitive participation, collective action, and reflexive monitoring. *Coherence* is where a practice (in the case of this thesis, of implementing the ASSIST programme) is made possible by a set of ideas about its meaning, uses and utility, by socially defined and organised competencies. These meanings and competencies hold the practice together and make it possible to share and enact it. This leads to either the inhibition or the promotion of the actor's (in this case the implementer's) apprehension of a practice as meaningful. Actors also define or assess the practice by its differences from other practices, a process called differentiation (May et al. 2009).

Cognitive participation relates to purposive interaction chains that make up an implementation process. This involves collective purposive action aimed at a goal, where goal orientation includes resistance, subversion, or reinvention as well as affirmation and compliance, but it also always involves some effort around the practice of play. Actors (or implementers) position themselves for the interactional and material work of *collective action.* Enrolment could be mandatory or negotiable. The component of *reflexive monitoring* is about the continuous formal and informal evaluation of the practice by participants in the implementation process, and the formality and intensity of this monitoring work reflects the nature of their *cognitive participation* and *collective action.*

The NPT accounts for how programmes are successfully implemented within institutional settings. However, its application to implementation in less-formal environments, e.g. communities could be limited. For example, the concept of collective or social production and organisation of work is easily defined in an organisation or among professionals. However, it is less clear how these manifest where implementation involves a variety of individuals in non-standard, perhaps resource-constrained environments, e.g. communities. Regardless, this theory is one of the key contributors to May's evolving work towards a general theory of implementation.

d) The General Theory of implementation

Carl May's work (May 2013) towards the general theory of implementation is an advancement from the middle-range NPT. It is an explicit effort towards developing a 'grand theory' specifically on the implementation of health interventions. The aim is to produce a robust set of conceptual tools that enable researchers and practitioners to identify, describe, and explain important elements of implementation processes and their outcomes. The theory is developed through linking and integrating constructs from several theories from the disciplines of sociology and psychology to describe and explain elements of implementation. The general theory has four constructs namely capability, capacity, potential, and contribution. These constructs are linked into four propositions of the theory as is illustrated in Figure 2.

Figure 2: Constructs and propositions of the general theory of implementation. adapted from May (2013).
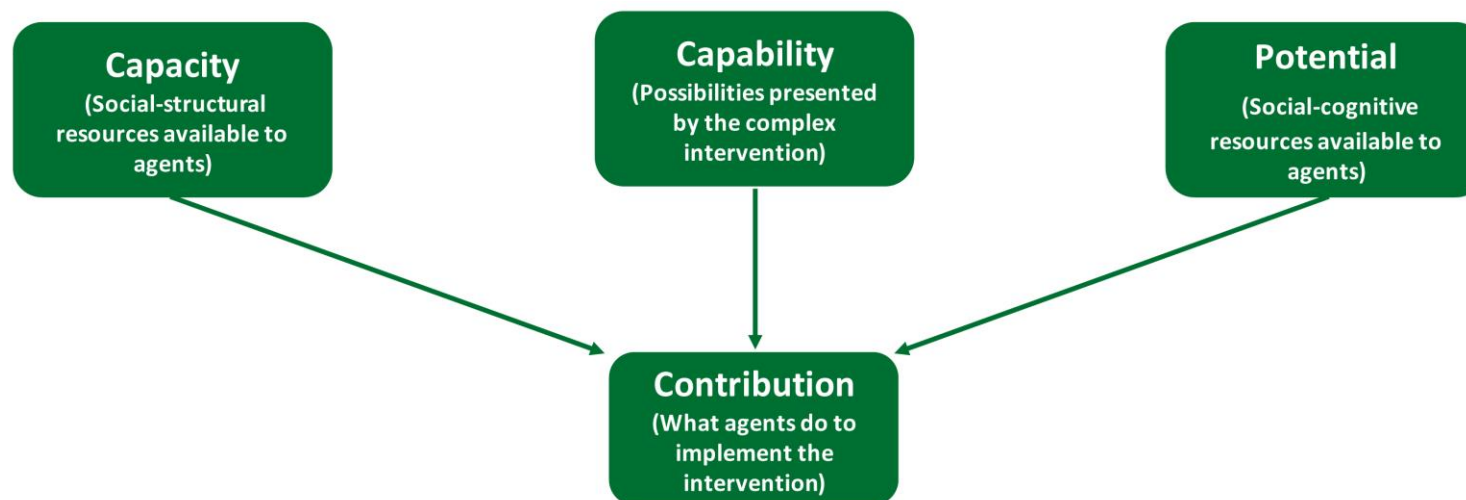
Agents = Individuals or groups that interact with each other and between whom Information and other resources about the intervention flow.

The Propositions

1. Capacity : The incorporation of a complex intervention within a social system depends on agents' capacity to cooperate and coordinate their actions.
2. Capability : The capability of agents to operationalise a complex intervention depends on its workability and integration within a social system.
3. Potential : The translation of capacity into collective action depends on agents' potential to enact the complex intervention.
4. Contribution : The implementation of a complex intervention depends on agents' continuous contributions that carry forward in time and space.

In the theory, implementation is conceptualised as a social process, and the central claim is that social and cognitive processes of all kinds involve social 'mechanisms' that are contextualised within social systems and from which spring expressions of agency. Therefore, an intervention's *capability* is operationalised by agents through the social practices that they perform (workability), and their success at this depends on whether the intervention can be integrated into the social structure in which the intervention is being implemented.

The *capacity* of the implementation of a complex intervention occurs when agents deliberately attempt to initiate its incorporation within a social system, in a way that modifies the operation of that system and changes its possible outcomes. However, the translation of capacity into collective action or *contribution* depends on the agents' *potential* to enact the complex intervention, and this carries forward in time and space.

Although this theory represents a notable step towards an overarching theory of implementation, it remains emergent, and it is yet to be tested. Moreover, the integration of constructs from social theories with those from psychology introduces further challenges to the prospects of developing standardised measures of implementation in that relative importance of the two may be hard to distinguish. May also acknowledges that the multi-discipline method of building the theory is emergent and untested, but perhaps this also reflects the conceptual complexities of implementation science that have been discussed in section 2.3.a)

2.6 Programme Sustainability

a) Conceptual challenges

There is increasing recognition that the extent to which new programmes are sustained is influenced by many different factors (Stirman et al. 2012). Little is known about how well or under what conditions health innovations are sustained, and their gains maintained once they are put into practice (Proctor et al. 2015). However, the term sustainability is conceptualised in a variety of ways, and this has implications for the advancement of knowledge on

programme sustainability. In its simplest form, sustainability refers to the longer-term implementation of interventions. Therefore, all the issues that have been discussed as challenges of implementation (section 2.3) apply to both long and short-term implementation.

Definitions of sustainability though, go beyond the longevity of delivery, and they can stem from the variety of domains in which public health interventions occur. For example, Gruen et al. (2008) note that in community development, sustainability is about the capacity of the community and individuals to maintain changes in, say, a health behaviour. In health promotion, it is as much about the maintenance of the intended health benefits over time, as it is about the longevity of the operations of the intervention. In organisational change however, sustainability can be about how well interventions have become institutionalised in organisations or health and social systems.

Gruen et al. (2008), propose that sustainable health programmes should be regarded as complex systems that encompass the programmes, the target health problems, and the programme drivers or key stakeholders including the target communities. Similarly, in their review of sustainability Schell and colleagues (2013) define sustainability capacity as: the existence of structures and processes that allow a programme's supporters to leverage resources to effectively implement and maintain evidence-based policies and activities.

Unsurprisingly, these diverse definitions of sustainability lead to further diversity in planning for, monitoring, or evaluating sustainability. Moreover, they suggest a complex relationship between sustainability, the process of implementing interventions, the context in which it is implemented and the resources available for it. Therefore, despite the fact that process models described in section 2.4a) depict sustainability as the last stage of the implementation process, recent recognition of the dynamism of the process of implementation have moved away from thinking about sustainability as the end game, to seeing it as an ongoing dynamic process (Shelton, Cooper, and

Stirman 2018). In this type of conceptualisation, the process of sustaining the programme is intertwined with that of implementing it.

Moore et al. (2017) make a comprehensive attempt to define sustainability. Their work draws on and synthesises definitions of sustainability from over 200 studies. They conclude that sustainability includes five constructs 1) that after a period of time 2) the programme continues to be delivered, 3) that individual behaviour change is maintained, 4) that the programme may adapt while 5), continuing to produce benefits for individuals or systems. When it is conceptualised in this way; then sustainability is a dynamic part of the implementation process. However, this conceptualisation of sustainability introduces the risk that the concepts of implementation and sustainability become conflated. At the same time, the results of programme evaluations and research suggest that "sustainability must be studied as a distinct and dynamic phenomenon" (Stirman et al. 2012). Therefore, separating the concept of implementation from that of sustainability while also acknowledging their inter-connected nature is an enduring challenge in this thesis and in the literature, and it is a challenge that some frameworks of sustainability also attempt to resolve.

b) Frameworks, models and general conceptualisations of programme sustainability

The frameworks, models, and conceptualisations of sustainability are similar to the implementation frameworks and models (section 2.4) in that, they too seek to describe the process (of programme sustainability), and to identify the domains in which variables that influence sustainability are located. One of the early attempts to conceptualise sustainability is that by Shediac-Rizkallah and Bone (1998). This framework suggested that the potential influencers of sustainability derive from three major groups of factors: (1) project design and implementation factors, (2) factors within the organisational setting, and (3) factors in the broader community environment. On the other hand, Simpson (2011) adopt an integrated approach that incorporates the stages of a process model (i.e. training, adoption, implementation, and practice), with the barriers and facilitators of the

process. They propose that the stages and the influencers of sustainability (e.g. preparation and maintenance) systematically address the common barriers that can reduce what they call innovation success and permanence.

Taking a slightly more explanatory approach, the Dynamic Sustainability Framework (DSF) by Chambers, Glasgow, and Stange (2013) attempts to address what they call the paradox of sustainment and ongoing change. They propose that sustainability is not just about the long-term maintenance of the programme to its original protocol. Rather, it emerges if implementation is delivered as a process of optimising the potential of the programme to its current context. Thus, the variables for sustaining the programme are located in the interactions between the context and the intervention. Therefore, optimised and sustained programmes are inherently those that have been adapted to fit their context as a part of the process of implementing them.

Consequently, sustainability emerges from the ongoing adaptation of interventions, to achieve the fit between the intervention and the multi-level contexts. In addition, implementation is done with the expectation of ongoing improvement rather than of diminishing outcomes over time. Thus, they dismiss the concepts of 'voltage drop' and 'programme drift' (see section 2.3b).

In their nine-domain framework of public health program capacity for sustainability, Schell et al. (2013) include the following: funding stability, political support, partnerships, organisation capacity, programme adaptation, programme evaluation, communication, public health impact and strategic planning. They propose that their framework can help establish a shared understanding of sustainability for practitioners, funders, and researchers across a range of public health areas and that it is responsive to calls for greater theoretical and definitional structure and clarity.

The final conceptualisation of sustainability is from a review by Pluye, Potvin, and Denis (2004). The objective of their review was to re-conceptualise what they called the *structural* and *temporal* dimensions of sustainability. The former relates to where programmes are sustained (for them in

organisations), and the latter relates to the moment they are sustained (i.e. the time). They see organisations as providing a useful structure to reconcile community-based and organisation-based perspectives on sustainability. They found that implementation is characterised by stages, starting with pre-implementation or adoption, followed by process descriptors such as implementation or monitoring and evaluation, and ending with later stage descriptors such as maintenance, institutionalisation, or sustainability.

Therefore, most of the conceptualisations of sustainability reviewed here see sustainability as a phenomenon that is influenced by factors related to the intervention, its wider context, plus the enabling resources available to it, including the people involved. These contribute to knowledge about what programme sustainability is, where the variables that influence it are located, and what they are. Therefore, it supports researchers and implementers with planning for programme sustainability. However, of all the frameworks for sustainability, few have been translated into valid and reliable tools for measuring sustainability (Luke et al. 2014).

However, as will be seen in the next section, these frameworks and conceptualisations do not yet explain how sustainability occurs, so the concern about the lack of a theory of sustainability remains outstanding.

c) Gaps in knowledge

Although there is a growing body of literature on sustainability, it is fragmented, and as with the implementation literature, there is a lack of consensus on the core constructs of sustainability (Schell et al. 2013). In their review of the dissemination and implementation literature, Greenhalgh and colleagues (2004) point out that there is a "near absence of studies focusing primarily on the sustainability of complex service innovations."

The work of Proctor and colleagues (2015) is notable in its effort to identify the gaps in knowledge and other challenges that are associated with sustainability research. They find that the following research areas need to be prioritised; 1) conceptual consistency and operational clarity for measuring sustainability, 2) developing evidence about the value of sustainability, 3)

identifying its correlates and strategies for sustainment, 4) advancing the theoretical base and research designs for sustainability research, and the workforce capacity, 5) advancing a research culture, and 6) improving funding mechanisms for sustainability (Proctor et al. 2015).

A more recent review by Shelton, Cooper, and Stirman (2018) agrees with these priorities, and it identifies similar if slightly varied challenges as fundamental to achieving and studying implementation and sustainability research. These include; 1) fidelity/adaptation versus sustainability (i.e. to what extent can programmes be adapted over time while remaining true to their form?) 2) how to conceptualise and define the term sustainability, 3) how to measure it 4) methodological issues of studying sustainability and 5) the need for rigorously testing sustainability frameworks. However, although significant conceptual work on defining sustainability has been done, there remains a dearth of tools for measuring sustainability.

d) Measures of sustainability

In their work on programme sustainability assessment, Luke et al. (2014) found that only two of seventeen frameworks for sustainability in the public health literature were tools for measuring sustainability, and none of them have been tested for reliability or validity. They argue that reliable and valid tools that are relevant for public health are needed to measure sustainability at the programmatic level. Therefore, their Programme Sustainability Tool (PSAT) was developed to establish the basis for instrument development so that a program's capacity for sustainability can be better assessed in real-world public health settings. However, like many of the frameworks, this tool can only be used to assess or understand the capacity for sustainability but not how it occurs.

2.7 Conclusion

Against this background, both the implementation and the sustainability literature can be described as diverse in how key concepts and problems are defined, yet limited in the tools that can be used to study the problems. This is compounded by the fact that the literature for the two concepts is

developing in a parallel fashion and it is dominated by implementation, even though the two are clearly linked. Creative approaches of studying these concepts separately as well as together are needed in order to capture their own character, but also their relationship to each other, and any existing or emergent knowledge around them. This PhD project represents such an attempt through studying implementation as a stand alone concept, (Study I) and as part of the process, (Studies II, III and IV). Thus, the studies of sustainability II. III and IV are an extension of the study of the implementation process, which was conducted in Study I.

Chapter 3   Methodology

3.1 Introduction

This chapter is intended to facilitate independent assessments of the credibility or otherwise, of the basis on which I make claims of knowledge in the thesis. The nature of what is real (ontology) and the basis on which we consider it to be real (epistemology) have implications on how a credible research project is pursued (methodology). Methodology in, turn has an impact on the methods to be adopted, on the outcome of the investigation, and it has a considerable influence on what is considered to be valid knowledge (Howell 2012).

The chapter has four objectives. The first is to outline and justify the basis for the qualitative methodological approach that has mainly been adopted in this thesis. This will be achieved through clarifying how the qualitative paradigm is in keeping with the research questions of the thesis. The second is to justify how the adopted philosophical positions have influenced the choice of methods. Therefore, the chapter will also explain how the methodology and methods support decisions on what is claimed as knowledge (epistemology) in the thesis and how that has been understood to be such (ontology). This will be followed by an appraisal of both the methodology and the methods, and how anticipated and emergent ethical issues were dealt with in the project.

However, while the chapter covers the overall methodology of the thesis in full, the overall methods are only briefly outlined. This is because the details of the methods and conduct of studies are provided as part of the study reports in chapters 4, 6, 7 and 8.

3.2 Research Paradigm

Decisions on the appropriate methodology and methods were influenced by the research questions of the PhD (section 1.2). They were also influenced by the first two of the three PhD objectives, namely: to understand the implementation processes of community-based public health programmes

and to identify the factors that may have enhanced the sustainability of a school-based public health programme (section 1.3).

In deciding the most appropriate methodology for the project, I considered three factors. The first was the field of investigation. The second was the unit of investigation. The third was assessing the available methodologies for their suitability to the theoretical assumptions of the project and so their capability to underpin the knowledge of the project.

Consideration 1

With respect to consideration 1, the field of implementation science is still emerging, and within it, very little attention has been paid to sustainability. In addition, there is no consensus on how key concepts including "implementation" and "sustainability" are operationalised or how they should be measured. (Hawe, Shiell, and Riley 2004; Rychetnik et al. 2002; Chaudoir, Dugan, and Barr 2013; Proctor et al. 2011) These gaps in knowledge highlight the pertinent areas for inquiry, and they influence what should be asked and how those questioned should be framed.

Further, some questions are amenable to certain ways of inquiry, but not to others. For example, in seeking to investigate "the nature of the process" of implementation, I was looking for explanations relating to what the successful implementation of community-based public health programme is, and how it is achieved. The way this question is framed requires different methods of investigations from what would be used if it was a more quantitative leaning question such as: how can the implementation of community-based public health programmes be measured? Thus, the answers to the questions that I asked could be identified more appropriately through qualitative accounts of the process than from quantitative evaluations of it.

 Consideration 2

The unit of the investigation was community-based public health programmes. Unlike scientific laboratories, community environments are sources of uncontrollable factors, which impinge on the outcomes of interventions or programmes that may be delivered in them. Consequently,

community environments pose additional challenges to programme evaluators, because the programmes are implemented in them are sensitive to features of their local contexts (Craig et al. 2008). In 2000, the Medical Research Council published guidance on what it called "complex interventions", and it updated it in 2008 (Craig et al. 2008). The updated version aimed to address some concerns with the original one, such as that the original guidance was more applicable to experimental rather than to observational methods, and that the definition of the complexity of interventions needs to go beyond the narrow dimension of having multiple components (Craig et al. 2008).

However, concerns remain that the updated version does not adequately reflect the developments in the methodology of evaluation that are based on the idea that many community, behavioural or population level programmes are better explained by the science of complex systems than conventional approaches (Anderson 2008). Given that this project was concerned with population level and community-based intervention, I assessed the ASSIST programme using the seven defining features of Complex Interventions (CIs) identified by Pawson and colleagues (2005).

Firstly, Pawson and colleagues propose that CIs are theories that postulate that if a program is delivered in a particular way, (e.g. the peer education of 12 – 13-year olds), then certain improved outcomes (reduction in uptake of smoking by children) would follow. Second, CIs are active, in that they achieve their effect via the active input of individuals (e.g. trainers, teachers, peer supporters etc.). Third, CIs have a long journey to implementation. In this case, from researchers, policy architects, commissioners, practitioners, managers, teachers to children. The success of the implementation process depends on the cumulative success of the entire sequence of mechanisms as the program unfolds. Fourth, CIs' implementation chains are non-linear and can even go into reverse, so that a top-down scheme can become bottom up. For example; consultations with parents about smoking could result in the incorporation or removal of certain elements of the program. Fifth, CIs are fragile and embedded in multiple social systems for example: a

smoking prevention programme implemented in a religious school could choose to remove controversial material such as the impact of smoking on say, sexual dysfunction, while a non-religious school may actively avoid any religious references. Sixth, CIs are leaky and prone to being borrowed, meaning implementers may consult and amend programs so their theories of how it should work, may differ from researchers as well as participants. Finally, CIs are open systems that feedback on themselves; so, for example, the children positive experience on the programme may encourage other children to want to be involved or vice versa.

The characteristics of programme complexity are perhaps more succinctly laid out as a complexity checklist in Pawson's later work, the Realist Manifesto. In that work, the checklist includes 1) programme Volition which is about the choice and architecture of the programme, 2) Implementation and its entire chain, inconsistencies, blockages, and unintended consequences, 3) Contexts, 4) Time including programme history and timing, 5) Outcomes, 6) Rivalry or the pre-existing policy landscape and 7) Emergence, which relates to emergent effects including unintended consequences (Pawson 2013). This is sometimes known as the 'VICTORE' checklist of complexity.

For the Medical Research Council (MRC), key dimensions of complexity include the number and difficulty required by those delivering the intervention, the number of groups or organisational levels targeted by the intervention, the number and variability of outcomes, and the degree of flexibility or tailoring of the intervention permitted (Craig et al. 2008). Therefore, against the above descriptions of programme complexity, the ASSIST, and other community based public health programmes are complex interventions.

3.3 Causality

In consideration 1, I determined that the answers to the research questions as framed (Section 1.2) would best be identified through a qualitative inquiry. This meant that methodologically, the project was also less suited to positivist approaches to causality in favour of those that are informed by complexity

science. For example, realist philosophy rejects the possibility that social science can ever discover the law-like regularities that underpin positivist views of causality (Sayer 2000). Sayer's realism replaces the positivist regularity model with one in which objects and social relations have causal powers which may or may not produce regularities and which can be explained independently of them.

Therefore, in the realist approach to social science, especially where investigations are related to the uncovering of the nature of the causality in human psychological, social or sociological processes, more weight is placed on the methods that establish the qualitative nature of social objects and the relations on which causal mechanisms depend (Sayer 2000). Thus, in such circumstances, less weight is placed on quantitative methods for discovering and assessing empirical regularities. This means that in this thesis, causality refers to actual causal mechanisms and processes, which are involved in particular events and situations (Maxwell 2012). This approach to causal explanation is sometimes called process theory (Mohr 1982), and it is based on an analysis of the causal processes by which some specific events influence others. Therefore, according to (Maxwell 2012), a small sample or a few case studies can be studied in-depth using textual forms of data, which allow the retention of chronological and contextual connections between the events.

In this thesis, I sought to understand the process factors that affect the implementation and sustainability of public health programmes in their collective as opposed to the identification of quantifiable regularity of patterns relating to how individual variables could cause sustainability. Therefore, the PhD project was an inherently "process" oriented inquiry about human actions, behaviours, and the connected social processes suited to the causal assumptions of realist philosophy. I concluded that a richer understanding of how community-based public health programmes are implemented and sustained could best be achieved through a broad qualitative inquiry capable of paying attention to the programme, its context including sociological

factors, the actors and the recipients involved and how these relate to sustainability.

However, in Study IV (Chapter 8) I sought to analyse secondary questionnaire data that involved 163 children. Since this was an existing questionnaire, I was limited to the data that was on them. Previously, I had hoped that I would be able to conduct some quantitative analysis of the data, for example, to link the anonymised children's demographics, e.g. gender with their responses to certain questions, e.g. the number of conversations they had had with their peers. However, the questionnaires did not collect adequate data on demographics, to enable quantitative analyses beyond descriptive statistics. Consequently, although some level of descriptive statistical analyses of this data was possible this data was largely only amenable to qualitative methods (see section 8.4.3).

3.4 Ontology

The ontological assumptions behind this project were consistent with the key tenet of realist philosophical positions that phenomena exist independent of our theories (or our minds). Consequently, our understanding of it is separate from the actual phenomena (Bhaskar 2008; Sayer 2000). This means that there are always multiple realities, rather than single objective truths. Further, there is a constant interaction between what we think we know and what actually exists. Thus, we update our knowledge of what exists by constantly evaluating what we experience of any phenomena. Therefore, our theories about the world are always grounded in particular perspectives, so that our knowledge is always partial and fallible (Maxwell 2012; Archer 1995) . Consequently, although phenomena exist independent of our minds, what we know of it is always under construction. Thus, in this thesis, ontological realism (the independence of what exists from what we know of them in our minds) is paired up with epistemological constructivism (about how we get to arrive at our knowledge of its existence).

Therefore, I subscribe to the general view that positivist or quantitative modes of inquiry are better for identifying regularity of pattern from which

causal conclusions can be inferred, for example in closed or linear experimental systems (Pawson and Tilley 1997; Sayer 2000). However, they are unsuited to explaining complex, unpredictable, and irregular phenomena from the social and community environments in which complex interventions like community-based public health programmes are implemented.

Therefore, I concluded that by relying on realist ontological assumptions, it is possible to inquire on the nature of complex phenomena such as implementation, to partially understand how it is embedded in its context and how that influences related phenomena of interest such as sustainability. In this thesis, the ontology of the implementation and sustainability of community-based public health programmes is uncovered using a triangulation of evidence and conclusions from multiple investigations and methods (see section 3.6). Synthesis is achieved using the framework analysis developed by Ritchie and Spencer (2002).

3.5 Epistemology

Consideration 3

The third and final consideration involved appraising the available methodologies for their suitability with the objectives and the theoretical assumptions of the project and so their capability to underpin claimed knowledge. Therefore, in line with my ontological realism and epistemological constructivist philosophy (section 3.4), I analysed the collected data with the intention of gaining insight into the causal mechanisms which could contribute to the successful implementation and sustainability of the programme. I also wanted to question how the mechanisms were so and to theorise how they would impinge on the nature of the implementation and the sustainability of the programmes.

However, it has to be noted that although the project shares the epistemological assumptions of realist philosophy and evaluation, it is not a traditional realist inquiry into the causal mechanisms of the programme's effectiveness. For example, the determination that the ASSIST programme was a complex intervention (see consideration 2 section 3.2) justifies the

working assumption that guides the interpretation of much of the knowledge in the thesis, that the implementation processes and the sustainability of community-based public health programmes are embedded in their complex environments. Indeed, the ASSIST programme explicitly intends to harness the social networks of children as vehicles for disseminating smoking prevention messages. Therefore, the positivist philosophical paradigm was deemed less capable of taking into account the complexities of the programme as described in this project (consideration 2) and of supporting the identification or the interpretation of knowledge relating to the research questions as they were framed in this project.

Thus, realist philosophy informs my thoughts about the project, and I use it prospectively to inform how I think about the subject. I also use it retrospectively to explain claimed knowledge. However, I do not use it as a technical tool for arriving at the knowledge itself. Instead, the knowledge is arrived at in a pragmatic fashion, i.e. through triangulating the evidence and conclusions (Yin 2014) from the multiple methods of investigations that are used in the project, and using the framework approach (Ritchie and Spencer 2002), to arrive at the pertinent themes (see section 3.6 below).

3.6 Methods

The original design of the main study within the PhD project was to be a comparative case study between two similar Local Authorities A and B. Local Authority Area A, henceforth called LA (A) was still implementing the programme at the time of study, and Local Authority Area (B) henceforth called LA (B), was no longer implementing it. However, as will be seen in the relevant study report (Chapter 6), due to the retrospective nature of the study plus the fact that more than three years had passed since LA (B) stopped the programme, I achieved only two out of a planned nine interviews in LA (B). I determined that this information was not enough to make a credible comparative case study. Therefore, I amended the design of the project from a comparative to a more detailed case study of LA (A). However, where the

limited data that I collected at LA (B) added insight to the findings, then that information is included in the discussions.

Four studies were conducted using different methods. Study was a Systematic Review of Reviews, Study I

I involved interviewing implementers of the programme, Study III centred on observation of the programme in action at LA (A), and Study IV was an analysis of feedback questionnaires that the children fill in as part of the training to deliver the programme. Sections 3.7.1 to 3.7.4 briefly describe the multiple studies. The full detail of how the methods were operationalised are reported in chapters 4, 6, 7 and 8.

3.6.1 Rationale for the multi-method study approach

Triangulation

This section gives a rationale for the use of multiple methods of investigations and how the evidence obtained from the single studies was integrated. Owing to the complexity of the subject and of the environment in which the programme is implemented discussed in section 3.2, the most appropriate way of approaching the project was to use multiple methods of investigation, to arrive at a triangulated view of reality. This involved comparing the findings and the conclusions obtained using one method (e.g. interviews) with those obtained from another (e.g. observations), also known as triangulation. Yin (2014) distinguishes two conditions in which triangulation occur. In the first one, multiple sources (data triangulation) are synthesised as part of the same study findings. In the second type, the multiple sources are analysed separately, but it is their conclusions that are triangulated (results triangulation). Thus, the first approach involves converging the evidence, while in the second approach, the evidence is non-converging because the studies are treated as separate Yin (2014). Figure 3 illustrates the differences between these two types of triangulation.

Figure 3: Convergence and non-convergence of multiple sources of evidence adapted from Yin (2014)

Convergence of evidence (single study)

Documents	Archival Records	Open ended Interviews

Findings

Observations (direct and participant)	Structured interviews and surveys	Focus interviews

Non-convergence of evidence (separate studies)

Site visits	→ Findings	→ Conclusions
Survey	→ Findings	→ Conclusions
Document Analysis	→ Findings	→ Conclusions
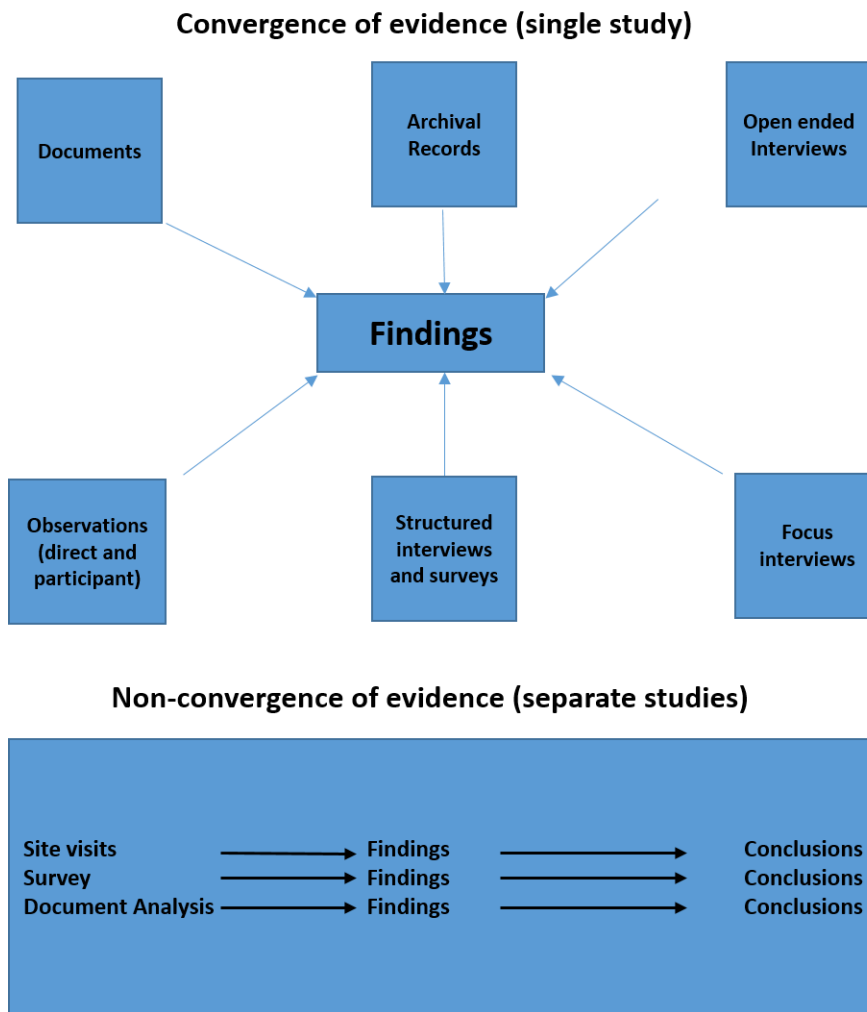
In this project, I used both types of triangulation. I used the triangulation of data to develop the mechanisms of sustainability that make up a key part of the thesis's contribution to knowledge. In practice, this means that the evidence that backs up the mechanisms of sustainability that I ultimately propose in chapter 9, was identified first from the individual studies and second from the collective conclusions of the studies. Chapter 9 explains the mechanisms of sustainability that were built using this process. Table 14 in that chapter illustrates the evidence that was extracted from single studies and its link to mechanisims of sustainability. Table 15: Extracts from the process of identifying the mechanisms from multiple sources of the data

illustrates the process of identifying and linking evidence from the multiple studies to the mechanisms of sustainability

The second type of triangulation was done more broadly through constant comparison of the conclusions of the studies. This type of triangulation can be identified throughout the discussion and concluding sections of studies II, III and IV.

The triangulation of the data and results was an important way of dealing with some of the inherent weaknesses of the project design including those of the chosen study methods. For example, one of the key challenges of the project was that the original plan for a comparative case study design was abandoned due to the inability to trace an adequate number of interviewees from the comparative Local Authority B. Such a design would have strengthened the results through enabling insight into both a programme that was sustained, and a programme that was discontinued at Local Authority Area B. Further, the methods used in the study have inherent weaknesses. For example, the problem of recall bias in interview studies or that of researcher bias during observations. Therefore, given these inherent weaknesses, the triangulation of the findings from the different studies strengthen the construct validity of the methods used in this case study project (Yin 2014).

Sections 3.7.1 -3.7.4 is a preliminary outline of the methods that were used, and more details are provided within the methods section of each study, Chapter 4, 6 7 and 8.

3.7 Methods

3.7.1 Study I: Systematic Review of Reviews

I used this method to understand the process factors of the successful implementation of public health programmes, i.e. research question 1, *what is the character of the implementation process of community-based public health programmes?*

Given the emerging nature of implementation studies, the Systematic Review was the most appropriate method for scoping the subject, and for setting the parameters for the subsequent studies II, III, and IV. Chapter 4 reports on the details from the study protocol, the selection criteria, the search strategy, data analysis and its findings and conclusions.

3.7.2 Study II: Interviews

The qualitative and retrospective nature of this study meant that the most appropriate way of understanding how the programme was implemented and sustained was to collect data from the people who were involved in the implementation process of the programme. Such data could also be collected using methods like face-to-face interviews, telephone interview, or focus group discussions. However, unlike telephone interviews, face-to-face interviews have the advantage of allowing data relating to both verbal and non-verbal communication to be collected (Quinn 2002). In addition, some of the interview topics were linked to the roles that the individuals played in the programme. Therefore, not all interview topics were relevant to all the participants. Consequently, the focus group discussion method would have also been an inappropriate way of collecting information that may only apply to one of the participants. Therefore, the face-to-face interview method was the most appropriate.

Interviewees were recruited at all key points of the implementation chain, including the Principal Investigators (PI) of the ASSIST trial, the senior leadership at the organisation responsible for rolling out the programme, Local Authorities areas (A) and (B), trainers, and the school liaison teachers. Chapter 6 provides the full details of the conduct of the interviews, who was interviewed, and it reports the findings of the study.

3.7.3 Study III: Observations

The observational study attempted to extend insight through the observation of two areas. The first was the organisational environment of the organisation that is contracted by LA (A) to implement the ASSIST programme. This organisation is hereafter codenamed OWL for anonymity purposes. The

second observations were of the implementation process. This involved observing the children's training process. Thus, I observed how LA (A) implements the intervention. Observations were conducted at four schools in LA (A). Chapter 6 reports the full details of the conduct of the observations alongside its findings.

The purpose of this study was to supplement the interview method since interviewees always report from their own perspectives. One way of counteracting this weakness is for researchers to make their own perceptions to achieve a more comprehensive view of the setting being studied, than would be achieved from the interviews alone (Patton 1990). However, the weakness of the observation method itself relates to the fact that complete objectivity is impossible and pure subjectivity can undermine the credibility of the findings (Quinn 2002). Therefore, the danger is that the researcher may tell the story from their own perspective only.

Therefore, the combined use of the interview and the observational study methods mutually strengthened the weakness of both studies. In addition, to minimise the risk of projecting my own subjectivity onto the data, I kept a reflexive diary in which I recorded my impressions of each observation. Therefore, while I recorded the observations in the context of my subscription to the ontological realism and epistemological constructivism explained earlier on in this chapter, I also noted my thoughts on the observations in relation to any knowledge that I may already have. These include my personal perceptions of what I was observing, (e.g. the children are disrespectful), what I gathered from the interview study, or from the literature about the programme. Therefore, during synthesis of the data, I was able to separate my own perceptions from what I had extracted from the data using the set methods. The reflexive diary also recorded other reflexive thoughts relating to the PhD journey in general.

3.7.4 Study IV: Analysis of feedback questionnaires

The success of the ASSIST programme depends on the peer educator children (aged 12-13) implementing anti-smoking conversations among their

peers. Consequently, the peer supporters are the ultimate implementers of the intervention. However, these conversations are by their nature inaccessible to research. Therefore, the feedback forms that the children fill in as part of their training provide the best opportunity for understanding their perspectives of the programme, how they implemented the programme and the character of the environment in which they deliver it.

The questionnaires also offered some scope for assessing the connections between the environment in which the children deliver the intervention and how that might link to the sustainability of the programme. They also allowed an appreciation of a range of socially embedded issues such as the programme's acceptability to the children and their friends including their fidelity to the intervention.

The children filled in the feedback questionnaires twice. The first one (Wave 1) is filled in immediately after they receive their 2-day training. It collects tick box and free format information about their views on the training they have just received, how they feel about the upcoming task to deliver anti-smoking messages to their peers, what they learned, and suggestions about how the programme could be improved and other more general questions about the learning environment.

The second questionnaire (Wave 2) is filled in at the end of the programme, which is six to ten weeks after the initial 2-day training and after they have finished implementing the messages. The children are asked to comment on their perspectives on the follow-up sessions, including how they delivered the messages. Chapter 8 outlines the details of this study and its findings.

3.7.5 Ethics

The ethical conduct of the three studies (Study II III and IV) was governed and approved by the University of Exeter Medical School Research Ethics Committee approval reference Oct16/B/098/1. Appendix 1 is the letter that I sent with the full application for approval to the Ethics Committee. It outlines some of the ethical issues that I faced and how I addressed them in

accordance with the committee's advice on a previous application. Appendix 2 is the letter and certificate of approval from the ethics committee. Due to its length (70 pages), I have not included the full copy of the ethics application, but a copy of it is available on request. This section will give a brief outline of how I dealt with the key anticipated and the emergent ethical challenges.

The Interview Study

This study had three main anticipated ethical challenges. The first was related to interviewee anonymity. The design of the project was that I was going to interview individuals in key roles along the key intervention delivery points (see Figure 9) of the programme. However, some of the key roles only had one individual in them. This meant that where interview questions were focused on the role itself (e.g. the PI), then complete anonymity in reporting the study could not be guaranteed. Therefore, I advised such interviewees of this risk first, verbally when I made the first request for their involvement, second using their consent forms and information sheets (Appendix 13) and thirdly, I reminded them of this just before the start of their interview.

The second challenge was related to the sensitivity of the subject of inquiry. For example, there was a chance that some respondents could feel uncomfortable to discuss certain aspects of the programme such as the reasons the programme was discontinued at LA (B) or the barriers to their continued involvement LA (A). This is because the reasons behind a programme's discontinuation or a person's decision to withdraw from the project may be perceived as a negative assessment of the programme or of the individuals in charge of developing and promoting it. The third ethical challenge was related to the retrospective nature of the programme, for example, some participants could feel unsure about their recollection of facts and events, or they could worry about the implications of any poor recollection to the research project.

The following steps were taken to minimise these risks.

- Participants were advised and reminded multiple times of their right to decline to respond to any questions that they felt were too sensitive.

- They were told they had a right to advise me if they (during or after the interview) felt that anything they said, or were about to say could not be made public and to request that I destroy them if they wished. One participant exercised this right by asking me to switch off the recorder mid-way through the interview and then advising me again when they wanted me to switch it back on.

- Participants were also advised that they did not need to recall facts perfectly or to answer every question. They could also withdraw from the research at any time without any disadvantage to them.

- Information sheets and consent forms containing the details of anticipated risks were emailed to interviewees at least two weeks before their interview date. Before the commencement of each interview, I also verbally asked all participants to confirm that they understood the information sheet and the risks and their options in relation to anonymity.

However, on a personal level, the most ethically challenging issue that emerged was when I was advised that one of the people who had taken part in the interviews had suddenly died. This was particularly difficult because, during the course of the research, I had grown to know this individual, and to appreciate their enthusiasm for my project, and to know of the work that they put in to ensure that some of the information that I requested from their organisation was made available.

Thus, the challenge was to balance the emotionally difficult feelings that arose when I was posthumously listening to their interview, or when I was analysing or quoting from it. In addition, the fact that I no longer had the opportunity to go back to them to ask for clarification if I needed one, meant that I had an extra obligation to ensure that I represented them as accurately as was possible. Therefore, during analysis, I ensured that where the idea that I was presenting from their contribution hadnot been identified in other interviews or studies, then they were supported by verbatim quotes.

Therefore, the triangulation approach that I took in this PhD also supported me with achieving this need to represent this interviewee accurately.

The observational study

The main ethical challenge of this study was how to ensure that the children and their parents had the full understanding of my presence and my intentions during their training, and that they were able to consent to it in a way that did not jeopardise the project. On advice from the University of Exeter Research Ethics Committee, I consulted the University of Exeter Child and Mental Health Group who are experienced researchers on children in schools. On their advice, the "opt-out" rather than the "opt-in" method of consenting to the project was chosen. This was because the project was considered low- risk and that most children and parents would want to take part. However, attempting to get each child to send in a consent form before participating (i.e. opt-in) risked the observations being cancelled even if only one child forgot to return their "opt-in" form. Therefore, the following steps were taken to minimise some of the anticipated risks.

- The information sheets advised the parents that their child would be participating in a programme which was being studied and it encouraged the parents to discuss this project with their child. They were also advised that should either the parent or the child object to my presence in the project they had the right to withdraw the child from it at any point.
- On the day of the training, the trainers introduced me to the children, and I explained the project to the children and how I intended to carry it out throughout the training.
- I wore a visible and large tag singling me out as the researcher so the children could identify me easily.
- Children had the opportunity to ask their trainers or me any questions relating to my project during break times.

Emerging ethical issues

A couple of ethical issues emerged during the observation of the children's training. One was related to a child's behaviour during training and the other to the actions of a staff member. These incidences were investigated by the delivering organisation, and I was asked to provide an account of what I observed in one of the investigations. Although the events in themselves illuminated some of the findings of the studies, they presented an ethical challenge in that my role as an independent researcher was blurred with that of an insider reporting on organisational procedures. This was contrary to the terms on which the participants had given their consent for me to observe the process. However, everyone who was in attendance was asked to report on their observations. Thus, my report was to corroborate what others said they saw, rather than as the only report.

3.8 Data storage

There was no need to collect or keep personal data of any of the interviewees or the children. All required data was kept in a secure and confidential manner and according to the University's Information and Technology security system. Hard copies of field notes or questionnaires were stored in securely locked cupboards in a lockable office, which is in a building which is only accessible via swiping an ID card. All recorded interviews were transferred from the portable recorder to the University server within 1 – 2 hours of the interview finishing after which, it was deleted from the portable device. All other electronic data was saved on the University server and it was password protected. The data will only be retained for five years or as long as necessary according to university policy.

Reflective note 3

The initial spells of self-doubt, have passed. I feel in control again. At one of the regular supervisory meetings, we agree that the first study should be a systematic review of reviews. There is an existing pool of studies of implementation that a different team had worked on, so I could start from there. I develop the protocol and start to work it. Among other things, I am looking for measures of implementation with a plan to perhaps develop a new framework or a tool that would contribute to the gaps in knowledge in this area. This is because at this point the title of the PhD project is: *"Achieving Change in Public Health Evaluation Practice: The Development of Markers of Implementation*. I love it! Its one of the reasons that made me choose this topic. In addition, there is a pool of studies to start from and I know what I am looking for. I just have to find it. Well…

Perhaps I am being optimistic, but maybe naïve, but it is fair to say that as I start this study, the possibility of finding nothing has not really crossed my mind. However, as I screen the abstracts, and read the full papers I realise that the issue of measures of the implementation of public health programmes has not featured strongly. I am hugely disappointed with the results. As I write them up, I think to myself; how am I going to progress this PhD since the plan was to develop the measures of implementation from the findings? So at the next meeting I am not so enthusiastic, in fact I take it as some sort of crisis meeting about a way forward for the project. So I say, well, I found this and I found that but I found nothing on measures that I can develop further! What next then? Shall I refresh the study search? Or do another fresh systematic review? My supervisors appear very pleased and satisfied with what I have presented. I don't get it. I think they haven't grasped the seriousness of it all. So I repeat the concern. Where is the project heading next? One of supervisors says; well you just said you found a gap on the sustainability stage. What do you think of that? Oh Yeah! I did didn't I? Just then, another lesson in 'nothingness' dawns on me:

Lesson 3:

There is no such a thing as finding nothing. A finding of nothing is a finding of something

Chapter 4   Study I: Review of Reviews of Implementation Studies

4.1 Introduction

This chapter reports on the methods and conduct of Study I, and it discusses its findings and conclusions. The purpose of this review of reviews was to scope the topic in the literature and to inform or shape of the subsequent studies II, III, and IV. Therefore, the study is a broad investigation of the nature and character of successfully implemented public health programmes. From this study, I identify the key aspects of implementation and I discuss how these may affect the prospects of successful implementation. I also assess the adequacy of available frameworks for understanding successful implementation. The results highlight gaps in knowledge on the sustainability of community-based public health programmes and the measures of implementation processes. I investigate the gap on sustainability further in studies II, III, and IV.

4.2 Study-specific research questions

This study was the first of the series of linked studies, which collectively tackle the first PhD research question, i.e. what is the nature and character of the processes that make successfully implemented community-based public health programmes? However, there were three questions specific to the study. The first question focused on investigating the process of implementation.

> a) Are there recurrent, identifiable, and conceptually distinct stages, aspects, or indicators of successful (or unsuccessful) implementation, which are specific to community-based public health programmes in different settings?

The second question attempted to assess the adequacy of implementation frameworks in public health programmes:

> b) How do the findings in study-specific question (a) map onto the Consolidated Framework for Implementation Research (CFIR) (Damschroder et al. 2009).

I chose the CFIR because it is an overarching typology made up of constructs from 19 key implementation theories and frameworks. The authors of the CFIR identified these constructs using criteria such as the strength of their conceptual or empirical support for influence on implementation, their consistency in definitions, or their potential for measurement. Therefore, to answer this question, the findings from question (a) were assessed against the CFIR, to see how well the CFIR reflected those findings. The third question was aimed at identifying and assessing the adequacy of tools for measuring successful implementation.

> c) Does the literature report any measures of the implementation stages, aspects or indicators of the successful implementation of public health programmes identified in question (a)?

Since one of the original aims of the PhD research project was to develop measures and markers of implementation, the purpose of this question was to verify the status of any existing measures and to assess whether any identified measures or indicators would form a skeleton for that task.

4.3 Study-specific objectives

In line with the study-specific research questions, the objectives of Study I were to:

a) Find systematic reviews of the implementation of public health programmes.

b) Develop a list of stages aspects or features that could be indicators of successful or unsuccessful programme implementation.

c) Analyse how these map onto an existing Consolidated Framework for Implementation Research (the CFIR) developed by (Damschroder et al. 2009)

d) Assess available tools for measuring the aspects of implementation identified in a), including their validity or reliability.

4.4 Methods

4.4.1 Search strategy

Study I was a systematic review of reviews of implementation studies. The included studies were extracted from a pool of 166 studies, which were previously identified for a systematic scoping review by Thompson Coon et al. (Unpublished)[1], known hereafter as the "Thompson Coon pool of studies." The aim of the Thompson Coon study was to collate and describe all the existing systematic reviews and evidence syntheses of the evaluations of implementation in the literature. The purpose was to explore the different methods that are being used to synthesise the evidence on successful implementation/knowledge translation and to identify examples/ techniques/methods of best practice that enable a clear message to be drawn from the research.

The original search strategy for the Thompson Coon investigation was constructed iteratively by two information specialist who were members of the research team. They used a mixture of Medical Subject Headings (MeSH) and free text words, after consultation with repositories of Knowledge Transfer (KT) and implementation papers (E.g. KT+ on https://plus.mcmaster.ca/kt/), key websites and knowledge transfer resources (e.g. KTwiki on https://whatiskt.wikispaces.com/) and examination of key papers. The master search strategy is shown in Appendix 3.

Studies were identified by searching electronic databases and hand-searching the reference lists of included papers and the KT+ database. No limits were applied for language. The search was applied to seven databases; Medline, EMBASE and HMIC (via Ovid), CDSR, Cochrane Methods Studies and DARE (via The Cochrane Library) and CINAHL via EBSCOHost from the year 2000 to March 2013. In addition, a date limit of post-2000 was applied to reflect the lack of papers identified before this date during their scoping of the topic.

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[1] Thompson Coon J. Exploring the Objective and Function of Evidence Synthesis of Evaluations of Implementation: A Systematic Scoping Review – This study was written-up in 2013 and is yet to be published.

4.4.2 Inclusion and exclusion criteria: Primary pool of studies

The Thompson Coon study was interested in all studies of implementation. Their inclusion criteria were as follows:

- Studies were selected if they contained a synthesis of quantitative or qualitative information on the implementation of evidence-based recommendations, programmes, or initiatives and:
- If they had explicit, predefined, and reproducible methods documenting study identification, selection, and synthesis, as well as clear aims and review questions.
- Conference abstracts were included if they contained sufficient information to allow the appraisal of methodological quality and assessment of the objective and intended function of the synthesis. Attempts were made to locate the full text of any conference abstracts that were deficient in this level of detail.

4.4.3 Results

One hundred and sixty six (166) papers were included in the Thompson Coon studies. A 10% sample of the studies was checked by a second reviewer and consensus was achieved through discussion. Figure 4 is the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow chart of the process that they used.

Figure 4: PRISMA flow diagram of the study selection process used in the Thomson Coon et. al. study
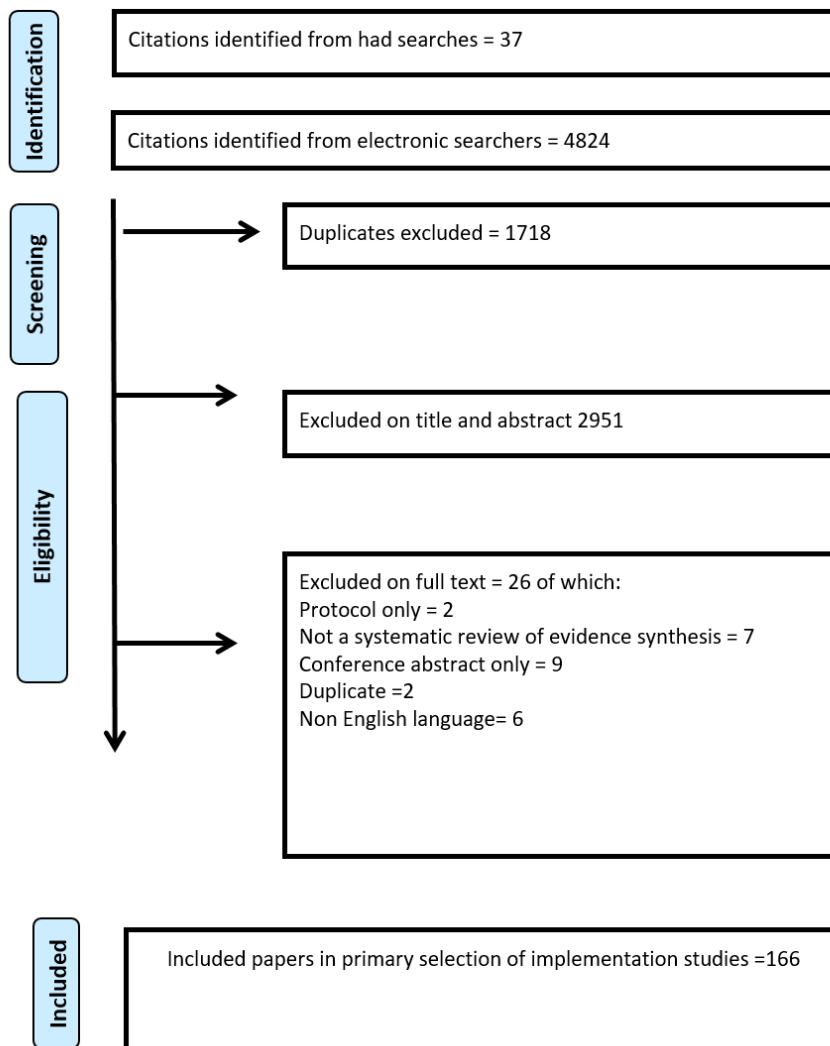
4.4.4 Study Characteristics

Approximately two-thirds of the Thompson Coon studies were published between 2008 and 2013. Their methodological quality was assessed by one reviewer of the research team, (MR, JTC, BA or BW). Quantitative papers were assessed using the Measurement Tool to Assess Systematic Reviews (AMSTAR) (Shea et al. 2007), while qualitative papers were assessed using a bespoke instrument based on the Enhancing Transparency in Reporting the Synthesis of Qualitative Research tool (ENTREQ) (Tong et al. 2012). Using the AMSTAR quality assessment tool, 3% of these studies were

considered high quality 47% moderate quality and 50% were of low quality. I considered this quality assessment to be broadly applicable and adequate for my study therefore, I did not re-assess the studies that were selected for inclusion into this review of reviews for quality.

4.4.5 Inclusion and exclusion criteria for the review of reviews

This section provides the key information from the study protocol for this review of reviews and a copy of the protocol is available on request. Thompson Coon and colleagues were interested in all studies of implementation in health, while I was only interested in the studies that looked at the implementation of community-based public health programmes. Therefore, I developed and applied a protocol for selecting the studies that were appropriate to this PhD project. Studies were selected from the Thompson Coon pool of studies if they:

- Focused on prevention of ill health or the promotion of good health (i.e. public health programmes).
- Were about populations rather than individuals.
- Took place in communities or places of habitual residence or occupation such as care homes, schools, or workplaces.

Therefore, studies were excluded if they took place in treatment environments (e.g. acute or community hospital), or if they reviewed preventative or diagnostic clinical services (e.g. screening, or vaccinations). Studies which were about guidance or strategies for implementing treatment-based services were also excluded, as were those that focused on the care providers (Doctors/Nurses) rather than the intervention recipients.

4.4.6 Results

To establish process validity, I and a research associate (HH) jointly screened an initial 25% (N=41) of the titles and abstracts. We then screened the rest of titles and abstracts independently. There were seven discrepancies, and agreement on the inclusion or exclusion status of those papers was reached through consensus. Using this process, 111 of the 166

titles and abstracts were excluded, leaving 55 papers for inclusion to the full-text review stage, which I conducted. In addition, two members of the supervisory team (MP) and (RA) also independently full-text reviewed 11% (N=6) of these papers. These papers were chosen randomly and this was done to ensure high reliability of the study selection process but also to explore and agree on the data that could be extracted. There was 100% agreement on the inclusion/exclusion status of these papers, and there was a general agreement on the type of data that would be extracted.

Two papers, Durlak and DuPre (2008) and Dusenbury et al. (2003) were found to have used the same framework/paper, Dane and Schneider (1998) but in different ways. I decided that the understanding of those papers would be enhanced by adding the Dane and Schneider (1998) study to the inclusion pool. In any case, this study also met the inclusion criteria because it was a systematic review that looked at the degree to which the integrity of programmes, was verified and promoted in evaluations of primary and secondary prevention programs. Therefore, 22 papers were included in the data extraction stage. Twenty of the twenty-two papers were qualitative/descriptive systematic reviews, one was a qualitative review of reviews Poobalan et al. (2009), and one was a systematic review which was descriptive, and it had some quantitative assessments but without meta-analysis Fiebelkorn et al. (2012).

Figure 5 is the PRISMA flow diagram of how the studies relevant to this scoping review were identified from the Thompson Coon et al. studies. Appendix 4 provides the details of the 34 studies that were excluded and the criteria that they failed to meet.

Figure 5: PRISMA flow diagram of the study selection process for the studies included in this thesis

Identification

Citations identified from Thomson Coon et al = 166

Citations identified from citation tracing = 1

Screening

Excluded on title and abstract = 111

Eligibility

Total excluded at full text = 34

Included

Included in study = 22
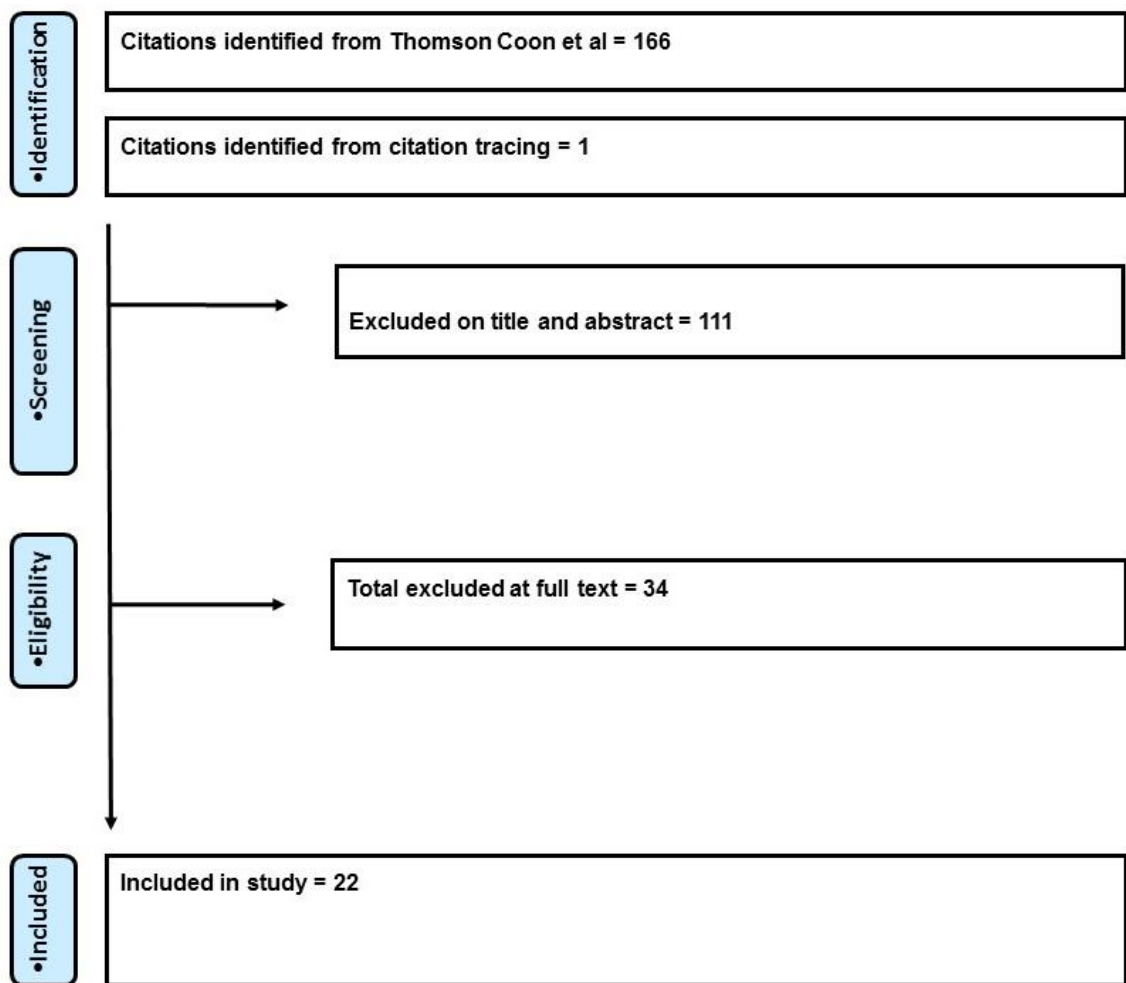
4.4.7 Study characteristics

The studies were not re-assessed for their methodological quality at this stage, because I considered the assessment carried out by Thompson Coon and colleagues as is described in 4.4.4 to be adequate. In addition, all of the included papers were clear about their methods, and review questions and they used appropriate methods for their study designs.

However, some of the reviews (Arai et al. 2005; Child et al. 2012; Clayton, Bambra, et al. 2011; Garside, Pearson, and Moxham 2010; Greenhalgh, Kristjansson, and Robinson 2007; Poobalan et al. 2009; Rabin et al. 2010; Dane and Schneider 1998; Murta, Sanderson, and Oldenburg 2007; Durlak and DuPre 2008; Dusenbury et al. 2003) reported methodological and other

issues in their own included primary studies. These included the variation in how the primary studies reported on their implementation processes, what aspects of it they reported, differences in how they framed their research questions, variations in the use of implementation terminology, inadequacies in the reporting of aspects of implementation, and of evaluation methodologies. Some of the papers also noted that these issues created challenges in comparing, interpreting, and generalising study findings.

4.5 The Data

4.5.1 Organisation

Categorising the studies

To identify the data that could respond to the question regarding stages and aspects of implementation, the studies were first organised according to how they approached the subject of implementation. Thus, papers were categorised into three groups. Group 1 was for process-based reviews; (Dane and Schneider 1998; Dusenbury et al. 2003; Fixsen et al. 2005; Murta, Sanderson, and Oldenburg 2007; McMahon and Fleury 2012; Durlak and DuPre 2008).

These reviews approached implementation through using or making reference to an established or a new framework/typology of implementation, e.g. the RE-AIM framework (Glasgow, Vogt, and Boles 1999). They also generally described or categorised their findings using the frameworks and their associated process-related terminology such as; *fidelity, adoption, reach, sustainability, adaptation* etc.

Group 2 (Van Eerd et al. 2010; Arai et al. 2005; Child et al. 2012; Clayton, Bambra, et al. 2011; Garside, Pearson, and Moxham 2010; Greenhalgh, Kristjansson, and Robinson 2007; Ingram et al. 2011; Johnson et al. 2011; Pérez-Escamilla et al. 2012; Semenic et al. 2012; Smithson, Garside, and Pearson 2011; McMahon and Fleury 2012) approached implementation through reviewing barriers and facilitators of implementation.

The third group (McInnes and Askie 2004; Fiebelkorn et al. 2012; Poobalan et al. 2009; Rabin et al. 2010; Williams, Dennis, and Harris 2011; Williams, Palar, and Derose 2011) looked at implementation through reviewing how the intervention was implemented. Thus, these studies looked at particular strategies of implementing a programme, e.g. 'Participatory' ergonomic interventions (Van Eerd et al. 2010) or 'congregation-based' interventions (Williams, Palar, and Derose 2011), and from that, they identified key factors for successful or unsuccessful implementation. One of these studies also looked at the issue of implementation from the user's perspective, i.e. older people's views and experience of fall prevention strategies (McInnes and Askie 2004).

However, these categories were not mutually exclusive. For example, some of the papers that looked at implementation from a process perspective also identified barriers and facilitators like training, and some studies that looked at barriers and facilitators also identified aspects of the process of implementation such as participant engagement. Therefore, it was possible to use the frameworks presented in the process-based studies as tools for understanding the constituent concepts in those papers, as well as for organising the data that was found in the rest of the studies.

Grouping the concepts

This process attempted to identify the data that could respond to study-specific question (a) i.e. stages and aspects of implementation. However, only one of the reviews, (Fixsen et al. 2005) explicitly identified a "staged" process of implementation namely; *exploration, installation, initial implementation, full implementation, sustainability and innovation*. Another paper (Durlak and DuPre 2008), borrowed from the Diffusion of Innovations (DOI) theory (Rogers 2010) whose full stages are; *dissemination, adoption, implementation and sustainability*.

Therefore, the stages from these two frameworks were compared diagrammatically (Figure 6: Stages and Aspects of Implementation, colour codes orange and blue). This was then used as the skeleton on which to

compare the conceptual themes emerging from the frameworks that do not mention stages. These were; the RE-AIM framework used in the (McMahon and Fleury 2012) review, the Linnan and Steckler (2002) framework used in the Murta, Sanderson, and Oldenburg (2007) review, and the Dane and Schneider (1998) framework used in both the (Durlak and DuPre 2008) review and in the (Dusenbury et al. 2003).

Thus, similar themes from these frameworks were incrementally added to the diagram by placing them in the column holding an equivalent concept (Figure 6). However, not all the frameworks had equivalent concepts for each stage, and two separate stages of *installation and initial implementation* in Fixsen (2005) were deemed to be thematically equivalent to the single stage of *adoption* in other frameworks (Figure 6).

The data extracted from group 2 and group 3 papers were then reviewed to check if it contained items that fall in the developing skeleton of stages and aspects of implementation identified in the theoretical frameworks, or if additional stages or aspects could be identified in them.

Figure 6: Stages and Aspects of Implementation

Core components of implementation Fixsen (2005)

Consultation and Coaching

Staff performance & evaluation

Decision support data system

Integrated & Compensatory

Preservice Training

Facilitative administrative support

Recruitment and Selection

Systems intervention

Note

The colour coded boxes across the figure are a visual representation of the stages of implementation and the relational positions (to each other) of the concepts within the papers.

The full implementation stage is depicted in various ways by the papers, with Fixsen (2005) developing the core implementation components (the circular diagram) while the DoI Rogers (2008), presents this as a stage of the diffusion process. The RE-AIM used in MacMahon (2007), The Steckler and Linnan framework used in Murta (2007) and the Dane and Schneider (used in Dusenbery (2003) and Durlak (2008) present variants of the aspects of the implementation stage. Dusenbery 2003 (brown) and Durlak 2008 (red) both use the Dane and Schneider (1998) framework (green). Dulark (2008) replaces Adherence with Fidelity, .and adds three more aspects to the original list, Monitoring of control and comparison, Programme Reach and Adaptation.

Stages of implementation

	1	2	3	4	5	6
Fixsen (2013)	1. Exploration	2. Installation	3. Initial implementation	4. Full Implementation	5. Innovation	6. Sustainability
Rogers (DoI) used in Durlak 2008	1. Dissemination	2. Adoption		3. Implementation	No equivalent	4. Sustainability
RE-AIM Framework used in MacMahon (2012)	No equivalent	1. Adoption		2. Reach / 3. Efficacy Effectiveness / 4. Implementation	No equivalent	4. Maintenance
Steckler and Linnan (2002) used in Murta (2007)	1. Context	No equivalent		2.Reach / 3.Dose Delivered / 4.Dose received / 5.Fidelity of implementation / 6.Recruitment	No equivalent	No equivalent
Dane & Schneider (1998)	No equivalent	No equivalent		1. Adherence / 2. Exposure / 3. Quality of delivery / 4. Responsiveness / 5. Programme Differentiation	No equivalent	No equivalent

Dusenbery (2003)

Definitions or Types of fidelity of implementation	Measures of Fidelity of Implementation
1. Adherance	1. Adherance
2. Dose	2. Dose
3. Quality of programme Delivery	3. Quality of programme Delivery
4. Participant responsiveness	4. Participant responsiveness
5. Programme Differentiation	5. Programme Differentiation

Aspects of implementation

Durlak (2008)
1. Fidelity
2. Dosage
3. Quality
4. Participant responsiveness
5. Program Differentiation
Plus
6. Monitotring of controla and comparison
7. Programme Reach
8. Adaptation

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4.5.2 Extraction

Data was first collected into a general extraction sheet where it was organised by the research questions that it was relevant to, starting with study-specific research question (a)

> Are there recurrent, identifiable, and conceptually distinct stages, aspects, or indicators of the successful (or unsuccessful) implementation of community-based public health programmes and interventions in different settings?

Additional information such as the author's comments on data quality, or the general gaps that they identified in implementation research, and any anomalous findings were also recorded. Appendix 5 is a summarised version of the extraction sheet. It indicates in brief, what findings (e.g. stage, aspect or barrier or facilitator) were identified in what study, in response to study-specific question (a).

To extract data for secondary research question (b), the findings from the study-specific question (a) were mapped onto the most suitable domain of the CFIR. Appendix 6 represents the exercise to map some of the extracted data onto the CFIR dimension that appeared to fit them the most. Therefore, in addition to checking whether the domains of the CFIR were relevant and important to the evaluation of the successful implementation of community-based public health programmes, the CFIR was also assessed for how well it reflected the aspects of implementation. i.e. the stages, or the barriers and facilitators of implementation that were found in (a). The basis for analysis of fit was the Damschroeder's definition of the constructs of the CFIR, (Appendix 7)

Finally, the data extraction sheet also recorded whether a paper assessed, commented on, or referred to how the aspects of implementation it identified could be measured or evaluated (secondary question c, see section 4.2). However, the data under this question was too limited to require synthesis.

4.5.3 Synthesis

Data synthesis was an iterative and multi-staged process. Papers were initially synthesised within their group, and group findings were compared for similarities or differences, while also seeking to verify their underlying shared conceptual meanings. In addition, the frameworks of the process orientated papers (Group 1), were used as tools for organising the findings while the findings from Group 2 and Group 3 papers were also understood in light of "their place" in the frameworks.

Using thematic analysis techniques, the information from the data extraction sheets (Appendix 5) was further synthesised by recoding and extracting the maximum number of themes from it. Thus, items which I thought shared meaning or referred to the same general idea were given the same code. For example, adaptation, flexibility, tailoring, adjusting, or taking into account the context, were coded as 1, while engagement and participant responsiveness were coded 2, and fidelity and adherence to programme were coded 3 etc. This means that the coded concepts were extracted from the frameworks of the group 1 papers, as well as from the descriptions of the papers that did not use frameworks (Groups 2 and 3).

Table 1 is an example of how I tried to identify, capture and reconcile some of the different ways in which concepts were presented in the papers

Table 1 : Aspects of implementation and the meanings they represented

Aspect	Definition	Notable Observation
Reach	Attendance rates to intervention Murta (2007) from Steckler & Linnan (2002)	Reach had a consistent meaning across the papers that covered it.
	Participant rates of target audiences and their representativeness (RE-AIM framework Glasgow et al (2004)	
	Participation rates, program scope rate of involvement and representativeness Durlak (2008)	
Exposure	An index that may include any of a) the number of sessions implemented, b) the length of each session, the frequency with which program techniques were implemented. Dane & Schneider (1998) used in Durlak (2008) and Dusenbury (2003)	Changed to Dose in Dusenbury (2003) and refers to the amount of program delivered
		Changed to Dose in Durlak 2008 and refers to how much of the original program has been conducted.
Adherence	Is an aspect of program integrity (Dane & Schneider 1998) which is the extent to which specified program components were delivered as prescribed in program manuals. Adherance to program (Dusenbury 2003).	In Durlak (2008) Adherence is replaced by Fidelity and it means the extent to which innovation corresponds to original intended program. Adherence in Dusenbury relates to programme delivery and this is similar to what Durlak (2008) calls Dose (see above note).
Quality of delivery	Is an aspect of program integrity Dane & Schneider (1998) which is the extent to which specified program components were delivered as prescribed in program manuals.	How well different program components have been conducted (Durlak 2008)
		Ratings of provider effectiveness which assess the extent to which provider approaches a theoretical ideal in terms of delivering program content.
		Is represented by Fidelity and integrity of the program which is the extent to which the intervention was delivered as planned. Steckler & Linnan used in Murta (2007)
Participant responsiveness	A measure of qualitative aspects of program delivery that are not directly related to the implementation of prescribed content such as implementer enthusiasm, leader preparedness, global estimates of session effectiveness and leader attitudes towards program (Dane & Schneider 1998)	Ratings of provider effectiveness which assess the extent to which provider approaches a theoretical ideal in delivering program content.
		Is represented by Fidelity and integrity of the program, which is the extent to which the intervention was delivered as planned. Steckler & Linnan used in (Murta 2007)
		The extent to which a program theory and practices can be distinguished from other programs (Durlak 2008).
Programme differentiation	A manipulation check that is performed to safeguard against the diffusion of treatments that is to ensure that the subjects in each experimental condition received only the planned intervention. Dane & Schneider (1998)	Identifying unique features of different components or programs so that these components or programs can be reliably differentiated from one another
		Whether critical features that distinguish the program are present Dusenbury (2003)
Monitoring for control and comparison	Describing the nature and amount of service received by members of these groups (treatment contamination usual care alternative services. (Durlak 2008)	This is similar to programme differentiation described in the same paper (Durlak 2008).
Adaptation	Durlak 2008 Changes made in the original program during implementation	In other papers, this was referred to using terms like flexibility, or taking into account the context.

Finally, the most consistently used concept was allocated as the final label for the group. This final concept was also assessed for whether it was a stage, (situated in time/order of implementation) or an aspect, which might influence any stage of implementation. Table 2 illustrates the final stage of the synthesis process and the final labels for the aspects of implementation.

Table 2: Final synthesis of the aspects of implementation

Data Synthesis table : Aspects of the implementation process								
Flexibility Tailoring Adjusting Fitting Context Adaptation	Participant responsiveness Acceptability Receptivity Engagement	Adherence Fidelity Integrity	Duration	Quality	Monitoring of comparison situation. Programme differentiation	Recruitment Reach	Theory	Design
Final labels of aspects of implementation								
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Adaptation	Engagement	Fidelity	Dose	Quality	Programme differentiation	Reach	Theory	Design

Given the challenges of variation in terminology that were experienced during this process, and as is already identified by others (Hawe, Shiell, and Riley 2004; Damschroder et al. 2009), individual papers were revisited to check that their final concept shared meaning within and between papers, and to note any variation.

4.6 Findings

4.6.1 Stages and aspects of implementation

Study-specific Research Question: Are there recurrent, identifiable, and conceptually distinct stages, aspects, or indicators of successful (or unsuccessful) implementation, which are specific to community-based public health programmes in different settings?

Despite the variations in terminology that challenged the synthesis, it was possible to identify common themes between and from within concepts and terminologies. Five stages, which seem to constitute the process of the implementation of public health programmes, were identified.

Stage 1: Pre-implementation activities

In the Fixsen et al. (2005), this stage is called the *exploration* stage (see Figure 6). The purpose of the stage is to assess the potential match between community needs, programme needs, and community resources and to make a decision to proceed with the programme or not. For Rogers (2003) , used in (Durlak and DuPre 2008); the *dissemination* stage is about how well information about a programme's existence and value is supplied to communities to facilitate its *adoption*. However, in Linnan and Steckler (2002), this theme is described within the broader concept of pre-existing contextual conditions that may facilitate or impede implementation fidelity. Therefore, they argue for a pre-implementation analysis of contextual factors. Consequently, the group 1 papers identified that the activities which are done during dissemination, and exploration of the context are (i.e. *pre-implementation)* are crucial facilitators of the a*doption* (or not) of the intervention.

In the group 2 and 3 reviews, the theme of *pre-implementation* action was identified from descriptions such as: taking the social-cultural context into account, stakeholder involvement, consultation, or making practical considerations (Arai et al. 2005; Child et al. 2012; Ingram et al. 2011; Morant et al. 2011; McInnes and Askie 2004; Pérez-Escamilla et al. 2012; Fiebelkorn et al. 2012; Poobalan et al. 2009; Rabin et al. 2010; Semenic et al. 2012; Williams, Palar, and Derose 2011).

The McInnes and Askie (2004) review report that some barriers and misperceptions of the intervention may need to be addressed before delivery to ensure participation. Some studies from the Linnan and Steckler (2002) review also found that support from management and supervisors was crucial to the success of work-based stress management interventions, while Fixsen et al. (2005) concluded that exploration activities and strategies have an impact on the success of implementation efforts. McInnes and Askie (2004) report that to improve programme uptake, some barriers and misperceptions of the intervention may need to be addressed prior to client

participation in a falls prevention programme. Consequently, it was concluded that **Stage 1** of the implementation of public health programs was *pre-implementation* action.

Stage 2: Programme Adoption

In the papers that used frameworks (Group 1), **Stage 2** was represented by the concept of *adoption* (Figure 6). In the DoI theory, used in Durlak (2008), this is about whether local organisations/groups decide to try a new programme. The RE-AIM framework describes it as the participation rate and representativeness of interventionists and delivery settings. However, Fixsen et al. (2005) split this stage into two; *installation and initial implementation*. *Installation* refers to all the tasks that need to be completed before the first participant is seen and it involves active preparation or training necessary to initiate the program. The *initial implementation* stage involves a change in the overall practice environment, in keeping with the new evidence-based programme (i.e. the act of *adoption*).

In the rest of the papers, this stage was corroborated by descriptions commensurate with programme *adoption*, such as: training, the active involvement of key stakeholders, communication, cultural awareness, programme awareness, consultation, piloting interventions, assessing relevance to target groups, ensuring managerial support, understanding existing behaviours, building political will, mass media campaigns, incentives, and community mobilisation (McInnes and Askie 2004; Greenhalgh, Kristjansson, and Robinson 2007; Ingram et al. 2011; Arai et al. 2005; Johnson et al. 2011; Fiebelkorn et al. 2012; Pérez-Escamilla et al. 2012; Poobalan et al. 2009; Semenic et al. 2012; Van Eerd et al. 2010). The Fiebelkorn et al. (2012) review, found that the lack of adoption of point-of-use water treatment interventions may be attributable to the ineffective promotion of the programme and inadequately designed interventions. They suggest that theory-driven evaluation of interventions, plus using culturally influential sources to spread intervention messages that are culturally relevant would

enhance the understanding of factors associated with *adoptio*n. This would also contribute more to the successful replication of interventions.

In terms of how the adoption stage affects the implementation process, Fixsen et al. (2005) found that the purveyor's (programme provider) attention to organisational change efforts during *installation* increases the likelihood of successful implementation effort. However, McMahon and Fleury (2012), reported that the majority of their studies did not describe their inclusion/exclusion criteria enough for them to calculate *adoption* rates. Similarly, Rabin et al. (2010) found that few studies of their review reported on all stages of the dissemination and implementation process and there was considerable variation in the outcomes assessed by their included studies.

Stage 3 : Implementation

Stage 3 of the process is *implementation* (Figure 6). This stage is characterised by a collection of loosely defined and fluid terminology, and this presented challenges in the data analysis. In Fixsen (2005) this stage is called the *full implementation* stage. In the DOI theory, Rogers (2008) it is *implementation*. Both The RE-AIM and the Steckler et al. (2002) frameworks include implementation alongside aspects like *reach, efficacy and effectiveness, dose delivered* etc. (Figure 6 colour codes olive and turquoise). Although the (Dane and Schneider, 1998) framework did not contain the specific term *implementation*, its constituent aspect of *adherence,* is thematically equivalent to *fidelity* while *exposure* is equivalent to *dose delivered* and *dose received* from the (Steckler et al., 2002) framework (Figure 6).

However, although the *full implementation* stage of the Fixsen stages of implementation, matches the other frameworks, its constituents are different. (See "core components of implementation" Figure 6 circular orange diagram, versus the "aspects of implementation" in the rest of the frameworks).

This was because, at the *implementation* stage, the Fixen (2005) review focused on the implementers of the programme rather than on the process. Therefore, for them, this stage was about building evidence and quality into

the daily performance of the practitioners. Consequently, what they call "core components of implementation" are the actions that support the practitioner for example, through careful staff selection, pre-service training, consulting and coaching, staff performance evaluation, decision support systems, facilitative administrative support and systems intervention (Figure 6 circular diagram colour code orange). However, these components were thematically similar to what Dusenbury (2003) calls "elements of high-fidelity" of implementation namely; 1) training 2) programme characteristics 3) teacher characteristics, and 4), organisational characteristics. Therefore, in line with the rest of the papers of this review, these components were classed as barriers and facilitators of implementation, rather than as aspects of the implementation process.

Although both (Durlak and DuPre 2008) and (Dusenbury et al. 2003) reported borrowing the Dane and Schneider (1998) framework, they presented it with different terminology from its original source and between them. Durlak replaced the concept of *adherence* in that framework with *fidelity,* and both replaced the concept of *exposure* with *dose*. There was no explanation for the replacements.

Additionally, Durlak (2008) report that the concept of *"program differentiation,"* (which is about ensuring that subjects in each experimental condition received only the planned intervention), has not received much attention in the literature and so they did not evaluate it any further. However, given that they also proposed the addition of a new yet similar concept called *"monitoring of control/comparison conditions,"* (Figure 6 colour code red), the dismissal of the original Dane and Schneider's concept of "program differentiation" was surprising.

Equally confusing were the inconsistencies in how the aspects of implementation were presented. In Durlak (2005), (Figure 6 colour code red) *fidelity* is the first of the aspects of implementation and it is followed by the same set of aspects (*dosage, quality, participants' responsiveness and programme differentiation*) that Dusenbury (2003), describes as representing

both "definitions of fidelity implementation" and "measures of fidelity implementation" (Figure 6 colour code brown). However, Durlak adds *monitoring of control and comparison, program reach,* and *adaptation.*

It is worth noting that some of the aspects of implementation such as *dose delivered,* and *dose received,* were almost exclusively discussed within the frameworks of the process-based papers (group 1). However, others (Murta, Sanderson, and Oldenburg 2007; Dane and Schneider 1998; McMahon and Fleury 2012; Rabin et al. 2010) also reported that the majority of their studies did not present information that explicitly linked process evaluation variables with outcome evaluation, and that very few reported on all stages of the dissemination and implementation process.

Further, both Dane and Schneider (1998) and Murta, Sanderson, and Oldenburg (2007) found inconclusive or contradictory results regarding *dose* and they concluded that there was insufficient evidence to reliably identify the process indicators of outcomes for it. Consequently, the circumstances in which these aspects influence implementation could not be assessed beyond these papers could not be assessed any further.

Stage 4 Adaptation

Synthesis of **Stage 4** of the process required a reordering of the Fixsen stages. This was because in the Fixsen framework, stage 4 is *sustainability* and it is followed by stage 5, innovation. However, in this framework, *innovation* is about opportunities to refine and expand programmes and implementation practices as opposed to inventing new programmes. Therefore, I determined that when described this way, *innovation* can be said to be equivalent to *adaptation.* However, in the Durlak framework, *adaptation* was classed as an aspect of implementation (Figure 6). Therefore, *adaptation/innovation* was classed as **stage 4** of the process. Fixsen (2005) argue that post-implementation adjustment is necessary to allow for flexibility in form (e.g. processes and strategies) without sacrificing the function associated with the component.

Similarly, Dane and Schneider (1998) argue that adjusting programmes to accommodate collaboration with target communities is not inconsistent with programme integrity. However, for the Durlak and DuPre (2008), the fidelity-adaptation debate is inappropriately framed in "either-or terms" and, it suffers from imprecision in the measurement of important constructs. The rest of the papers do not present *adaptation* as a stage, but they discuss its general desirability and implications for program fidelity and successful implementation and outcomes. They described it as flexibility, tailoring, adjusting interventions, or fitting to the context.

However, Dusenbury et al. (2003) conclude that it is difficult to currently have confidence in any of the arguments for or against *fidelity,* reinvention or mutual *adaptation* because research has not yet indicated whether and under what conditions *adaptation* or *reinvention* results in a loss of programme effectiveness. However, despite the conceptual doubts and limited definitive conclusions, *adaptation,* was the most identified stage/aspect of implementation, identified in half of the papers.

Stage 5: Sustainabiity

Sustainability is the final stage of the DoI theory, and it is equivalent to the maintenance stage of the RE-AIM framework. However, none of the Group 2 or 3 reviews reported any more detail, but it was mentioned as an outcome of successful implementation.

Therefore, this study identified five stages of the implementation process namely; *1) pre-implementation, 2) adoption, 3) implementation, 4) adaptation and 5) sustainability.*

In addition, nine aspects of the implementation stage of public health programmes were identified, namely; 1) *fidelity, 2) dose delivered/received 3) quality of delivery, 4) participant responsiveness/engagement, 5) programme differentiation , 6) programme reach 7) adaptation, 8) theory and 9)programme design* (also see Figure 6 and later Figure 8).

4.6.2 Mapping the findings onto the CFIR

Study specific research question (b): How do the findings from the study-specific question (a) map onto the CFIR?

To respond to this question, an assessment was made of how well the CFIR reflects the findings from question (a). This was done by comparing the findings from study-specific question (a) to the domains and the constructs of the CFIR. The domains are: *(i) the process* by which implementation is accomplished; *(ii) the characteristics of the Intervention*, *(iii) the inner setting (iv) the outer setting and (v)* the *characteristics of individuals* involved with the intervention or implementation the process. Figure 7 indicates the five domains plus their associated constructs. Appendix 7 describes the constructs in more detail.

Figure 7: The Consolidated Framework For Implementation Research adapted from Damschroder (2009)

Research (CFIR)

Implementation

Characteristics of the Intervention	Inner Setting	Outer Setting	Individuals Involved	Implementation Process
• Intervention Source • Evidence Strength and Quality • Relative advantage • Adaptability • Trialability • Complexity • Design quality • Cost	• Structural characteristics • Networks and communications • Culture • Implementation climate	• Patient needs and resources • Cosmopolitanism • Peer pressure • External policies and incentives	• Knowledge and beliefs about the intervention • Self-efficacy • Individual stage of change • Individual identification with organisation • Other personal attributes	• Planning • Engaging • Executing • Reflecting and evaluating

Domain: The implementation process

The domain of the *implementation process* is made up of the essential activities, which are common across organisational change models, namely: planning, engaging, executing, reflecting, and evaluating. Planning refers to the degree to which a scheme or method of behaviour and tasks for implementing an intervention are developed in advance as well as their quality and methods. Planning can be evaluated by assessing five considerations namely how stakeholders' needs and perspectives are considered, how strategies are tailored for appropriate subgroups, appropriateness of style for information delivery, communication channels, monitoring and evaluation methods, and the use of strategies to simplify execution (Damschroder et al. 2009). This is in line with three aspects of implementation that this review identified, i.e. *adaptation, participant engagement, and monitoring*.

In the CFIR, planning is presented as managed and executed by "implementers" and their organisations. Therefore, successful planning depends on their skills, the resources available to them, the procedures they follow, as well as the degree to which they incorporate the needs of the target audience. However, this review of reviews found that participants were not passive recipients of interventions, but they had multiple active roles in the implementation process. Failure to incorporate the views or expertise of participants had a negative effect on implementation. In their review of fall prevention programmes, Child et al. (2012) found that older people considered themselves as experts in the preventing their own falls. However, health care professionals considered them as lacking in the competency to identify their own propensity to falls or to take individual responsibility for their own treatment. Consequently, older people viewed the way in which healthcare professionals offered fall advice and prevention programmes as insulting, dictatorial, and disempowering.

McInnes and Askie (2004) concluded that rather than design and implement programmes on the basis of the evidence of effectiveness alone, "it is important to consult with individual potential participants and find out what

characteristics they are willing to modify and what changes they are prepared to make to reduce the risk of falling."

Similarly, in the review of studies of participatory ergonomic interventions in the workplace, Van Eerd et al. (2010) found that the following participant responsibilities were central to the success of the interventions process; problem identification, solution development, and implementation of change. They concluded that program participants were key factors in the participatory ergonomic interventions process.

In the review of the use of congregation-based programmes, Williams, Palar, and Derose (2011) also acknowledges the value of the principles of Community Based   Participatory Research (CBPR) to implementation. CBPR involves community members, organisational representatives, and researchers in all aspects of the research process. They argue that incorporating these in implementation can enhance the success of congregation-based HIV intervention development. It can also help participating organisations better understand issues related to cultural values and spiritual sensitivity and can identify the right approach to successfully initiating and tailoring the intervention.

Executing implementation according to plan is also central to successful implementation. This may consist of the degree of *"fidelity"* to a planned course of action, intensity (or in this case *dose*), and the degree of engagement of key leaders in the implementation process. *Fidelity* was identified as a key aspect of implementation. However, there was a distinction between *dose delivered* and *dose received*. *Dose delivered* was the number or amount of intended units/components of each intervention, which was actually delivered, and was related to the efforts of the intervention providers. On the other hand, *dose received* was the extent to which participants used materials, resources or techniques recommended by the programme and so it was related to the audience's engagement with the programme (Murta, Sanderson, and Oldenburg 2007; Linnan and Steckler 2002). Therefore, the dose that the participants received was not necessarily

the same as the dose that the implementer delivered nor was it within the control of the implementer.

Engagement in the CFIR domain of process is about attracting and involving appropriate individuals (e.g. early leaders, opinion leaders or formally appointed internal implementation leaders). This review found that leadership was a barrier and a facilitator of implementation (Arai et al. 2005; Dusenbury et al. 2003; Semenic et al. 2012). However, the findings on engagement were about the extent and manner in which the participating communities engaged with the intervention (Child et al. 2012; Durlak and DuPre 2008; Dusenbury et al. 2003; Johnson et al. 2011; McInnes and Askie 2004; McMahon and Fleury 2012; Pérez-Escamilla et al. 2012; Poobalan et al. 2009).

Finally, in the CFIR, the construct of reflective and evaluative activity includes quantitative and qualitative feedback on the progress and quality of implementation as well as regular personal and team briefing about progress and the experience of the implementers. While organisational feedback is important, what the studies in this review identified, was the need for participant views to be fed back to the implementing organisation and programme implementers. For example, Child et al. (2012) found that some participating older people did not believe that health care professionals were actually interested in their wellbeing. Similarly, the review of return to work programmes identified that participants' motivation to engage with the programme was undermined if they felt that the purpose was just to move them off disability benefits (Clayton, Bambra, et al. 2011). They conclude that the purpose of the programme must align with personal goals and be perceived to be legitimate for the individual. Therefore, feedback of such views from participants to implementers may support more action to improve participant engagement.

Domain: The Characteristics of individuals involved

In the review of studies of return to work programmes for disabled people Clayton, Barr, et al. (2011) found that there was a gradient of readiness for work among participants, with the participants who were more work ready at

the baseline returning to work quicker and needing less support than others. Further, participant work readiness was also a motivating factor for implementers to select the participants who were easier to work with to achieve programme targets faster. This created differential access to the programme and ultimately differential programme impact. This confirms that the *characteristics of the individuals involved* in the programme affect the key aspects of implementation such as *fidelity* and *adaptation*.

The findings regarding the role of participants in the implementation process was supported by another finding that, whatever the state of the scientific evidence behind an intervention, communities made their own evaluation of the "social value" of the intervention (Clayton, Barr, et al. 2011; Child et al. 2012; Greenhalgh, Kristjansson, and Robinson 2007; Arai et al. 2005; Ingram et al. 2011; McInnes and Askie 2004; Poobalan et al. 2009; Williams, Palar, and Derose 2011).

In the McInnes and Askie (2004) review, some studies reported a mismatch between the strategies willingly accepted by older people (e.g. walking aids, home modification, low-intensity exercise) and those that are most effective (e.g. balance and strengthening training). They concluded that the social aspects of fall prevention programmes (rather than the scientific evidence that they prevent falls) might be their strongest selling point. Therefore, community members (whether participants or not) attached a "social value rating" to the intervention, the condition it was addressing, as well as the act of taking part (or not) in the programme. These values were of material consideration on decisions to take part in interventions. People were reluctant to take part in fall prevention programs in which the social value of participation had not been promoted.

However, although the participants had the right to participate in the interventions or not, public health interventions also had the power to socially "alienate" or "include" individuals, and they could modify people's social identities. In the study about older people in fall prevention programmes, Child et al. (2012) found that older people did not comply *(adherence)* with

certain walking aids (e.g. the walking cane) because it conferred the undesirable social identity of a "frail geriatric" to the participant. Therefore, the use of recommended walking aids was viewed as a marker of loss of independence. For this reason, some older people would often walk without walking aids just for show (Child et al. 2012).

In the review of return to work programmes for disabled people, Clayton, Barr, et al. (2011), found that taking up offers of subsidised jobs conferred a lower social and professional status to the participants. In the one about the uptake of information to prevent skin cancer, (Garside, Pearson, and Moxham 2010), found that tanned skin was not only considered healthier, but brown-skinned individuals also had the desired identity as "aesthetically beautiful" individuals. This status was threatened by interventions, which were promoting covering up in the sun.

Further, the acceptability of some interventions was culturally sensitive. For example, dance classes were acceptable for western older people, but Chinese older people considered dancing to be a youth activity. Thus for older people dancing conferred a socially demeaning identity of an immature adult. There were also other strong cultural influences, which were sometimes linked with metaphysical ideas such as fatalism. For example, certain consequences (e.g. falls) in older age were considered inevitable out of the control of individuals. In those circumstances, the intervention was viewed as pointless (Johnson et al. 2011; Child et al. 2012).

In addition, the identity of both the implementer and the participant were relevant considerations in decisions about whether to participate in an intervention or not. In the Ingram et al. (2011) review, young mothers participating in a social services intervention aimed at preventing unintentional child injuries at home were concerned that being targeted by social services would earn them the social identity of "incapable parents." Similarly, older people did not always consider contact with health professionals empowering. Therefore, the review confirmed that

characteristics of individuals were relevant to aspects of implementation, particularly *adoption, engagement, and fidelity.*

Domain: The Inner setting

Damschroeder (2009) notes that much of the literature in support of the construct of *inner setting* domain (i.e. structural characteristics), came out of the Damanpour (1991) seminal research into organisational innovation. This explains the dominance of organisational factors in the *inner settings.* Thus, this domain is inherently about organisations. These include organisational characteristics such as; age, size, the webs of social networks, the nature and quality of formal and informal communications, the organisational culture, the shared receptivity of involved individuals to an intervention and the extent to which use of that intervention will be "rewarded, supported, and expected within their organisation (implementation climate).

There was some evidence of organisational factors like communication, leadership, or incentives, but the mapping exercise also found that socially embedded processes such as communication to participants, consultations with them, the use of community leaders, or participatory methods were important.

Domain : The Outer setting

The CFIR domain of the *outer setting* is equally concentrated with organisation related constructs. These include the extent to which patient needs and their barriers and facilitators are accurately known and prioritised, the degree to which an organisation is networked with other organisations (or cosmopolitanism), the competitive pressure to implement an intervention (peer pressure) and external policy and incentives. Therefore, although this setting is broadly described as about the structural political and cultural contexts through which the implementation process will proceed, its constructs mostly presume an organisational (or a corporate) environment.

While there was some evidence of organisational factors such as communication, leadership, or training in this review of reviews, the findings relating to the social environment like access to the intervention, competing

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priorities for participants, or other contextual factors were not adequately reflected in the CFIR. Therefore, the community-related factors, e.g. participant views, interpersonal relationships or social networks, which the review identified as key to *adoption, adaptation, sustainability, and adherence* appear to be on the periphery of both the outer and the inner setting of the CFIR.

Domain: The Characteristics of the intervention

The final CFIR domain of "characteristics of the intervention" has eight constructs namely; 1) adaptability, 2) intervention source, 3) evidence strength and quality, 4) stakeholder perception of the relative advantage of implementing the intervention, 5) trialability, 6) complexity, 7) the design quality and packaging of the intervention and 8) the cost.

The findings highlight the fact that the characteristics of the intervention are crucial to the success of implementation. *Adaptation* was the most identified aspect of study I, (N=11), and this was in line with the construct of adaptability in this domain.

However, not all of the CFIR constructs from this domain were identified in the review, and when similar ones were found, they were related to participants rather than to implementers, their organisations or their stakeholders. So for example, instead of organisational stakeholder perceptions about the relative advantage of implementing the intervention, participant's perceptions about the relative advantage of adhering to the intervention was identified.

The (Arai et al. 2005) review, found that some of the barriers to the adoption of a smoke detector intervention were that participants found "false alarms" from the devices a nuisance, while (Johnson et al. 2011) found that participants were not interested in interventions which were not in line with their personal commitments. Similarly, the inconvenience of putting on and keeping hats on small children to prevent sunburn, (Garside, Pearson, and Moxham 2010) or of using walking aids to prevent falls, (Child et al. 2012) affected the participant's *adherence* to the intervention. The McInnes and

Askie (2004) review, concluded that the views of patients on the intervention may be indicators of factors that promote adherence and acceptability.

Although the strength of evidence is identified as important in the CFIR, it is also acknowledged that this is not always dominant in individual decisions to adopt or to adhere to interventions, nor is it sufficient. This is in keeping with the findings of the review that regardless of the strength of scientific evidence, people still evaluated interventions for their social value. The remaining constructs of this domain like trialability and complexity were captured in the general discussions around the importance of taking into account the context during the pre-implementation stage, and the need to make sure that interventions carried a strong rationale and value to the target population. Generally, therefore, the findings in this review were in keeping with this domain.

4.6.3 Question (c): Measures of implementation

The data that was extracted for this question was very limited and imprecise. The Dane and Schneider (1998) review reported that only a few of their studies reported specific measures of aspects of implementation. They reported that one of their studies used a combined measure of adherence, quality, and responsiveness and another used a combination of adherence, and exposure. There was no further detail on the measures or comment on their usefulness and validity for other public health programmes.

Reporting on the characteristics of the studies assessing the impact of implementation on programmes the Durlak and DuPre (2008) review found that the majority of their studies (N=41 or 69% assessed only one aspect of implementation and only 18 (31%) evaluated at least two aspects such as fidelity or dosage. The largest group (n=37) evaluated *fidelity,* while 29 assessed *dosage.* Only three evaluated the impact of adaptation on programme outcomes and few monitored any of the other aspects of implementation such as *quality or program reach*.

The Durlak paper includes a table which describes the aspect of implementation that was measured, the number of measures used as well as

a brief description of the method that was used to assess implementation (e.g. self-report, observation or attendance figures). However, they do not report on the usefulness or validity of any the measures or methods used.

The Fiebelkorn et al. (2012) review of point of use water treatment reported that their ability to understand behaviour change was limited by difficulties in objectively measuring the consistency of point of use water treatment. The Rabin et al. (2010) review found that the majority of their studies did not report on the reliability or validity of measures included and only one study in their review included reliable and valid measures. Greenhalgh, Kristjansson, and Robinson (2007) noted the measurement difficulties arising from the long-term nature of their intervention (school feeding programme). Pérez-Escamilla et al. (2012) assessed an integrated scale up framework for scale-up called Assess Innovate Devolve Engage Devolve (AIDED). They concluded that the framework was useful, but its empirical validity remains to be tested.

Dusenbury et al. (2003) noted that measures of *fidelity* of implementation have been weak and that there are no widely applicable standardised methodologies for measuring *fidelity*. They noted that part of the challenge of developing measures involves not only defining the concepts to be measured but also in developing measures that can be used. They concluded that valid measures for programme implementation are needed. Finally, Durlak and DuPre (2008) argued that the fidelity versus adaptation debate is framed inappropriately and it suffers from the imprecise measurement of constructs. However, they add that given the multi-dimensional complexities of most innovations, it seems unlikely that standardised measures of all aspects of implementation that apply to all types of innovations can be developed.

Therefore some papers in this review of reviews reported limited information on measures of the implementation process, but the majority (59% or N=13) did not report anything on the existence or quality of relevant measures of the implementation of the programmes.

4.7 Discussion

The first objective of study I was to understand the nature and character of successfully implemented public health programmes. This was achieved through investigating whether there are identifiable stages, aspects, or indicators specific to the implementation of community-based public health programmes, and the relationship between the stages and aspects of implementation (question (a)). The second objective was to assess whether/how any aspects of implementation were reflected in the CFIR, an established generic framework for implementation (study-specific question (b)) and the final objective was to review any available measures (question (c)). The study identified 22 reviews of implementation of community-based public health programmes. The synthesis of the findings identified stages and aspects of implementation in all three groups of papers, i.e. the reviews that utilised process frameworks, those that looked at strategies, and those that looked at barriers and facilitators of implementation.

Stages of implementation

Five stages of implementation were identified starting with *pre-implementation activity, adoption, implementation, adaptation and sustainability*. Although these stages appeared sequential, in practice, they were interactive and interconnected. For example, the exploratory activities of stage 1 (Figure 6) could improve the implementer's understanding of the context, as well as their understanding of how participants are likely to view the programme. This directly influences some of the aspects of implementation in stage 3, i.e. *reach, dose delivered/received*, *participant responsiveness, and adaptation*. It also improves the prospects for *sustainability* (**stage 5**) happening.

Efforts to achieve aspects of implementation (**stage 3**), e.g. *fidelity* improve the chances of the programme being effective. This has a backward impact on **stage 2**, *(more adoption)* and a forward influence on **stages 4** *(adaptation)* and **stage 5** *(sustainability)*.

Further, *adaptation* **(stage 4)** is an ongoing process that starts almost as soon as **stage 1** (*pre-implementation*) starts. This is because *pre-implementation or* exploration activities are likely to uncover favourable or unfavourable contextual factors, which may necessitate *adaptions* throughout the programme. In turn, these will affect the implementer and the participant's response to the programme.

Further, the success of each stage improves the chances of success for other stages. For example, the *adoption* stage was consistently attributed to the quality of the processes of Stage 1 (*pre-implementation*) activities. Figure 8 illustrates the interactive and mutually reinforcing nature of these stages and aspects of implementation.

Figure 8: The interactive nature of the stages and aspects of implementation
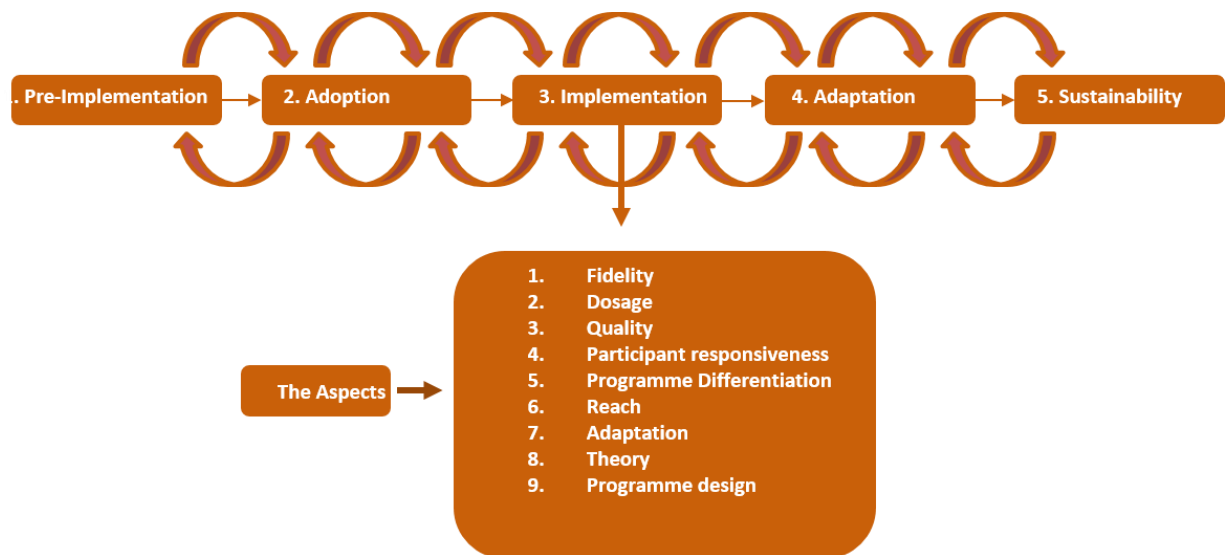
Aspects of implementation

Despite inconsistent terminology, nine aspects of implementation were identified: as; 1) *adaptation, 2)participant responsiveness/engagement, 3) fidelity,4)dose received/delivered, 5) quality of delivery, 6) programme differentiation, 7) reach, 8) theory, and 9) programme design.* (see *Table 1*).

The review was challenged by the inconsistency of terminology. Moreover, some identified efforts to simplify terminological added on to the clutter rather than to clarity. For example, Durlak's replacement of the term "*programme*

differentiation" with "*monitoring of control and comparison."* Similarly, some reviews used the concepts of *adherence* and *fidelity* as if they were interchangeable, while others considered them to be different concepts. This confusion suggests a need for implementation scientists to prioritise the building of consensus to standardise the terminology over the need to create new terms or more clarifier phrases.

Adaptation was the most identified aspect of implementation and its dual potential to boost adoption and to threaten fidelity were well articulated. The findings also suggest *adaptation* and participant engagement mutually influence each other. In addition, *adaptation* enhances the quality of delivery. Thus, where participants fail to engage with the programme, the quality of the implementation is of little consequence. Further, where *adaptation* to local circumstances is not done properly, the degree of *fidelity* to original plans could be counterproductive. Consequently, the quality of delivery is influenced by both the degree of fidelity and the degree of adaptation.

However, there was little information regarding the measurement of *adaptation.* In addition, measures were largely discussed with the key objective of achieving *fidelity* rather than achieving *adaptation.*

The conversion of the *dose delivered* to *dose received* was found to be largely influenced by participants. Therefore, the measurement frameworks of community-based public health programmes will need to have the capacity to evaluate dose received and not just dose delivered.

These results also suggest that in these types of programmes, the power relationship between the programme, its implementers, and the participants is dynamic and complex. For example, participants were not just passive recipients of the process, but they regularly adopted roles as implementation partners and social evaluators of the programme. In addition, there was evidence that where *pre-implementation* contexts are not taken into account, and where the objectives of the intervention were not aligned to those of participants, well-intentioned programmes inadvertently became disempowering. Thus, some participants perceived public health

programmes as patronising, labelling, isolating, and capable of changing or modifying their social identities. These are akin to the Foucauldian concept of the medical gaze (Foucault 1977), in which recipients of health interventions are powerless. These perceptions affected the extent to which aspects of implementation such as participant responsiveness, and dose received could be achieved. Therefore, researchers and implementers need to consider the power dynamics that new public health programmes may introduce during implementation and the impact that this may have on implementation, engagement and ultimately programme effectiveness.

The aspect of *programme differentiation* reflects the shifting or uncontrollable context, within which community-based public health programmes are often implemented. For example, the Durlak (2008) review reports a finding in which after taking into account the possibility that participants were exposed to an alternative of the programme, the mean effects of 46 programmes rose from 0.02 to reach significance at 0.24. This meant that if issues related to the implementation of the intervention and the receipt of services by control groups could be controlled, these programs would have been twelve times more effective. However, the sources of contaminants in complex public health environments are unlikely to be known, so action may be limited to monitoring the impact of potential contamination on the programme.

The CFIR

The review found that the CFIR does not adequately reflect the socially embedded factors which were found to influence the successful implementation of these programmes. This is illustrated in the implied setting of the domains of the CFIR and the factors that were found in this study. For example, where the CFIR talked of culture, this refers to the prevailing culture of the implementing organisation, while for the findings of study I, this also refers to the "social culture" within communities. Where the CFIR talks of structural characteristics, this refers to the social architecture, age, and maturity of organisations. In these findings, these also refer to the strength of the structures within the participating communities, e.g. access to the intervention (e.g. proximity to bus stage), or the availability and strength of

social capital, (friends or family) to persist with an intervention, e.g. breastfeeding.

Finally, these findings suggest some gaps in the measurement and evaluation frameworks of public health programs and the need for a framework that recognises the dynamics of implementation between the social-community environment, the participants, the intervention and the implementers.

However, these findings need to be assessed against their strengths and weaknesses of the study. The biggest limitation of this study was relates to its methodological approach as a review of reviews. This approach meant that questions could only be answered to the extent that the included reviews provided the relevant information. Other limitations relate to the emerging state of the field. These include; non-standardised terminology, inadequate reporting of the implementation processes, and differences in research question framing. These limitations presented challenges on the extent to which data could be synthesised.

A key outcome of some of these limitations though, was that there was little data in the reviewed papers to study-specific question (c), regarding the availability of measures of implementation. This finding was useful in that it highlighted the state of knowledge on the subject, but it was problematic in that the PhD's original intention to explore the implementation process and its measures was no longer possible.

4.8 Conclusion

The stages and aspects of implementation which the review identified are probably standard across different kinds of programmes. However, study I suggests that the way in which they apply reflects the complex nature of community-based public health programmes, the systemic pattern of the problems they try to resolve and the shifting social-cultural contexts within which they are situated. Therefore, with public health programmes, the process of implementation is not a sequential or a one-way delivery process. More often, it is an interconnected chain of components, namely pre-

implementation, adoption, implementation, and adaptation. Thus, it is an interconnection of the implementer's delivery action, plus the reaction of the participant's and their contexts.

Therefore, evaluations of public health trials and programmes need to account for how the components of implementation interact with themselves and with the social environment. For example, fidelity needs to be evaluated alongside inevitable adaptation, the engagement effort of the implementers alongside the participants responsiveness, the dose delivered alongside the dose received, the quality of delivery alongside the participant's own unofficial evaluations and so on. Therefore, this PhD proposes an extension of the CFIR to include domains and constructs which are specific to the community environment. These would be complementary to the organisational domains and constructs currently reflected.

Finally, although the literature identified sustainability as the final stage of the process (Figure 6), there was very limited data on sustainability and how it happens. There was also limited data regarding measures of implementation. Consequently, it was not possible to use this data as a skeleton for developing a framework of markers and measures of the implementation of public health programmes.

Therefore, a key outcome of study I was that the original intention to investigate and develop measures of implementation to develop an evaluation framework was abandoned in favour of pursuing the understanding of how sustainability of public health programmes occurs. This was done through a primary study of the ASSIST, a school-based smoking prevention programme in the UK. The ASSIST programme was chosen based on the fact that it is an evidence-based programme and on the length of time that it has been implemented. The next chapter will give a brief description of the case study of the thesis, the ASSIST programme.

Chapter 5   The ASSIST

5.1 Introduction

This chapter introduces the programme that is the case study of this thesis. The case study is a national programme, which was developed from A Stop Smoking In Schools Trial (ASSIST). The chapter will cover how the trial behind this programme was conducted, its findings, and how the programme that was developed from it is delivered nationwide. The chapter is very brief, but the purpose is to provide the context and the background knowledge required to understand the case study without mixing it up with the studies.

The contents of the chapter and other representations of the A SSIST programme throughout the thesis have has been extracted or summarised from a combination of: the publications that the researchers of the trial have made, such as (Audrey et al. 2006); (Audrey, Holliday, and Campbell 2006; Audrey et al. 2004; Campbell et al. 2008; Hollingworth et al. 2011; Starkey et al. 2009; Starkey et al. 2005). Other general knowledge has been obtained from programme literature, e.g. the training manual, and from the interview and the observational studies that were conducted. The references relating to the ASSIST are included in the general references for the thesis, but for ease of reference, they are also provided at the end of this chapter (section 5.5).

The chapter is divided into four sections. Section 5.2 will provide the rationale for using the ASSIST as the case study, section 5.3 will provide the details of the trial behind the programme, section 5.4 will provide the delivery structure of the programme, and it will summarise the impact of the programme and the prospects for it. Section 5.5 provides the references related to the ASSIST.

5.2 The rationale for using the ASSIST as a case study

In deciding what programme to use as a case study, I was looking for a programme that had been developed from peer-reviewed research, one which could be said to have been sustained (e.g. more than two years in

operation), and one which was still in operation at the time of the study. The ASSIST met all this criterion in that it is a programme that been running for over five years, it has been widely adopted across British schools, and it is still being implemented. Therefore, it is an evidence-based public health programme of demonstrable sustainability. Further, all the key individuals related to the programme were accessible, including the Principal Investigators of the trial that led to the programme, the senior staff at the organisation responsible for the national rollout, the senior staff at the Council as well as the local organisation that was delivering it.

5.3 The ASSIST trial

The history

The researchers of the ASSIST report that research published before the trial (early and mid-90s) indicated that interventions addressing attitudes and smoking behaviour were largely unsuccessful (Campbell et al. 2008). Further, unlike the ASSIST, most of the available peer-led programmes were classroom based. Thus, there was an established need to explore what would work in reducing the uptake of smoking.

The ASSIST trial was developed from an exploratory trial which was trying to apply the Diffusion of Innovation Theory to adolescent health. This exploratory research was funded by the Medical Research Council (MRC) and the Wales Office of Research and Development for Health and Social Care, Mid Glamorgan and Bro Taf Health Authorities and the European Commission. The results of the exploratory trial were promising in terms of potential effectiveness. This led to the MRC funding the follow-on trial to evaluate the effectiveness of the intervention. The ASSIST programme was rolled out based on the results of the main trial.

The Design of the trial

The design was a cluster randomised controlled trial, and it involved 10,730 students, aged between 12 and 13 years old from 59 schools across England and Wales. A total of 5372 students were randomly assigned to the control group for usual intervention while 5358 pupils were randomised to an

intervention group. Table 3 provides the details of the intervention and the process that was followed to identify the children who were trained as peer supporters. I have tabulated the information here, but it is otherwise unmodified from the researchers own report of the trial which can ben found in (Campbell et al. 2008).

Table 3: Stages in the ASSIST intervention, adapted from Campbell et. al (2008).

Description	Process
1. Nomination of peer supporters	Completion of questionnaire by all students aged 12–13 years (UK Year 8) to identify Influential peers. The key questions asked were; 1) "Who do you respect in Year 8 at your school?" 2) "Who are good leaders in sports or other groups activities in year 8 at your school?", and 3) "Who do you look up to in Year 8 at your school?" To achieve a 15% critical mass of the year group participating as peer supporters, the 17·5% of students with the most nominations were invited to a recruitment meeting
2. Recruitment of peer supporters	Recruitment meeting held with nominees to explain the role of peer supporter, answer questions, and obtain their agreement to attend the training course • Trainers made it clear that students who smoked could only be peer supporters if they were committed to trying to stop smoking • Parental consent for training course participation sought by investigators
3. Training of peer supporters	Overall purpose of the training programme was to enable the peer supporters to engage in informal conversations with their peers about the effects of smoking and the benefits of not smoking • 2-day training event held out of school, facilitated by a team of external trainers who were experienced in youth work, led by health-promotion specialists • The training aimed to: provide information about short-term risks to young people of smoking and the health, environmental, and economic benefits of remaining smoke-free; develop communication skills, including verbal and non-verbal communication skills, listening skills, expression of feelings and ideas, group work, team building, cooperation and negotiation, ways of giving and receiving information, and conflict resolution; and enhance students' personal development, including their confidence and self-esteem, empathy and sensitivity to others, assertiveness, decision making and prioritising skills, attitudes to risk-taking, and exploration of personal values • Methods used to achieve these aims included participatory learning activities such as role plays, student-led research, small group work and discussion, and games

After the children were trained as peer supporters, there was a 10-week intervention period in which they were expected to implement the intervention with their peers in informal settings, and they were asked to log these conversations in a pro-forma diary. During this period the children also received four follow up sessions in their school, delivered by the trainers. These follow up sessions were intended to provide support to the children during the period of implementation, problem-solving, and monitoring their diaries. At the end of the 10-week implementation period, the children were given a certificate and peer supporters who handed in their diary were given a gift voucher.

The primary outcomes of interest were smoking in the past week in both the school year group and in a group at high risk of regular smoking uptake. At baseline, uptake was defines as occasional, experimental, or ex-smokers, There was also a process evaluation of the intervention, as well as a cost-effectiveness analysis. The schools were followed up on three separate occasions, immediately after the intervention and at 1 and 2 years after.

Findings

The measures of the levels of nicotine levels in saliva were taken at the baseline; and at the two follow up points, were used to validate the self-reported smoking behaviour. The trial found the ASSIST programme to be effective in reducing smoking prevalence over the two year period of follow-up, with an odds ratio of 0.78 (95% CI: 0.64-0.96)(Campbell et al.). The researchers concluded that this suggests that the ASSIST could lead to a reduction in adolescent smoking if implemented at the population level.

5.4 The ASSIST Programme

The success of the trial led to the rollout of the ASSIST as a national programme, which makes the case study of this thesis. The programme is delivered from a manual and it follows the same procedures that were used during the ASSIST trial (see Table 3). However, the children are no longer given gift vouchers for filling in their diary, and due to poor compliance, the filling in of the diary is no longer a requirement.

National Delivery structure

After the success of the trial, researchers spent two years disseminating the results of the trial and engaging stakeholders and investigating how best the intervention could be rolled out in schools. A not-for-profit organisation called DECIPHer IMPACT Ltd (DI Ltd) was set up as the key delivery vehicle of the programme. The role of DI Ltd includes to:

1. Promote the uptake of the programme to Local Authorities nationwide, and issue them with licenses to deliver the programme. Licences are offered for a fee of £11,000 per year, and they are issued on a minimum of a three-year term.
2. Produce, update, and distribute the training manual materials.
3. Conduct quality assurance through monitoring delivery and providing feedback to Local authorities.
4. Work with Local Authorities to solve implementation issues.
5. Promote the ASSIST beyond the UK.

Other aspirational functions relate to expanding the remit of the organisation to other types of evidence-based programmes in public health. The local authorities have the liberty to deliver the intervention in schools using their own staff or to contract the delivery to an external organisation.

Reach of the programme

As of 1st November 2018, the DECIPHer Impact Ltd's web site on http://evidencetoimpact.com/assist/ reports quite a considerable level of the programme's reach as follows:

- Over 131,000 students have taken part in the ASSIST nationwide, via more than 21,000 peer supporters.
- The ASSIST is now available in France
- The programme is part of a big research project and it will be rolled out in Belfast and Bogota in the next academic year.
- The ASSIST methodology is also being applied to research into other health behaviours including drugs, nutrition, and fitness.

5.5 Useful References on the ASSIST trial

Audrey S, Holliday J, Parry-Langdon N, Campbell R (2006). 'Meeting the challenges of implementing process evaluation within randomised controlled trials: the example of ASSIST (A Stop Smoking in Schools Trial)'. **Health Education Research** 21(3):366-377.

Audrey S, Holliday J, Campbell R (2006) 'It's good to talk: An adolescent perspective of talking to their friends about being smoke-free'. **Social Science and Medicine** 63(2):320-344.

Audrey S, Cordall K, Moore L, Cohen D, Campbell R (2004). 'The development and implementation of a peer-led intervention to prevent smoking among secondary school students using their established social networks'. **Health Education Journal**63 (3):266-284.

Campbell R, Starkey F, Holliday J, Audrey S, Bloor M, Parry- Langdon N, Hughes R, Moore L. (2008) 'An informal school-based peer-led intervention for smoking prevention in adolescence (ASSIST): A cluster randomised trial'. **Lancet 371:1595-1602.**

Hollingworth W, Cohen D, Hawkins J, Hughes RA, Moore L, Holliday JC, Audrey S, Starkey F, Campbell R (2012). 'Reducing Smoking in Adolescents: Cost-Effectiveness Results From the Cluster Randomized ASSIST (A Stop Smoking In Schools Trial)'**Nicotine and Tobacco Research** 14 (2):161-168.

Starkey F, Audrey S, Holliday J, Moore L, Campbell R. (2009). 'Identifying influential young people to undertake effective peer-led health promotion: the example of A Stop Smoking In Schools Trial (ASSIST)' **Health Education Research**24 (6): 977-988.

Starkey F, Moore L, Campbell R, Sidaway M, Bloor M (2005). 'Rationale, design and conduct of a comprehensive evaluation of a school-based peer-led anti-smoking intervention in the UK: the ASSIST cluster randomised trial'. **BMC Public Health** 5:43

Reflective note 4

The next study (Study II) turns out to be the hardest to develop. We agree that the next stage is to study the sustainability of the ASSIST. Me and my supervisor RA travel to meet the CEO of Decipher Impact Ltd to propose the project. Part of that proposal is an observational study of the organisation and its role. The CEO assures us the proposal is acceptable in principle but since I would need to be located at the organisation for a few months, it needs Board approval. The Board is not meeting for at least two months. Since the proposal is acceptable in principle, I write it up as part of the upgrade plan and report. I feel in control again. What could go wrong?

The next Board meeting is in the same week as my upgrade date, but I am optimistic. However, a day before the upgrade, I receive an email from DI Ltd saying due to unforeseen staff circumstances, they are not able to support the project. So yet again, I have to restructure the direction of the study, but this time, within one day of the upgrade deadline. Yet, somehow, this unexpected and drastic change does not bother me.– not in the same way that the conceptual talk in the first meeting did anyway. I guess I do not have time to panic, or I have finally embraced uncertainty as the nature of the beast. Therefore, I calmly rework the plan into a comparative case study of two local authorities within 24hrs. I pass the upgrade and I immediately get to work, building an excellent rapport in both Local Authorities. However, even this too is to be later changed. A few days before the first meeting was due to take place, and after months of meticulous planning and scheduling, and receiving assurance, the second Local Authority pulls the plug on the project. It's now 2 years since I started. I have a right to panic, but again I do not have the time to. So instead, I just develop a new plan for a more intensive case study.

Still, these challenges pale in their significance compared to what happens next. I receive an email that one of the interviewees who had been so helpful throughout this project has suddenly died. Listening and analysing the transcripts of their interview was one of the hardest things I had to do. This chapter is dedicated to them. Another lesson in "nothingness"

Lesson 4

They say failing to plan is planning to fail, but sometimes plans fail because a valued life no longer lives, and where that life physically was, there is absolutely nothing, and nothing can ever replace it.

Chapter 6   Study II: How the ASSIST was sustained - Perspectives from across the implementation chain

6.1 Introduction

This chapter reports on the methods and conduct of the interview study (Study II), and it discusses its findings and conclusions. The study evolved from the key findings of the review of reviews study that there is a paucity of information on the sustainability stage of public health programmes. It is also informed by the results of a previous study by some of the supervisory team (Pearson et al. 2015a), in which they found that evidence around how health promotion programmes become routinised into school policy and practice was limited. Other key authors of implementation science such as (Proctor et al. 2015; Scheirer and Dearing 2011; Schell et al. 2013; Proctor et al. 2011) have also identified the knowledge gap in relation to longer-term implementation of public health programmes.

The study is the second of the series of linked studies, designed to tackle the second of the two PhD questions;

- With reference to a school-based public health programme, how is sustainability achieved over time?

It also offers further insight into the nature and character of the implementation process (PhD question 1), through investigating how implementers perceive the implementation process.

6.2 Research questions

The study-specific questions were:

a) What are the factors of programme sustainability in a successful school-based public health programme?

b) What school-related and local community-related factors support or hinder the introduction, implementation and longer-term sustainability of public health programmes in schools?

6.3 Study-specific objectives

The broad aim was to understand how and under what conditions school-based public health programmes are sustained beyond their research trial period. The objectives were to:

a) Follow up or verify some of the findings of the review of reviews.

b) Investigate whether there are empirically identifiable factors of programme sustainability across the implementation chain.

c) Explain how these factors may contribute to the sustainability of the programme.

The findings of this study are later compared with the real-time observations of the implementation of the ASSIST programme Study III (Chapter 7). Therefore, the study was also intended to shape the subsequent studies III and IV.

6.4 Methodology

As a qualitative project, the aim was to capture the perspectives of people who had acquired knowledge about the ASSIST, through their involvement as researchers, programme promoters, commissioners, decision makers, implementers, or as recipients of the programme. The epistemological assumption was that it is possible to gain access to the perspectives of the interviewees regarding the implementation of the programme and its sustainability and that those perspectives were not only meaningful and knowable but that the interviewees could make them explicit (Quinn 2002).

This involved inquiry into some basic topics about the programme such as its history, resources, how it is delivered, any challenges faced etc. In addition, the perceptions of the interviewees about how they described their involvement or that of others, how they said they relate to each other, and to the programme, or to their organisation, and whether any of their reported actions or relationships had influence on the sustainability of the programme. Therefore, the project raised open questions about phenomena of interest in a particular contextual setting (Daymon and Holloway 2010). While interviewing the individuals was the best way of accessing reported

perceptions, it was also supplemented by three other data collection methods, namely the review of reviews, the observational, and the questionnaire studies. Therefore, the interview study also provided an opportunity to verify some of the findings of the review of reviews, as well as to guide the subsequent observation study.

Since the PhD also sought to take into account the context in which the implementation process took place; the inquiry was particularly suited to qualitative methods (see section 3.2). However, the value and the appropriateness of the qualitative inquiry to this project was discussed in chapter 3, and so it will not be discussed again in this section. However, section 6.5 provides the details of how the data was collected.

6.5 Methods

Sources of interviewees

The original plan was of a comparative case study design involving semi-structured interviews at Local Authorities A and B, with individuals from all the five key points of the programmes' delivery chain. These were the trial stage, the organisation that was contracted to deliver the national rollout of the programme, the commissioning local authority, the organisations commissioned by the local authority to deliver the programme locally, and the schools (see Figure 9).

Figure 9: Key intervention delivery points from where interviewees were selected

6.5.1 Rationale for selecting interviewees

All the required interviewees at LA (A) were traceable because the programme was still running. However, it was anticipated that some interviewees at LA (B) would not be traceable because their programme was no longer running. Therefore, the plan was to supplement or boost the data with a documentary analysis of the existing records on the programme at LA (B). Table 4 lists the planned interviews and the rationale for conducting them and their reference codes. The reference codes are later used to identify the source of quoted material later on in the chapter.

Table 4 :   Rationale for planned interviews across the key delivery points

Interviewee	Reference code	Rationale for interview
Principal Investigator	PI	To gain insight into the development and the design of the trial and to assess whether these were relevant to the programmes' sustainability.
CEO of Decipher Impact Ltd	DICEO	DI Ltd is the organisation that was set up to oversee the rollout of the programme, so it represents the national operational structure. This interview intended to investigate whether there are any factors of sustainability related to the delivery structures, which support the implementation of the programme.
Council Leadership (Public Health Consultants)	PHC	To understand the environment from which decisions to commission and implement the programme are made, including assessing the councils' public health priorities, vision, and goals as they relate to programme sustainability.
Council Programme Leads	CPL1 CPL2	These were the local officers who were responsible for the programme within the councils. The aim of interviewing them was to gain insight into factors of sustainability within the Council's ASSIST implementation model, such as the skills, and attributes of the programme's lead staff including any local support structures that may be in place and how this may relate to sustainability
Staff at commissioned organisations	TR1 TR2 TR3 TR4 (Trainers)/Programme Coordinator (PC)	Both councils contracted local organisations to deliver the programme. The aim of this interview was to uncover first-hand information about implementation and other factors that implementers regard as having influence on the sustainability of the programme.
Liaison Teachers	LT1, LT2, LT3	To gain insight into school-related factors that may influence sustainability.

6.5.2 Planned interviews

The plan was to recruit interviewees from equivalent roles from the selected local authorities (A) and (B). Where a role was carried out by more than one individual, (e.g. trainers or liaison teachers), a combination of their experience and availability would be used to select the most appropriate interviewee. The more experienced individuals were valuable for their history, and detailed knowledge of the programme. Each interview was designed to provide particular insight towards answering the general research questions. Table 5 lists the number of interviews, which were planned to take place and where.

Table 5 : Planned Interviews

Implementation chain	Description of interviewees	PI	LA (A)	LA (B)
Trial	Principal Investigator	1	-	-
Delivery organisation	Chief Executive Officer DI Ltd	1	-	-
Council senior leadership	1 Public Health Consultant per Council	-	1	1
Programme Leadership	1 Programme lead per council	-	1	1
Programme Coordination	1 Coordinator per council	-	1	1
Trainers	3 per council, approx. 1 per training team	-	3	3
Liaison teachers	1 per school, 3 schools per council.	-	3	3
Planned Totals		2	9	9
Total number planned		20		

6.5.3 Achieved Interviews

LA (B) agreed to support both the contact tracing of their programmes' ex-staff and the identification of the supplementary documents. A project team was set up, and it included myself, the council's current consultant in Public Health, their Advanced Public Health Practitioner, and their ex-Programme Coordinator. The project plan was approved at the senior leadership level, the council's Consultant in Public Health. A date for discussing and agreeing on the documents which were deemed relevant for analysis was scheduled three months in advance, to March 24^{tt} 2017. In the meantime, the Advanced Public Health Practitioner at the Council would compile all the possible documents, and they started tracing the ex-programme staff on my behalf.

However, despite establishing a good rapport with the council and the long-range planning, LA (B) cancelled the project a few days before the agreed date for the document discussion. They cited newly emerged concerns regarding third-party access to the Council's electronic information systems. In addition, only three of the required nine interviewees (the ex-programme coordinator, and two ex-trainers) agreed to be contacted about the project. One of these two trainers also failed to gain permission from their current organisation to take part in the project. Therefore, at LA (B), only two interviews were completed. These were, one with the ex-programme lead and the other with the ex-trainer. Figure 10 provides the details of the all interviews which were conducted successfully and the ones which were not.

Figure 10: Interviews achieved
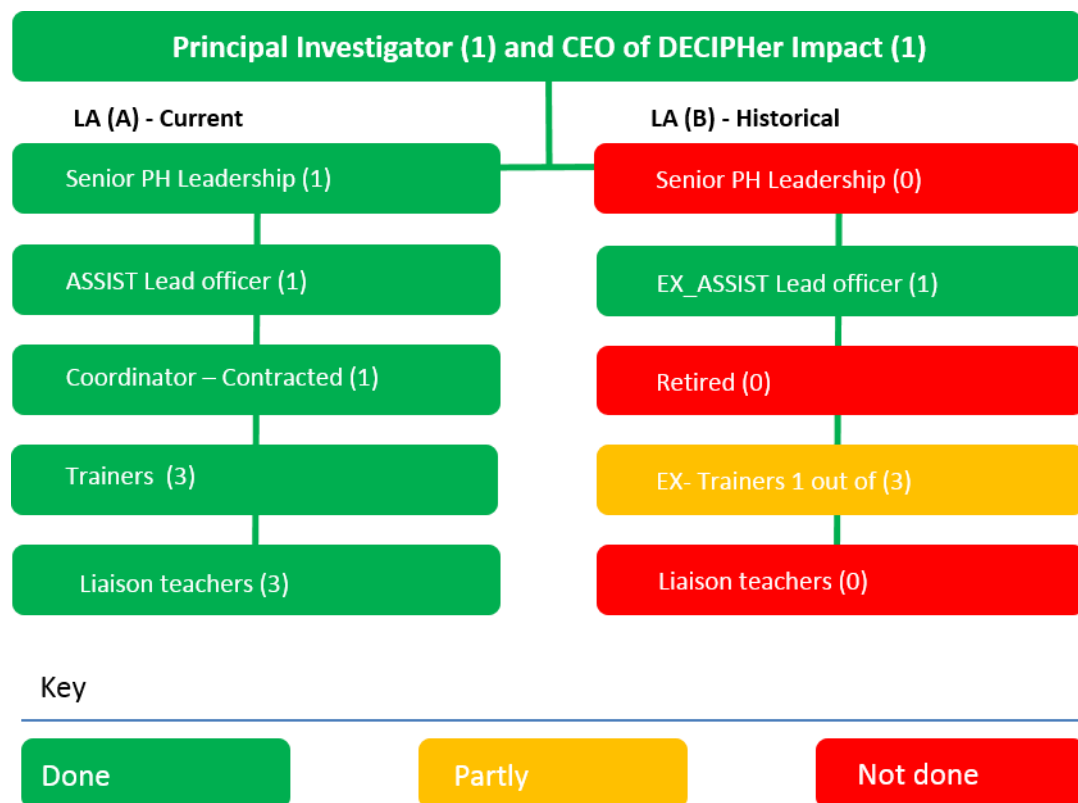
The interview with the ex-programme lead at LA (B) was very insightful and rich. It also corroborated some of the findings at LA (A), regarding the barriers and facilitators of implementation, and it highlighted some stark contrasts between the two authorities. However, the data from their ex-

trainer's interview was conceptually thin, as the interviewee had a poor recollection of the programme.

In view of this I considered the possibility of identifying an alternative local authority to replace LA (B). However, the difficulties of contact tracing which I faced at LA (B) were inherent to the retrospective design of the study rather than unique to LA (B). Therefore, it was likely that these difficulties would continue to challenge any other replacement Local Authority. In any case, it was too late in the project (late spring 2017), to recruit a new case study. Therefore, the comparative aims of the study were dropped in favour of a more detailed qualitative case study at LA (A). The new plan involved adding non-participant observations of the process of implementing the programme, and of the organisational environment in which the programme is implemented (Study III). However, although the project is no longer a comparative case study, where the information from the two interviews that were completed at LA (B) illuminates the findings of LA (A), then the relevant extracts from those interviews are incorporated into the analysis.

6.5.4 Conduct of interviews

The Council's Programme Lead introduced me to the health improvement team responsible for implementing the ASSIST programme at OWL, the organisation which is contracted to deliver the programme. The programme Coordinator at OWL invited me to a team meeting where I presented the project. Team members supported this project by identifying the staff who fit the study's criteria for interviewees, which included the length of time that they had been involved with the programme.

On agreement, all interviewees were sent information sheets regarding the project three to four weeks before the interview dates, and again a week before the interview. Appendix 8 - 12 are some samples of the information sheets that were sent to some of the participants. All ethical principles around consenting were governed and approved by the University of Exeter Research Ethics Committee (see Appendix 1 and Appendix 2).

All interviews were conducted face to face, except one, which was conducted by telephone because of the geographical distance to the location of the interviewee. All interviews were recorded on a portable digital recorder from which they were uploaded to the University of Exeter secure server within two hours of the interview ending, and it was then deleted from the portable device. The raw data was in the form of verbatim transcripts of the interviews. The researcher test-transcribed two transcripts, to gain transcription skills, and to assess quality. All other transcripts were transcribed in full by a professional service.

Interviews were semi-structured, and based on a topic guide. In designing the topic guide, I took into account the following; the type of person being interviewed, their role in the implementation chain, and the research questions. All guides covered three types of questions; those specific to the individual being interviewed (e.g. qualification and background), those relating to the individuals role in the programmes' delivery chain (e.g. trainer) and those which were generic to everyone such as their views on sustainability, barriers and facilitators of implementation or resources required. Appendix 14 and 15 are samples of some of the topic guides that were used. However, since this was a semi-structured interview, each interview was also allowed to evolve through probes and follow-on questions of emerging points.

6.5.5 Data Analysis

The analytical task was to transform the data into a coherent structure without losing touch with the intended meaning. This involved a combination of listening to the audio, reading and re-reading of the transcripts to gain a deeper understanding of the data and to develop initial codes. Data coding and sorting were managed in NVIVO 11, and it was analysed using techniques from the Framework approach developed by (Ritchie and Spencer 2002). According to this approach, the role of the data analyst involves detection, defining, categorising, theorising, explaining, exploring, and mapping. The analysis process used the stages outlined this approach

namely; familiarisation, identification of a thematic framework, indexing, charting, mapping and interpretation.

Stage 1: Familiarisation

In this stage, I listened to and read the audio transcripts several times and I noted my initial impressions on the script alongside any emerging basic patterns or categories. I did this to gain familiarity of the scope of the data and to facilitate the identification of key themes or patterns within each interview transcript.

Stage 2: Identification of a thematic framework

Stage 1 yielded first order or "rudimentary themes" which I used as the beginnings of the process of labelling and automated indexing in NVIVO. I then coded all similar-themed text from across the transcripts to an initial list of labels. At this stage, the labels were crude and simple aggregates of all text associated with a particular allocated label for example, training, or children's behaviour, or programme diaries etc. I re-assessed and compared, these labels and that led to collapsing of some codes and splitting of others.

Stage 3: Indexing

The next stage involves inferring and deciding the meaning of each coded passage firstly on its own, and second in the context of the interview as a whole. I summarised each text unit for its apparent or surface meaning, and I also evaluated it for its underlying or implied meaning. I then re-categorised these meanings into second-order themes.

Stage 4: Charting

I collected the indexed data into one of three charts namely; barriers of implementation and sustainability, facilitators of implementation and sustainability, and the design of the intervention. Table 6 illustrates how text extracts were interpreted and categorised.

Table 6 : Sample extracts illustrating the interpretation and categorisation process.

Meaning unit	Summarised latent meaning	Abstracted Underlying meaning	Category
After a few, I can't remember at which point we had conflict resolution training. Well maybe the training to do with coping with the behaviour and stuff, maybe that should be part of the course, or we should have addressed that earlier really because when we first had to deal with it, we were out of our depth I suppose. Because none of us are teachers (TR1)	We did not have the skills in behaviour management. We received conflict resolution training after we had already started implementing the programme.	Initial training sessions were difficult because they were delivered before we had received any training in behaviour management. They became easier after we received the training.	Barriers to implementation
Yeah, I think it's, you know like I've said before, it's easy you can pick it (the programme) off the shelf, and you know, and the session plans are good, and, so it's easy to pick up and… and run with (TR2)	The manualised design of the programme makes it easy to deliver without much preparation time.	The nature of the intervention supports individuals to make decisions to take part in it.	Elements of programme design
One of the early things that I needed to do was to go out and talk to other people in different roles, and managers in different organisations about the programme, to get them involved and get them interested, and we had quite a bit of success with getting other teams involved (PC1)	The programme involved active engagement of potential decision makers and implementers.	Early marketing of the programme supported programme acceptance and good engagement with it.	Facilitator of implementation

Stage 5: Mapping and interpretation

The final stage was interpreting the data. Here, the final theoretical concepts were abstracted through looking for associations, comparing and contrasting the common patterns between and within the text excerpt of the abstracted meanings and theorising the results to answer the research questions.

For example, a range of factors such as the manualised design of the programme, the uncomplicated nature of the intervention message (do not smoke), and the common sense mechanism of the intervention (everyone understands the peer-to-peer processes) all facilitated implementation and sustainability. The common thread between these factors was "simplicity", so simplicity was therefore theorised as one of the ultimate drivers behind the sustainability of the intervention.

6.6 Findings

6.6.1 Barriers to Implementation and sustainability

A number of barriers to implementation and sustainability and their sub-themes were identified namely: trainers (recruitment, retention, maintenance on a cycle, and trainer type), resources, type of school and type of children trainer's line managers, and coordinating logistics.

a) Trainers

One of the challenges of implementation and sustainability is to recruit and retain trainers on a programme cycle. At their interview, CPL1 described the trainer recruitment strategy as follows:

> "We asked people who worked in jobs which related to either children or young people or smoking, we engaged with those people in those jobs, and we engaged with them and involved them and got them to include this role as part of their role. (CPL1)"

The recruited trainers are given a 3-day training course, after which they are expected to commit to deliver at least one school 'cycle'. Each school cycle involves two full days of training the children, and four follow up sessions (lasting 1 hour each) in the 10 weeks after the children's initial training (refer to more details in Chapter 5). Thus, there is a voluntary but formally

recognised agreement between the trainers, their line managers, and the programme leads, to incorporate delivery of the training into individual roles. Therefore, the programme does not appear to be overly time-consuming per trainer. Still, Trainer 1 observed:

> "We have had issues over the past few years, and I did actually raise it in our meeting. I said, 'I'm not happy with this anymore…. They were just dipping in and out saying, 'I can make that day. I can't make that day'. So I got a bit feisty about it and said, 'look when I did the training I remember being told if you sign up to this you've got to sign up to the whole thing. You don't just do one day's training, and one follow-on and all the rest of it." (TR1)

However, the fact that the programme is less time consuming is also part of the problem, because the irregular delivery pattern prevents it from becoming a routine part of a trainer's role. Consequently, in practice, the role of the trainer is an "additional task" which is in perpetual competition with the demands of routine primary roles.

> "I think the main reason for people dropping off the trainer's list is that this isn't their core work, so some were doing it as a goodwill gesture almost and then obviously with the cuts and resources and people's time being under pressure it's kind of the first thing that goes." (TR2)

Other reasons affecting trainer recruitment and retention include; change of jobs, change of line managers, trainers losing interest in the role, or managers de-prioritising smoking prevention work.

However, the high trainer turnover is counteracted by a consistent presence of a committed group of trainers who I describe as 'rescue-trainers' because they are passionate, and committed enough to remain on the programme whatever the nature of the challenge they faced.

> "I've been fully committed to it for the whole of that time. I've done at least two schools delivery wise if not more. Because a lot of the time I've helped out when others have dropped out as well, so I've ended up doing a lot more…" (TR1).

TR1 was originally recruited from the tobacco control service. However, despite her expressed frustration, when she changed jobs to an unrelated job

in the taxi regulation department, TR1 made a passionate case to her new line manager, and she secured the approval to continue on the programme. She explained that her length of involvement in the programme was due to her passion to working with young people and her intense disapproval of smoking. Therefore, she was a self-proclaimed advocate or champion of the programme.

The ongoing and personalised championing of the "cause of the ASSIST" whatever the difficulties also featured in the narratives of some of the other trainers. TR3 described a traumatic incident in which she tried to calm down a child who was misbehaving during training by throwing shoes at her friends across the room. The trainer gave this child some "time-out" and "guided" her by the shoulder to her teacher. The child later reported the incident to her parents who took it up with the school. She described the negative consequences of her attempt to bring order to the training room as follows:

> "And then it was investigated as if it was a formal complaint, and my colleagues and the children were questioned. My colleagues had seen what happened, said, "No, I didn't grab her arm or anything; she just literally guided her to the teacher." Her friends said that I did, her mother, who was a teaching assistant, said that my colleagues were going to obviously stick up for me. But eventually, I think a letter was sent to the mother saying they felt there was no evidence to suggest that I'd done that…" TR3

This incident placed this trainer under a stressful period of investigation, which threatened her reputation and her career:

> "…for me as a facilitator, it was really horrible, and it put me off for a little while, maybe even doing it again." (TR3)

Yet despite this intense experience, she was determined to continue in her role:

> "…but then I thought actually, no because I'm not in the wrong, I didn't do anything wrong whatsoever, and you're (the child) not going to stop me delivering that programme So that really raised alarm bells with all of the trainers at the time, that such a small thing like that could escalate. So that was why we had the behaviour training." (TR3)

She also reflected on it as a learning opportunity:

> "We were very naive in knowing how much bad behaviour to
> take before we brought a child to the teacher…. it was a very
> big learning curve for us. But it didn't put us off it just was
> good because we learnt from that." (TR3).

Therefore, like TR1, this trainer also put her continued role as down to her personal commitment to make a difference to young lives. Outside work, she was a leader of a girl guides (Brownies) group. She also explained her involvement in the ASSIST as a reflection of her personal passion to advancing the anti-smoking agenda because her father died of lung cancer. Holding similar strong anti-smoking views, TR2 attributed her resilience on the programme to her professional experience in working with young people in mental health crisis.

> "I think because I've dealt with crisis before and when I was
> on the CAMHS outreach team you'd go up to the hospital,
> and you didn't know what you were walking into so you
> couldn't get anxious about it because you just didn't know so
> you kind of get there and then you work through whatever
> you need to work through… Well, I think I've learnt what's
> the point of worrying about something that's not going to
> happen? I'll get there, and I'll deal with whatever I deal with."
> (TR2)

Like TR1, she explains her 'rescue trainer' role as follows:

> "I really just held it (the programme)…I managed to get the
> teams in place, get some dates together.. and made sure
> that we delivered a programme until the new coordinator has
> been able to really pick it up again and run with it." (TR2)

The role of 'rescue trainers' was also acknowledged by other trainers in general who noted that regardless of workload challenges, the trainers that are very passionate do their best to remain on the programme.

b) Gaining approval from Managers

Trainers cited line managers as one of the reasons for both trainer drop-out and trainer retention.

> "I think my old manager had to fight that case with my new
> manager because unfortunately, I was moving into a team

> where there was just me and my manager so the workload
> there was higher." (TR2)

Changes in line managers also influenced the quality of support that trainers received.

> "At first, I was line managed by a lady who had never done
> ASSIST before, and the two managers who came after were
> not trained either…...so that was quite difficult. I'm how line
> managed by a manager who trained …I know I can go to
> someone who understands the programme and we can
> figure something out…"(PC0)

Another trainer described the difficulties in transitioning from manager to manager as representing a period when the programme had lost its way, and some trainers dropped off, and she again highlights her 'rescue trainer' role.

> "When T was in charge, she was quite supportive as well,
> and then it was passed onto G, who didn't really know very
> much about it… I really kind of kept the thing going, because
> G yes got the coaches and the refreshments, made sure that
> was ordered, but as far as support for facilitators went, it
> completely dropped off, and that's when we started losing
> really interest from some of the external facilitators who had
> volunteered to do it. I think some of the paperwork went
> astray then... So it really did lose its way a little bit…"(TR3)

A full time-coordinator was later recruited to improve things, and they facilitate the programme including recruiting schools, organising logistics, supporting trainers through regular team meetings, and general problem-solving.

c) Resource limitations - Funding

The initial licence to deliver the programme costs £11,000 a year per Local Authority. One licence is valid for all schools in the Local Authority's area. The fee excludes all logistics and delivery costs such as staff time, transport for the children, venue hire, and food. There were also additional costs, which emerged during implementation such as the costs of training the trainers in behaviour management, child protection, and first aid. DI Ltd estimates that the total cost of a three-year licence is approximately £100,000. At the Council leadership level, there was frustration with the cost of the license:

> "I'm surprised at the lack of flexibility on negotiating the licence fee. It feels to me like the DECIPHer ASSIST programme people have maybe not caught up with the reality of austerity in public sector…." (PCH)

In their interview, DI Ltd confirmed that the fee was inflexible, but for them, it was the perception that it should be flexible, that was frustrating.

> "We will get people, as with all walks of life, saying, "Well that seems a bit expensive, can't you do it cheaper than that" ... but we can't reduce the delivery costs. So if someone says "this is twice the amount that we can afford, then there is no solution because we could halve the licence fee, but they'd only be saving 10% or 20% of their total costs. So they can't do it" anyway." (DICEO)

Yet the Council's frustration was precisely with this very point. If delivery and other costs were extra, what exactly was the licence fee for?

> "Pretty much my understanding is that the fee we pay gives us permission for us to deliver it according to the programme. There's some updated material that might come ... But actually, anything over and above that, if we want to train more trainers, there's additional costs to all of that stuff involved." (PHC)

From DI Ltd.'s point of view though, the licence covered far much more than a mere "permission to deliver."

> "So people will say they're expecting a three-day course with a few notes, a few handouts, or whatever. What they actually get is a two or three hundred page manual with lesson plans with objectives, with examples of good open-ended questions…. Everything they need to do to replicate what was in the trial is in here. It's not left to chance." (DICEO)

The mutual frustration with the license fee probably represents differences in perception. However, a more fundamental concern from the council was that the licence fee did not take into account the length of time that a Council had been implementing the programme:

> "So in the context of the fee for the licence, I think there's a bit of a reality check that they need to make….. I mean we've been doing it for so long there is a lot of known knowledge on the theory behind it, on the peer support approach." (PHC)

The Council felt that the longer they implemented the programme, the more skilled they got, and so the less the support they needed from DI Ltd. Therefore, they saw the fixed licencing model as unfair.

> "…there is no negotiation, it's that's your fee kind of thing….but actually we've been delivering this for six years. There is a strong push to say could we not do something else?" (PHC)

The frustration with the inflexibility of the license costs also encouraged considerations of stopping the programme. In addition, it raised questions about the merits of designing cheaper alternative programmes, and about whether the programme had been sustained as long as it could:

> "We could spend a small amount of resource and make our own model out of that. I'm not sure that we might not breach some licence things about how far do you have to move it away to do that and stuff like that." (PHC)

There was also suspicion that other councils have probably used the programme to develop one of their own.

> "Maybe that's what other areas do I don't know; maybe they're just not paying them saying, "We'll deliver it and call it something different." I don't know; maybe we're naïve to carry on paying the licence fee, who knows. But it gives us legitimacy." (PHC)

The interview with the programme lead from LA (B) corroborated this suspicion. They described their reasons for discontinuing the programme as follows:

> "I think we had a conversation quite early on or halfway through the ASSIST programme, saying things like, "Urgh, we could just write our own, you know", "Well why don't we just do that?"… I must have gone to, Deputy Director and said ... We think we can do it so much more cheaply. So if we were to do that will you continue with some funding towards it?" He said, "Go away and figure out what figures you're talking about.".(CPL2)

Therefore, there was a desire to develop a localised programme at LA (B). However, the cost of the ASSIST was the major reason why the programme was stopped.

> "The ASSIST was very expensive. I was able to look around
> at other youth programmes where the licence was hundreds
> as opposed to thousands. So that was a complete no-
> brainer, we're just not buying it! Frankly, I'm astonished
> anybody did!"(CPL2)

In contrast, although the idea of developing their own programme was considered at LA (A), they concluded that there was no credible alternative to the ASSIST for preventing young people from taking up smoking. They assessed that their own intervention would not have the same credibility as the ASSIST.

> "Even outside of Public Health, when we talk about the
> programme, we can lean on the evidence that supports it. I
> think it does help to establish its credibility to a long way."
> (CPL1)

And,

> "They've found the money… if they don't do this intervention,
> what else have they got really, you see?" (TR3).

Thus, LA (A) knew that they could develop their own intervention, but their idea of credible evidence was evidence that had been evaluated and could be verified. As a result, they did not believe that the option of developing their own programme as the cheaper of the two.

> "They've talked about doing our own thing here, but if you
> did your own thing you'd have to pay somebody to create a
> programme, it would have to be evaluated, looked at…
> Whereas for the same amount of money, over three years,
> as you would pay one person, you can pick up a programme
> (the ASSIST), that's constantly being updated, and has got
> all the evidence behind it… and has been evaluated, and is
> easy to use really. "(TR3)

In contrast, LA (B) appeared to have a mixed, if confusing take on evidence and the need for programme evaluation. On the one hand, they were confident enough to replace the ASSIST with their own unevaluated intervention, and on the other, they were cynical about the adequacy of the evidence behind the ASSIST:

> "I asked the question in the early days what do we do about
> the evaluation of this? The answer from DECIPHer IMPACT

> came back saying actually you don't need to evaluate it because we've done all that, we've got the results, we've made it very stringent. All you have to do is run it, and you have a good deal of confidence then that you're going to get the same results as us." (PL2)

However, despite the belief that the ASSIST needed re-evaluation, the possibility of regular re-evaluation was also presented as problematic,

> "Then in terms of sustainability of the actual programme, in some ways it (the ASSIST) kind of shot itself in the foot because it was such a mammoth research programme in the first place. When it was set up to give the results that it gave, with the sheer quantities of students involved how could you do that again?" (PL2)

Thus, it appeared that LA (B) was of the view that to be valid and credible, the researchers or the local authorities need to regularly repeat and re-evaluate the trial.

> "We didn't have any suggestion that that (ongoing evaluation) was happening in the background at all. So even if you'd wanted to do it all again you would have run your ASSIST programme for three years, big gap (to evaluate) while you're waiting for ASSIST II to be born, and then run ASSIST II. And what would you do in a big gap (the evaluation) period? (PL2).

Therefore, there was a sharp contrast between how the two Local Authorities understood evidence and evidence-based programmes. This influenced their perceptions of the programme costs, which in turn influenced their decisions to sustain the programme or not. Thus, LA (A) focused on the intervention's credibility, and they placed value on the independence of evidence, while LA (B) appeared to look at the cost of the intervention in isolation and they placed more value on locally generated evidence.

However, while LA (A), had a more positive take on the ASSIST, but the issue of resources remains a constant threat to the programmes' sustainability, and the local authority is continuously seeking new ways of financing the programme. For example, in the 2016/17 delivery year, they attempted a more creative way of reducing license fee costs, but they were unsuccessful.

> "the plan was to reduce the price of the licence by partnering with another local authority and splitting the cost effectively, but securing a commitment with the two councils really at the same time, was difficult because we're different cycles in our budgetary planning" (PL1)

Other attempts to limit expenses included a review of the delivery costs, as was noted but the programme coordinator:

> "I was told we need to be no longer paying for venue, for food and for transport of the kids for the two-day training but these are key motivators to get the kids engaged in the programme. So we looked at going to deliver ASSIST within schools, and we looked at them bringing their own packed lunch…. This completely changes the whole dynamic of the programme it's not the same..." (PC)

However, the trainers actively resisted the suggestion to cut some of the key operational costs of the programme because they believed it breached the fidelity of the programme.

> "I think some of those things they're going to take away are the things that have helped it work. The fact that they come and they get their lunch, and all the rest of it and they get their toast. They (the children) think it's great." (TR1)

Therefore, trainers sought the external endorsement of the idea that cutting costs would damage the integrity of the programme.

> "So I had a chat with DI Ltd about it, and they said that it's integral to the programme that the kids are taken off the school premises, it's really important… and then when we started talking about transport and food, they said "it's not a deal breaker to not provide them with food.".. but with his knowledge and experience was able to say, "you end up with quite big inequalities, you have the kids who bring like a fantastic packed lunch and the kids who bring barely anything and also, how well are they going to work if they haven't been fed properly", at school that's one thing but for this, it's our project, we're investing in it, and it needs to work". (PC)

Therefore, there was a stark contrast in the way in which the two LAs assessed evidence-based programmes, and the extent to which they went to achieve fidelity, and to keep the programme e.g. by considering creative partnerships to reduce expenses.

Consequently, although the LA (A) programme was consistently challenged with the issue of resources, the implementing staff were prepared to think creatively to keep the programme. However, they were not prepared to accept adaptations, which they believed threatened the fidelity of the intervention.

d) Type of school and children recruited

Due to the limitations of resources, LA (A) was not able to offer the programme to all the schools within its locality. Therefore, their school recruitment strategy was to target the schools which were located in the neighbourhoods that have the highest rates of smoking. However, the schools in these neighbourhoods were also believed to be more deprived and harder to work with.

> "The more deprived the school, the less willingness there is
> to engage or to do what they need to do.." (PC)

and

> " I did end up doing schools that were in the poorer areas of
> the city that are renowned for a bit of bad behaviour" (TR1).

Thus, trainers relied on the schools to manage the process of recruiting the children to the programmes. The quality of coordination received from the school determined the quality of the implementation process including whether that school was going to go through with the programme or not. A trainer described one such school as follows:

> "This contact teacher there we had one meeting, she was
> just going that extra mile and making sure she'd fulfilled what
> I'd asked for and she was brilliant.. she organised forms in
> alphabetical order, called parents and explained what the
> programme was about and the next day we had 100% of the
> consent forms" (PC)

Where such proactivity was lacking, the programme's requirement to recruit a minimum of 15% of the year group was difficult to meet, and this lead to implementation difficulties. One such school was described below:

> "And then we have the challenges we've had with School X,
> where the forms haven't really been chased up and then
> when I go to collect them, there's less than half there that we
> gave out and there's no communication about that… so
> yeah, you do need to rely on them to do stuff"…(PC).

However, the time pressures on liaison teachers meant that involvement in the programme was a juggling act. One liaison teacher described this pressure as follows:

> "In reality, I will always make time because I understand the
> need for the project but I have, as the ladies will tell you, not
> been the quickest to reply to emails, because unfortunately,
> although the project is very viable the day to day of my job
> means that I can literally leave the office and have four
> things happen, at which point, I will deal with all four things
> but not the original thing." (LT3)

Late cancellations were very costly because they happen after trainers had already spent a lot of time running the nomination and recruitment sessions in the schools, and food and venues had already been booked. This added additional challenges to trainer recruitment and retention because the managers of the trainers whose programmes were cancelled in this manner were unlikely to re-prioritise the programme. The type of liaison person that the school provided and their level of seniority also affected implementation.

> "What has happened in the past, is we've had head teachers
> who are really excited about it, and then they pass it to a
> teaching assistant who hasn't got the same relationship with
> the pupils… so the discipline is not the same… and, then
> that poor teaching assistant struggles to get them out of
> class, or the consent forms and then definitely struggles with
> trying to arrange follow-ups and getting those kids to come to
> follow-ups". (TR3).

Poor pupil behaviour was an issue that was repeatedly raised by trainers, and it was observed as part of Study III. Trainers said they were not sure of their limits in managing the behaviour of the children. The fact that teachers were not supposed to be involved in the delivery also meant that some teachers were confused as to what their actual role was. Did they need to intervene in behaviour management without being asked or should they just

wait to be asked? However, describing what she considered an "unhelpful" liaison teacher during training, PC had this to say;

> "He needed (liaison teacher) to have been a bit more aware
> of what was going on in the room and even if he was aware,
> to act on it when he felt he was professionally needed to"
> (PC).

The ambiguity of the role of the liaison teacher was articulated by one liaison teacher as follows:

> "I know that we are supposed to take a back seat, but
> obviously, I have had that email just to help with the more
> outspoken students that we have…" (LT3).

In response to behaviour issues, the Council paid for a special behaviour management programme for all trainers. The trainers who went on it indicated that they still rely on the strategies that they learned on that programme more than three years prior. However, this was a one-off training session, so newer trainers have not had the opportunity to go on it.

e) Communicating the benefits and impact of the programme

One of the key challenges highlighted throughout the interviews was the difficulties in explaining to stakeholders the local impact of the programme. CPL1 explained this problem as follows:

> "Uptake of smoking in young people will still go up between
> the ages of 12 and 15,.whether you've had this programme
> or not… what we're talking about is a reduction in the rate of
> uptake, and that's quite a difficult thing to get across"
> (CPL1).

Thus, while the fact that the programme was based on scientific evidence helped with council decisions to adopt the programme; decisions to sustain it required demonstrating that the programme was making a local impact. The complexity of explaining the value of the programme to stakeholders was described as follows:

> "When people say does it work? For us to say "well yeah, the
> (trial) evidence is really good", it's a weak answer really, but
> the strong answer is complicated, so it's a real conundrum

there in the way that we try to express the value of the
programme." (CPL1).

LA (A) further described the complexities of achieving locally relevant
evidence from a single public health intervention:

> "We can't just make a kind of baseline measure of smoking
> and an after level of intervention of smoking and say that it's
> either succeeded or not succeeded." (CPL1)

Yet, while the LA was clear that they couldn't make any kind of baseline
measure of a before and after level study to prove that the programme is
working, that is exactly what they did. They asked the organisation
contracted to deliver the programme to conduct a 'before and after study'.
The coordinator of the ASSIST programme expressed her frustration with the
Council's request for such a study:

> "I had a conversation with the council that they would like to
> start a bit of a local evaluation. They said the thing that they
> gets asked all the time is, "Does it work? Does it stop people
> smoking?," They want us to do that right before the
> programme and then just after follow-up sessions to see if, in
> that time period, smoking rates had changed. My personal
> view and the view of the team is that that's not really what
> the ASSIST is trying to capture. .. and then I had a
> conversation with DI Ltd, and they echoed the same, they
> said "Maybe we should be asking questions like 'Has anyone
> talked to you recently about smoking?' So I fed this back to
> the Council, but they said they really just want to just capture
> a very easy, "Do you smoke? Yes/no?" before and after....
> "(PC).

Other interviewees also expressed dismay at the idea of such a study;

> "That's just ridiculous because they've just wasted a lot of
> money on collecting data that's completely useless.
> Because if you do before and after with this age group, then
> even if you've got the most effective smoking prevention
> programme in the world, there will still be an increase in
> smoking rates amongst kids going from the age of 11 to 13
> (anonymised).

However, this was not a case of ignorance about patterns of smoking uptake,
or of how preventive programmes work. The council clearly acknowledged
that the programme could only reduce the rate of uptake rather than the

immediate prevalence of smoking and that this was a complex thing to communicate to others. However, justifying an ongoing spend of public finance requires demonstrable evidence. Therefore, another enduring threat to the sustainability of the programme remains how to communicate the local impact of the programme without providing the evidence for it.

6.6.2 Facilitators of implementation and sustainability

a) Funding

The issue of funding was both a barrier (as described in 6.6.1c) and a facilitator. As a facilitator, its role goes back to the history of the ASSIST in the area. In 2010, LA (A) was struggling with higher than average rates of smoking, and it received a government grant to reduce inequalities in smoking. At the same time, a new NHS initiative to support Councils reduce their smoking rates was launched. Following consultation with academic experts, the strategy was to approach the issue by strengthening their tobacco control and regulation activities, but also to support smoking cessation and to prevent new uptake. This transformed the tobacco control service from one that focused on controlling young people's access to tobacco and regulating the activities of tobacco retailers, to one that included health promotion through the prevention of smoking. The ASSIST programme was chosen for the health promotion part of the study because it was (and it remains) the only evidence-based intervention of its type that had been proven to prevent smoking in young people. Therefore, it was the only credible option.

The initial set up and running costs of the ASSIST were met by a government grant with NHS support. The availability of external funding encouraged the adoption and establishment of the programme. After the two-year grant ended, the Council met and continued to meet the full costs associated with implementing the programme. However, despite the resource limitations outlined in 6.6.1(c), the LA (A) still sees the fact that the programme is paid for as a facilitator of the programme's implementation and sustainability;

> ".. I think the licence setup is positive, firstly because you
> have to resource it with money. I think it demonstrates a

> commitment, or actually, it does more than demonstrate a commitment. It secures a commitment locally to deliver it. So it's an investment we've made, so we want to make it work". (PC1)

An corresponding view was taken on the fact that the programme was offered free of charge to schools:

> It's a bit of a double-edged sword because I think if we started expecting the school to pay for it, then we wouldn't get any, they're tight but school X's last minute cancellation of the programme made me think that if they were paying for it, they would have said something sooner. So the fact that we're now asking schools to contribute towards travel costs is good, it shows that they're willing to invest something in it (PC).

Therefore, despite difficulties in securing resources for the programme, one of the important reasons that the LA (A) sustained the programme is their positive attitudes towards programme's costs. This in sharp contrast to LA (B), which discontinued the programme because it was expensive (see section 6.6.1c).

b) The Partnership model of delivery

The original government grant was channelled through the environmental health department. However, this department had expertise in tobacco regulation and control, but not in health promotion. Therefore, the department had to build a strong partnership with other departments which had health promotion expertise and those who had a stake in the issue of youth smoking.

> "We had to because we pretty quickly realised that on our own, as a regulatory service, we were never going to be able to deliver this sort of programme, and I think we were never going to be able to get the reach, we were never going to be able to deliver it at the right sort of scale, but also probably most importantly, we didn't have the right skillset necessarily to deliver the training to people. So we talked to the Youth Service, the Stop Smoking Service, the people who were more already in this field...."(PC)

Thus, the delivery model involved a network of partners from various departments and services working together:

> One of the early things that I needed to do was to go out and talk to other people in different roles, and managers in different organisations about the programme, to get them involved and get them interested, and we had quite a bit of success with getting other teams involved.

Therefore, there was a concerted effort to promote the programme at both the managerial and the implementation levels. This means that multiple individuals across the organisation had a stake in ensuring that the programme was implemented successfully. This also meant that there were multiple individuals in different departments acting as champions of the programme. The strong partnership model also supported the sustainability of the programme by reducing the need for dedicated paid trainers, given the prevailing challenges around resources.

The strategy of anchoring the intervention into a localised and recognisable problem for partners and stakeholders continued to feature across the implementation chain. At DI Ltd, the general approach was that their role was not to sell the programme to local authorities, but rather, to highlight what the ASSIST could offer those Local Authorities who had already identified smoking as a problem.

> "Well, firstly we are not a hard sell direct marketing organisation… I think our job is to make sure that if smoking prevention for young people appears on their list of priorities, then they are aware ASSIST exists and that they could make a deliberate choice to go for the evidence-based programme." (DICEO)

Smoking was a recognised key issue for LA (A) because they had a higher than the national average rates of smoking. In addition, they made strategic efforts to contextualise the intervention to schools, through supporting them with understanding the scale of the smoking problem as it relates to them:

> "One of the things is the recognition of smoking as an issue for the schools, and I think generally they take that and they recognise it as an issue, but sometimes I think it's a little bit intangible…there's a public health smoking survey every two years in year eight and year 10, and I think that's really helping to locate the schools around identifying what their issues might be, and then the ones which come out with higher rates of smoking, I think that's helping to create a bit

> of a, nudge the door open for us if you like, to create a bit of
> a need, almost like demand, so it's demand led then (CPL1).

Therefore, the council ensures that schools have access to data and evidence regarding smoking. Finally, as discussed in 6.6.1(b), one of the ways in which the Council convinced various managers to release their staff to the programme was through highlighting the relevance of the problem to their own work area. Thus, once the target individuals accepted the problem, then it was easier for them to accept the ASSIST as the solution.

c) The Manualised nature of the programme

The ASSIST is a detailed programme delivered to manualised specifications. While LA (B) saw this as restrictive, LA (A) considered the manual an asset:

> "If the ASSIST was on all the time then maybe you could
> develop a bit more yourself but actually because you're
> literally stepping in and out of your role….. I don't have to
> take any time out to prepare for ASSIST, and I think that is
> an asset…I could just turn up on the day and pick the
> manual up.." (TR2)

Other trainers also said the manual was an important consideration in their decision to join and stay on the programme. The availability of a 'readymade' programme manual means that the partnership delivery model described in 6.6.2 (b) is more easily sustained because different people can come in and out of the programme without giving up too much of their time. In addition, it improves fidelity, and their confidence in what is being delivered.

d) Programme championing and marketing

Various activities to market and champion the programme was identifiable at all points across the programme delivery chain beginning with the principal investigators of the ASSIST trial. The researchers spent about two years championing the case for the national adoption of the programme in schools and identifying the best scale-up model.

> "We had public health conferences, and we were speaking
> very closely with the people. There was a lot of knowledge
> engagement of non-academics.. both myself and the other
> PI, and increasingly the people who were working for the
> company would go to the UK smoking cessation conferences
> or some of the other major kind of gatherings of public health

> people. As well as doing quite a lot of mailing, phone calling
> etc.We did quite a bit of work with Department of Health, …
> spoke to some of their key policy people. We put effort into
> influencing things like the NICE guidance our research report
> fed into the tobacco control white paper *Kills*. So, we did
> quite a lot of engagement of that type with policymakers and
> that sort of thing..”(PI)-

The researcher's role in championing the programme was later taken over by DI Ltd. At LA (A), all interviewees credited the programme lead with tirelessly championing the continuity of the programme since its inception. That individual was also a self-declared enthusiast of the programme; that they have even completed some self-motivated research on the programme. When asked to describe the type of Councils that adopted and sustained the ASSIST, DI Ltd described such Councils as follows:

> "I would say that the ones that do continue, there's usually
> an enthusiast, a flag bearer that just loves the programme to
> bits, really believes in it and just wants to carry on, and
> there's certainly a tendency for there to be more danger if
> that key person leaves and is replaced by someone that
> hasn't got the background, hasn't gone through, you know,
> seen the journey and they could find it quite easy to say "well
> I can see where we can save some money, we'll stop doing
> the smoking prevention thing". So I think that's important"
> (DICEO).

However, in addition to the identified central champion, active programme championing and marketing activity was identifiable at every point in the programme delivery chain. At the senior leadership level, the consultant in public health had this to say;

> "I've managed to persuade us (the council) that this is priority
> enough for the next three years to carry on." (PCH)

The two reasons that the Consultant gave for personally championing the ASSIST were of interest to sustainability. First, the Council had just launched a citywide vision and strategy for health improvement and promotion programme. This focused on tackling four behaviours: smoking, physical activity, diet, and alcohol. The ASSIST was seen as a perfect fit into that plan because year 2, was focused on health improvement in schools.

> "I suppose that's key because in advocating for this programme, particularly at the current time, reducing resources etc., we could, for example, do something that isn't based on the ASSIST, but something that still raises the profile of smoking in schools… but I suppose the (trial) evidence has enabled me to advocate against doing that at this stage and say, "Well yes okay our year two of the health improvement strategy focuses on schools," and the ASSIST has been on schools.."

The second reason was that the principles and techniques of the ASSIST reflected the "systems leadership" view of public health that the consultant had. Their view was that the ASSIST could be used as the model for the sustainability of health improvement.

> "I guess for me the interesting thing in terms of health improvement in its totality, and the life course approach is the use of a peer and peer support. So the influences at a young age are really key to that, so I like that bit of the model to me is really important, it is that who are the influencers at your time, at what time of life? ….. my interest in that across the life course is in terms of building sustainability for health improvement across our behaviours, across our challenges is much more around peer support, shared knowledge and accountability.." (PCH)

Under this vision, the ASSIST techniques could be adapted to the local authority's strategies for dealing with other chronic illnesses. Thus the consultant sees the ASSIST as some kind of "seed" intervention from which other health-promoting interventions conditions could grow.

> "...so peer support to help people with long-term conditions manage their long-term conditions, e.g. learning from a diabetic, how to control your diabetes or from somebody with COPD what to do... health champions, or peers within communities advocating for health behaviours." (PCH)

The council's attraction to the peer approach was also a pragmatic acknowledgement of the tensions between the need to adopt evidence-based programmes and the costs of implementing those programmes.

> "For me, the peer-to-peer approach is a no-brainer in terms of a way of building a sustainable system because we cannot commission enough interventions to deliver the need around healthy weight, alcohol, stopping smoking and all that, we just can't do that. So a dispersed model of peers

> who can support, have motivational conversations, brief
> interventions out there ..is another way. So I think that that is
> the bit that interests me most about it I suppose." (PHC)

From a commissioning perspective, the vision was that the Council could collaborate with the voluntary sector to develop interventions for other chronic illnesses, which were modelled on the ASSIST. The Council could support implementation through say, funding the costs of training of voluntary sector staff, and the voluntary organisations would be free to use their training to seek funding elsewhere to deliver the interventions.

Thus, interviewees described the different ways in which they championed the programme. Sometimes it was through proposing new funding models, (see 6.6.1c), sometimes it was about stepping up to rescuing delivery and at other times, it was through being the advocate for the fidelity of the programme championing through seeking the evidence needed to resist unacceptable adaptations (6.6.1a). The individuals who took on these championing roles explained their motivation using narratives of their personal connections to the intervention, such as the loss of a loved one to cancer, or their personal passion for making a difference in the lives of children and young people.

At the school level, champions were also key to sustainability.

> "There might be a champion for ASSIST within a school, and
> they leave, and someone else comes in and says, "I don't
> really fancy this." (DICEO).

The role of various programme champions was later verified during the observational study, and it will be reported in Chapter 7. Therefore, the programmes' sustainability can also be attributed to the existence of various individuals who were actively selling the programme within the Council, to school decision makers, to colleagues, to line managers, to potential trainers and to other stakeholders. In addition, they took individual responsibility for implementing the programme where others were not able.

e) Support from DI Ltd

With respect to the supporting structures of the programme, one of the various roles of DI Ltd is to provide a quality checking mechanism for implementers, and this strengthens the credibility of the programme:

> "DI Ltd does quality assurance, and they do visits and that sort of thing. It's an enabler, that is because it's not a bash you over the head with a stick sort of thing... we did some additional capacity building among our trainers on behaviour management of the kids because they flagged up that we needed to do that." (CPL1)

Trainers who received the behaviour training indicated that it supported them with coping with poor pupil behaviour and how they implemented the programme, while those who had not received the programme were concerned about their ability to manage classroom behaviour (see section 6.6.1d). Other support services from DI Ltd include connecting councils via conferences and workshops, enabling them to benchmark themselves, and to share experiences.

DI Ltd also supports Councils with solving common implementation problems and clarification of certain aspects of the programme. DI Ltd is also able to gain clarity from the researchers who sit on the board of DI Ltd.

> "We (researchers) would discuss at the meetings of the company, you know if there were modifications. So things like e-cigarettes or other things that were coming through…We would come up and consider whether these were things that could be done... There were a number of changes that people would want to make, which we just said, "Well that really undermines the potential of the programme working." (PI)

This clarity and simplicity of the chain of support and communication reinforces the credibility of the programme, and it is supportive of fidelity. For example, trainers relied on advice from DI Ltd to make a case to management against proposed programme modification, which threatened programme fidelity (see 6.6.1c)

6.6.3 The design of the intervention and implementation sustainability

Many of the factors discussed in 6.6.1and 6.6.2 (e.g. resources) are related to the design of the intervention, and they focus on the conditions that are required for the programme to be implemented, e.g. funds, or trainers. This section presents the factors that are specific to the nature of the intervention.

One of the reasons why councils found this programme easy to adopt can be traced back to the origin of its trial. The ASSIST trial was developed at the request of Mid Glamorgan Health Authority, following a researchers' presentation about a peer-to-peer sexual health programme. In response to the presentation, Mid Glamorgan said;

> "That's great, but actually our priority issue here is adolescent smoking. So, can that model of peer influence be perhaps adapted to adolescent smoking?" So, in Mid Glamorgan they then got some money from the local authority to sort of begin to work with the researchers on developing the intervention (PI).

The fact that the ASSIST trial was designed in response to a problem recognised by a health authority means that the programme was designed with the needs of a health authority in mind. Therefore, the authority could easily understand the programme plus it had the potential to appeal to other authorities facing the same problem.

One of the common reasons that interviewees gave regarding why the council had adopted and sustained the programme was that people understood its simple "peer-to-peer" approach as common sense. At the Principal Investigator level, this was described as follows:

> "Between the ages of, 12 and 16 or 17, I mean kids don't really care what their parents or teachers or anyone else is telling them. But they do care about what their friends think and what the norms and things are within their groups. "So, it's an obvious thing… So that was what was so good about ASSIST, that it sort of tackled that peer pressure thing head on and used that mechanism of peer pressure in a positive way" (PI)

Thus, the researchers took advantage of the widely accepted knowledge that children are influenced by their peers to design the programme. In turn, the Council took advantage of the same principle to promote the programme:

> "… I mean I think it's not rocket science to say that kids influence each other more than adults influence kids, so that's how I try to express it sometimes, so I kind of go back to the principles that the programme's based on, talk about those principles, and actually those aren't that complicated, and those fit to a lot of what people are expecting and what they already believe anyway" (CPL1).

Therefore, stakeholders including council staff, parents, and schools understand the simple mechanisms through which the programme is supposed to work without much justification. This simplicity supports sustainability at multiple levels, e.g. the council's efforts to promote the programme to schools and stakeholders, the school's decisions to accept the programme, the parent's decisions to consent to their children's participation and the officers with making an ongoing case for sustaining the programme. At the trial level, the PI articulated the simplicity of the intervention by making a comparison with other kinds of health promotion interventions.

> "If you don't actually know what the messages are that you want to say to these kids anyway ... So with alcohol, what do you want to say? The smoking message was so simple, it was; don't smoke. Whereas alcohol, you're probably sort of saying, "Well maybe don't drink much, but it doesn't matter if you drink a little bit. But if you do drink a little bit, don't binge drink. But then now and again it's okay to have a binge, but just don't have it so often. If you do get drunk, be careful about the injuries and accidents and safe sex and things that might occur out of that." So, it's just such a complicated thing… the same thing with nutrition and activity, as we know the message is so complex (PI.)"

At the implementation level, simplicity played out as follows:

> "Well, I think the good thing about it is that it's there and you pick it up, and you just run with it, so nobody's having to do updates or anything, they're doing that themselves and the manual is very easy to use (TR3)."

Trainers identified the manual with simplicity, and they said this was a key factor in their decision to be involved in the programme (6.6.2d). Therefore,

one of the key reasons why the ASSIST was so widely adopted and sustained was that it was an easy programme to understand, its implementation was made simple by the manual, and it could be presented to multiple stakeholders in a way that reflected their interests.

6.7 Discussion

The aim of the interview study (Study II) was to gain insight from the key implementers and influencers of the programme about how LA (A) implemented their programme and what school or community-related factors affect the implementation and the sustainability of their programme.This section will discuss the findings of the study, in light of the stages and aspects of implementation that were found in the review of reviews (Study I). It will also discuss the finding to the study specific questions (section 6.2), and it will provide an explanation of how identified factors worked together towards sustainability.

The review of reviews Study (I) identified five stages of implementation of public health programmes, namely *pre-implementation activity, adoption, implementation, adaptation and sustainability*. It was suggested that these stages are not necessarily sequential in nature, and they overlap so that the quality and process of one stage affects one or more of the other stages (see Figure 8)

In addition, it was found that the relationship between programme implementers and participants is complex and that their roles are often blurred. Participants can take on a variety of roles including as social evaluators of the programmes at various points in the process. Study I also found that many of the identified aspects of implementation were linked to the social domain of the implementation process. The interview study demonstrates how *pre-implementation* activities support successful implementation and how they contribute to the sustainability of the programme. The interviews traced *pre-implementation* activities back to the trial stage. Researchers spent more than two years disseminating their trial results, developing a model of the programme that could be scaled up, and

attempting to influence policymakers, as a way of stimulating a nationwide *adoption*.

This resulted in the creation of (DI Ltd). DI Ltd supports the programme's sustainability in a number of ways. First, it promotes a*doptions* in new Local Authorities. Second, it supports existing Local Authorities with maintaining the implementation of the programme. Thirdly, it provides a quality assurance mechanism, and this enhances the credibility of the programme to commissioning authorities. Finally, the presence of the researchers on the board of DI Ltd allows the programme to continue to demonstrate its links with its evidence base, further strengthening its credibility and the ongoing case for sustaining the programme.

At the Local Authority level, *pre-implementation activity* was evident in their partnership model of delivery. For example, the trainer recruitment strategy involved engaging a wide range of service managers. Interest was stimulated by highlighting the relevance of the programme to their work areas. Since managerial support was an important determiner of trainer availability, the *pre-implementation* engagement of managers supported trainer availability, and it created multiple advocates of the programme.

The Local Authority also spent time on the preliminary engagement of schools, and this involved highlighting the smoking rates and associated problems in the schools locality. Placing the intervention in the context of the school's local circumstances supports the school's decision to *adopt* the programme and to justify their ongoing involvement in it.

At the school level, *pre-implementation* activity was also identified by the extent to which a school prepared itself for the intervention. Implementers and DI Ltd described the schools, which sustained the programme as the ones which had liaison teachers who went the extra mile in their pre-programme engagement of its pupils and parents. These schools executed the *pre-implementation* programme requirements in an organised fashion. Thus, schools that failed to sustain the programme were perpetually unprepared and unable to sustain pupil and parent interest in the

programme. Both types of schools and teachers were observed in action, and they will be discussed in study III (Chapter 7).

The review of reviews found that the purpose of the *pre-implementation* stage is to facilitate the major decision for an organisation like the council to a*dopt* the intervention. However, this interview study suggests that the *pre-implementation* stage is not just a discrete stage limited to the activities that happen just before a programme is *adopted*. Rather, it includes a coherent collection of preparatory activities that start from the research dissemination stage, and they continue at varying scales throughout the stages of *adoption* (Local Authority) and *implementation* (Local Authority and schools), and they even take place at the individual implementer (trainers, liaison teachers) level. These include attempts to contextualise the programme to potential stakeholders such as decision-making line managers at the Council, trainers and schools. Therefore, *pre-implementation* activity continues to take place long after the programme as a whole has been formally *adopted*. The purpose of these activities is to facilitate the stakeholder *adoption* of specific parts of the implementation process, for example, to facilitate schools, trainers, children, and parents to adopt the programme. This illustrates the findings of the review of reviews (Study I), regarding the character of the implementation process and the nature of the interactive relationship between the various stages of implementation. In addition, they suggest that these stages are recurrent (see Figure 8). Moreover many of the reasons that facilitated the *adoption* stage such availability of funding and trainers also facilitated the quality with which the *implementation* stage could be delivered.

Similarly, the interview study also confirmed that *adoption* is not a distinct stage. Rather, it is a combination of the initial major decision to adopt the programme, and a collection of ongoing minor decisions to adopt parts of the process, by various individuals across the programme's implementation process. Therefore, taken together, these decisions support and reinforce the ongoing adoption of the programme, i.e. sustainability. In this interview study, these decisions were both individual and collective. For example, a senior leader decided to champion the programme because it is aligned with their

own vision for citywide public health, line managers adopted it because it fitted their work agendas, 'rescue trainers' decided to take responsibility for maintaining the implementation and resisting programme modifications, and dedicated liaison teachers, developed unique ways of recruiting children and engaging their parents. Thus, the ongoing decisions that various individuals across the delivery chain took in championing the *adoption* and *maintenance* of the programme were crucial to the successful implementation and sustainability of the programme. While decisions to personally champion the programme were informal, without them, programme implementation and sustainability was under threat.

Therefore, although these individuals have different reasons for their commitment, collectively, they champion the cause for the longer-term *adoption* (i.e. the sustainability), of the programme. In contrast, the coordinator of LA (B) took different decisions because they believed the programme was expensive and that they could develop a more localised version. Consequently, while LA (A) staff promoted the programme to new and existing stakeholders, the coordinator at LA (B) engaged senior management into a proposal to replace (or de-adopt) the programme.

The review of reviews identified that many of the factors that influenced the aspects of implementation (i.e. *adaptation, participant responsiveness/engagement, programme design etc.)* were located in the social-communal rather than the organisational domains of the process. The interview study corroborates this finding in that many of the barriers and facilitators of implementation and sustainability that were identified were also located in the social-communal domains of the implementation environment. For example, the barriers of implementation and sustainability such as; type of children, type of school, and the difficulties of communicating the benefits of the programme to stakeholders and the community all emanate from or are related to the social-communal contexts of the children, and their schools and they relate to their understanding of the value of preventative programmes. (see section 6.6.1)

Additionally, the rest of the barriers (e.g. resource limitations, trainer availability, or unsupportive line managers) were almost exclusively resolved through individual level activities such as personal lobbying for line managers' approval, or taking personal responsibility as a 'rescuer' of the programme's implementation, or investigating joint commissioning arrangements etc. Therefore, even barriers which were organisational in nature were resolved through personal level action.

Moreover, where individuals took action to resolve barriers and maintain implementation, they explained their action as being motivated by personal or social experiences, such as the loss of a loved one to lung cancer, their love for working with young people or their personal "hate" of smoking. Further, the Council's partnership model of delivery and trainer recruitment strategy relied on influencing individual manager's perspectives on the value of the programme to their individual work areas.

Thus, the multiple programme advocates who were crucial to the sustainability of the programme were created through a deliberate social process of raising the personal value of the programme to relevant individuals, rather than through a technical process of making staff understand the importance of the programme to organisational goals and imperatives. The implications were that a network of programme advocates was created and this enhanced the potential for achieving the key aspects of implementation such as the *fidelity* of the programme, *participant engagement,* and *adaptation.*

Other relevant factors of successful implementation and sustainability were related to the design of the intervention. These included the manualised design of the programme, the uncomplicated nature of the intervention message and the common sense mechanism of the intervention. Thus, a key factor of sustainability was that implementers regarded the intervention as simple. The ASSIST was also seen as a replicable model for developing citywide health promotion activities.

LA (A) had a positive attitude towards programme costs. Therefore, although the resources were limited, the fact that it was paid for, was a facilitator of committed delivery. Therefore, part of the programme's sustainability story is that it is a "paid for" programme. However, the paradox is that resource limitations remain one of the biggest threats to the programmes sustainability.

The fact that the programme is the only evidence-based programme of its kind also justifies the council's decision to adopt and maintain the programme. Ironically, though, the councils' inability to produce demonstrable localised evidence of the programme's impact also remains one of the biggest threats to its sustainability. Moreover, the longer the programme is sustained, the stronger the pressure to continue to justify ongoing implementation. Therefore, the Council's decision to do what everyone else thought was a pointless "before and after" study, reflects the highly pressurised and under-resourced contexts in which the programme operates. At the same time, it is indicative of the council's determination to continue to implement the programme and its commitment to evidence-based approaches.

These findings though need to be assessed within the context of the strengths and weaknesses of the study. The key strengths of this study are that it was successful in validating many of the findings of the reviews of reviews, around the nature of implementation, while also extending insight into it. In addition, the case study design allowed for a deeper investigation of the LA (A) programme, where all the required interviews at LA (A) were completed.

However, the study remains subject to the classic weakness of retrospective interview studies, such as contact tracing and recall bias. For example, one of the interviews of LA (B) was less rich due to recall bias. In addition, the extended length of time that the programme has not been running at LA (B) (3 years), meant that only 2 of a possible 9 interviews were achieved. This led to a change of design from a comparative, to an in-depth case study.

Regardless interviews also only provide insight from the perspective of the I interviewee and this can mean some important aspects are missed (Quinn 2002).

In recognition of this weakness, the upcoming observational study (Study III) was designed to complement and strengthen the findings of Study I and II. Thus, Study III was a real-time ethnographic observation of the implementation of the programme. Therefore, the next chapter offers a further opportunity to continue to examine and extend insight from the findings of the review of reviews (Study I) and the interviews (study II), while continuing to investigate how the ASSIST was sustained.

6.8 Conclusion

Study II sought to understand what factors have contributed to the sustainability of the ASSIST programme in LA (A) and how. It also sought to assess the empirical validity of the finding of the review of reviews (Study I).

A range of barriers, facilitators, and other factors relating to the social-community environment including the type of school and its environment and the design of the programme were found to influence both the implementation and the sustainability of the programme. These factors are in keeping with the findings of the review of reviews (Study I) in that they continue to locate successful implementation and sustainability within the social contexts of the people that are involved in the programme. The fact that the ASSIST is sustained in an organisational environment which is grappling with a chronic lack of human and financial resources, also reflects the social processes, efforts, and the level of strategising by the collective and individual efforts of the implementers of the programme.

This interview study also extended the understanding of the nature and character of the implementation process that was found in the review of reviews. Thus, while Study II concluded that the stages are procedurally connected and that one stage affects its subsequent as well as other stages, Study II added the idea that these stages extend across the implementation process and are recurrent. In addition, stages extended across the

implementation process through the actions and decisions of implementers, and this was also the mechanism through which programme sustainability was achieved.

Therefore, the interview study concludes that the factors of sustainability are embedded in the implementation process. In addition, it draws a similar conclusion to Study 1, that the social-cultural environment surrounding the process of implementing the programme, including the relationships between people implementing it, the personal and reflective views of those individuals, their shared values, their agency, their relationship with decision makers, and with the programme itself play an important role in sustaining the programme. This though is not to dismiss the role of organisational factors in sustaining the programme. In fact, organisational factors relating to justifiable spend of resources were continuously at play throughout. Therefore, the organisational environment is one of the areas which I turn in the next chapter.

Reflective note 5

By now I am well into the process. I expect the upcoming study of the observation of the training of the children to be full of fun and easy. I tell myself I won't be under the same pressures that I was in the interview study. Pressures like; to remember to ask my interviwees every possible question that could have the slightest link to sustainability, or to not forget to use the topic guide while not appearing too robotic, or to pick up on important hints as the interviewee talks, or to rememember an important point I could have probed after the event, or the most stressful of them all; to wonder if the recorder is still working as we speak, without checking it! I also will not have to endure the anxiety of the process of going home, connecting the recorder to the computer while worrying whether the interview is all there. In this study, I just have to sit there, observe and record what is happening in front of me.

But this assurance in itself, triggers other doubts. As I try to imagine myself in a room, observing the trainers and the children, I already know the answers to some of the questions that are automatically popping up in my head and how futile it is to ask some of them. But I can't help it. It's like the questions are just asking themselves in my head! Questions like: Do I really think observing this will say anything about sustainability? How? What if it doesn't? then what? Will I just report that the observations didn't bring up much? What would become of the project?

But on the morning of the first observation, I am bright and optimistic. I ask my daughter to choose me what to wear. Something not too formal. I need to look 'cool' enough to the kids without looking like one of them, since I am only a little over five foot. So I also ask my sister's opinion on the dressing. Suddenly, meeting the children is more daunting than the executives I just interviewed? How is that so? But in the end, this turns out to be the most enjoyable study. It brings to life many of the assertions that interviewers made. So I wear a bright smile as I observe things come up that already did at interview, an even brighter one at those which are totally new, and my eyebrows are raised as I observe those which contradict the interview study …then the fifth lesson; the false illusion of unknowns as 'nothings' dawns.....

Lesson 5

They say there are three sides to every story, I say there are four. Your side, my side, the truth, and "the unknown."

Chapter 7 Study III: How the ASSIST was sustained - An observational account of the implementation process

7.1 Introduction

This chapter reports on the methods and conduct of the observational study, (Study III) of the implementation process of the ASSIST programme in LA (A). It also discusses its findings and conclusions, while referring to the findings of the review of reviews, and the interview study. It will also attempt to provide an explanation of how identified factors of implementation worked together towards sustainability.

The study is the third of the series of linked studies, designed to collectively tackle the second of the two PhD questions:

- With reference to a school-based public health programme, how is sustainability achieved over time?

The study evolved from key findings of the review of reviews that there is a paucity of information on the sustainability of public health programmes. It is also informed by similar findings by members of the supervisory team (Pearson et al. 2015b) and other key authors of implementation science such as (Proctor et al. 2015; Scheirer and Dearing 2011; Schell et al. 2013).

It offers insight into this question by observing factors that could have contributed to the sustainability of school-based public health programmes. In addition, it informs PhD question 1, by offering a real-time investigation into the character and nature of the implementation of a school-based public health programme.

While study II relied on the interview method of investigation, this study attempts to extend insight into implementation and sustainability through observations of two areas: the implementation processes of the ASSIST programme, and the environment of the organisation from which it is implemented.

The organisational environment is of interest to sustainability because "the core components" of implementation (e.g. staff training) cannot be installed or maintained without hospitable leadership and organisational structures" (Fixsen et al. 2005). In addition, while many of the barriers and facilitators of implementation and sustainability that were found in the review of reviews and in the interview study were located in the social-cultural environment, "type of school" was found to be relevant to the implementation process.

Moreover, the CFIR and its nineteen composite frameworks identify organisational factors as important influencers of the implementation process. Therefore, there was a need to observe the organisation environment to ascertain the role of organisational factors on the sustainability of the ASSIST programme.

Finally, although the interview study clarified some of the reasons why the programme was easily accepted by its commissioners, schools, and parents, of LA (A), their insight into the children was only via the perspectives of the trainers. Therefore, observing the children during their training sessions was one way of understanding what the children thought of the peer-to-peer approach, assess their peer relationships, and how that might affect their effectiveness in delivering the intervention to their peers.

7.2 Study aims and objectives

The study had three objectives. The first was to investigate whether and how the implementation process influences the programme's sustainability. Second, to observe the environment of the organisation which the Local Authority commissioned to deliver the programme (hereafter codenamed OWL), and to assess whether and how it influenced the sustainability of the ASSIST programme. Finally, to assess, extend, supplement, confirm, or reject some of the findings of the review of reviews and the interview studies.

7.3 Study-specific research questions

The study-specific research questions were:

a) What are the process-related factors that support or hinder the implementation and sustainability of a school-related public health programmes in LA (A)?

b) What are the organisational related factors that support or hinder the implementation and sustainability of the ASSIST in LA (A)?

7.4 Methodology

As a qualitative investigation, this observational study was an attempt to understand, describe and interpret how those involved in implementing the ASSIST programme go about their role of implementing it, how they relate to the programme, to their organisational environment, and to each other and whether and how any of their actions or relationships influence the sustainability of the programme. Therefore, the project raised open questions about phenomena of interest in a particular contextual setting (Daymon and Holloway 2010).

Thus I shared the setting in which the ASSIST is implemented to develop (as far as was possible) an insider's view of what is happening, or the emic perspective (Patton et al. 2000). At the same time, I was an observer, attempting to develop a descriptive and interpretive narrative of the process, i.e. an etic perspective. The findings of the observations allowed comparisons to be made between how the programme is supposed to be implemented as per its manual, and the interview reports of how it is actually implemented. These different perspectives extended the insight into the various factors that could only be identified through observation but which also impinge on how the programme is sustained.

The value and the appropriateness of the qualitative inquiry to this project was discussed in Chapter 3, and so it will not be discussed again in this section. However, Section 7.4.1 provides the details of how the data were collected.

7.4.1 Methods

a) What was my role as the observer?

The conduct of the observations of this PhD can be described using the typology of the observer role described by (Gold 1957). On the one end of its scale is the "complete observer," who does not interact with the participants and their role is concealed to them. This type of observation was incompatible with the study by design because the observer needed to be physically present to observe the implementation of the programme as it happened. On the other end of the scale is the "complete participant observer" where the researcher fully interacts with the social situation and their role is concealed from the participants. This type of observation was also deemed unsuitable for this study because it was impractical to conceal the researcher from the children and the ethical validity of the study was dependent on obtaining informed participant consent.

In between these two ends are the intermediate role combinations of the observer as participant and the participant as the observer. In the former, the observer is also a member of the participant group, e.g. a nurse researcher, observing nurses on the ward on which they also worked. In the later, the observer places themselves among participants just to observe them.

Since the researcher was not part of the implementing team, the "participant as observer" role is closest to how knowledge was obtained in this study. However, participation was limited to supporting non-core parts of the training sessions, such as: carrying and unpacking learning materials, taking part in ice-breaker activities, acting as an adjudicator on games, replacing drinks etc. This role facilitated rapport with the participants while minimising the risk of the researcher contaminating the implementation process.

b) Data Collection: What was observed?

Observations were recorded as field notes in a notebook, and the notes were organised by the name of the session in the manual (e.g. ready steady cook). Two questions were pertinent to the development of the process for observation, and the first was "what to look for." This question was guided by

the study-specific research questions (section 7.3), and the findings of the previous two studies. The second question was "where to look." This question was guided by the domains of the CFIR. The decision to use the CFIR to guide the observations was appropriate but also opportunistic, given the earlier findings that the CFIR is strong on organisation factors. Therefore the task was to look in all five CFIR domains (where to look), for answers (what to look for) to the study specific questions: "*What are the **process** and **organisation** related factors that support or hinder the implementation and sustainability, of a school-based public health programmes in LA (A)"?*

The 2-day training sessions per school started at 9:30am until 2:30pm each day, and the follow-on sessions were an hour long. However, given the length of the 2-day training sessions, there was the risk of observation fatigue and the danger that I could lose focus in the process. Mason (2017) suggests that to avoid "unfocused and void" observations, researches should develop a process for linking research questions to guide the observations. To achieve this, I developed an observational schema (Figure 11) which was based on the CFIR. The role of the schema was similar to the role that the topic guides played in the interview study. Thus, it acted as a visual and mental prompt about what I was looking for. Each CFIR domain was populated with some basic questions, which aided the identification of activities that could contribute answers to the research questions.

In addition, Patton (1990), suggests that all observers or evaluators of programmes need to ask some basic questions, e.g. what goes on in the implementation process of the ASSIST? What do participants and staff/do? What is it like to be a participant? Therefore, the field notes also recorded things like how training is delivered, any strategies, skills theories and techniques used the quality of interactions between the trainers and trainees, any issues or discussion points raised by participants etc.

I also observed the post-session briefings that trainers had, and I used them to ask questions about things that I had observed and to gain further insight

into the process. These questions included how the trainers thought the training went, what went well or not, and where relevant, inquiries into any observed adaptations or omissions were made, or why they did not ask the teacher to help with the children's behaviour. Fig 11 is the schema that guided the observations.

Figure 11: Schemata for the observations of the implementation process
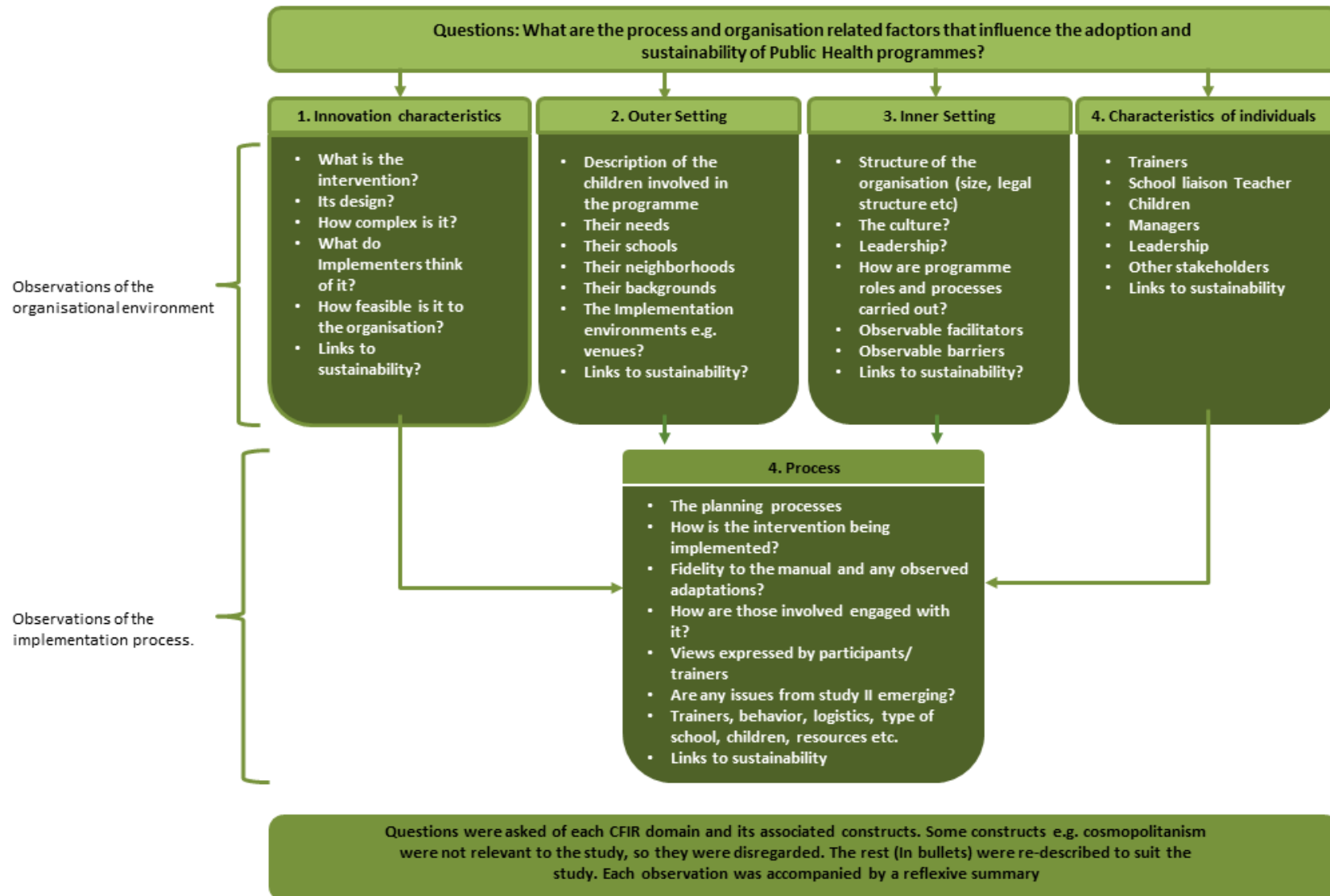
The observations of the organisation environment involved spending one full day a week over a five-month period from January to May 2017 with the team that was responsible for implementing the programme. These observations were about gaining a feel of the environment via sharing office space, attending team meetings, observing programme-planning processes, noting the skills, techniques, or conceptual knowledge employed in programme delivery. In addition, they were also used to look out for and verify the barriers and facilitators of implementation and sustainability that were identified in Study I and II.

The purpose of the observation schema was to assist with framing the observations rather than to limit the data that could be collected. Therefore, the observations also evolved with what was observed. Thus, where necessary, the researcher sought clarification of points of interest through striking conversations with team members and asking some questions such as: how often do the ASSIST team meetings happen? Who is in charge of organising them? Who is responsible for what role in the team? How long have they been a member? Etc.

Ultimately, the observation strategy included making ongoing references to the research questions, asking the same question in the alternative (e.g. either barrier or facilitator) making comparisons with the findings of studies I and II and adding reflexive thoughts about what had been observed. However, some of the specific constructs of the CFIR domains, e.g. cosmopolitanism were not relevant to the study. Therefore, they were not included in the schema that guided the observations

c) Procedure and conduct of the observations

The first step was to conduct briefing meetings about the project with the senior public health leadership at the council and with the senior leadership and staff responsible for implementing the programme at OWL. The purpose of these briefings was to build rapport and to familiarise key individuals with the project. Project approval was obtained from senior management at both

the Local Authority and at OWL, and a non-disclosure agreement specific to the board level meetings at OWL was put in place.

Information packs were sent to trainers three to four weeks before a scheduled training date. These advised them of the researcher's intention to observe their session, how they could opt out of the project, and contact details for further information, or complaints. A week before the training session date, the information sheets were sent out again to remind the trainers that they still had the opportunity to object to the researcher's presence during the training session. This ensured that trainers had a chance to give genuine consent. Appendix 8 to Appendix 12 are various samples of the information sheets that were sent to some of the participants and Appendix 13 is a sample of one of the consent forms.

Similarly, the children were given multiple opportunities to get information about the project. Liaison teachers first introduced the project to the children during the recruitment session, and I verbally explained the project to them and how I would conduct it. The children were then given information sheets for the project, plus consent forms for their parents to confirm that the children could attend the programme. (See Appendix 8 and 9, consent forms and information sheets for the children and their parents)

As explained section 3.7.5 and in the letter to the Research Ethics committee (Appendix 1), the consent process for the children and their parent's was on an "opt-out" basis, and it was obtained by using the programme's own consent process. Thus, parents and children were advised that a researcher would be present in the training session that their child had been selected to attend. They were also reminded that if either the child or the parent were unhappy with the plan, they had the option to opt out of the programme. The "opt-out" method of consent was preferred to the "opt-in" method because on advice from the Child and Mental Health Group (see Appendix 1) it was felt that obtaining individual "opt-in" consent for group-based sessions increased the risk of failure to observe entire sessions for reasons other than actual withdrawal of consent, e.g. if one child forgot to

return their form on time. In addition, the fact that there were only four schools which could be observed meant that the risk of failing to observe at all was deemed unacceptably high for a project which was considered to have a very low risk of harming the participants. Appendix 8 and Appendix 9 are the information sheets with the children's "opt-out" consenting process, and Appendix 13 is a sample consent form for the participants who were required to provide "opt-in" consent process, i.e. all interviewees.

7.4.2 Results

a)   Observations and interviews in the organisation environment

The observations took place at OWL, the organisation that the Local Authority (A) has commissioned to implement the programme. The researcher spent one day a week over the five-month between January and May 2017 working from and observing the office space of the team that is responsible for implementing the programme at OWL. In addition, the Deputy Chief Executive, the Chief Operating Officer, and the Head of the Health Improvement team were interviewed to gain more clarity about the organisation. Table 7 is the schedule of the activities that were observed and the interviews that were conducted.

Table 7: Details of observed sessions plus interviews conducted in the organisational environment

SCHEDULE A: OBSERVATIONS OF THE ORGANISATION ENVIRONMENT		
Activity Code	**Description**	**Date**
BM1/09	Board Meeting	09/01/17
BM 2/16	Board Meeting	16/03/17
BM3 /18	Board Meeting	18/05/17
BSC1/14	Board Sub Committee – Sustainability	14/03/17
HITM1/02	Health Improvement Senior Management Meeting	02/03/17
ATM/06	ASSIST Team meeting	06/04/17
ANT/30	ASSIST New trainer Meeting	30/04/17
INTERVIEWS		
HHI	Head of Health Improvement	29/11/16
COO	Chief Operating Officer	19/05/17
DCE	Deputy Chief Executive	22/05/17

b)   Observations of the implementation process

The original plan of the study was to observe the schools in LA (A) from their planned start date of September 2016 and to finish the project in March 2017. However, the Local Authority's attempts to find an alternative funding model through sharing costs with a neighbouring local authority led to the programme being delayed from September 2016 to January 2017. This shortened the period that was available for observing the implementation process, and it limited the number of observable schools to two. However, since the comparative arm of the study LA (B) was also no longer possible, there was need to gain more depth and breadth in what was observed as the case study. Therefore, there was value and researcher capacity to increase both the observation period and the number of schools to be observed.

As a result, the observation period was rescheduled to be between January and May 2017. However, it was not possible to observe all the training and follow-on sessions for a number of reasons. The 2-day training session of school S was cancelled because the school was unable to recruit the number of children required by the programme. Further, some of the follow-on sessions in different schools took place at the same time, and some of them fell outside the study period. Therefore, full observations of the 2-day training sessions were completed at three out of a possible four schools. However, the cancellation of the programme at the fourth school was valuable in itself because it contributed insight into some of the reasons that threaten the sustainability of the programme.

 A complete set of observations of the 2-day training plus four follow-on session were achieved at school J, and all but two follow-on sessions were achieved at school D. However, there were a number of diary clashes with the follow-on sessions of school D, and the last two of its follow-on sessions fell outside the study period. Therefore, six out of a possible ten follow-on sessions were successfully observed. The findings from these six follow-up sessions were corroborated by descriptions of follow up sessions that were obtained from the interview and some from the questionnaires study.

Therefore, it is likely that the fact that four out of ten possible sessions were not observed did not make a significant difference to the findings. Table 8 is a schedule of the sessions, which were successfully observed, those that could not be observed, and their associated reasons. It also includes some opportunistic observations. The opportunistic observations were not scheduled at the time of research design because they only emerged during the course of the observations. However, they were still covered by the ethics certificate of approval as part of the general observations of the programme. The two opportunistic observations were the observations of the 3-day training of trainers offered by DI ltd, and observation of how trainers promote the programme to stakeholders; in this case, it was to trainee teachers.

Table 8: Schedule of observed and opportunistic sessions

SCHEDULE B: OBSERVATIONS OF THE IMPLEMENTATION PROCESS					
CODE	DESCRIPTION	SCHOOL CODE			
		SCHOOL J	SCHOOL P	SCHOOL D	SCHOOL S
PN	Peer Nominations	04/01/17	25/01/17	Diary clash	Diary clash
PR	Peer Recruitment	09/01/17	01/02/17	21/02/17	29/03/17
PLN	Planning Session	16/01/17 & 26/01/17	09/02/17	None scheduled	Cancelled
PTS	2-day core training	31/01/17 -01/02/17	21/02/17 -22/02/17	03/05/17 -04/05/17	N/A
FUSCH1	Follow Up 1	09/02/17	02/03/17	Diary clash	N/A
FUSCH2	Follow Up 2	27/02/17	Diary clash	Diary Clash	N/A
FUSCH3	Follow Up 3	13/02/17	20/04/17	Out of study period	N/A
FUSCH4	Follow Up 4	29/03/17	Diary clash	Out of study period	N/A
SUPPLEMENTARY OBSERVATIONS					
TOT	Training for trainers	21/03/17-23/03/17			
EXPRN	Assist Presentation to student teachers	16/01/17			

7.4.3 Data Analysis

Data analysis was underpinned by the framework method developed by (Ritchie and Spencer 2002). This is the same approach that was used in study II and is described in section 6.5.5.

The analysis strategy was four-pronged: a) to search for concepts, themes, and theories that were found in Study (II), b) to identify discrepancies between the two studies c) to look out for new themes and d) to constantly review the relevance of all themes to the research questions. Consequently,

the starter themes were transferred from Study (II). Further, given that the data was in the form of manual field notes and I had the skeleton themes from the interview study, it was more efficient to use direct manual rather than electronic coding. Therefore, data sorting and coding process started at a more advanced stage than it did in Study (II).

The raw data was read, and re-read and coding was done line by line, marking out themes of interest in line with the analysis strategy. It was possible to categorise the data from the observations of the implementation process into the same three categories that were identified in study II, i.e. Barriers, facilitators, and factors related to the intervention. However, the data from the observations of the organisation environment was more diverse in its themes so it was less amenable to categorisation.

7.5 Findings

7.5.1 Observations of the implementation process: Barriers

A number of the barriers of implementation that were identified in Study (II) were observed in action, namely: trainer retention, type of school (engagement and leadership support) type of children (behaviour), and logistics.

a) Availability of Trainers

The observations validated the difficulties associated with the availability of trainers which were discussed in the interview study, section 6.6.1. Observation PN1 of the nomination session of school J recorded the following such incidence:

> *"One trainer's manager has said she needs to be somewhere else and can no longer deliver the session. The other two are not pleased especially as one them says she does not work on a Wednesday, but she says she still made herself available for the session. The other one says she is only present "for the love of it" because she has moved organisations and the ASSIST is irrelevant to her new role"…..*

The second trainer expresses her frustration as follows:

> *"I am very angry about this. I will send a "ranty" email. It's not on! This session has been booked in for six months in advance, and the manager still said she had to be somewhere else? (TR1).(Observation PN2)*

However, despite the obvious frustration, the trainers immediately reorganised their roles on the session and delivered the session without the missing trainer. Similarly, in the training session for school J, another trainer also gave a last minute notice of absence, so another trainer had to step in. The interview study identified the unavailability of trainers as a key barrier to implementation. Thus, the observed incidences validate the importance of trainer commitment, the role of 'rescue trainers' and the influence of line managers to the implementation process and to the sustainability of the programme. In addition, they question the delivery model in which the managers who supplied staff to the programme, also retained an ability to re-allocate those staff to other priorities without notice. This was identified and discussed in study II, section 6.6.1.

b) Behaviour Management

Covering nearly 100 children across four schools, these observations confirmed the earlier interview reports discussed in 6.6.1d. that the poor behaviour of the children was a significant barrier to successful implementation . Thus, it was a potential threat to programme effectiveness, and it affected the morale of the trainers. Reduced morale and ineffective delivery are both threats to sustainability of the programme. However, at school J, the first observations of behaviour and managerial response to it were positive. In observation PN3 I noted:

> *The liaison teacher is walking us through the school corridors to the training room. Along the way, he grabs an electronic device off one child and tells them that it would be returned to them via their parents. Moments later, he asks another child to see him at the office to "explain" his shoes. As we walk past the corridors, all the children respond to us by politely getting out of our way. Some of them greet the teacher, others fall silent just as we walk past them….*

In observation PN4 I went on to further record the impact of this teacher's presence in the session room and the effectiveness of his disciplinary measures.

> *The teacher has left the room. The children have become uncontrollably noisy and disengaged. Some are throwing pieces of paper and pens at each other. The trainers are shouting their presentations out and asking the children to keep quiet. The children are not responding. The environment is chaotic as the trainers go through slide after slide of presentation. The teacher has walked back into the room. The room has fallen immediately silent. The trainers continue with their session….*

However, during the ASSIST training which was out of the school, the children's response to disciplinary efforts or to the presence of their teachers was different. In addition, the teacher who was observed effectively disciplining the children in their school became passive during the ASSIST training. A trainer expressed their disappointment with this teacher as follows:

> *They (the teacher) needed to have been a bit more aware of what was going on in the room and to act on it when they felt they were professionally needed to, not be talking on their mobile phone. (Observation PT5).*

However, at their interview, the teacher explained that their passive approach was because they understood that they could not be involved in any aspects of the delivery of the ASSIST unless they were expressly asked to do so. However, at end of session de-brief, when I asked the trainers why they did not call for the teacher's intervention. Their explanation was that such a request would have undermined their authority in the eyes of the children. Thus, the trainers expected that the teacher would use their own judgement on when to intervene, while the teacher expected to be asked.

Alongside the poor behaviour and chaotic environment, I also noted an emerging theme of violence. For example, when the trainers asked the children to set up the house rules for the training session, the first rule that the children of school J put forward was "no violence!" Other observations suggested why some children felt that it was important to have an explicit rule

on violence. In Observation PT7, the trainers asked the children to organise themselves into four groups. One of the self-organised groups ended up having an argument. One of the children began to cry because another child had told them that they could not be in that group. The crying child complained that they were always 'bullied' out of group games by the boys in that group. The teacher intervened, and the trainers ended up reorganising the groups using the children's dates of birth.

In a role-play of how they would start conversations with their friends, the children of schools P and J enacted violent scenes, which involved: snatching cigarettes from a smoker, fights breaking out in response, and throwing bottles and shouting (observation PT8). These incidences corroborate some of the reports of the trainers during the interview study. For example, one trainer recalled incidents in which the children of a particular school were so out of control, that the trainer questioned their own safety. The following year, the programme was withdrawn from that school it has not been offered to it since. While many of the group behaviour issues were at most process disruptors, some serious incidents similar to those trainers described in the interviews were also recorded. In observation PT9, I noted:

> *Child X is repeatedly throwing themselves off their chair and onto the floor and back again. Trainer 4 asks the child to stop this behaviour, but the child does not pay any attention. The trainer walks over to the child, taps them on their shoulder, and politely asks them to sit back on their chair.*
>
> *The child obliges but is clearly unimpressed. Later this child had a conversation with their friend about the trainer who had tapped them on the shoulder. As part of that conversation, the friend asked the child " I think trainer 4 "likes" you...*

Later, the misbehaving child wrote on their evaluation form that the one thing they did not like about the course, was "Trainer 4 touching them." Although it was very clear to everyone that the trainer's action was just an adult's attempt to stop the child from injuring themselves, the negative connotations of a child reporting being "touched" by an adult were obvious.

At de-brief, trainers reflected on the seriousness of the incidence. They discussed what they called the "huge risks" involved in working with other people's children, how they can protect themselves, how this puts off other people joining or staying on as trainers, and they expressed sadness that the days in which you could just naturally interact with children were gone. (Observation PT11).

The trainers agreed that the matter would be referred to senior management who subsequently launched an investigation. Management responded by immediately removing the concerned trainer from the training panel. New child protection guidelines were issued, and they were reinforced at a team meeting. In addition, management decided that all trainers would now be required to train to a minimum of what they called a level 2 in child protection. Finally, any ASSIST games that required any kind of contact with the children would no longer be done, unless the children had signed a formal consent form.

Another behaviour and management incident was triggered when trainers reported concerns to their line management about the manner in which a liaison teacher tried to get uncooperative children to take part in an end of training activity. This report triggered another managerial investigation, to which I was asked to comment, and a formal report was sent to the school's leadership.

I do not know if the school took any action on the liaison teacher following this report. However, in their interview, the concerned liaison teacher had confirmed that they were the only member of staff who could be released to the ASSIST as they had no teaching responsibilities. Therefore, if the report led to the removal of the teacher from the ASSIST, then it is likely that this school will not be able to take part in the programme the following year.

I also observed that the children's behaviour generally affected the behaviour of the trainers. For example, I noticed and overheard trainers expressing apprehension or demonstrating nervousness just before the start of the

session. Some of the coping mechanisms that I noticed included: recounting difficult sessions with previous children and what could be done to stop repeat incidents, expressing frustration that they had not received formal training in behaviour management, displaying nervous body language such as pacing around the room, or taking audibly deep breaths just before the children arrived. Trainers also engaged in self-assuring conversations with and between themselves. I recorded the following such conversations:

> "*I am a nurse; this shouldn't scare me.*" *(PN10) and*

> "*You will be fine; remember you can't let them smell your fear or they will eat you alive!*" *(PT11) and*

> "*The children can be quite terrifying..*" *(PT12)*

c) Type of School

The Office for Standards in Education (Ofsted) describes three of the four schools in this study (School J, School P, and School S) as "good schools." Ofsted also notes that these schools have a "well above average" proportion of students known to be eligible for the pupil premium (i.e. children from lower income households, and children in care and service children). According to the Council, these schools are located in the most deprived neighbourhoods of the area, which also face poorer health, and higher rates of risky behaviours, e.g. smoking, sedentary lifestyles, alcohol abuse, and poor diet. At interviews, the liaison teachers of schools J and school P described their own children as coming from deprived and difficult backgrounds and grappling with a range of social and economic difficulties.

In the interview study, trainers (PC, and TR3) identified that the "type of school" affected its level of engagement and its willingness to do what they are supposed to do (6.6.1d). They described schools in the deprived neighbourhoods as less resourced, more disorganised, less engaged with the programme, and that their children were more difficult to manage. In contrast, school D is located in one of the wealthier neighbourhoods on the city's outskirts. Ofsted judges it as "outstanding" and describe it as having an

average number of children eligible for the pupil premium. The liaison teacher of this school described the pupils as "the type that actually wants to be there, and that it is a "sought after" school. Many of its pupils travel lengthy or multiple bus journeys just to get to it.

The observations of these schools validate some of the findings of the interview study in that the most challenging behaviours and incidents were observed in the schools that were described as more deprived, i.e. schools J and P. For example, in observation PT13 I recorded that at some point, the children of school J were being asked to keep quiet on average of every five minutes. In observation PT14, I noted:

> *The environment is so noisy and disruptive; it is so difficult for the trainers to deliver the sessions while following some of the more subtle recommendations that I am noticing in the manual, e.g. making constant references to post training conversations...*

Trainer 4 corroborated my impression of the day as follows:

> *It took a while to get anything into them, they did not apply themselves to it, and as I was delivering, it did not feel like they responded in the slightest. I did not feel in control…We did not congratulate them throughout the day for being nominated to the course because then with their behaviour; we would be lying to them... (PT15)*

It is worth noting that this was the same school whose liaison teacher was recorded as uninvolved in the disciplining of the children during training, (section 6.6.1d) and it was the same whose participation was on the condition that it was provided with transport to the venue. Thus, the school was broadly less engaged and less committed to the programme.

The other also deprived school S, had their programme cancelled because it failed to recruit the programme's minimum requirement of at least 15% of the children of the year group. The disorganised manner in which this school handled the ASSIST programme was evident at their recruitment session. In observations PR16 and PR17 I noted:

On arrival, the liaison teacher is not available. No one knows who they have handed the programme over to. The receptionist sends someone to go round the classes to see if anyone knows anything. A teacher arrives with the children, but they also say they don't know anything about the programme, they were only asked to bring the children to the session. The session starts late….

This highlighted the schools' low levels of engagement with the programme. Thus, the school put in very little effort into the programmes' *pre-implementation* activities, and there was no ownership of the programme, or of decisions relating to it. The way the school managed the recruitment process of the children was also evidently short of the programmes' requirements as was recorded in Observation PR18:

At the end of the recruitment session, the trainers give the children envelopes containing parental consent forms. They realise that 8 children have turned up whose names were not on the list. The list was compiled by the trainers, and it was sent to the school in advance. The School was supposed to bring only the children who were on that list. The 8 children who should be present are not present. The children who are present explain that their tutor has swapped them with another child. No one knows why. The 8 children are told that they cannot come to the programme because the rules of the programme require that only the top 15% - 18% of the nominated children can attend. These children are visibly disappointed as they walk out of the room back to their classrooms….

The trainers expressed their disappointment with the manner in which the school had handled the recruitment session. This was particularly disappointing because the programme coordinator had sent all the requirements of the programme weeks in advance, they had explained it to the liaison teacher at a face-to-face meeting, and they had followed all conversations up with confirmatory emails. Therefore, the school demonstrated a clear disregard of the programmes stipulations, such as how children are selected to the programme.

However, according to the lead trainer, this disorganisation and lack of commitment was typical of how this school had engaged with the programme year on year. In the previous year, this school's programme was cancelled

for similar reasons. Following this cancellation, the programme coordinator decided that the programme would no longer be offered to this school in future. In addition, although the other two deprived schools J and P achieved their recruitment thresholds, they reached their targets right on the deadline meaning that they too only narrowly avoided cancellation for similar reasons.

However, the way the schools recruited the children to the programme may also have influenced whether the schools reached their recruitment thresholds or not. For example, I observed that the liaison teacher of School J emphasised to the children that they should ensure their parents filled in their consent forms as otherwise, they would miss the day trip. School P used a similar strategy of appealing to the children to convince their parents to sign the forms.

In contrast, the outstanding school D proactively sold the programme to the parents rather than to the children. At interview, their liaison teacher explained that in addition to the programme's information sheets for parents, the school writes its own letter specifically recommending the programme to the child. The letter highlights all the benefits that previous students on the programme gained, such as communication skills, confidence, and knowledge. As a result, this school has always achieved 100% recruitment with all consent forms returned well before the deadline. This school has been implementing the programme consistently for the last five years, and unlike the other two schools, it drives its own children to the programme.

These findings confirm what was found in the interview study, that the type of school and its wider characteristics are important factors in whether and how the programme is implemented and they have an influence on the sustainability of the programme. 6.6.1d.

d) School Leadership
So far, the findings suggest a straightforward positive relationship between enthusiastic school leadership and successful implementation and sustainability. However, in practice, the relationship was observably complex. In observation PR19 of the recruitment session of the highly engaged school

D, I captured the paradoxical role of a highly engaged and enthusiastic liaison teacher follows:

> *Instead of just introducing the ASSIST team to the children, and then handing over the session to the trainers, the liaison teacher has launched straight into the details of the programme. He goes on to tell the children; "you are selected to this programme because you are representing your school, so you have to be at your best behaviour…"*
>
> *The trainers exchange shocked looks as the teacher goes on to pre-empt the rest of the session. Finally, mid-way through his delivery, Trainer X shouts out; "Excuse me, sir! can we say that"?*
>
> *The liaison teacher acknowledges her interruption, but he continues to explain the full details of the remainder of the programme to the children anyway…*

Since the programme specifically requires that teachers should not be involved in the delivery, this teacher's takeover of the recruitment session was a breach of implementation fidelity. Moreover, contrary to the manual's stipulation that the trainers should use the session to enthuse the children about the upcoming training, e.g. by emphasising that they were chosen because they were influential, the teacher advised the children that they were chosen to represent their school. Thus the emphasis was now on behaving to represent the school rather than because they were living up to the expectations of the peers who had nominated them to the programme.

A similar programme "take-over" was also observed in school P, where another enthusiastic liaison teacher unexpectedly took charge of the "end of training" talk session, to present her own "post-training" plan to the children. The teacher explained that as an "off-shoot" of the ASSIST, they would open up their office each lunchtime for the children who had been trained, to hold anti-smoking sessions for other children. The children who took part in this initiative would then be rewarded with "points" from the schools' existing reward scheme.

The children were excited with this proposal, and they immediately started passionate negotiation with the teacher about "how many points" a session should be worth. This enthusiastic response to the teachers plan was in sharp contrast to the rather "dry" atmosphere, in which the children had just signed their assent forms to become ASSIST peer supporters. The children's excitement for the teacher's proposed plan was not lost on the trainers. At de-brief, one trainer noted her frustration:

> *I know the school is excited, but I wasn't sure if that wasn't*
> *undermining because we just got the children to sign up and*
> *they say oh, you can also sign up to this other thing that I*
> *have planned? (Observation PT20)*

These observations are consistent with the oral accounts of trainer 1 and trainer 2 during the interview study. These trainers described their experience of enthusiastic leadership in another less-deprived school H from the previous implementation year. These trainers noted that although the high levels of engagement from the school's leadership and their well-behaved and engaged children were appreciated, the biggest difficulty for the trainers was how to "continuously, but politely" stop the liaison teacher from being involved in the implementation process.

Therefore, while an engaged and enthusiastic school leadership was useful for logistics and successful delivery, it was also reported and observed to interfere with programme fidelity. In addition, the trainers reported feeling disempowered with such type of teachers.

e) Logistics

The observational study identified two seemingly minor, but potentially serious barriers of implementation, which had not emerged in the interview study. The first was the type of room that was available for the nomination session. The way the children are nominated is important to the implementation process because to achieve programme effectiveness, nominated children must come from the representative range of the social networks in their year group. According to the programme, the nomination sessions, need to take place in a room that has desks so that the children

can make their nominations without being influenced by other children. In practice, this seemingly simple requirement was a lot harder to achieve as was noted by Trainer 5:

> *"In a way, Decipher (Ltd) live in fantasy land with this. They say the room should have desks or nominations must be by tutor group etc. Well, the reality here is that schools have these lecture theatre rooms set up with no desks and schools would not have time and resources to do it tutor group by tutor group. (PN21).*

All of the observed nominations took place in lecture room type auditoriums. In addition, the whole year group did the nominations at once, as opposed to the ideal tutor group by tutor group, and the children sat in very close proximity. In school P, the available room at school was smaller, so some of the children were asked to go to the adjacent "café style" open space. However, the nature of this space plus its roundtable sitting plan encouraged grouping, and the children were overheard conferring. A visual inspection of the nomination forms confirmed that the children who sat on the same desk nominated a similar list of children. Therefore, the inappropriate nomination spaces could influence the type of children who are nominated to the programme, for example, by favouring the popular but not necessarily the influential ones.

The second seemingly minor, but equally important logistical challenge was that most of the children came to the nomination session without pens. However, the subsequent trips to fetch pens created a chaotic environment with some children leaving as others were re-entering the room, and others were filling in their forms. This environment was equally conducive to conferring.

The final logistical barrier was timetabling. Only 8 out of 20 children attended follow up 1 of school J, because the rest went on a day trip, while at follow up 4, some children went on a geography trip instead. There were also timetable clashes with PE at follow up 1 for school P. Since the ASSIST programme is

planned as a package, the children who do not attend all sessions are less equipped as peer supporters.

These logistical barriers have major implications for the effectiveness of the programme because they interfere with the type of children who are selected to the programme and the effectiveness of the programme depends on these children. Any threat to effectiveness is also a threat to sustainability since the implementation becomes pointless.

f) Resources

Although the issue of lack of resources was prominent at interview, its impact on implementation was not directly observed. This could be because the decision to implement the programme was effectively a decision to resource it, so resources were less of an issue at implementation. However, there were some indicators of the financial constraints within which the programme was being implemented. For example, trainers were overheard wondering whether the food budget would also cover their own lunch or just the children's. For the schools, school J was able to take part in the programme on the condition that the programme provides transport.

I also recorded some emergent resource-related issues, which are likely to place pressure on existing and future programme resources. For example, on the morning of day 1 of the training for school P, the trainers discovered that they had no first aider among themselves or the teachers. The trainers said that they had not ensured that one of them was a first aider, because they assumed that schools would never send children on any trip without a first aider. However, the school said having a first aider on the team was not one of their considerations. An impending cancellation of the programme was only avoided because a first aider was found among the members of the staff from the venue. Following this incident, a managerial decision was made that all trainers would now be required to be first aid trained, thus placing a new demand on both trainer time, and financial resources.

Other minor observed barriers to implementation were related to the logistics of delivery such as technology glitches, room changes, and coordinating and organising learning materials.

7.5.2 Observations of the implementation process: Facilitators

The absence of most the barriers of implementation discussed in 7.5.1 was also observed as facilitators. For example, trainers were observed either rescuing or de-prioritising the programme depending on their level of commitment. Similarly, the absence of some facilitators was observed as barriers. Thus, the less engaged school and its children were observed to be disruptive to the implementation process, while the opposite was true for the more engaged school. Since these were discussed at length in the interview study sections 6.6.1 and 6.6.2 and this study's' section 7.5.1, they will not be discussed any further here.

7.5.3 Observations of the implementation process: The design of the intervention

The observational study supported many of the barriers and facilitators of implementation and sustainability, which were identified in the interview study. However, the impact of the design of the programme on its implementation and sustainability was observed to be quite complicated, and in some cases, at odds with the programme assumptions. For example, although the children in a training cohort are not expected to be friends, the social tensions that were observed between some of them raised questions about the state of the general peer-to-peer environment, in which they were expected to deliver the intervention.

Tensions were particularly evident during self-selecting group activities (e.g. the crying child described in section 7.5.1(b) and during break times. In addition, the children's negative perception of their peer environment was evident in the house rules that they set, and in the aggressive role-plays that they designed (section 7.5.1 (b)). This suggests that the children may not be in agreement with the central idea of the programme, that they shared their

messages in friendly peer-to-peer environments. In addition, it appeared that the children also had difficulties with understanding or appreciating the programme's central concept of prevention. Trainer 3 captured this observation this way:

> *It doesn't matter how many times you tell them that they are only supposed to have conversations with their friends, to prevent them from taking up smoking. Somehow, they have it stuck in their heads that they are supposed to talk to smokers and stop them smoking. (TR 3 observation TR22)*

Indeed, trainers were observed repeatedly emphasising to the children that they were only required to have conversations with their friends, to prevent them from taking up smoking, but not with other children who were not their friends or were already smokers. The trainers' observed characterisation of the children's difficulties in grasping the concept of prevention was also corroborated by other sources, e.g. from the interviews, from the questions that the children raised during training, and from their reports on who they were having conversations with. For example, at a follow-up session when the children were asked who they had had a conversation with; child X of school J demonstrated this difficulty as follows:

> *"I did not have any conversations because I did not meet any smokers, plus no one in my family and none of my friends smoke!"*

Other children agreed with this child, shouting back in a chorus, saying "yeah!" me too! In addition, none of the children observed in all the six follow up sessions, described a conversation with a non-smoking friend. Instead, they gave detailed personal accounts of some successful, but also some notably difficult conversations with smoking family members as follows:

> ***Child A:*** *"I told my mom to stop lighting a cigarette in the car. She stopped and told me to get out of the car. She said if I didn't want her to smoke in the car, then I must start walking everywhere…(observation FU 20)*

> ***Child B:*** *"My mom said if she stopped smoking, she would have to kill us because smoking stops her from being stressed with us"(observation FU 21)*

> ***Child C:*** *"I told my Granddad that he was stupid for smoking because he would die, and we had a massive argument!" I am no longer speaking to him… ...(observation FU 22)*

Throughout the observations, I noted that the children were more concerned with the smoking habits of their families than they were with the possibility that their friends would start smoking. This raised some new questions about how the children viewed the core aspects of the intervention, how that affected how they would implement the peer-to-peer conversations, and how that relates to the programme's sustainability. Some of the implications of these questions were explored in more detailed in the final Study IV, and they are reported in Chapter 8.

While it would appear logical to encourage the children to have conversations with both the children who were already smoking and those who had not started smoking yet, the reality was that the skills required for discouraging a non-smoker from taking up the habit are different from those required to stop a smoker. Moreover, the child who was already a smoker was likely to be older than the 12-13-year-olds undergoing the peer-to-peer training, and so they were unlikely to be influenced by such conversations. In any case, the children also described smoking children as the "hard" ones. Thus, the peer educator themselves are unlikely to feel influential over the type of children who already smoke.

The other design related aspect that was observed to be relevant to implementation and sustainability was the manualised nature of the programme. However, the observations of the role of the manual in successful implementation were at odds with those that trainers suggested during interviews. At interviews, trainers described the manual as a simple "off-the-shelf" document. They also generally agreed that the manual simplified implementation, it saved time, it assured them of fidelity, and that all this was supportive of their decisions to accept and continue their involvement in the programme.

However, the supposed simplicity of the manual was not validated by the observations. Firstly, the manual is a 265-page file of double-sided sheets, which are regularly updated by DI Ltd as and when it is required. However, for cost reasons, the manual cannot be reprinted in full each time an update is made. Therefore, DI Ltd only provides electronic updates of the pages that need updating. Consequently, trainers still work off the original paper manuals, replacing outdated sheets when required. However, these repetitive one-sided updates onto a double-sided file have burgeoned an already big manual into an impractical document. Trainer 2 described the implications of this to the implementation process as follows:

> *"You cannot run off a whole manual. You only get updates which is a pain because they are single sided, but the paper manual is double-sided, so you can't get rid of the outdated version from the manual. Trainer Y updated all files at some point, but it is now outdated again! This isn't working very well".*

The impracticalities of working with this manual raise fidelity issues in that it introduces the risk of accidental implementation of old material alongside new ones, and it increases the risk of the failure to follow pertinent session points, due to the sheer volume of the material. It was also observed that the overly detailed instruction on everything from the setup of tables to the distribution of pens by colour, across flip chart groups contributed to difficulties in prioritising the manual's instructions. During implementation, I observed trainers routinely quality check their own delivery against the manual, and I noticed them worrying about whether any omissions however minor, would have consequences on the effectiveness of the programme.

In their quest for fidelity to the manual, trainers were also observed meticulously planning and practising; *what to say, what not to say,* what to do, *what to remember not to do, the order in which it appeared, etc.* However, once delivery started, the environment determined what they said and did. For example, during the training of school J, a "fact ball" exercise was not used, and a "values continuum" session was modified because

trainers feared that the children would be uncontrollable given their behaviour.

One trainer reported that to avoid these challenges, they have designed their own prompt cards, which they often lend to other trainers. The trainer reported that these prompt cards made delivery easier and more fluent, and her fluency in delivery was confirmed at observation. However, unlike the manual, the trainer had not updated their prompt cards since they were developed five years ago. Therefore, although these prompt-cards are more user-friendly,than the manual, they introduce the risk of the training drifting away from the spirit and the detail of the updated manual.

Ironically then, these observations confirmed that the manual promoted the overall trainer's efforts for achieving fidelity, but they also suggested that the size of the manual, the process of updating it, and the process of following it posed some threats to fidelity. The observations also confirmed that although the manual triggered perceptions of simplicity in the trainers, in practice, the manual contributed to the complexities of delivery. Finally, although the trainers considered the manual as a source of assurance about what they had delivered, each time a discrepancy was found, then the use of the manual as a quality-checking also took away the confidence in their own delivery.

7.5.4 Observations of the organisational environment

With reference to the observation schema Figure 11, the observations of the organisational environment did not add any more insight to the role of the *characteristics of the intervention,* or of the *individuals involved,* than those which were found in the interview study or in the observations of the implementation process outlined section 7.5.1 -7.5.2.

Therefore, this section focuses on the findings in the CFIR domains of inner and outer settings. These findings were obtained from *a* combination of interview data with senior leadership at the implementing organisation OWL, and the observations of the various meetings outlined in Table 7 and from the

weekly observations of the general workplace as a setting. However, in line with the terms in the official non-disclosure agreement with OWL about this project, the contents of observed board meetings cannot be disclosed or quoted from, except in general terms to outline the broad character of the issues that may affect the implementation or the sustainability of the programme.

In its official documents, OWL describes itself as is one of the largest Social Enterprise Organisations delivering NHS services in England. It has nearly 3000 staff, a £100m turnover, and it delivers more than 80 services across multiple locations. It also describes itself as a multi-specialist community provider, covering a diverse range of clinical care, community physical and mental health care, adult social care, and professional specialist services.

The size and diversity of the organisation is relevant to the sustainability of the ASSIST for several reasons. Firstly, the ASSIST is an integral part of a £6m health improvement contract, which includes the provision of smoking cessation services, and healthy eating. Tagging the ASSIST to a larger contract is a strategic decision by the Council and OWL because the ASSIST is deemed too resource-intensive to be sustained as a standalone project. Thus, as a large organisation, OWL is well placed to compete for larger contracts and to carry the costs of all associated tendering processes, from which the assist benefits.

Secondly, the irregular delivery pattern of the ASSIST means that it is financially unsustainable to dedicate staff to it. Therefore, the delivery model of the ASSIST relies on an organisation which is large enough to have a pool of flexible staff who can be assembled at short notice while remaining available in the long term. As part of responding to this challenge, and of the need to improve organisational responsiveness to a variety of work streams, OWL has established a workforce multi-skilling strategy. This involves training all health improvement staff on a range of health promotion projects including the ASSIST. During interviews, management was proud of this strategy, which they explained as a "win-win" plan because it solved the

organisational challenges of sustaining staff on non-routine projects like the ASSIST, while also expanding their skills.

However, some team members were sceptical about why this was being done, its implications on their status as specialist practitioners, how it affected the identity of their teams, what it said about the comparative value of their occupation and their role in influencing the changes. In observation OG23 I captured the following conversation:

> *A: Multi-skilling teams? The problem is that everyone has a vision of what we should be doing as XYZ team. Nobody has told us what that vision is so when we get a shortfall somewhere, one of us is called up to help. Would they do that to nurses?*
>
> *B: I hear X is going to keep in team A this week. They said team A is in crisis we got to help. We have to save £0.5m. They won't take that off anything. Not the hospitals.*
>
> *A: The council has said they do not have money allocated to Public Health. The government's ring fence of public health budget ended, so there is no money. But nobody listens to us that's the problem!*

Although the size of OWL as an organisation is supportive of the sort of financial security that is required to sustain the ASSIST, the bulk of OWL's income is for clinical work. As per observation OG23 above, the tension between clinical and non-clinical public health was evident in some of the staff comments about the differences in resourcing decisions, and expressions of perceived organisational prioritisation of clinical over non-clinical work or staff. However, clinical work is subject to a range of national Key Performance Indicators and measures, e.g. proportions of patients experiencing delayed transfer of care, or the rates of dementia diagnoses. These measures have a huge bearing on the organisation's own sustainability in that they can determine whether a Care Quality Commission (CQC) inspection results in the organisation being put in special measures or being granted a middle or top rating. At senior management meetings, it was clear that a huge part of sustaining the organisation was managing national

performance indicators, which of course do not apply to the outcomes generated by the ASSIST. Three months later, I captured a similarly sceptical conversation between a different set of team members:

> *A: I am not sure we are a team. Are we supposed to be the XY or is it the XYZ team?*
>
> *B: I don't know and are we supposed to be having team meetings or is it practitioner meetings?*
>
> *A: I said before I have stopped worrying about it.*
>
> *B: Good idea!*

While some of this may simply represent general uncertainty by staff, it is also reflective of the difficulties in creating strong teams to sustain a programme that has an irregular delivery pattern like the ASSIST. Regardless, in their quarterly meetings, trainers were observed collectivellly employing various tactics to solve implementation problems and to sustain the ASSIST's operations. In observation TM24 I summarised their attempt to solve the problems of a lack of administrative support for the ASSIST as follows:

> *Team members are of the view that a request to management for block admin support is unlikely to be successful in the prevailing financial environment. Therefore, their plan includes: choosing "the right person" to make the request, jointly craft the exact wording of the request, and to make sure that the request is addressed to more than one manager, one of whom is the one manager that they believe is most likely to support the request.*

Of note was the manner in which the problem was approached, how team members jointly owned it and their anticipation of managerial responses to various options. This validates the role of programme championing and marketing that was discussed in the interview study 6.6.2d. Thus, the ASSIST was largely championed from the bottom, and no ASSIST related championing was observed outside of the implementation team.

The size of the organisation also means that it has a significant potential to influence the health of the local population via its position as a large employer. The observed strategic efforts to capitalise on the size of the organisation included plans and discussions to extend NHS health checks to its 3000-strong staff while engaging other large employers in the area to sign up to a range of workplace health and wellbeing initiatives. Therefore, OWLs' ability to reach out to a large pool of residents is of interest to the local commissioning authorities in that it fosters the image that OWL has an intrinsic capacity to add value to its public health contracts more easily. Consequently, adding the ASSIST to the larger health improvement contract is a credible option.

OWL's strong standing as an influential player in local and regional health is also evident by its senior-level representation at its region's Sustainability and Transformation Plan. At interview, OWL senior leadership also explained other organisational opportunities and challenges relating to its legal set up. For example, that as a Social Enterprise, OWL has more flexibility of operation because it is not subject to much of the so-called 'red tape' that grip NHS organisations. This is important in that it allows OWL to meet some of its delivery challenges easier.

At the same time, OWL's reliance on NHS funding restricts its ambitions for growth. For example, while it is not allowed to run a deficit, large surpluses are also subject to recall by commissioners regardless of whether they were caused by negative factors, e.g. under-performance, or over- allocation of funds, or by positive factors such as improved efficiency.

7.6 Discussion

This observational study has validated the majority of the findings around the barriers, and the facilitators of the implementation and sustainability of the ASSIST programme that were found in the interview study. These include the type of trainers, trainer retention and availability, type of line managers, children's behaviour, and behaviour management, school leadership including the type of school, and type of children.

Since these were discussed in the interview study sections 6.6.1-6.6.2, this discussion will focus on the findings that were either different between the two studies, or those that were new. These include the manualised nature of the programme, the children's response to the programme, the role of school leadership, emerging issues on resources, and the role of the organisational environment. With respect to the design of the intervention, the finding that the children had difficulties with the programme's core concept of prevention has serious implications for whether and how the children implemented the programme after their training.

From what was observed, there was little evidence that the children had been actively implementing the programme among their peers. It was also clear that they were very concerned about their smoking relatives, but they were either indifferent, unconvinced or dismissive of the risk of their own peers taking up smoking. However, the sustainability of the programme's operations is only useful if the children go on to implement the programme. The children's attitudes on the risk of their friends taking-up smoking raised questions about the extent to which children can appreciate or value preventative measures.

These results suggest a fundamental difference between how children problematise the issue of smoking, their preferred approach to intervention, and who they perceive as being at risk compared to public health professionals. Thus, to children the classic preventative approach is not as self-evidently convincing as it is to public health professionals. Therefore, the definition of adolescent "health" problems like smoking must be seen as an essentially professional agenda. However, such agendas may be relatively ill-informed by young people's own perspectives, and this should be an important concern for peer education (Milburn 1995). Thus, researchers and practitioners must pay attention to the ethical questions about the role of children in defining the problems and shaping the solutions to public health problems that affect them. If the children lack conviction in the key principles

of the interventions, they are unlikely to implement the intervention, making any sustained programme operations before this stage pointless.

Another enduring critique of peer education projects which are based on the DoI theory relates to the unstructured process through which the transfer of messages is meant to occur. An important gap in peer education research is that some approaches to peer education rest on the assumption of a "diffusion effect" for the sustainability of the intervention, i.e. that peer supporters will continue to educate others beyond the parameters of the intervention (Harden, Oakley, and Oliver 2001). However, "the many levels of cascading messages tend to be lost in the system, effectively reducing these programmes into no more than "Chinese whispers" (Turner and Shepherd 1999). Indeed I was not able to determine the quality of the children's reported conversations.

The organisational observations also highlighted the fact that clinical work influence organisational priorities in ways in which health promotion work like the ASSIST could not. This could partly explain the general invisibility of the ASSIST outside the implementation team. It is notable that the majority of the factors which were found to support the sustainability of the ASSIST in the interview study, e.g. programme championing, or commitment, are located in the fairly junior implementation team. Thus team members were in charge of the whole process from championing the programme internally and externally, to implementing it and plugging up shortfalls to maintain fidelity and sustainability.

Therefore, although the size of the organisation enhanced the security of the programme, there was no obvious evidence that the internal organisational setting and structures played a significant part in sustaining the programme. While surprising, this finding is similar to the findings of a study of practitioner fidelity (Schoenwald, Halliday-Boykins, and Henggeler 2003), which found that fidelity was not associated with measures of the organisational climate. In fact, organisational culture and climate were associated with practitioner fidelity when fidelity was low but not when it was high.

Similarly, in their study of the sustainability of peer-assisted learning strategies (Baker et al. 2004) found that teachers who had a high mastery of an innovation may be able to persevere in their implementation despite organisational challenges. This is akin to the 'rescue trainers' who have been identified in this thesis (Baker et al. 2004). These trainers have been implementing the ASSIST for more than five years, and their high level of perseverance and commitment was documented in the interview study, and it was observed.

However, an alternative or additional explanation is that the low-key presence of the programme could be because the ASSIST is a small non-clinical project within a large clinically focused organisation. Therefore, it is of relatively low priority compared to the core business of the organisation. This could encourage the creation of an empowered or semi-autonomous implementation team, whose members have full responsibility for the programme including influencing programme decisions, control of implementation and personal ownership of the programme.

The finding that the manual complicated rather than simplified implementation has three implications. Firstly, it means that manualised programmes (whether actually complex or not), can foster perceptions of simplicity, and that simplicity (whether actual or perceived) is an important consideration in trainer retention and programme sustainability.

Second, an overly detailed manual can defeat its own purpose by threatening rather than promoting fidelity. Poor fidelity is a threat to programme sustainability in that it renders any sustained operations potentially ineffective. Thirdly, although the manual can generally be assuring, it can also be disempowering to those who use it as a quality-checking tool. Therefore, a balance needs to be struck between promoting fidelity and fostering acceptability through perceptions of simplicity, and the practicalities of its use at implementation.

The findings regarding the role of school leadership were interesting in that on the one hand; a disengaged leadership failed to intervene in disciplining the children as was required by the programmes. On the other, a highly engaged leadership also ignored the rules of the programme regarding the nature of their involvement in the implementation, and they tried to modify it. Thus, the effect of these two kinds of polarised leadership was the same.

Therefore, although a core principle of the ASSIST is that it should not be delivered by teachers, these results suggests that enthusiastic school leaders who are likely to be more engaged with the programme will expect more involvement regardless of the programme's prescriptions, while disengaged leaders will be uninvolved even where they are required to be. This suggests that there is a need to rebalance and re-clarify the role of school leadership in the programme.

Finally, the findings on emerging risks highlight the unforeseen difficulties of implementing programmes in the school-age population. The "touching" incident in section 7.5.1b had several implications for implementation. First, it diverted the subject of the post-implementation de-brief away from general processes to the specific incident. Second, it triggered managerial interventions to protect the trainers and the organisation, rather than to improve the process. These managerial interventions added time pressures (e.g. to train) on already over-stretched trainers. Finally, the removal of the trainer involved in the incident added pressure to the remaining trainers to complete the programme without her. The incident also highlighted the magnitude of the risks involved in implementing school-based programmes, and it forced the trainers to evaluate their own future in the programme. The imposition of the extra training requirements required further resources in an already resource-stretched environment.

These findings need to be viewed in light of the strengths and weaknesses of the study. A key strength of this study was that it was designed to address the limitation, of the interview study, by offering a real-time opportunity to verify some of the findings of study II. Thus, the study was successful in

verifying the previous finding, rejecting some of them, but also identifying new factors that could not be identified through interviews alone.

However, its key limitation is related to its design as a real-time observational study. The implications were that some follow up sessions could not be observed because they were happening at the same time as other observable sessions in a different school (Table 8). The ongoing challenges around the funding of the programme also delayed the study by three months. This means that the study was limited to observing the schools, which were available for training in that period, rather than ones that had been selected by some sort of study criteria. Further, the delay of the programme start date limited the number of schools that could be observed, and it meant that where an implementation session were cancelled, there was no opportunity to reschedule observations.

7.7 Conclusion

The fact that the ASSIST is sustained and delivered by a large organisation, but it has a very low status within it, continues to reflect the idea that the social processes of championing, strategising and marketing the programme employed by a collective of fairly junior implementers of the programme are crucial to the sustainability of this programme.

Therefore, the observational study sustains the conclusion of both the review of reviews and the interview study, that many of the factors of sustainability are embedded in the social environment surrounding the process of implementing the programme. These include the relationships between the people implementing it, the participants, the personal and reflective views of those individuals, their shared values, their agency, their relationship with decision makers, and with the programme itself.

The observational study validated some of the key findings of Study I and Study II, particularly the general barriers and facilitators of implementation. These included the availability of trainers, type of school, type of children, resources etc. However, the study also questioned some of the findings of

the interview study such as the role of the manual, and the type of school leadership. Therefore, it added deeper insight through identifying findings, which were not apparent in both Study I and Study II.

Reflective note 6

By now, I have stopped being surprised by the unexpected as change has become a normal part of the project. Still, I am tired of changing stuff. I don't want any more surprises. So I look forward to the next questionnaire study. The programme coordinator of OWL shows me where the questionnaires are. They are all neatly packed and well labelled and already anonymised. I am impressed. I tell myself that this study has no capacity for throwing up any more surprises. I am in charge of it.

So I start the process of coding the questionnaires, knowing exactly what I am going to do with them. But did I really think this study will be unsurprising? Haven't I learned from the others? Soon I work out that although this is a simple questionnaire with uncomplicated responses, they are all manual and there are nearly 1344 responses in wave 1, and 1540 in wave 2! So for all the illusion of a neat study that came with this supposed "ready-made data" that I naively thought I could just play with, what I wasn't prepared for was, how boring, mundane, lonely, exhausting, mind-numbing and repetitively endless the process of developing this study was going to be. I had thought that I would be done with the coding within a matter of days, but I found that I could not work on it for any more than 1.5 to 2 hours at a time before getting so bored, that I would regularly wander off to social media land. There at least, was always something to make me laugh, or to make me feel like crying at the horrors of the world, or to make me angry about the state of it….

But before all this, I had always looked down on social media for all it's excesses and fakeness. Now I found myself sucked into it. So I was inwardly embarrased to be one of those people that spend so much time there and I would be defensive each time my husband or even daughter suggested I spend too much time on face book. But I told myself they had no idea what these questionanires were and they wouldn't understad if I tried to explain. Social media wasn't as boring as these lifeless questionnaires sitting in front of me. So slowly, I find myself spending some of the time I should be working on this project posting things on Facebook, engaging in furious debates with strangers about Brexit. Yes! Brexit! But sometimes I would comment on stories of unknown individuas from far-flung lands, lands as far as Australia, India, Africa, even individuals in places I had never heard of.. like as type, the christian missionary killed on Sentinel Islands! And of course, I couldn't escape Donald Trump!…who could?

So in the social media world, I find plenty of bored frustrated, angry, happy, sad, or exhausted people like me who want to throw their opinions at the world like aimless darts, not because they think anything will change by it, but probably because it is the least they can do. Many wonder about where the Brexit project is heading. All are sure that neither May nor Corbyn know what Brexit means..Johnson, Gove, Rees-Morg didn't fare any better! And Cameron? Oh! He has just become the Lord Voldermort of Brexit. "he who must not be named on any Brexit debate!" But its been nearly two years since it all started, we still don't know what Brexit is ..but "we citizens of the internet" are sure that the just approved deal on the negotiating table is not the one anyone except Mrs May and the EU want. The irony is that those who want to leave, appear to cry the loudest about the manner of leaving and those who wanted to remain want to remain even more! so what is it? How did we get here?

So the questions are endless, but I come off these types of debates feeling cleverer more prepared and more organised than the entire world leadership. Putin and Mugabe included! Perhaps Merkel and Trudeau are the only ones who come out unscathed..So when I am in this "clever mode", the questionnaires are nothing I can't tackle!

But each time I debate on social media I also get filled with so much guilt about how much time I just spent arguing with strangers instead of writing my project. Sometimes that guilt forces me to punish myself to make that time up. On such days I can sit at my desk for say six hours, only half of which are on this work, and the other half is just me pretending to know better than all these 'hapless' politicians who are ruining the world for our children..

Children… did I say, children? Where are mine by the way? Oops! I check the time, its 3:09pm! I need to pick them up! So I quickly get off the pink tracksuits in which I live, and I give myself a few minutes on the mirror. I don't want to turn up as "that careless" mom on the school gate, and embarrass my children? The moms at my children's school are always immaculate and professionally dressed so I need to keep up with them. But this too is a dream because at least once a week, I show up at the reception where the children whose parents are late pickers assemble. I open the reception door dreading the look on my daughter's unimpressed little face. Then as if on cue Milie asks that very farmiliar question … What took you so long mommy? And Callista would go; YET AGAIN! Ermm sshhh.. I would whisper to them as I give them what I hope is a "silencer kiss", while hoping that no one else around us has heard their question.. But they have.. So on our way out I appeal to them to bear with me. I say..Millie, mommy is very busy finishing her PhD. Do you know what a PhD is? Just give me a few more months and I will be right on time each and every day… but I could tell that they didn't believe a word of what I said nor were they interested in the regular lecture about what a researcher does...., because the next question would be about something completely unrelated.. like.. its swimming lessons today mommy, did you bring the costumes with you?

Swimming! of course it is swimming lessons day.. ! But I would almost always have forgotten the kit. So we would drive back home, try to pack the swimming bag quickly but we would always forget one thing. Sometimes the change of clothes, sometimes the hairbrush and at other times the towel or the swimming cap. We were always lucky to make Millies 4:00 pm start on any consecutive weeks.. so this term we gave up the swimming. We couldn't keep up with it. Another lesson in nothingness?..

Lesson 6

Nothing that is wasted is ever truly wasted… The time I supposedly wasted on social media had its way of racking me up with so much guilt about neglecting both my children and my project. But that guilt had its own way of jostling me into a furious work mode. Much of my thoughts in this thesis came out of this process. It was a process of fighting with myself, of questioning my character, my choices, and my willpower to stop doing what I knew was wasting so much of my time. As I type, it's a battle I haven't won yet..

Chapter 8   Study IV: Is the ASSIST actually sustained? Peer supporters and their implementation environment

8.1 Introduction

This questionnaire study (Study) IV is the final of the series of linked studies, which individually and collectively tackle the second PhD question:

- With reference to a school-based public health programme, how is sustainability achieved over time?

Although the observational study offered some insight into the peer relations and the likely environment in which the children implemented the programme, the insight was limited to the observable aspects during training. Therefore, this study, which involved analysing the questionnaires that the children filled in after the training was also an attempt to verify and assess some of the issues that emerged during the observational study, for example, the quality of the peer relationships and their viability for implementing and sustaining the programme.

Therefore, while the interview and the observation study focus on the professionals, their organisations, and the processes that they followed during implementation, this study was designed to extend understanding about the children. Thus, I tried to understand how the children implemented the ASSIST in their peer circles, their thoughts on the programme, the character of the social-cultural environment in which they implemented the programme, and whether or how these influenced programme sustainability. Therefore, the questionnaire study also informs PhD question 1 regarding the nature and character of the implementation process, by offering further insight into how the children affected the implementation processes of the peer-to-peer messages.

This chapter discusses the findings of the questionnaire study with ongoing reference to the findings of the review of reviews, the interview study and the observational study (triangulation). Finally, I will attempt to provide a coherent

explanation of how I combined the findings to improve my understanding of sustainability.

8.2 Aims and Objectives

The key aim of the questionnaire study was to gain insight into the environment in which the "peer-supporter" children implemented the intervention. The study was also an opportunity to assess the children as individual programme participants, and whether and how individual-level factors had any influence on how they implemented the intervention and whether that was relevant to programme sustainability.

However, the questionnaires were part of the routine programme data collected from the children. Therefore, I was limited to what was in them. For example, their format impinged on what could be gained from them to meet the aims and objectives of the study. These objectives include: to understand the social-cultural environment, in which the children implemented the intervention, to assess the relevance of that environment to the sustainability of the programme, and to understand the views and perspectives that the children had on the programme.

8.3 Study-specific research questions

The Study-specific research questions were:

- What is the character of the social-cultural or communal environment within which peer supporters deliver the programme?

- How relevant are the social-cultural factors to the sustainability of the ASSIST programme?

In practice, this study involved looking for answers to a variety of subsidiary questions such as: What do the peer supporters think about the programme after their initial 2-day training? Could these views influence whether or not they implemented the intervention? Do their views about the intervention change after they start the delivery? How well equipped for the task do they

feel? Did they do the task? If not, why not? If yes, how many conversations did they have by the end of the follow-up 4? How easy/difficult did they find the conversations? What challenges did they face? What are the implications of these views to overall programme implementation and sustainability?

8.4 Methodology

This study intended to analyse the questionnaire responses of 163 children who took part in the ASSIST programme between 2015 and 2017 at LA (A). The rationale for analysing these questionnaires was that they could shed more light into the environment in which the children implemented the intervention than the observational or the interview studies.

I also hoped that I could find some more detailed information on whether certain types of children were more likely to sustain the implementation of the intervention than others. However, since the study was not a primary survey, it was not possible to ask additional questions, which would have been more closely aligned to some of what I wanted to get from it. For example, the questionnaires did not collect the children's demographic data, and most were open-ended. Therefore, any quantitative analysis was limited to descriptive statistics. Therefore, the findings could not be linked to the demographics of the children, beyond their schools. Consequently, although the data allowed some quantitative types of evaluation, e.g., the number of children versus the number of conversations implemented, or the number of children who raised a particular concern the data was not amenable to inferential statistics.

Although inferential statistics were not possibe, the descriptive statistics add value to the findings through shedding light on the relative importance of certain issues, e.g., how many conversations most of the children reported, or how many raised particular concerns. Therefore, the qualitative methodology with descriptive statistics is the main mode of this study. The value of the qualitative approach to this project was explained in chapter 3, so it will not be discussed any further here.

8.4.1 Methods

Data collection: The questionnaires

The data for this study was extracted from the feedback questionnaires that the children fill in immediately after they receive their 2-day training (Wave 1) and 8 – 10 weeks later just after their final follow-up session (Wave 2). The questionnaires are from five schools from the implementation cycles of 2015/16 and 2016/17 at LA (A). In the Wave 1 questionnaire, the newly trained peer supporters are asked to rate the quality of the training they have just received and to give their views on it including any concerns that they may have about their upcoming role as peer supporters. At the same time, they are also asked to formally sign up to their new role as a peer supporter ready to implement the intervention. Appendix 16 is a copy of the Wave 1 questionnaire.

In the wave 2 questionnaire, the children are asked to rate the follow-up sessions, including to give information about, how many conversations they have had with their peers, how easy or hard they found the task, and whether they would recommend the programme to their friends and why. Appendix 17 is a copy of the Wave 2 questionnaire.

However, some questions were excluded from the analysis because they were not relevant to the project, for example, the questions which asked the children to rate certain sessions on a scale.

8.4.2 Results

The response rates were high. 162 out of 163 children responded to Wave 1 questionnaire, and 154 of these also responded to wave 2. This represents a 99% response rate at wave 1 and 94% at wave 2. However, in the 2016/17 cycle, a trainer initially administered the wrong questionnaire to school J. Therefore, the correct questionnaire was re-administered a week later, but only eight children completed it because the other 12 had attended a different school activity. The remaining 12 children filled in their questionnaires at follow up session two, which was four weeks after they should have done so.

This had two implications for the project. Firstly, the late filling in of the questionnaires could affect the children's recollection of the training, so their responses to the questions about the training they had just received, such as questions 1, 2, 4, 5 6 7 in Appendix 16 could be less reliable. Second, the implication was that it could affect the children's perception of their task because they now had to respond to the questions after they had started implementing the intervention, rather than before.

Therefore, the responses from this school were checked to see if they were notably different from the other schools. The check revealed that more than half (12 of the 20) of the children in this school did not respond to the question that asked them whether they had any concerns about talking to their friends about smoking. In addition, 8 of the 20 children did not respond to the question about what they would change about the course (Question 5), compared to only 1 and 2 children from two other similar sized school groups. Overall, this school also had the highest number of uncompleted questions at 28. Although these numbers are too small for any statistically significant conclusions, the fact that fewer children responded to the questions which were sensitive to the timing of the questionnaire, suggested that the questionnaire administration may have affected the responses of the children. However, the responses to the questions that were answered were in keeping with those from the rest of the schools, and no new themes were identified in this school. Therefore, this exercise also confirmed that the project achieved data saturation and that adding or removing these questionnaires to the analysis pool would not change the overall results. Therefore, they were included in the analysis.

8.4.3 Data management and analysis

As noted, the data available in this study was limited by the fact that the questionnaire was from a secondary source, so it was designed for purposes other than this project. Therefore, one of the limitations of this study was the quality of the questionnaires. For example, most of the questions that were asked were independent questions that did not link to others. This meant that there was limited scope for gaining further insight through comparing the

responses between different questions, or of pooling the data from all the questions and treating them as one body of data. Therefore, much of the analysis was done per question, allowing for comparison where it was possible.

In terms of process, questionnaires were imported from MS Word to NVIVO 11, one school batch at a time, beginning with Wave 1. Coding was done by school category, working systematically from question 1 to question 7. Each response was coded to its corresponding parent node (the question) and within it to their appropriate child node (the emerging themes). This process was applied iteratively, and themes were coded to new child nodes as they emerged. The contents of each node were inspected for accuracy or duplication. The final codes were inspected by the supervisory team.

The analysis was underpinned by the same framework method developed by Ritchie and Spencer (2002), described in the interview study section 6.5.5 and also used in Study III. An analysis chart was created and it charted the process from the raw labels in NVIVO to the final themes and concepts, and the process was in 4 stages. Table 9 is a sample extract from the matrix, illustrating the four stages of how data from question 3 was analysed and summarised. The rest of the questions in the questionnaire were analysed in a similar fashion.

Table 9 : An extract from the data chart illustrating the analysis process

Data source	Latent themes	Abstracted themes	General analytical narrative	Analytical narrative RE: Sustainability
	Stage 1	Stage 2	Stage 3	Stage 4
Q. 3 The main concern about talking to my peers about smoking is	1. Peer Aggression 2. Peers not listening 3. Peer dismissal of conversation 4. Peers perception about it 5. My confidence 6. Failing to persuade friends with the message 7. No concern	1. Peer Reaction 2. Peer perception of the project 3. Peer engagement with intervention 4. The risks involved 5. The social consequences of involvement 6. Ability to execute the plan 7. Skills 8. Ability to make a positive impact on friends. 9. Confidence (positive or negative)	The biggest concern the children had was related to the reaction of their friends. They anticipated one of three responses **a)** Violence: here children worried that if they initiated peer education messages, their peers would be so annoyed that they would kick, punch, or slap them **b):** that their peers would dismiss the conversation and taunt, laugh or socially exclude them including calling them names**, c)** they would dismiss them and do nothing about the messages in which case the children worried about the consequences of the friends who did not act and ended up smoking. They were also concerned about exactly what the peers would think of the idea, whether they would be bored with it, or think it was not true, or just generally not be interested, especially if they were non-smokers. They also worried about the wider social consequences of raising such a conversation, e.g. in one child's words, they worried about becoming "that guy"? Finally, they worried about their own ability to pull the whole thing off, including whether they would remember what to say.	The identified risk and personal consequences were potentially very costly to individual children. If some of the concerns were to manifest as the children anticipated, (e.g. violence, taunting, falling out with friends), then the chances are that these children were unlikely to repeat the conversations, effectively stopping the intervention. In addition, where the children were worried enough about these risks they were likely to avoid starting the conversation altogether and again effectively stopping the intervention. The concern about their peers dismissing or disbelieving the conversation and doing nothing about it suggest that going through the course gave these children new knowledge and that this knowledge came with the burden of worrying whether the friends who ignored the messages would be affected by the negative consequences of smoking such as cancer and death. This could have two implications; it could motivate the children to be persuasive and persistent in their messages to achieve the programme outcome. On the other hand, the burden of worry could discourage conversation attempts so that they do not have to know who would accept or reject the messages. The worry about what the peers thought of the idea highlights issues around both the social acceptability of public health programmes, and of the individual child's credibility as a vehicle for disseminating the programme. Either way, if children thought their peers would find the conversation boring, or that their peers would think less of them for starting it, then they would be less motivated to bring the subject up.

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Column 1 in table 9 represents the question for reference. An stage, 1 of the analysis process, I listed the latent themes identified from the raw data of that question. In stage 2 I abstracted the maximum number of themes represented from the latent themes. Thus, extra themes like the risk inherent in being involved, or the social consequences of it were identified. Stage 3 represents the initial general appraisal of the abstracted themes. The final stage 4, includes a summative interpretation of the themes as they relate to sustainability.

The same process was applied to Wave 2 data, but as a separate project. The findings were reviewed with reference to a) the study-specific research questions, b) PhD research questions, 1 and 2, c) the findings and conclusions of Studies I, II, and III (triangulation). The final themes were inspected by the supervisory team and they were interpreted in the context of the wider literature.

8.5 Findings

8.5.1 Wave 1

There were eight questions in the wave 1 questionnaire. The first question asked the children about which session they enjoyed the most. Figure 11 illustrates the proportion of children who reported liking a particular session,.

Figure 12: Proportion of children and the sessions they enjoyed the most
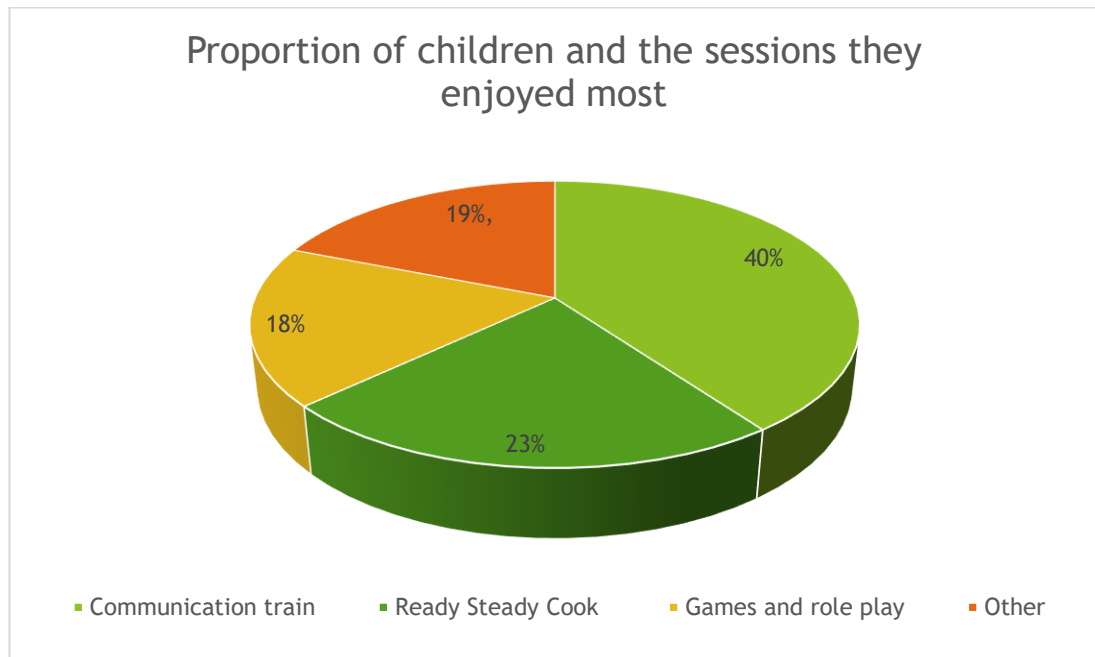
The "communication train" was the most popular session identified by (40%) of the children, and this was followed by a knowledge-based session called Ready Steady Cook (23%). 18% enjoyed games and role-play and the rest preferred a variety of other sessions including other dimensions of the training such as group working, and food.

Question 2 was an open-ended reflective question, which asked the children to indicate some things that they had learnt about themselves on the course. There was no definitive or distinct pattern of what the children felt they gained from the session. This could be because the questions were open-ended and so the responses were unrestricted. However, the responses suggested that following the training, some children became aware of their personal

strengths, e.g. their persuasion skills or how they could improve their interaction with their friends.

The top three responses were that they gained confidence, new communication skills, or new knowledge. A number of them also described a new awareness of their own character and said things like; "I learned that I should not be shy to put my opinion forward." Table 10 records the top three responses. It also records some unexpected responses regarding smoking and of the children who reported that they learned of their own weaknesses.

Table 10: What the children said they learned about themselves from the training

What they had learnt about themselves	Proportion of children (%)
That they gained confidence	20
That they improved their communication skills	18
That they acquired new knowledge	16
Other	22
Other random but notable responses	Proportion (%)
That they will never smoke	18
That they had a weakness	6

Some of the children, who reported on their newly acquired knowledge (16%), demonstrated it by quoting the smoking-related facts that they had just learnt. However, 18% of the children randomly noted on their forms that they would never smoke. This could suggest that the children acquired a sense of self-agency because there was no question that asked them about their smoking intentions. 6% of the children reported that they learned of their own personal weaknesses, such as lack of confidence, or poor skills in interacting with their friends. Only three children said that they had not learnt anything at all about themselves.

Question 3 asked children to indicate the main concern that they had about talking to their friends about smoking. On aggregate, the biggest concern for 65% of the children was about how their friends would react to peer education messages.

Table 11 indicates some of the more specific concerns

Table 11 ; The concerns that the children had about implementing anti-smoking conversations

Concern	Proportion of children (%)
That their friends would be dismissive	40
That their friends would react with physical aggression	25
The fate of the friends who dismissed the message	10
A lack of confidence in executing the plan	18
No concern	5
Other	2

40% of the children believed that their friends would be dismissive of their efforts. These children said things like: they will laugh, ignore, "take the mickey" they will not believe me, or they will not take me seriously. 25% of the children were concerned that starting anti-smoking conversations with their peers would result in physical aggression, and falling out with friends. These children said things like; they will punch, slap, gang up, or swear at me, or that they will fall out with me. These children were also worried that they would be labelled with various names such as "that guy." Other children worried that their friends may be offended with the conversation or that they may just find the conversation irrelevant. However, for some of them, the concern about their friends dismissing the conversation was not just about how that would make them feel. At least 10 % of them also worried about the fate of the friends who rejected the message. Thus they worried whether those friends could go on to smoke and then end up being sick or "dying" from the consequences of smoking. This suggests a certain level of processing the newly acquired knowledge about the potential consequences of the intervention failing. Given the findings of the interview and the observational studies regarding the difficulties some children had with understanding the concept of prevention, this suggests that some children were able to appreciate the value of a preventative approach to health.

10% of the children indicated that they had no confidence in their own ability to execute the plan. These children raised concerns about forgetting what to say, saying the wrong things, or making a mistake in the delivery and then panicking afterwards. Only 5% of the children said they had no concern.

In Question 4, children were asked about what they thought was their main achievement on the course. 51% of them said their newly acquired knowledge as their biggest achievement, and they were impressed with themselves for it. Reported achievements included communicating with people that they would normally not communicate with, and making new friends and team working. 14% of the children listed improved confidence as their main achievement, while others valued a variety of simpler personal achievements such as listening or giving good answers.

On being asked what (if anything) they would change about the course, (Question 5), the responses could be categorised into three theme areas a) activity modification b) improving the experience of being on the course, and c) having a choice in how they learnt. Their suggested improvements included making activities longer, making the course residential and increasing the fun and games, e.g. by reducing the amount of sitting down, less listening and writing, and more action. On the overall experience, the children suggested enhancements such as menu-based food choices and they appreciated the extra perks such as meeting footballers or going to the playground at lunch. However, other children wanted to have a say in how their learning took place, through having a choice in what working groups they were allocated to. 11% said they were so satisfied that they would not change anything.

In question 6, the children were asked to identify what other help they thought they needed in relation to being a peer supporter. More than half of them (63%) doubted their own ability to start the conversations or to communicate the messages persuasively. These children felt that they needed more help with their confidence and some of them expected the task to be hard going so that they would need support with personal skills, like

resilience, patience, and listening. A few children (6), indicated that as non-smokers, they were not motivated or interested enough to talk about the subject. Only 6% of the children indicated that they did not need any support.

In question 7 children were asked to say how they had contributed to the course. The responses to this question include things like; giving good answers, or raising my hand, or being helpful, or listening. Thus, like question 4, they were varied, and they did not add much insight to the objectives of this study.

In question 8, the children were asked to complete the following statement

After this training, I have more confidence to be able to …

Almost half of the children (44%) completed this statement positively with a range of responses such as talking to people about smoking, suggesting that they were more confident to be able to talk to people on the subject of smoking. However, the question was a leading statement that sought a confirmatory response to "acquisition of confidence." Given that in question 4 only 14% indicated that their biggest achievement was improved confidence and that in question 6, 63% felt they needed help with their confidence and communication skills, the responses to this question were unlikely to be indicative of actual acquisition of new or more confidence.

8.5.2 Wave 2

There were eight main questions and 2 sub-questions in wave 2 questionnaire (see Appendix 17). Question 1 asked them to circle how many anti-smoking conversations they had had with their peers. The choices were 0, (1-5), (6-10), or more than 10. Table 12 presents the findings to this question.

Table 12 : The number of conversations that the children had

No of conversations	No of children reporting	%
0	16	10.3
1-5	90	58.4
6-10	36	23.3
More than 10	12	8

The majority of the children (58%) indicated that they had had between 1 – 5 conversations, with a further 10% reporting no conversations at all during the implementation period. However, during the observation study (Study III), when the children were asked about how many conversations they had had, less than 5 out of an average of about 20 -25 children per session would report having had a conversation. In addition, many of the conversations that they reported were with family members rather than with friends and most of these children would recount the same conversations at each follow-up session. Further, less than 4 out of 20 children per session brought back the diaries in which they were supposed to fill in the number of conversations that they had had. Of those who brought diaries with them, only 1 or 2 were filled in with details of the conversations that they had had. However, diary completion has consistently proved to be so difficult to achieve, that from 2017, DI Ltd issued new guidance that, the diary is no longer an essential part of the intervention. Therefore, these results corroborate the findings of the observational study that the children's rate of the intervention was low.

However, the results are in sharp contrast, to the findings of the process evaluation of the ASSIST trial, in which Campbell et al. (2008) report that 84% of the children handed in their diary. However, they also note that there is a possibility that the children over-reported the number of conversations that they had had. For example, in their process evaluation, less than a quarter of the year group (the target children) reported that a peer supporter had spoken to them about smoking "in the past few weeks". In addition, they also find that a disproportionate number of the conversations (45%) were

with other peer supporters compared with other students at 20%. However Campbell et al. (2008) also note that this finding needs to be viewed with caution because the phrase "past few weeks" was open to interpretation and that the general population of the children did not know who the peer supporters were. Therefore, they may not have responded accurately to the question as to whether a peer supporter had spoken to them about smoking "in the past few weeks".

However, from the researcher's report, the children of the trial talked extensively about the nature of the conversations that they had had, how it went, the facts and the strategies they used to overcome difficult conversations and what tactics they employed to persuade their friends to take their messages seriously. This is unlike the repetitive accounts of the same conversations that were observed in this PhD project.

Campbell and colleagues also reported that the children in the trial reported that conversations took place at the beginning of the follow-up period and they waned over time. This according to the researchers was because the children's implementation strategy was to introduce the subject in response to their friends queries about where they had been in the past two days. However, given the findings of the observational and the questionnaire study, it can be argued that the implementation was opportunistic rather than purposefully strategic. This could be indicative of the lack confidence to start conversations that children reported in this questionnaire study, or it could be due to the children's perceptions of a harsh implementation environment that has been reported in Studies II III and III of this PhD project.

Therefore, given the low number of conversations that the children reported in the observational study, the questionnaires, the diary, and the reported possible over-reporting in the trial, it is not unreasonable to estimate that the number of conversations that the number of conversations that the majority of the children (68%) had was closer to 1 than they were to 5.

Both the observational and the interview study found that the type of school was a relevant factor in how the programme was implemented. A number of

interesting findings related to schools were found in this questionnaire study. For example, more than half of the children from an all-girls school indicated concern that their friends would react violently to anti-smoking conversations. At wave 2, almost a third of the children from this school also reported that they had had no conversations at all. Although the numbers are too small for any statistical inferencing, so that the type of school may not be influential on the number conversations, it is still possible that the children's negative perception of their environment stopped them from implementing the intervention. It is also possible that their single-sex environment could have affected both their perception of the environment and their experience of implementation. In contrast, only 1 of the 12 boys from an all-boys school reported that they anticipated a physically aggressive response for starting conversations.

On the other hand, the three schools which had the highest proportions (40%, 32%, and 29%) of their children reporting that they had had more than 6 conversations were also the same schools which trainers in the interview study reported as being highly engaged, more resourced and from wealthier neighbourhoods of the local authority. Only three children across these three schools reported that they were concerned that their friends might react aggressively to an anti-smoking conversation.

In comparison, only two children across the two schools which trainers had reported as being less organised, from the deprived neighbourhoods, and with the most difficult children, reported that they had more than six conversations. Further, nearly half of the group of children from one of these two schools reported that they found the conversations quite hard, and this was the highest proportion reported in a single school.

Therefore the questionnaire study found that the more engaged schools reported more conversations and their children also reported less concern with violence and vice versa. Thus although the numbers are small in this study, this conclusion is in keeping with the finding of both the interview and the observational studies, that type of school was relevant to the children's

perception of their environment and that their perceptions potentially had implication for the number of conversations that the children went on to implement.

More than half (52%) of the children who found the conversations easy, attributed the ease of conversation to the fact they spoke to friends and family and to the fact that that they were listened to. However, 32% attributed it to their own confidence. Twelve of the eighteen who found the conversations quite hard attributed that difficulty to the reaction of their friends and to their own lack of confidence in bringing the conversation up. Overall, many of the reported reaction of the peers mirrored some of the concerns that the children had raised in the Wave 1 (question 3). Thus, some of the peers did not listen, some got bored, others did not believe the facts, they got aggravated, did not agree with them, or their feelings were hurt by the conversations.

All of the children except one said they would recommend this programme to their friends. The two key reasons given for this were for knowledge (50%), and that it was a fun way to learn (31%). However, only 12% of the children said that they would recommend the programme because of its stated goal, i.e. to prevent their friends from taking up smoking. This could be reflective of the findings in the interview and the observational studies that despite the repeated message that the programme was about preventing the uptake of smoking, some children remained unconvinced with the concept of prevention, or they did not understand it.

Figure 13 is a snapshot of a child's response to one of the questions in the questionnaires:

Figure 13: A snapshot of a child's response to a question

This response could suggest that the child felt that they are executing the trainer's agenda as expressed in their use of "(you)." In addition, the reference to "cutting" cigarettes highlights the difficulty that was identified in Study III, regarding understanding that the programme was about "preventing" rather than "stopping" smoking.

At least 4% of the children said they would recommend the programme to their friends because it gives confidence and a few others recommended it for the great food and because you get time off school.

8.6 Discussion

This questionnaire study has extended insight into the implementation and sustainability of the ASSIST through highlighting the context in which the children implement the programme and their views on it. It has also validated some of the findings around the role of the social environment on the process of implementation that was found in Study I. In addition, it has highlighted the barriers, and the facilitators of implementation and sustainability of the ASSIST programme, which interviewees identified in study II, and which were also observed in study (III).

These include the children's perception of their social environment, the possible impact of those perceptions on their role in the programme, the extent of their engagement with the programme at the peer implementation stage, and the role of the type of school, the social environment, and the type

of children. This section discusses the implications of these findings on the programme.

The majority of the children (65%) were concerned with the reaction of their attempt to initiate peer-to-peer conversation. They described a peer environment, which was characterised by a power struggle, social sanctions, shifting group membership, social aggression, physical violence, social exclusion, and alienation. These descriptions are at odds with the programme's working theory, the DoI, which relies on friendly amicable social networks. However, these results do not necessarily challenge the validity of the ASSIST trial's results on programmes effectiveness. What they do though, is highlight an apparent dissonance between the children's perception of their environment (aggressive, antisocial, etc.), and the environment that is required to be at play (i.e. amicable, friendly) for the programme to work. The children's perceptions of an aggressive environment is corroborated by the theme of violence and social tension which was identified in the role-play scenes that the children designed during the observational study, but also in how they related to each other during unstructured activities, in the conversations between themselves and in how they behaved during training (section 7.5.1b).

Moreover, the literature highlights some scepticism about the extent to which the DoI theory applies to health behaviours like smoking. The argument is that while the diffusion mechanism is clear when there is an innovation to be adopted, the reverse is less convincing, in that unlike *"taking up"* smoking, or *"adopting"* condom use, *"not taking up smoking,"* is not really an innovation (Turner and Shepherd 1999). Turner and colleague argue that although the DoI theory is accepted as one of the theoretical rationales for peer education programmes, peer education still seems to be a method in search of a theory, rather than the application of theory to practice. They further point out that most of the theories used to justify peer education programmes have something to offer towards an explanation of why peer education might be

effective, but that they are also limited in scope, with little empirical evidence to support most of their claims in practice.

Therefore, if the dissonance between the programme's theoretical assumption and the practical reality of the children's environment is accepted, then, we do not have enough clarity on the mechanisms that would lead to the effectiveness of the ASSIST in the practical world. Further, even if the peer environment is as is described in the DoI, the children's anticipation of a socially negative environment suggests that such an environment is prone to disruption each time the peers try to introduce the intervention.

In addition, if the children's descriptions of the environment are correct, then the programme would not be expected to work as is theoretically envisaged, but if they are incorrect, the programme should work. However, such a binary characterisation of the environment is reductionist, given the known variations in social contexts. Thus, the question isn't whether the children's characterisations of their environment are correct or not but rather, when are they correct, and when are they incorrect? What forces make the environment lean towards the DoI and what makes it lean towards the children's descriptions? How do we know when these forces are present or absent in an environment?

These questions suggest an environment, so complex that the social network mechanisms as described in the DOI, could be; 1) theoretically and practically valid, or 2) theoretically valid but practically unstable, or 3) theoretically wrong and practically invalid, or 4) any one of these 3 scenarios all of the time, or any one of them some of the time. It is also possible that certain environments (such as good supportive schools) trigger the stability of the mechanisms while others do not, and that some children can stabilise unstable environments better than others can, but we do not know the stabilisers.

However, whether correct or not, the children's descriptions of their environment do not necessarily mean that all or any of their concerns materialise in practice. Indeed, Wave 2, findings suggest that many of the

children's pre-implementation concerns did not materialise in the manner that some of them envisaged. Therefore, although the "reaction of peers" was the biggest *pre-implementation* concern, the majority of those who experienced actual negative reactions at implementation cited low impact reactions such as their peers getting bored with the conversations, or they did not listen. There was no report of the higher impact reactions, such as being kicked, punched or ganged up on and no conversation related incidents of violence were reported in the interview or the observational study. In addition, more than half of the children who found the conversations easy attributed the easiness to the positive aspects of the environment such as that their peers listened, or that because the spoke to friends. Therefore, although violence was an emergent issue during the observational study, and that some children anticipated it, the questionnaire study suggests that it was not typical of the children's practical environment.

Moreover, the majority of the children attributed both the ease and the difficulty of conversations to the reaction of their peers and less than a third attributed the success or the failure of conversation to themselves. Thus, the extent to which the interventions were successfully implemented was largely out of the control of the implementing children, and it was dependent on the receiving children. Further, confidence was cited as the reason why some of the children found the conversations hard or easy, and why some children did not implement any interventions at all. It was also identified as one of the key areas that the children felt they needed support. Therefore, in the absence of an obvious legitimacy to implement the intervention, or at least the self-confidence to do so, these children risked being ignored, questioned, socially alienated, or as some of them believed, potentially at the receiving end of violence. This may account for why the majority of the children had very few conversations. Moreover, a key design feature of the ASSIST is that the nominating or "target" children are never told about the purpose of the nomination exercise or who was nominated. This may explain why some of the children were concerned that their credibility and legitimacy would be challenged by their peers.

Although the peer supporter children were supposed to be the most influential of their year group, their concerns about being ignored, ganged up on, laughed at etc. suggest that many did not recognise or believe in their own influence. Further, the actualisation of any influence that they had could be stopped by the reaction of the peers. This suggests that being considered influential by their peers or attending high fidelity training, was not enough to convince the children of their own power of influence. It also highlights shifting power relations between the children and their peers.

In Study III, interviewees identified a range of barriers of implementation like staffing, funding, leadership, programme design, communication, children's behaviour etc. However, no concerns about the actual delivery of the programme by the children were raised. This could be because accessing the environments in which the children implemented the programme is inherently not possible, and the methods that were in place to support such an understanding (e.g. diary returns) have been ineffective. Consequently, it can be argued that the fact that the peer-to-peer design of the intervention is inaccessible for evaluation may mitigate against programme stoppage on the grounds of low rates of implementation. In that sense, the design of this programme could also be a factor in its sustainability story.

8.7 Conclusion

This questionnaire study was an attempt to understand the nature of the environment within which peer supporter children implement the intervention and the implications of that environment to the implementation and the sustainability of the programme. It identified discrepancies between the assumptions of the program theory (the DoI), and what the children think of their environment. Further discrepancies were identified between what the children thought of their environment and what that environment probably was. The children's perception of the quality of the environment within which they implemented the conversations was relevant as to whether they implemented or abandoned the intervention, how they implemented it, their

experience of the implementation, and whether they continued or stopped implementing the intervention. In addition, the study confirmed the role of some of the barriers and facilitators of implementation including the type of school, and type of children.

Therefore Study IV sustains the conclusion of Studies I, II and III that the factors of sustainability are embedded in the social environment surrounding the process of implementing the programme. These include the relationships between the people implementing it, the personal and reflective views of those individuals, their shared values, their agency, their relationship with decision makers, and with the programme itself.

However, these findings need to be understood in light of key study limitations. For this study, the key limitation was that the questionnaires were from a secondary source, thus they were designed for a different purpose. Consequently, it was not possible to pilot, amend, or add new questions to the questionnaire to make the questionnaire more relevant, and the quality and type of questions meant that the analysis was limited to the question, with limited comparisons of responses between the questions. In addition, the questionnaires did not collect any demographics of the children. Therefore, statistical analyses were limited to descriptive statistics. For example, while it was possible to analyse results in school categories, it was not possible to say whether the same child who said they were concerned with physical aggression at Wave 1 went on to have no conversation in wave 2. Further, as would be expected, the children's responses to the questions were very brief and this limited the ability to gain deeper insight into their responses. However, the overall strength of these results lies in the consistency of responses across different schools, children from different year groups, and the corroboration of findings across the four studies strengthen these results. The next chapter (Chapter 9) will now synthesise and discuss the findings across all four studies and their implication to the implementation and sustainability of public health programmes.

Reflective note 7

One of my supervisors has been insisting that I should start using automatic formatting. I insist on doing it manual, so his feedback always mentions it. But, right now auto-formatting is the least of my troubles. Instead of auto-formatting, the auto-questions have switched themselves back on in my brain. This time they are asking: What is the point of all this work? OK I found some barriers and facilitators of implementation? So what? What is new here? And of course the dreaded; if not new, what happens to the PhD then? Will this work ever become original?

As these auto-questions continue to torture me, I think my supervisor has given up on ever being able to get me to switch on my auto-formatting. Comically enough though, his own comments on my work are manual and actually posted to me rather than emailed. Eventually the please auto-format request has become an advisory note than a suggestion (it's up to you Thandie, but I think it will make your life easier if you do it). So he is not giving up on it yet. I kind of half see his point, but not quite. Right now, I don't need any distractions –save for social media of course! But when I sit down I just need to write. I combine the four studies into one document, then voila! I have 40,000 words! The headings that looked ok in the smaller documents are now all over the place, the spacing is off, the size?. The tables are split up. Then suddenly it hits me. This monster will not be managed manually or I will grow old while trying. So I invest some time in doing automated formatting and it pays off massively. The document now looks more interesting, more reassuring, if more like a PhD thesis! I even get cocky enough to think my thesis is better looking than others are! There is a place for style after all?. So now, at the click of a button, the computer fills in the words "Chapter 9". But that's it! the responsibility of filling in this chapter rests with me and it starts to weigh heavily on me. I am producing no more than a paragraph a day. Also, I am getting wound up by people who keep asking if and when I will finish. My family have wisely stopped asking. I try to give my husband random updates but I can tell he stopped listening ages ago. Fine by me! But this writer's block isn't going away. So I decide to stop trying to write chapter 9 and to rewrite the methodology, and the literature reviews instead. It is in the process of doing this that I start to see some patterns in what the literature is saying compared to mine. In some parts it is saying the same things, at other times it is saying the same things differently, but right in there is also an emerging pattern of things that are in my findings that are not coming out the same. Another lesson:

Lesson 7: Yes, Terence, nothing is said that has not been said before, but there is always room for seeing, and so, saying it differently.

Chapter 9   Consolidating the findings

9.1 Introduction

This PhD sought to investigate two questions:

1. *What is the nature and character of the processes that make successfully implemented community-based public health programmes?*
2. *With reference to a school-based public health programme, how is sustainability achieved over time?*

Four separate but linked studies were designed to respond to these questions. The review of reviews (Study I) provided a theoretical skeleton about the nature of the implementation process of community-based public health programmes, and it highlighted the gaps in knowledge about sustainability. These findings were extended through triangulating them with those of subsequent studies II, III, and IV.

This chapter is divided into five parts. The first part (section 9.2) focuses on PhD question 1. Therefore, it consolidates all the findings on the nature and character of the implementation of community-based public health programmes from across the four studies. The second part, (section 9.3) is concerned with PhD question 2. Thus, it consolidates the findings from the interview study, the observational study, and the questionnaire study. From these, I develop mechanisms that explain how community-based public health programmes are sustained. Section 9.4 illustrates the nature of sustainability by building a conceptual framework that demonstrates how sustainability evolves from the process of implementation. Section (9.5), discusses the findings and relates them to the literature. Section 9.6. concludes the chapter.

Therefore, the purpose of this chapter is to demonstrate the central thesis on the nature and character of the implementation of community-based public health programmes, and on how sustainability is achieved. Consequently, it summarises my contribution to new knowledge in this area.

9.2 PhD Research Question 1: The nature and character of the implementation of public health programmes:

9.2.1 The stages of Implementation

In the review of reviews (Study I), I found that there are five specific stages in the successful implementation of community-based programmes namely: *pre-implementation, adoption, implementation, adaptation, and sustainability*. I also proposed that these stages are interconnected and not discrete (Figure 8). The subsequent studies II, III and IV collectively confirmed these stages, but they also illustrated the proposition that I made in Study I, about the interconnected and non-sequential relationship between the stages. For example, although **Stage 4** *(adaptation)* logically follows on from **stage 3,** *(implementation),* in practice, trainers were observed making ongoing modifications or removing certain exercises from the session to suit particular circumstances such as the behaviour of the children (section 7.5.1b). However, as a manualised programme, the ASSIST is designed for high *fidelity*. Therefore, *adaptation* was not observed as a distinct stage of the process, but rather as small modifications of ongoing activity. This could suggest that in community-based public health programmes, *adaptation* is also characterised by a collection of small ongoing modifications rather than 1 one distinct stage.

In the interview study, I explained that the high rates of nationwide adoption of the ASSIST could be attributable to the high quality of its **stage 1** (*pre-implementation)* activities. These activities were traceable to the trial development period and the dissemination activities that the Principal Investigators and their researchers did. I also explained how the *pre-implementation* activities were anchored in the needs of local authorities, and so how *pre-implementation* wasn't one discrete stage just before implementation, but that *pre-implementation* actives continued throughout the process. For example, each time when attempting to encourage programme adoption at the level of line managers, schools, parents etc. Collectively, these actions influenced ongoing *adoptions*, and *sustainability* (see 6.6.2b).

This validated the finding from the review of reviews that successful implementation is more likely to happen if implementers understand the contextual factors of an intervention and if participants take an active role early on in the process.

In the review of reviews, I suggested that successfully achieving aspects of implementation like *participant engagement*, *recruitment, fidelity, quality of delivery* etc. **(Stage 3)**, enhances the chances of the successful implementation of the programme. I also proposed that high quality of implementation could potentially begin to highlight the evidence of the impact (or not) of the intervention and this could persuade others to *adopt* the programme (**Stage 2**) or not. In the interview study, I found that demonstrating the local impact of the intervention was so challenging that the council was forced to commission a "before and after" study to collect some evidence of impact. The difficulties associated with communicating or demonstrating the evidence of local impact can apply to wider public health programmes, and this remains a major threat to the sustainability of the ASSIST at LA (A). Finally, more *adoptions* would result in more *adaptations* **(stage 4)** to fit the variations in context, and this would support overall *sustainability* **(stage 5)**.

In summary, the findings about the stages of implementation across the four studies support the characterisation of the implementation of community-based public health programmes that I illustrated with Figure 8.

9.2.2 The aspects of implementation

In the review of reviews, I found that one of the key aspects that contribute to successful implementation (stage 3) is p*articipant engagement.* In addition, the way participants engage with programmes is moderated by their social-cultural environment and the personal values that participants attach to programmes. Thus, successful implementation is influenced by the socially embedded value judgements that participants make about their social preferences and the requirements of the intervention. For example, the social value attached to tanned skin versus the need to cover up to prevent skin

cancer, or the social undesirability of walking aids versus the risk of falls, or the stigma of taking up what were socially considered to be low-status jobs versus unemployment (see section 4.6.2).

Additionally, the social values were influenced by the social-cultural context in which the programme is situated. This finding was generally corroborated across studies II, III and IV. For example, in both the interview and the observational studies, the school that consistently and successfully engaged its children and its parents did so by highlighting the personal value of the programme to the parents. Their strategy was to promote the programme by presenting it in the context of known parental motivations (e.g. that their child would gain communication skills) as opposed to appealing to the programme's goal of reducing the uptake of smoking in other people's children. The strategy of contextualising the programme to potential stakeholders and participants was also identified across different implementation points, e.g. when engaging line managers, trainers, and schools (see section 6.6.2b)

Similarly, 'rescue trainers' explained their dedication to the programme using reasons which were rooted in their social and personal values (e.g. a personal dislike of cigarettes, or the loss of a loved one to cancer, rather than purely on the objectives of the programme (section 6.6.1). In study III, I observed that trainers recruited children through emphasising known motivators for children. For example, they promoted the 'fun' elements of the programme, such as that it would be a day trip out of school or they would have good food.

In the questionnaire study, the majority of the trained children reported that they would recommend the programme to their friends either for their personal knowledge (50%) and because it was fun (31%). Only 12 per cent of the children recommended the programme for its intended health goals, i.e. to prevent other children from taking up smoking.

At the organisational level of LA (A), the senior leadership explained that their decision to continue to commission the programme was partly because the principles of the ASSIST were compatible with their vision of the city's public health (section 6.6.2d). However, this vision was unwritten, and they described it as one that was always "in their head." As such, it represented a personal vision of the direction towards which the leader intended to stir the city's public health (see section 6.6.2d).

The informal evaluations and the "social value judgements" that participants made on the programme were beyond the control of the implementers and their formal implementation processes. However, the judgements were influential on the degree to which some of the key aspects of implementation such as *adoption, adaptation, participant responsiveness,* could be achieved, as well as on the prospects for sustainability. Therefore, the degree to which these personal values were aligned with the objectives of the intervention may explain why some trainers repeatedly dropped out of the programme at the last minute, while others consistently stepped up to deliver the programme, whatever the challenge.

The misalignment of personal values and priorities may also explain some of the children's response to the concept of prevention. For example, LA (A) had a strategy of targeting schools from the neighbourhoods that had the highest rates of smoking. In the observational study, up to 80% of the children from those schools said they had a close family member who smoked. The results of that study suggested that for these children helping their family members to stop smoking may have been a bigger and more immediate priority than preventing their friends from smoking in future. However, the ASSIST was designed to enable influential children to speak to their peers. Therefore, it can be argued that although the ASSIST training equipped these children with knowledge of smoking as a subject, they were ill-equipped to hold anti-smoking conversations with smoking adults, because in those instances they are not the influential party, and so the power balance would not be in their favour.

This may explain why some of the conversations that the children had with their family members were unsuccessful, even disastrous. For example, the child who was asked to get out of the car for asking their mother to stop smoking, or the one who had a "massive argument" with their grandparent. The latter reported that they were no longer on speaking terms with what they described as their "unreasonable" grandparent. Other children also reported their disappointment with the fact that their relative was still smoking, despite having conversations with them. Therefore, it is possible that these failed or 'unfruitful' family conversations with smoking adults may dampen the children's motivation to speak to their peers regarding not taking up smoking.

In the discussion section of the review of reviews, I noted that in these programmes, the conversion of '*dose delivered*' to '*dose received*' is moderated by who the participants were. In the interview study, the trainers highlighted the difficulties that they had with the behaviour of the children (section 6.6.1d), and in study III, the behaviour of the children was observed to get in the way of the smooth delivery of sessions (section 7.5.1b). Trainers were also observed *adapting* some sessions or doing away with others on the basis that a particular exercise would encourage particular children to be more uncontrollable. Therefore, children received varying degrees of some session depending on what cohort they were. At the same time, children from different school environments behaved and responded differently to the training.

In the questionnaire study, the majority of the children attributed both the failure and the success of their efforts to implement the intervention to the reaction of their peers, and only 32% attributed this to their own level of skill or confidence. These findings also confirm that the CFIR domain of "characteristics of individuals" affects the key aspects of implementation such as *quality of delivery, fidelity* and *adaptation.* Therefore, participants and their communities are not just recipients of interventions; they actively influence aspects of implementation such as *engagement* and *dose received,* through

exercising agency in interacting with the interventions (Moore et al. 2014). Therefore, in community-based public health programmes, the role of participants can be blurred at times in that it could involve both receiving the intervention and influencing the process of implementation. Consequently, evaluation frameworks will need to account for the extent and circumstances in which participants adopt different roles, and there is need to understand the sorts of programmes that will involve such roles.This result also strengthens the finding from the review of reviews that successful implementation of community based public health programmes, is dependent on the successful *engagement* of participant.

The final aspect of implementation, the quality of delivery generally refers to how well implementers have delivered the program. However, given the findings on programme *adaptation*, evaluation of the quality of delivery has to be subject to *participant responsiveness* and *engagement*. In other words, where participants are poorly engaged with the programme, then high *fidelity* of delivery would be of little consequence and where adaptation to local circumstances is not done, then the degree of fidelity could in itself be counterproductive. Therefore, the quality of delivery is influenced by both the degree of fidelity and the degree of adaptation. This also backs up the finding from the review of reviews that the successful implementation of public health programmes is unlikely to be achieved if the social or the personal values of participants, implementers and stakeholders are unaligned with the programme.

Therefore, the key conclusion regarding both the stages and the aspects of the implementation is of community-based public health programme is that they are interconnected, and they influence each other as is illustrated in (Figure 8).

9.2.3 The CFIR

All four studies linked some of the factors of successful implementation to the social context of the intervention, and the review of reviews found that such factors are not adequately reflected in the CFIR. For example, where the

CFIR talks of culture, this refers to the prevailing culture of the implementing organisation (Damschroder et al. 2009), while for community-based public health programmes, this also refers to the "social culture" or tradition within target communities. Where the CFIR talks of structural characteristics, this refers to the social architecture, age, and maturity of an organisation (Damschroder et al. 2009). For these findings, this also refers to the strength of the structures in the participating communities, e.g. access to the intervention (e.g. proximity to bus stage), or the strength of social capital such as family support to persist with an intervention say breastfeeding or diet.

However, the CFIR was developed for health services research and with patient outcomes in mind, rather the specific community based public health. In addition, Damschroeder (2009) already notes that much of the literature in support of some of the constructs that make up, for instance, the domain of *inner setting* came out of (Damanpour 1991) seminal research into organisational innovation. Therefore, the dominance of organisational factors in the CFIR is perhaps to be expected. What the findings suggest though, is a need for a more effective way of evaluating the factors that are embedded in the social environment.

Finally, these findings confirm the gaps in the measurement and evaluation of community-based public health programmes that were identified in the review of reviews and had been identified in the literature (Chaudoir, Dugan, and Barr 2013). Thus, another outcome of this question is the confirmation of the concern that there is a gap around appropriate tools for measuring the implementation process of community based public health programmes.

9.3 Research question 2: how is sustainability achieved over time?

This section consolidates the findings on sustainability from across the four studies. Using those findings, it develops ideas about the mechanisms of how public health programmes are sustained (PhD research question 2). To develop the mechanisms, I used the framework analysis approach (Ritchie

and Spencer 2002) to extract common themes from the factors of sustainability that were identified. These factors were first reported in section 6.6.1 to 6.6.3,9 (Study II) and their validity was confirmed or questioned in the follow-on studies III and IV, and it was reported in sections 7.5.1 to 7.5.3 and more generally across sections 8.5 to 8.6. Table 13 describes the six mechanisms.

Table 13: Description of the mechanisms of sustainability

Mechanism	Proposition
Credibility	Implementation is more likely to be successful and sustained if stakeholders such as decision-makers, the implementers, and participants perceive the programme as credible.
Simplicity	Implementation is more likely to be successful and sustained if stakeholders such as decision-makers, the implementers, and participants perceive the programme as simple
Marketability	Implementation is more likely to be successful and sustained if the programme has multiple qualities that can appeal to multiple stakeholders
contextualisability	Implementation is more likely to be successful and sustained if stakeholders such as decision-makers, implementers, and participants can identify the programme's marketable strengths and fit them to their own goals and contexts.
Justifiability	Implementation is more likely to be successful and sustained if stakeholders such as decision-makers, the implementers, and participants perceive the programme as worthwhile.
Consistency	Implementation is more likely to be successful and sustained if the implementers and stakeholders across the implementation chain either identified some or all of the above five mechanisms (credibility, simplicity, contextualisability, marketability, and justifiability) or the extent to which they made decisions or took actions, which either activated or deactivated them.

Table 14 below illustrates the influential factors that were extracted from single studies and their link to mechanisms of sustainability. Table 15: Extracts from the process of identifying the mechanisms from multiple sources of the data illustrates the process of identifying and linking the

evidence from the multiple studies to the mechanisms of sustainability. Section 9.3.1 discusses how the theories work to support the sustainability of the programme.

Table 14 : Extracts illustrating the process of analysing individual factors and their links to mechanisms of sustainability

Table X: Extracts from the theory building process			
Factor	Description	Link to sustainability	Mechanism
Funding	Funding was a recognised barrier, but within LAA it was also seen as an enabler.	The fact that the programme had to be paid for was seen as providing the impetus to actually deliver it well to get value for money. Once a decision to fund the programme had been made, it fostered a commitment to delivery so it could not be stopped.	Justifiability
Partnership model – joint problem ownership	As an issue, smoking was a multi-department concern, and the key marketing strategy for recruiting trainers was to engage various managers' and achieve their approval for their staff's involvement. This was done by highlighting the manager's stake in lowering uptake of smoking. For example, the youth service was engaged by their direct interest in young people, the neighbourhood regeneration team on their interest in anti-social behaviour, and public health on their interest in health inequalities etc.	The strategy of marketing the ASSIST as a solution to known problems of multiple stakeholders anchored the programme in their multiple contexts, and this increased the number of its local advocates.	Marketability Contextualisability
Commitment	Personal commitment was cited as the reasons that even individuals who had faced the highest risks during delivery (e.g. being investigated for disciplining a child during training) continued to be involved in the programme. Others cited personal relevance of the issue (my father died of cancer) or passion for working with young people.	Despite a number of barriers, some of which were career-threatening, trainers rationalised their continued involvement as a symbol of their commitment and ongoing belief in the programme. These trainers made the core team of individuals who have not left the programme since it started. The maintenance of these core trainers was crucial for initiating new trainees and maintaining consistency in delivery.	Justifiability
The Manual	This programme was delivered to a strict manual and required little input from implementers.	This was seen as attractive in that it did not require too much time, so it increased the acceptability and maintenance to potential trainers.	Simplicity
The evidence behind the programme	The fact that the programme is the only evidence-based programme on the issue was valued.	This is one of the reasons that justifies the ongoing spend on the programme.	Credibility, Justifiability

Table 15: Extracts from the process of identifying the mechanisms from multiple sources of the data

Sample narrative of the evidence	Mechanism	Link to sustainability	Example of Source
The fact that the programme is the only evidence-based programme for preventing uptake of smoking in children in UK schools enhances its credibility. This is valued at LA (A), and it was reported as one of the key reasons for continuing the programme. In contrast, LA (B), valued locally generated interventions, so the ASSIST was seen as less credible, and the programme was discontinued in pursuit of a cheaper and locally developed intervention. Further, the ASSIST was marketed to Local Authorities, trainers, line managers, and schools on the strength and credibility of its evidence base. At the peer implementation level, the children who found it hard to appreciate the concept of prevention found it hard to implement the interventions. Thus majority of the children believed that their friends would disbelieve the facts, dismiss them, or laugh the programme off, i.e. the children thought their peers would not perceive the programme as credible. Dismissive friends were among the key reasons some children found conversations hard, or why they did not attempt to implement the intervention with their peers.	Credibility Justifiability Consistency	The *credibility* of the programme justified decisions to adopt, find, and maintain funding to sustain the programme. It also supported efforts to promote the programme, and it improved the general acceptability of the programme to other stakeholders. The role of credibility and *justifiability* in supporting sustainability was identified across various points in the implementation chain including at the level of peer-to-peer conversations. This suggests a *consistency* of effect across the entire programme.	Study II Study IV

Sample narrative of the evidence	Mechanism	Link to sustainability	Example of Source
Where barriers to implementation like funding were identified, the programme relied on the organisation's capacity to justify ongoing implementation. In addition, once adopted, the programme needed to be able to continue to demonstrate why it was still worthwhile.	Justifiability Consistency	At LA (A), ongoing implementation was also about getting value for the money that had just been spent on the programme. Once a decision to pay for the programme was made, it triggered an incentive to continue delivering the programme for its life term, and to do it well. The disabling effect of funding was counterbalanced with its enabling properties. Thus at LA (A), paying for the programme justified its continuity. At LA (B), the programme was deemed expensive, so its continuity was unjustifiable.	Study II
Individuals who had faced the highest risks during delivery (e.g. being investigated for disciplining a child during training) cited personal commitment as the reasons they continued to be involved in the programme. These included the personal relevance of the public health issue (e.g. my father died of lung cancer) or having a passion for working with young people. The alignment between personal motivations and the programme goals supported these individuals with justifying their involvement in the programme to themselves.		Despite a number of barriers, some of which were career-threatening, trainers had personal justifications for their continued involvement based on their commitment and ongoing belief in the programme. These trainers made the core team of individuals who have not left the programme since it started. The maintenance of these core trainers was crucial for initiating new trainees and maintaining consistency in delivery.	Study III

Sample narrative of the evidence	Mechanism	Link to sustainability	Example of Source
The children's varying levels of engagement with implementing the peer conversations, and with understanding or accepting the concept of prevention affected their perception of whether the intervention was worthwhile and to who. The children who had smoking family members implemented the intervention within their families and during observations, most of the ones who verbally reported this did not report any other implementation attempts with friends. Others reported that they had not implemented the programme because they had not met any smokers. Thus having a smoking family member made the children question the justifiability of implementing the programme on friends who might smoke in future instead. At the same time, some conversations with smoking family members were disastrous and this had implications for future conversations.	Justifiability Consistency	Implementing the intervention with the goal of stopping smoking close relatives or friends was more personally relevant and easily justifiable. Starting conversations with children who might smoke in future, and where the reaction of the peers "might be" harsh was harder to rationalise.	Study IV
The school that was the most successful in reaching the programme's recruitment threshold of a minimum of the top 15% of the influential children in the year group did so by specifically engaging parents. They did this by pointing out the benefits of the programme to the child who was being asked to attend the training rather than using the standard programme information sheets or appealing to the idea that the programme would enable the child to help other children not to take up smoking. This school achieved 100% engagement rate of the upper limit of 18% way before the deadline to return consent forms.	Justifiability Contextualisability	Since the programme would result in the child skipping school for two days, highlighting the benefits of the programme to the child rather than anti-smoking benefits to the population of 12 – 13 year olds was more justifiable. Schools which failed to reach their thresholds had their programmes cancelled.	Study II Study III
This programme was delivered to a strict manual, and it required little input from implementing organisations, trainers, or schools. It had a simple message, a simple target audience and had a strong problem-solving mechanism at all implementation points.	Simplicity Justifiability Consistency	This was seen as attractive in that it did not require too much time, so it increased the acceptability to potential trainers, which was useful to sustaining operations.	Study I, II, III

Sample narrative of the evidence	Mechanism	Link to sustainability	Example of Source
The trial behind the programme was developed at the request of a local health authority, and it was designed with their needs in mind and with their involvement. At rollout, the strategy used by DI Ltd was to highlight the programme to local authorities who had already identified smoking as one of the issues that they wanted to address. At local authority level, the key marketing strategy for recruiting trainers was to engage various managersand their staff by highlighting their stake in the programme rather than solely focusing on the objectives of the programme. For example, the youth service was engaged based on their direct interest in young people's welfare, the neighbourhood regeneration team on their interest in anti-social behaviour, and public health on their interest in health inequalities and so on. In turn, trainers promoted the programme to schools based on the high smoking rates around the school's immediate local area, and to the children on its "fun elements." Thus, the programmes intended objectives was used as a secondary means for engaging stakeholders, in preference to those reasons which fit the contexts of the stakeholder first.,	Marketability Contextualisability Consistency Justifiability	The strategy of repackaging the ASSIST to suit the agenda of the target stakeholder anchored the programme in multiple contexts. This increased the number of the programme's advocates in the implementing organisation, and it improved acceptability, *adoption, engagement*, and ultimate *sustainability.* This strategy relied on highlighting the justification for involvement to the stakeholder. Therefore. It recognised the fact that the programme could be *marketed* on any one of its points of appeal. This strategy was also identifiable across a variety of points, again suggesting a consistency of effect across the programme.	Study I Study II Study III Study IV

9.3.1 Mechanism 1: Credibility

Proposition: *Implementation is more likely to be successful and sustained if stakeholders such as decision-makers, the implementers, and participants perceive the programme as credible.*

There were a number of reasons why the ASSIST was considered credible. Firstly, its RCT origins mean that it comes packaged with the so-called "gold standard" level of trustworthiness in terms of its scientific claims about effectiveness in preventing the uptake of smoking. Closely connected to this, was the fact that the programme was the only one of its type known to be effective in reducing the uptake of smoking in children in the UK. Thus, the ASSIST was both credible and unique. In the interview study, I established that this level of credibility was important for making a case for the *adoption* of the programme. It remains one of the key defence lines that is used each time the programme is threatened with stoppage.

The *credibility* of the programme was further reinforced by an effective support structure that went as far back as the PIs of the trial. This structure operated in a way that can be compared to an efficient product support package. Thus, users get a comprehensive 3-day product training, they receive a detailed manual of how to use the product, their licence fee includes a support warranty for the life of the product, and the support team are responsible for providing regular product updates and providing solutions to emerging implementation problems. In addition, user queries can be relayed not only to the product support organisation, i.e. Decipher Impact Ltd, but also to the "product manufacturers", i.e. the PIs. This effective product support service reinforces the perception that the ASSIST is unlike other health promotion interventions, and that there is no alternative but to continue implementing it.

However, although the programme's *credibility* comes with the programme's RCT background, plus other credentials, the currency of this *credibility* varies, and it diminishes with time. Therefore, although the scientific evidence base is an important justification at the adoption stage of the programme, this

credibility supports sustainability only up to the medium term. Thus, the paradox is that, with this *credibility* and sustained implementation, comes the pressure to prove the local impact of the programme. The simple query raised by commissioners and their accountable structures is that if this programme is evidence-based, and we have been implementing it for so long, then where is the local evidence of its effectiveness?

However, as is explained in section 6.6.1(e), proving the local impact of a preventative community-based programme is challenging for two reasons. Firstly, without some kind of prospective randomised approach to choosing which schools receive the programme, it is not possible to determine with any level of certainty, how many children, would have gone on to start smoking, and who will no longer do so because of the programme.

Secondly, the difficulties in isolating the impact of community-based public health programmes are connected to an inherent challenge of these programmes called *programme differentiation* (Durlak and DuPre 2008) (see section 4.7.). Thus, during trials, it is difficult to ensure that "subjects in each experimental condition received only the planned intervention" (Durlak and DuPre 2008). This challenge can only be magnified in non-experimental or 'real life' implementation environments because implementers have even less capacity to control of the environment than researchers have at trial. In any case, attempting to run a trial just to assess the local impact would require more resources in an already resource environment.

Therefore, the Local Authoritie's response to questions about the evidence of local impact is to present hypothetical projections of the possible reduction in smoking that could be achieved, if the programme achieves the expected 22% reduction in uptake of smoking that was achieved in the trial. However, the LA believes that this is too weak an answer to satisfy the ongoing (if misplaced) demands for the "hard evidence" that is perceived as necessary for making decisions to continue implementing the programme.

This failure to produce localised evidence of impact may eventually lead to the programme losing its *credibility* in the eyes of decision makers. In turn, a loss of *credibility* will diminish the key justification for maintaining the programme, i.e. its j*ustifiability.* This explains the council's seemingly inadvisable idea to commission a before and after study of the local ASSIST programme, section 6.6.1(e)

9.3.2 Mechanism 2: Simplicity

Proposition: *Implementation is more likely to be successful and sustained if stakeholders such as decision-makers, the implementers, and participants perceive the programme as simple*

This mechanism was also supported by analyses of data across all points of the implementation chain of the ASSIST. First, the ASSIST conveyed a simple message (do not smoke!). Second, it targeted a specific group of children, (12 - 13-year-olds). Third, the intervention was packaged in one manual that equipped implementers with knowledge about how best to implement it. Finally, the peer-to-peer mechanism relied on universally accepted knowledge, that children listen to their peers, and finally, it had a well-resourced chain of delivery and support mechanism as has just been described above (section 9.3.1).

However, the observations of Study III indicated that the *simplicity* that was associated with the manual was largely perceptual. In practice, the manual was observed to add, rather than to reduce the complexities of delivery. Nevertheless, the perceived *simplicity* was an influential positive factor in trainer recruitment and retention, and thus it was a key part of the overall sustainability of the programme. An alternative observation was made regarding the children in that the reasons that the children gave for not implementing the intervention or for finding the task hard suggested that the children who reported this, did not believe that this was a simple task of just speaking to their friends. Thus the complexity of the task influenced whether they would implement the task or not.

Finally, the perception of a *credible* yet a *simple* intervention supported line managers in accepting the programme. The clarity of what the programme was and how it worked meant that the programme had an inbuilt capacity to make its own case for *adoption* and continuity. This contributed to the next mechanism, the mechanism of *marketability*.

9.3.3 Mechanism 3: Marketability

Proposition: *Implementation is more likely to be successful and sustained if the programme has multiple qualities that can appeal to multiple stakeholders*

This mechanism is about the inherent appeal of the programme and whether these can be used to engage and maintain potential participants. It is also complemented by whether implementers, participants, and stakeholders can see those strengths and they can place it in their own *contexts* (also see section 9.3.4 below*).* This mechanism was also identified from the evidence provided at all levels of the implementation chain see (Table 14).

At the trial level, the researchers of the ASSIST designed the programme to fit a local authority, and they spent more than two years disseminating the results at academic conferences, to key national policymakers, and policy stakeholders. They also sought professional advice on how to develop a long-term implementation model for the programme. Thus, the initial activities of the researchers set up the foundation for nationwide adoption, and it created a model for ongoing implementation of the programme.

At the national level, DI Ltd had a specific remit for the national promotion of the programme. From their perspective, the fact that the ASSIST was developed in response to a problem that was identified by a local authority enhances its *marketability*. Thus, local authorities are more easily able to accept the programme because it was designed for the general context of local authorities. DI Ltd has been so effective in promoting the adoption of the programme that at the time of study they were in the middle of piloting the programme in France with a vision for expanding it to other countries.

At the Council level, the Council's programme champion and the 'rescue trainers' outlined the multiple ways in which they marketed the programme to various audiences using its various points of appeal. For example to political decision-makers, it was promoted on the basis of its scientific evidence; to schools, it was promoted by highlighting the school's obligation to contribute to the programme's intended objectives. This was presented alongside statistics of smoking rates in the school's local area. To the line managers of potential trainers, the programme was promoted on how it would complement the objectives of the line manager's departments. To the children, it was promoted on the basis that it was fun and it would be a day trip away from school, and to their parents, it was promoted on the basis that their children would gain valuable skills by attending the training.

Therefore the multiple strengths of the programme allowed implementers to present it to a variety of target audiences and that improved the chances of programme *adoption,* as well as *engagement.* The mechanism of marketability was closely connected to the next mechanism, in that the multiple strengths appealed to multiple people who were able to identify those strengths in relation to their own contexts.

9.3.4 Mechanism 4: Contextualisability

Proposition: *Implementation is more likely to be successful and sustained if stakeholders such as decision-makers, implementers, and participants can identify the programme's marketable strengths and fit them to their own goals and contexts.*

This mechanism is about the capacity of stakeholders to identify with the strengths of the programme and to see those as being aligned with their goals and own contexts. Thus, the difference between *marketability* and *contextualisability* is that to be successfully triggered, the mechanism of *marketability* relies on the properties of the programme and the actions of the implementers to promote them. On the other hand, the mechanism of *contextualisability* relies on the participant's responses to the *marketing*

activity and to their perceptions of how the attributes of the programme fit their own contexts and goals.

For the ASSIST programme, the multiple contexts include those of the local authorities, the commissioned organisations to deliver the programme, the rescue trainers, the schools, the children and other stakeholders across the implementation chain. In the interview study, interviewees attributed their involvement in the programme to the fact that the programme was aligned to their personal or professional values. For example, at the senior leadership level, the public health consultant saw the ASSIST model as being in tune with their personal vision and strategy, which they described as a systems-leadership style vision for their city's population health. In that vision, the appeal of the ASSIST model was that it could be used to create a network of community based peer-to-peer health promoters. This would be a cost-effective model for dealing with other prevailing public health problems, e.g. obesity. Such a programme would be seen as more *credible b*ecause it would be driven by local people who are living with the health condition in question, rather than by professionals as is usual. Such a strategy would also be in keeping with the prevailing economic *context*, in which Councils are slowly transforming into commissioning and strategic institutions, rather than delivery organisations (see section 6.6.2d).

At the trainer level, trainers linked their involvement in the programme to their own backgrounds such as a family history of lung cancer, or to the context of their careers, such as to expand their work portfolios. Although different, these motivations resulted in a collective will to sustain the programme, and in personal and collective efforts to resolve almost all emerging barriers of implementation. Any barriers that could not be resolved locally were referred further up the implementation chain. Therefore, the programme achieved an inbuilt problem-solving or a "survival mechanism" through its capacity to fit the multiple contexts or goals of the leadership and organisations, or of the people who were involved with it.

9.3.5 Mechanism 5: Justifiability

Proposition: *Implementation is more likely to be successful and sustained if stakeholders such as decision-makers, the implementers, and participants perceive the programme as worthwhile.*

Justifiability was the means through which either implementers played down the magnitude of known barriers of implementation, or they rationalised their continued involvement in the programme amidst significant challenges, e.g. career-threatening events. These barriers included lack of funding, lack of trainers, or challenging behaviours from the children etc. (see section 6.6.1)

This mechanism also supported the theory of *marketability* in that it allowed implementers to focus on highlighting the full range of ways in which the programme was worthwhile to potential stakeholders, rather than simply relying on the programme's own objectives and intended outcomes (e.g. smoking prevention and improved health).

Where the justifiability of the programme was called into question, e.g. at LA (B) or by the children, the programme was stopped, or it was implemented reluctantly. This mechanism was also identified as being in operation, at all levels, from the organisation to the individuals involved (see Table 14).

9.3.6 Mechanism 6: Consistency of mechanisms

Proposition*: Implementation is more likely to be successful and sustained if the implementers and stakeholders across the implementation chain either identified some or all of the above five mechanisms (credibility, simplicity, contextualisability, marketability, and justifiability) or the extent to which they made decisions or took actions, which either activated or deactivated them.*

Therefore, the mechanism of c*onsistency* is also about the extent to which the five mechanisms are present across the implementation chain and in various implementers, whatever their role. Evidence for these mechanisms was identified in all the primary studies, and across different points of the implementation chain, from the dissemination of the trial right through to the schools. They were also identified in relation to the organisational, the

personal, and the social environment. In addition, there was some evidence that where the mechanisms were absent or weakened; the continuity of the programme was at risk. For example, low programme *justifiability* at LA (B) led to programme stoppage, while at LA (A) the ongoing difficulties with proving that the programme is having a local impact continue to threaten both its *credibility* and its *justifiability.* Therefore, this remains one of the biggest risks to the programmes sustainability. Similarly, the children who had smoking family members struggled with justifying implementing anti-smoking messages to their non-smoking peers instead of their smoking family members. Moreover, prioritising messages to smoking family members has implications on the potential of the children to implement the intervention to their peers.

Therefore, these findings suggest that a *consistent* presence of the above mechanisms enhances the overall programme sustainability. In addition, they suggest that the mechanisms work together and are complementary. For example, *marketability* enhances *contextualisability,* while *simplicity* and *credibility* supports *justifiability* and *justifiability* enhances the ultimate *sustainability* status of the programme. In addition, my findings suggest that different theories of sustainability are most crucial at varying points of the implementation process. Thus, a programme that is perceived as complex and lacking in credibility will not be adopted at all. At the same time, once adopted, a programme which is unable to fit the multiple or changing contexts of its stakeholders or one that is low on its *marketability* and *justifiability* runs the risk of being abandoned post-adoption.

9.4 The nature of sustainability

At the beginning of this PhD, my conceptualisation of the implementation process was guided by the description of implementation that is commonly used in process models of implementation such as the knowledge to action framework, (Wilson et al. 2011) the RE-AIM framework (Glasgow, Vogt, and Boles 1999) the stages of implementation (Fixsen et al. 2005) or the DoI (Rogers 2010)(see 2.4). (also see Figure 6) These models describe

sustainability as the end stage of the process of implementing programmes. Consequently, my initial perception of implementation as a staged process guided how I framed study-specific research question (a) of Study I:

- *Are there recurrent, identifiable, and conceptually distinct stages, aspects, features, of the successful (or unsuccessful) implementation of public health programmes and interventions in different settings?*

However, the findings of the review of reviews were that the stages and aspects of implementation are linked and interactive so that they could occur both sequentially and simultaneously (Figure 8). This interactivity was confirmed in the interview and the observational Studies II, and III, but the findings also suggested that sustainability was not just a final stage of the implementation process it was a process in itself and it emerged alongside the implementation process. Studies II and III also demonstrated that the factors of sustainability could be traced right back to the dissemination of the results of the trial and at all points of the implementation process.

Therefore, these findings expand the prevailing conceptualisation of sustainability, so that sustainability can be both an end-stage of the implementation process and a process that evolves with implementation. Consequently, my key proposition in this thesis is the idea that higher forms of sustainability are achieved through the prolonged interaction between a programme's mechanisms of sustainability and the stages of the implementation process. The next section will illustrate this proposed embeddedness of *sustainability* in the implementation process.

9.4.1 The typology of implementation and sustainability

So far, I have responded to PhD research question 1), regarding the character of the implementation process of public health programmes. I have also proposed the mechanisms of how these programmes are sustained (PhD research question 2). This section will illustrate the proposed embeddedness of sustainability in the implementation process, as well as its

relationship to the context in which it is implemented, as was found in study I. This will be done through hypothetically plotting a progressing implementation process (findings for PhD question 1), against cumulative mechanisms of sustainability (findings to PhD question 2). Therefore, it will demonstrate how sustainability emerges from this interaction to create a "*typology of sustainability.*"

Figure 14 is the conceptual representation of the interactive relationship between the cumulative mechanisms of sustainability (vertical axis) and the progressive stages of the implementation process (horizontal axis) to produce the typology of sustainability (the gradient).

Figure 14: A conceptual illustration of the typology of sustainability
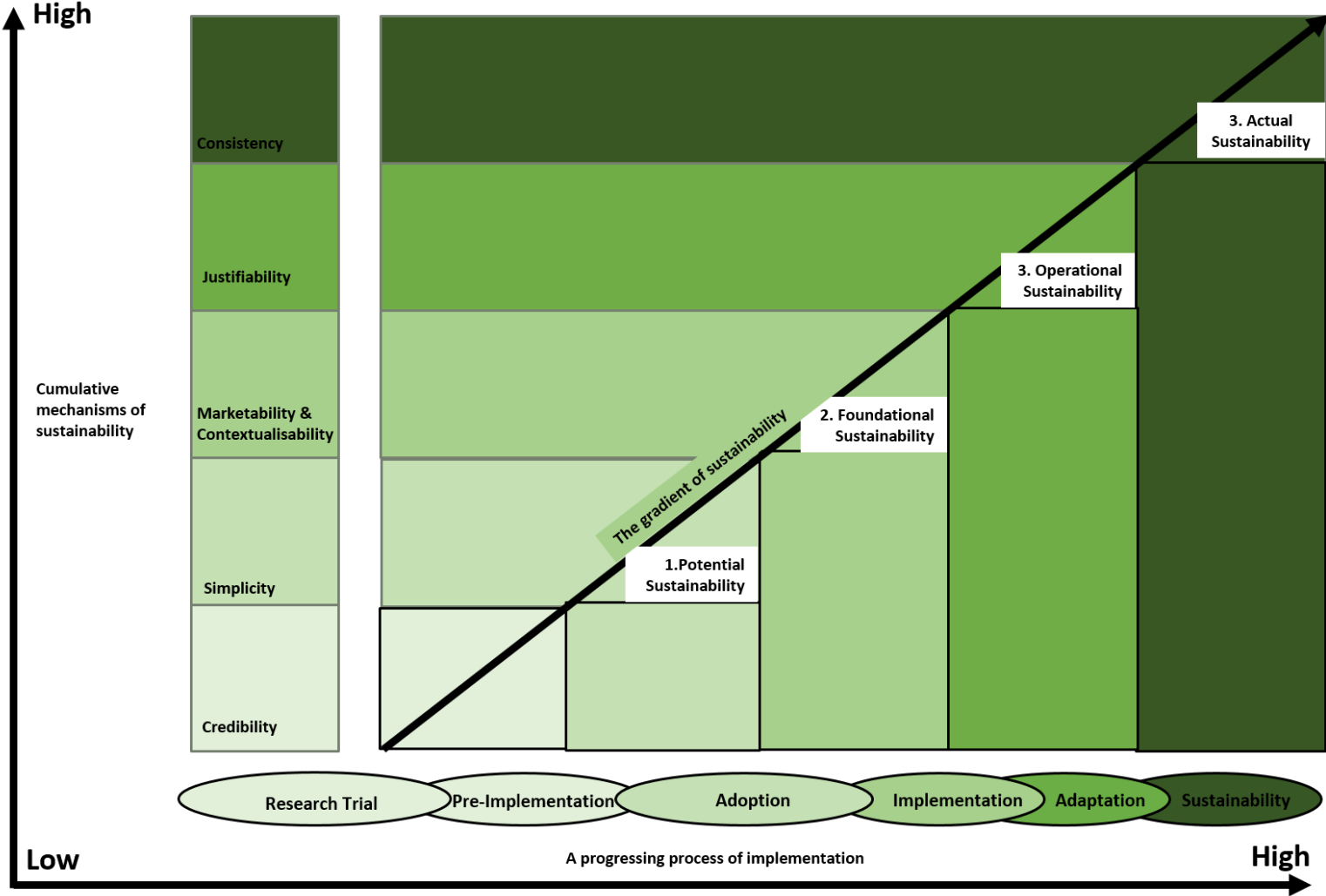
In study I, I explained that the stages and aspects of implementation were interactive and that they are affected by factors from the context in which the programme is implemented. These factors include people's social values, the culture in which the programme is implemented, the available skills and resources or the policy environments. These factors also affect both the implementation process and the decisions taken at particular stages of it. The stages also affect each other (see discussion section 4.7). The interactive nature of the stages and aspects of implementation was captured in figure 8, and it is replicated below.

Figure 8: Stages and aspects of implementation.
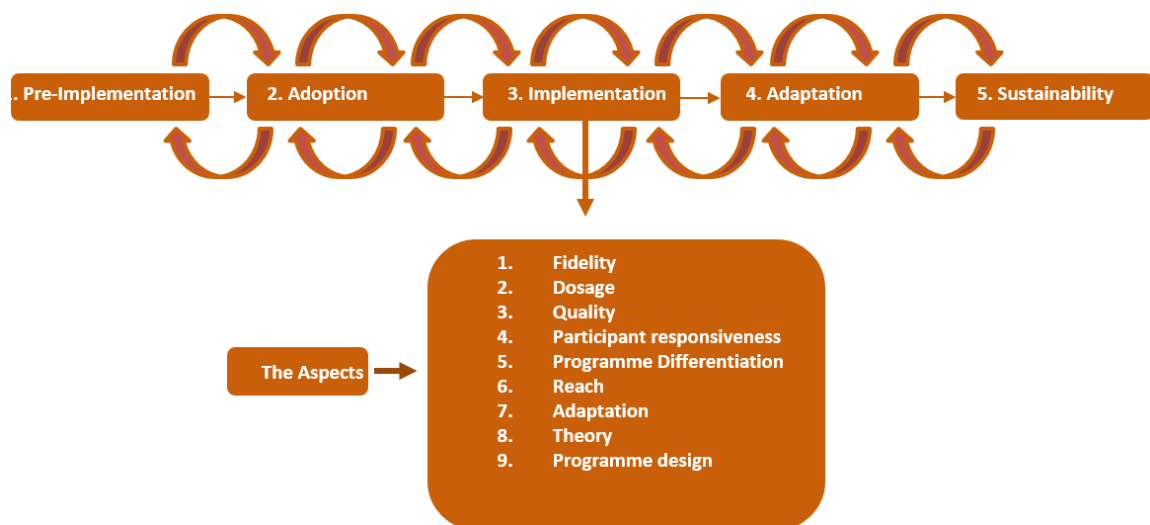
This findings can now be added to the typology of sustainability (Figure 14 above) so that the final representation includes both the different stages of implementation, the character of the implementation process, and the nature of sustainability (Figure 15 below). The orange circles in the figure represent the interaction between the implementation process and the context in which the programme is being implemented while the green chain represents the interaction of the stages of implementation with themselves as was found in study I. Therefore, this figure brings together the findings of all four studies.

Figure 15: A typology of implementation and the contextual interactions
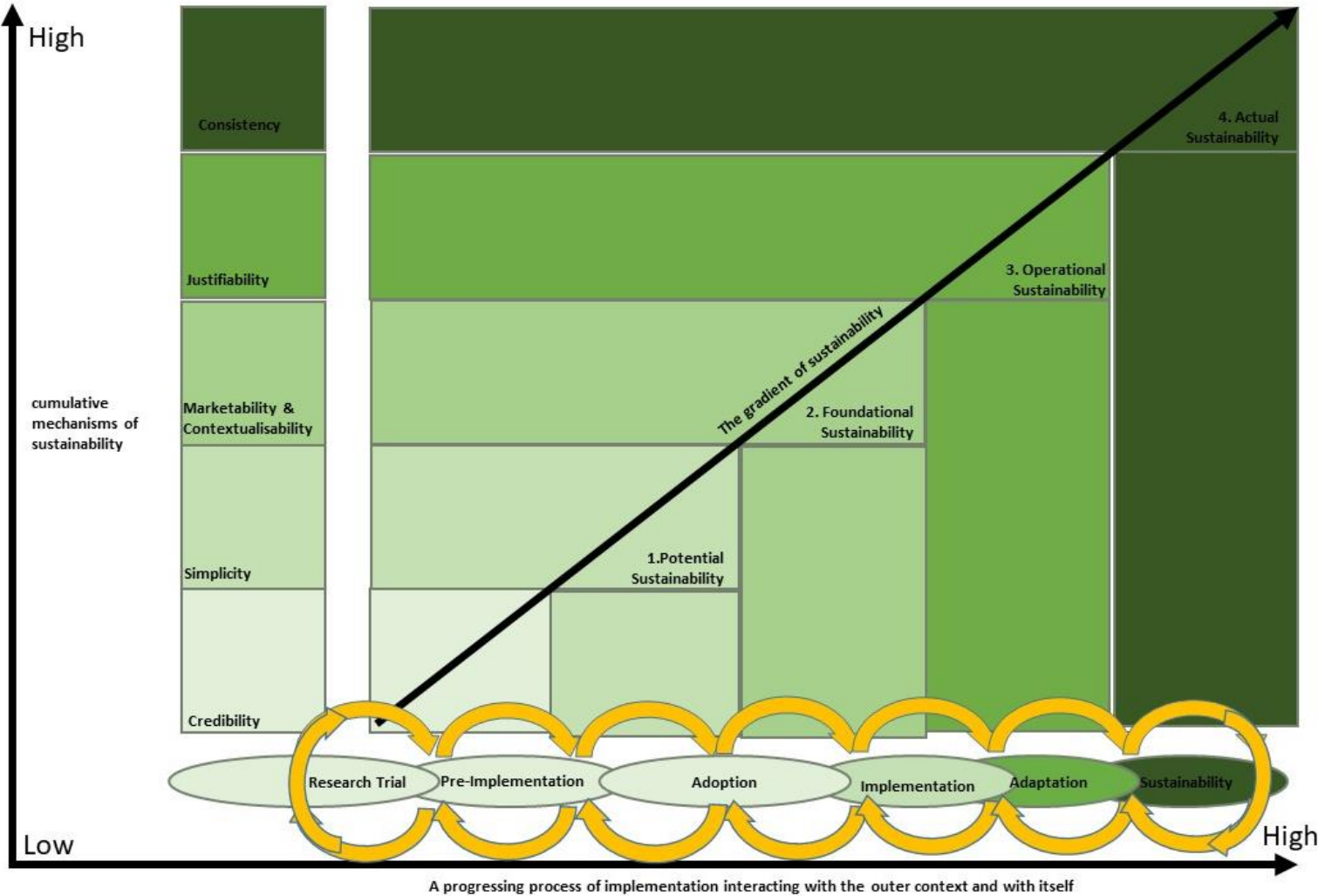
9.4.2 An explanation of the typology of sustainability

The synthesis of the findings across the studies suggest that the ASSIST programme was sustained because at the starting point of the implementation process *(pre-implementation),* the local decision-makers and programme implementers perceived it to be c*redible* and *simple*. Thus, *simplicity* was designed into the programme during trial and *credibility* was reinforced by the scientific status of the results of the trial. Therefore, these two attributes were present before the start of the *pre-implementation* stage. Therefore, s*implicity* helps to overcome the basic barriers to *adoption* e.g. the time, and effort that the trainers or the schools are required to spend on the programme. On the other hand, c*redibility* supports the initial rationale for *adopting* the programme. Therefore, taken together, *simplicity* and *credibility* represent the programme's basic capacity for sustainability, which I have called *potential* sustainability (Figure 14)

However, once the managerial decisions to adopt the programme are made, then the successful implementation relies on the engagement of implementers, stakeholders, and participants and this relies on the programmes' *marketability and contextualisability.* Thus, marketability and contextualisability work hand-in-hand in that the programme has to have marketable strengths, which could fit the agendas of multiple stakeholders, and in turn, the stakeholders need to be able to identify these strengths in relation to themselves or to their own contexts. Therefore, *marketability* and *contextualisability* help to establish and reinforce the implementation stage*.* Together they represent the second type of sustainability which I have called *foundational* sustainability, on which further sustainability could develop (Figure 14)

However, as the implementation process progresses a range of operational barriers, e.g. trainer availability or the children's behaviour emerge. Therefore, at this point, implementers need to continue to see the programme as worthwhile, whatever the operational challenges. Thus, the

programme has to have enough *justifiability* throughout the stage of implementation.

In practice, justifiability was evident in a number of actions or decisions that implementers took. For example, sometimes implementers, participants, or stakeholders played down the significance of known barriers of implementation or they rationalised and personalised their continued involvement in the programme despite significant challenges. Alternatively, they secured the ongoing involvement of others through highlighting the programme's *justifiability* to those people. Where the barrier was to do with the programme, suitable attempts were made to *adapt* the programme, thus, highlighting ongoing *justifiability* and maintaining the operations at the same time. These types of actions collectively *sustained* the operations of the programme. Thus they supported the third type of *sustainability* which I call *operational* sustainability. However, these three forms of sustainability are temporary or non-stable in nature because the absence of any one of them can trigger programme stoppage. Therefore, *actual* sustainability occurs when all the mutually reinforcing mechanisms of sustainability are present right from the trials behind these interventions and throughout the stages of implementation, i.e. *consistent* presence of the mechanisms.

9.5 Discussion

The conceptualisation of *sustainability* that has been proposed in this thesis suggests that the key influencers of sustainability of public health programmes lie in how the theoretical attributes of the intervention interact with factors at various stages of the implementation process and its wider context. It also illustrates the finding that sustainability starts with the design of the intervention and that it happens as part of the implementation process.

These proposals lend empirical plausibility to a similar conceptualisation of sustainability which was developed from a review of the literature by (Pluye, Potvin, and Denis 2004). As was briefly mentioned in section 2.6b), the objective of the Pluye and colleagues literature review was to re-conceptualise what they called the *structural* and *temporal* dimensions of

sustainability. The former relates to where programmes are sustained (for them in organisations), and the later relates to the moment that they are sustained (i.e. the time).

In their comparison of how various studies characterise the process of implementation, Pluye and colleagues find that implementation is characterised by stages, starting with pre-implementation or adoption, followed by process descriptors such as implementation or monitoring and evaluation, and ending with later stage descriptors such as maintenance, institutionalisation, or sustainability. These descriptions are similar to the stages of implementation that I identified in Study I (Figure 6 and Figure 8). However, their re-conceptualisation of sustainability includes three elements; the first is the implementation process, and it includes planning; implementation evaluation, and sustainability. The second is time, and the third is the organisational activities that are aimed at the programme's objectives, i.e. the process of *routinisation* and/or *standardisation.*

However, in keeping with their view that sustainability happens in organisations, (i.e. the *structural dimension* of sustainability), they argue that sustainability is concomitant with implementation because it may be limited to organisational routines, or it may comply with state-level institutional standards that give rise to more durable routines. Routines represent the primary processes of sustainability, while standardisation represents the secondary processes. These processes are by their definition, concomitant with implementation, and thus with sustainability.

Therefore, while the Pluye study also alludes to the idea that sustainability is embedded in implementation, the difference is that in this thesis, the concomitance between sustainability and implementation is the result of the interaction between a progressive implementation process and cumulative mechanisms of sustainability.

The other difference is that Pluye and colleagues perceive sustainability as emerging from its structural dimensions (i.e. the organisational structures)

because organisations, (whether formal or informal) are key to the processes of routinisation and standardisation. However, the role of specific structural organisational factors was less prominent in the findings of this thesis. It is possible that this is because the ASSIST is designed to be implemented in discrete project cycles as opposed to being continuously routinised or institutionalised or to become part of how an organisation does particular work. For example, the ASSIST has (a) an annual cycle of delivery, i.e. it is not continuously delivered (b) it cannot sustain a dedicated workforce, and (c) it requires periodic re-adoption decisions to be made because of its three-year subscription and licensing funding model.

Therefore, using the (Shediac-Rizkallah and Bone 1998) framework for conceptualising programme sustainability, it could be argued that these results suggest that to be sustained, a "project-style intervention" like the ASSIST, relies more on its own attributes (e.g. project design), and implementation factors, than it does on the structural or procedural attributes of its host organisation. On the other hand, more "routinisable" interventions, (e.g. embedding health promotion messages into a school curriculum), may rely more on the structural factors within the organisational setting. However, both types of interventions are also influenced by factors from their broader social-community environments.

9.6 Conclusions

The summary of these findings is that successful implementation of community based public health programmes is an interactive process involving *pre-implementation activity, adoption, implementation, adaptation* and *sustainability.* In addition, sustainability is actualised when all the mutually reinforcing mechanisms of sustainability are present right from the trial and throughout the stages of implementation.

Therefore, the design and the results of trials influence the primary building blocks of sustainability, namely, the *credibility* and *simplicity*. Further, mechanisms like *marketability or contextualisability* can be assessed during process evaluation. In any case, all the mechanism of sustainability need to

be consistently present from the trial throughout the implementation process. This new way of conceptualising sustainability could have the effect of changing the common perception of sustainability as a largely post-trial concern.

The other general conclusion from these findings is that the social-cultural environment of an intervention influences people's decisions to be involved in, or to involve others in the programme and it affects their terms of engagement. The findings also suggest that evidence-based public health programmes are more likely to be successfully adopted when they are promoted on their multiple strengths and immediate benefits rather than exclusively on their intended public health goals. This finding is similar to the findings of the Pearson et al. (2015b) study. Thus, researchers and implementers must employ strategies that will resonate with the participants at different levels and in different ways. This may mean promoting the programme based on its non-core, but socially valuable benefits, or even on its peripheral elements, such as that it is fun.

Reflective note 8

It's March 18. As I come close to finishing I start planning for jobs. First, I fill in the first page of the thesis. The title goes in, then I insert the date of submission as June 2018 and I am confident that I will make that one, but of course, this too keeps changing. Second, I start applying for jobs I say I don't really need to get the job now, I just want to start getting reconnected to the work world, and to get the hang of handling interviews so that by the time I finish writing this up, I will be ready to take on the jobs I really want. I get invited to interview for the first job I apply for. That gets me excited. I thought it was ok. But they don't contact me for a week, and when they do, it's via an HR email saying they will not be "progressing my application at this time." I ask for feedback and they say I need to make an appointment with the interviewer. I see through their "We can't be bothered with you anymore attitude" so I do not pursue it any further. The next is for a job I would really love to get. I feel it is a good interview but I do not exactly feel like I smashed it. But these interviewers are kind, they call me back on the same day, and they explain where I fell short. I agree with their assessment. When I learn of who got this job, I can see why. They had extensive experience in the one area that I had none.

The next one is my first ever telephone interview. I am nervous. Then during the interview, the interviewers keep asking me to repeat myself so I start to worry that my accent is getting in the way of my clarity. I give it my best shot anyway. But by the time it is over, I know this one is going to be another one that will not be "progressed." I just couldn't get myself heard. I wait for the call but an email comes a week later, no feedback and when I ask for it, it takes another four weeks and it looks like a copy-paste job. This employer surprises me and makes me angry. For their size and business, I expected more from them. I reply to their email expressing how I too was unimpressed with them. Unsurprisingly I never get any response to this, but it just felt satisfying to tell them how they need to consider the impact of such poor practice on job seekers. The next one is the worst. One of the interviewers was quite rude but I didn't perform well either. So I just wait for the standard line that I am now so used to.. "You were very impressive but….." ,But by now I have stopped caring about anyone's feedback. I will be my own judge. So their feedback looks kinder than I thought "my performance was." Will this ever work? Will all this work count for anything in my future career? I don't know.

Lesson 8

The scariest part about my career and future right now is that I know absolutely 'nothing' about what it will be. It's a scary place.

Chapter 10 Discussion: sustaining implementation or implementing sustainability?

10.1 Introduction

Through this thesis, I have attempted to provide insight into the two areas that I set out to investigate namely, the implementation process of community-based public health programmes, and how the programmes are sustained. Thus, I have explained the character of the implementation process, and I have developed a new way of conceptualising sustainability, which can be applied to similar programmes. This chapter has three objectives.

a) To discuss the overall findings on implementation and sustainability (section 10.2.)

b) To highlight the implications of the findings to research and practice (section 10.3)

c) To explain how the findings of thesis have contributed to knowledge and how they have extended the findings of the research which inspired this PhD project, which was carried out by the supervisory team (Pearson et al. 2015a) and how this feeds into the general theory of implementation and potentially an emergent theory of sustainability (Section 10.4)

10.2 Implementation and sustainability

I explained in section 2.6a) that one of the enduring challenges of the thesis is to avoid conflating the concept of implementation with the concept of sustainability, since sustainability is at one level, just longer implementation. In this PhD project, the concept of implementation was studied firstly in its own right (e.g. in Study I) and later alongside the concept of sustainability (e.g. in Studies II, III and IV). This approach and the overall findings provide some clarity on the two concepts. Thus, when sustainability is perceived as an end-stage of the process of implementation (e.g. as described in process models), then it is a snapshot in time.

Consequently, a programme is either sustained or not sustained, relative to the period of interest. Therefore, this staged-model of sustainability responds to sustainability as an outcome, and it answers the question; "what" is sustainability? This area of investigation can be understood through the various process models presented in section 2.4 and the capacity for sustainability can be assessed with emerging tools like the Programme Sustainability Assessment Tool (Luke et al. 2014).

At the same time, the findings in this thesis also propose that sustainability happens in the course of implementing the programme. This is a characterisation of sustainability as a process rather than as an outcome, and it answers the question how does sustainability happen? Therefore, to develop programmes that can be sustained, researchers should pay attention to the proposed mechanisms of sustainability. Thus, sustainability starts from the trial design stage, and it emerges alongside the unfolding implementation process as is outlined in Figure 14

These findings also validate the complex descriptions of sustainability as a process that includes a combination of factors related to the intervention, the context, and the implementers. These descriptions were discussed in 2.6a) and they include those proposed by (Moore et al. 2017; Gruen et al. 2008; Schell et al. 2013; Shediac-Rizkallah and Bone 1998; Simpson 2011; Chambers, Glasgow, and Stange 2013; Pluye, Potvin, and Denis 2004). In addition, they agree with aspects of programme complexity, namely volition, implementation, contexts, time, outcomes and rivalry (Pawson 2013) These were discussed in the background literature Chapter 2, and in the methodology Chapter 3. Thus, the role of the contexts of the intervention is recognisable in these findings, and the phenomenon of sustainability is understood through its underlying causal mechanism. This also reflects the fact that this thesis has been informed by realist philosophy and its approach to causality, such as the ideas advanced by (Bhaskar 2008; Pawson and Tilley 1997; Archer 2007).

10.3 Implications of the findings

This section will discuss some of the general findings from across the four studies, and the implications that they have for research and practice. These include the findings on; measures of implementation, communicating the value and local impact of public health programmes, promoting the social value of public health programmes, programme evaluation, ethical challenges, and research dissemination and planning for sustainability.

Measures of implementation

The review of reviews confirmed the ongoing concern in the literature that there is no terminological consensus around key concepts of implementation and sustainability and how they can be operationalised (Chaudoir, Dugan, and Barr 2013; Durlak and DuPre 2008; Rychetnik et al. 2002). Consequently, the paucity of standardised tools to measure these concepts should not be surprising, since concepts that have multiple meanings or referents cannot have a universal measure.

However, some of the within-study attempts to clarify terminology were also found to add to the terminological clutter rather than to clarity. This means that the focus may now need to be on standardising existing terminology as opposed to re-defining it to suit individual studies or re-clarifying it. In addition, attempts to develop standardised measures of the key aspects of the implementation of public health programmes may need to look beyond public health, or to adopt different investigative methods than those that were used in this PhD project. For example, given the developing multi-disciplinary approach to theory, new studies could also investigate whether there are measures from other fields (e.g. psychology, or organisation management) that could be adopted and adapted to public health programmes. Thus, it is possible that by narrowing down my review of reviews (Study I) to community-based public health, I may have excluded interdisciplinary reviews which may have contained suitable measures of implementation.

Communicating the local impact of public health programmes

The ongoing pressure to demonstrate the local impact of the programme that was identified in the interview study highlights the resource-constrained environments in which public health programmes are often situated. It also suggests that until some of the challenges around how we evaluate and communicate the value of preventative public health programmes to local stakeholders are resolved, these programmes will remain at perpetual risk of being discontinued prematurely.

At the same time, the demands for evidence of local impact highlight the value of evidence-based interventions to local decision-makers and their communities. However, the irony is that unless the local impact of such programmes can be demonstrated, then programmes that are adopted based on their initial scientific evidence, are also likely to be discontinued for lack of evidence. In this case, the longer the intervention was implemented without local proof, the higher the risk of discontinuation gets. Thus, long-term implementation (i.e. sustainability) can be self-destructive. In addition, if the local impact cannot be demonstrated, then questions are also asked about the general value of evidence-based programmes. Moreover, difficulties in understanding how the scientific evidence behind public health programmes apply to local contexts were identified at LA (A), and those difficulties were also connected to the reasons why the programme was stopped at LA (B). This suggests that there is a need for more transparency and for new ways of communicating the value of community-based public health programmes and of the possibility of demonstrating evidence of impact.

For example, in promoting the adoption of evidence-based programmes to policy and decision makers, public health researchers and practitioners must be mindful that it may not be possible to demonstrate the local impact of most preventative evidence-based public health programmes. Consequently, efforts to promote such programmes must make distinctions between the evidence of effectiveness that was achieved at trial, and the evidence of the local impact that local stakeholders may expect from programmes. Offering

clarity on this would help stakeholders to avoid conflating the unresolved methodological challenges regarding how to demonstrate the local impact of a preventative programme, with the more fundamental problem of a programme being ineffective. It is possible for example, that the impact of widely adopted national programmes may be demonstrable at the national but not at the local population level. Therefore, making these distinctions clear is particularly important if national policymakers are to be able to influence local decision makers to adopt programmes of "proven" or demonstrable impact on national population levels, but which may take longer to yield a demonstrable local impact.

 Alternatively, it may be possible that a local impact could be demonstrable, if the programme is delivered universally in the local area, e.g. to all schools rather than to just some schools or neighbouring authorities could jointly adopt programmes to increase the local coverage. Thus, researchers and public health practitioners need to take an active role in clarifying these nuances to policy and decision makers as well as to participants.

Finally, it is important that programmes that rely on children as ultimate implementers of public health interventions to the wider population of children need to identify the more general benefits to the children involved in implementing the intervention. These benefits need to be explained to the children and their parents. This would cover the ethical questions around whether it is appropriate to place the burden of changing the behaviour of entire populations on children. In any case, failure to do this may mean that the children or their parents may perceive the programme as irrelevant to themselves (i.e. low unjustifiability), and this could influence their levels of engagement with the programme.

Promoting the social value of public health programmes
In the review of reviews, I found that programme participants also use the social value of the programme to decide on their level of engagement with it. This suggests that participants are active agents who exercise their power of choice on programmes. Therefore, failure to promote the social value of

public health programmes, or promoting them exclusively on their scientific evidence, or objectives may introduce the risk of low participant engagement.

Programme evaluation

One of the reasons why the ASSIST programme was sustained at LA (A) is that it was promoted on its multiple strengths which were presented to match the target audience, i.e. its *contextualisabilty* and *marketability.* This is in line with the realist assumption that interventions do not work simply for being what they are, but rather it is the interpretations of their subjects that produce results (Pawson and Tilley 1997). In this case, the choices and perception that implementers, schools, children, and other stakeholders made at various points made, were relevant to whether the programme was sustained or not. Therefore, the choices that programme recipients make about the programme should be a material consideration in evalusation (Pawson and Tilley 1997)

Furthermore, the evaluations of public health trials and programmes need to account for how the components of implementation interact with themselves, with the social environment and the people involved in implementing the programme. For example, fidelity needs to be evaluated alongside inevitable adaptation, the engagement effort of the implementers alongside the participant's responsiveness, the dose delivered alongside the dose received, the quality of delivery alongside the participant's own unofficial evaluations and so on.

Ethical challenges

The peer-to-peer philosophy of the ASSIST programme has an inherent focus on children as members of their community rather than as individuals. However, the implementation of the intervention is an autonomous enterprise, since children must initiate the conversations as individuals and not as peer groups. However, the focus on the status of children as members of social groups has some ethical implications. For example, one of the outcomes of the children attending the training is that they acquire a deeper understanding of issues such as smoking-related morbidity and mortality. In

acquiring such knowledge, the children also acquire the personal burden of knowing what could happen to friends or family members who smoke. This burden of knowledge may explain why some children reported concerns about what could happen to the friends and relatives who ignored their messages. While this knowledge could motivate some children to persist in their delivery of the intervention to prevent their friends from smoking, it could also discourage others from starting conversations, to avoid the emotional burden of failing at it.

In addition, although it was found that many of the children's pre-implementation concerns did not materialise, the prospects and the action of starting conversations about smoking had a range of potential personal consequences. Therefore, peer education programmes must capitalise on the status of children as members of their social groups without losing sight of the fact that the children's engagement with the delivery of the programme is inherently individualistic.

In addition, the challenges in understanding the concept of prevention that the children had, plus their low rates of implementation raise some questions around interventions that rely on children. The fact that the children regarded the programme's objective as "to stop their friends from smoking" rather than "to prevent" them from taking it up, highlights a fundamental difference between how the children conceptualised the intervention, and the terms on which they engaged with it and what it is in public health terms. This is relevant to programme sustainability in that the children's impression of the kind of child that they were targeting (an existing smoker) was likely to be more negative than that of the child they were meant to be targeting (a potential future smoker). Moreover, existing smokers were likely to be older and so in different peer groups that the children and this could influence the rates at which the children implemented the intervention.

Thus, questions must be asked about the real viability and the actual post-trial stability of large-scale public health interventions that place the ultimate burden of implementation on children. There is also need to consider the

structural environment and the burden that peer educator children take on for supporting the broad goals of public health, especially where the primary beneficiary of the interventions are individuals other than the children themselves or their families.

Research dissemination and planning for sustainability

Although factors relating to the internal organisational structures of the implementing organisations were less prominent in the findings of this PhD project, the role of the national delivery model was clear. Thus, a significant reason why the ASSIST programme has been sustained for so long is the existence of DI Ltd, an organisation that was set up for the sole purpose of promoting the nationwide adoption of the programme and supporting its implementation. In addition, the researchers maintained their link to the programme through a seat on the board of DI Ltd. Therefore, the sustainability of programmes could be enhanced if research dissemination plans go beyond raising awareness to policymakers and stakeholders, to include specific structures for supporting programme maintenance and maintaining links to the evidence base.

Unresolved paradoxes

There were a number of paradoxical findings related to the design of the ASSIST programme. The first paradox relates to programme manuals. The observational study found that programme manuals have the potential to both promote fidelity and to disrupt it, they can empower and disempower implementers, and they can strengthen perceptions of simplicity while actually complicating the process of delivery. Therefore, the role of programme manuals in promoting programme fidelity or simplifying delivery should not be assumed. Thus, in designing programme manuals, researchers must balance the need to promote fidelity, with the need to maintain perceptions of programmes' *simplicity* while actually simplifying delivery.

The second paradox was the observed and the reported involvement of school liaison teachers in the programme. Although an engaged school

leadership was crucial to the logistical processes of the programme and to classroom discipline, it was reported and observed that these types of liaison teachers also expected more involvement in the programme. Thus it is likely that the programme's prescription for minimal teacher involvement was disempowering to highly engaged school leaders. Yet at the same time, the implementers did not feel that they had enough control of the process of managing the children's behaviour. This could explain why the highly engaged school leaders attempted to take more control of the programme than was allowed while the disengaged teachers were unavailable even when they should have been available. Both types of teachers had a negative impact on fidelity and prospects for sustainability. In addition, the minimal involvement of the disengaged teachers exposed the trainers to high-risk incidents involving the behaviour of the children. Therefore, designers of similar school interventions may need to balance the roles of outside implementers with the teachers' needs to be adequately involved in the programme, and they must consider the trainer's actual and perceived limits of authority over the children.

The third paradox relates to the role of programme costs in supporting sustainability. Programme costs continue to be one of the biggest ongoing challenges to the sustainability of the ASSIST programmes at LA (A) and it is the key reason why the programme was stopped at LA (B). At the same time, LA (A) reported that they attached a value to the programme because it was a paid for programme. Thus, paying for the programme was also the reason for continuing to deliver it, and to deliver it well. This means that assumptions that charging for public health programmes is detrimental to the sustainability of the programmes are not always correct. This is reassuring for future programme developers, given the difficulties in funding public health programmes. In addition, what the programme costs (e.g. licence fees) is what funds DI Ltd, which is central to the sustainability of the programme. Thus, the fees bring benefits which may largely not be easily perceived by Local Authorities.

Two other paradoxes have already been discussed throughout the thesis and also in this section under programme evaluation. These relate to the implementation process, e.g. the importance of *fidelity* as well as of *adaptation*, and the idea of longer sustainability introducing the risk of discontinuation.

10.4 Contribution to Knowledge

The findings in this thesis confirm and extend some of the findings of the research that inspired this PhD project (Pearson et al. 2015a). First, the Pearson study developed four "programme theories" that characterise successfully implemented school-based health promotion programmes. These were; preparing for implementation, initial implementation, embedding into routine practice, adaptation and evolution. These are similar to the stages of implementation that I identified in the review of reviews of this PhD thesis. Second, the Pearson study found that the depth and rigour of evidence concerning embedding into routine practice and adaptation and evolution was limited. Therefore, the new conceptualisation of sustainability that has been developed in this thesis has attempted to fill the gap around the key finding of the Pearson study, that there is a paucity of information on how school-based programmes are 'routinised' or sustained.

Third, the Pearson study noted that one of the reasons for the paucity of studies was that the time frame of most of their included studies was too short (2 years or less) to produce evidence about embedding programmes into practice so they were unable to explore important areas identified in the "embedding into routine practice" programme theory. This echoes the general concern that most public health programmes are not sustained beyond their trial periods and that this is one of the key reasons for the paucity of studies of sustainability.

The finding that sustainability is a process and that its factors can be traced back to the trial means that there is an opportunity to start assessing the mechanisms of sustainability as early as the trial stage. For example, as part of process evaluation, researchers could try to assess their trials for

simplicity, *credibility, contextualisability, or justifiability.* Such assessments could support the understanding of how to improve the simplicity or credibility of these programmes. Therefore, it could lead to the development of programmes that have the basic *potential for sustainability (*Figure 14). Simple, credible, and justifiable programmes in themselves support successful implementation.

An emergence of studies of the early stages of sustainability (i.e. potential and foundational sustainability (see Figure 14), would be an improvement on the current situation where conceptualisations of sustainability are dominated by the stage-model of the implementation process (Pluye, Potvin, and Denis 2004), with sustainability as the last stage, i.e. as is advanced by most process models.

The implication of the dominance of process-model-based conceptualisation of sustainability are that sustainability is studied mostly as a snapshot in time rather than as a process. Therefore, studies of sustainability cannot take place if programmes have been implemented for shorter periods. This creates the real problem that non-sustainability is difficult to understand. For example, in this project, my attempt to study why the ASSIST programme was stopped at LA (B) was unsuccessful because I could not trace most of the people who were involved in the implementation. In addition one of the two interviewees that I traced had significant recall problems. Therefore, I was unable to gain a deeper insight into non-sustainability. However, if sustainability had been conceptualised as a process as has been proposed in this thesis, then it would have been possible to investigate the presence or absence of mechanisms of sustainability while the programme was being implemented. Therefore, we could have understood the reasons that led to the non-sustainability of the programme better, and in real time.

Therefore, from the knowledge gaps of sustainability that were identified by (Proctor et al. 2015), my theoretical conceptualisation of the typology of sustainability contributes to the area of the need to advance the theoretical base on sustainability research. In addition, since it allows sustainability

research to happen earlier in the implementation process, it could also enhance the development of other areas of sustainability that Proctor and colleagues identified e.g. the design of research on sustainability. However, this also means that the thesis has not contributed to most of the other gaps that Proctor and colleagues identified, as priority areas for research. These include 1) conceptual consistency and operational clarity for measuring sustainability, 2) developing evidence about the value of sustainability, 3) identifying its correlates and strategies for sustainment, 4) advancing the workforce capacity for sustainability research, 5) advancing a research culture, and 6) improving funding mechanisms for sustainability (Proctor et al. 2015).

From the knowledge gap areas that were identified by Shelton, Cooper, and Stirman (2018), this thesis contributes to the gap about how to conceptualise and define the term sustainability. Therefore from their list, the remaining areas of knowledge gaps include; the 1) research on fidelity/adaptation versus sustainability 2) how to measure sustainability 3) methodological issues of studying sustainability and 4) the need for rigorously testing sustainability frameworks.

However although the literature specific to the sustainability of community-based public health programmes remains limited, there is a broader body of knowledge on sustainability in health management, a variety of which is documented in the literature review by Buchanan and colleagues (2005), and which builds on to the book Bunchanan and Colleagues (2006). In the 2005 review of the literature, Buchanan and colleagues define sustainability as the process through which new working methods, performance goals, and improvement trajectories are maintained for a period appropriate to a given context. Their aim is to review the literature to develop a provisional model of the process of influencing change, sustainability and decay as part of a platform for further research. (Buchanan et. al 2005). Their 2006 work focuses on the issues affecting the sustainability of new working practices. Thus, their focus is generally on broader organisational operations,

structures, working practices, and culture as opposed to the sustainability of specific health promoting interventions. They point out that sustainability implies a constancy of operations i.e. stability. However, they note that in an uncertain environment, working practise that fail to adapt are targets of change. Therefore, stability i.e. Sustainability has not been regarded as a condition to be achieved but rather as an inertia, or a problem to be solved. This though is a different concern from the central concern of this thesis, that intervention are not even implemented long enough.

However, the findings of their review are similar to those of this thesis in that they suggest that sustainability is dependent on multiple factors at different levels of analysis namely: substantial, individual, managerial, financial, leadership, organisational, cultural, political, processual, contextual and temporal. (Buchanan et al 2005).

Therefore, the health management literature on sustainability represents a body of knowledge that could broadly be applicable to the issue of the sustainability of community-based public health programmes, and to the development of theory. However, Buchanan and colleagues also acknowledge that sustainability has received limited attention. Therefore, more research is needed to investigate how the mechanisms of sustainability that have been proposed in this thesis can be operationalised before they can be assessed as part of trials or programmes. For example, the mechanisms in this thesis have been synthesised from the perspectives of the implementers of the intervention, from observations of the post-trial implementation and from a standard feedback questionnaire of the programme. However, researchers, implementers or participants may understand them differently, and they may use different means to assess them. Therefore, it would be necessary and important to refine these mechanisms into measurable concepts.

In any case some of the individual mechanisms of sustainability can be refined from existing bodies of literature. For example the literature on social marketing in public health (French et. al 2010; Ling et. al 1992; Walsh et. al

2010; Craig et.al 1988) could guide the process of refining the proposed mechanism of marketability and its role in programe sustainability.

However, there remains a general need to develop measures of implementation.This though is not something that can be resolved in this PhD thesis. Therefore this PhD project has added three new areas to the agenda for sustainability research that was identified by Proctor and Colleagues as well as Sheltonm Cooper and colleagues (2008). These new areas are; 1) how to operationalise the mechanisms of sustainability and develop their measures, 2) the development of approproate ways of studying sustainability earlier, and as part of the implementation process. The third area is related to the development of a theory that captures both implementation and sustainability (see the section that follows). Towards a general theory of sustainability?

In section 2.5, I discussed the existing theories of implementation and noted that most of them are interdisciplinary, having been developed in fields like sociology, psychology, or organisation theory. In addition, I discussed the progress towards the emerging general theory of implementation (May 2013). Given that I have argued that sustainability is a process that evolves with progressive implementation, then the general theory of implementation is relevant to any theory of sustainability that could potentially be developed from the findings of this thesis. However, such a project is beyond the scope of this thesis so in this section, I attempt to only briefly propose how I envisage the crude beginnings of the conceptualisation of such a project.

Firstly, most of the mechanisms of sustainability that I have proposed are largely attitudinal in nature. For example, for the mechanisms to be operationalised, the stakeholders of the programmes need to perceive the interventions as *simple, credible,* and *justifiable*. Thus, if potential participants believe that an intervention is *simple*, they are more likely to decide to adopt and implement it. Intentions to act are functions of potential agency May (2013). Therefore, these mechanisms can positively or negatively influence the implementer's agency. In turn, the success of that agency depends on

whether the intervention itself can be integrated into the social structure in which the intervention is being implemented. In sum, the mechanisms are influential on agency, and agency is necessary for the four constructs of May's general theory of implementation, (i.e. capacity, capability, potential, and contribution) to be activated. Therefore, these findings are in keeping with the agentic approach that is central the general theory of implementation (May 2013), (see section 2.5 and Figure 2). Consequently, I propose that there are feedback loops between the mechanisms of sustainability outlined in this thesis, the 'agency' that is central to May's theory and successful implementation, and sustainability. Figure 15 is an illustration of an emergent general theory of both implementation and sustainability.

Therefore, borrowing from the general language of May's theory, the findings of this thesis confirm that the sustainability process of community-based public health programmes involve social mechanisms that are contextualised within the social systems of the intervention and from which spring expressions of implementer agency. Those expressions of agency are at least in part, triggered by the attributes of the intervention, i.e. the mechanisms of sustainability. The six mechanisms interact with each other. However, context, local conditions, and time will mean that the operation of some mechanisms will have a greater impact at certain points than at others.

Figure 15: A conceptual illustration of a potential general theory of implementation and sustainability
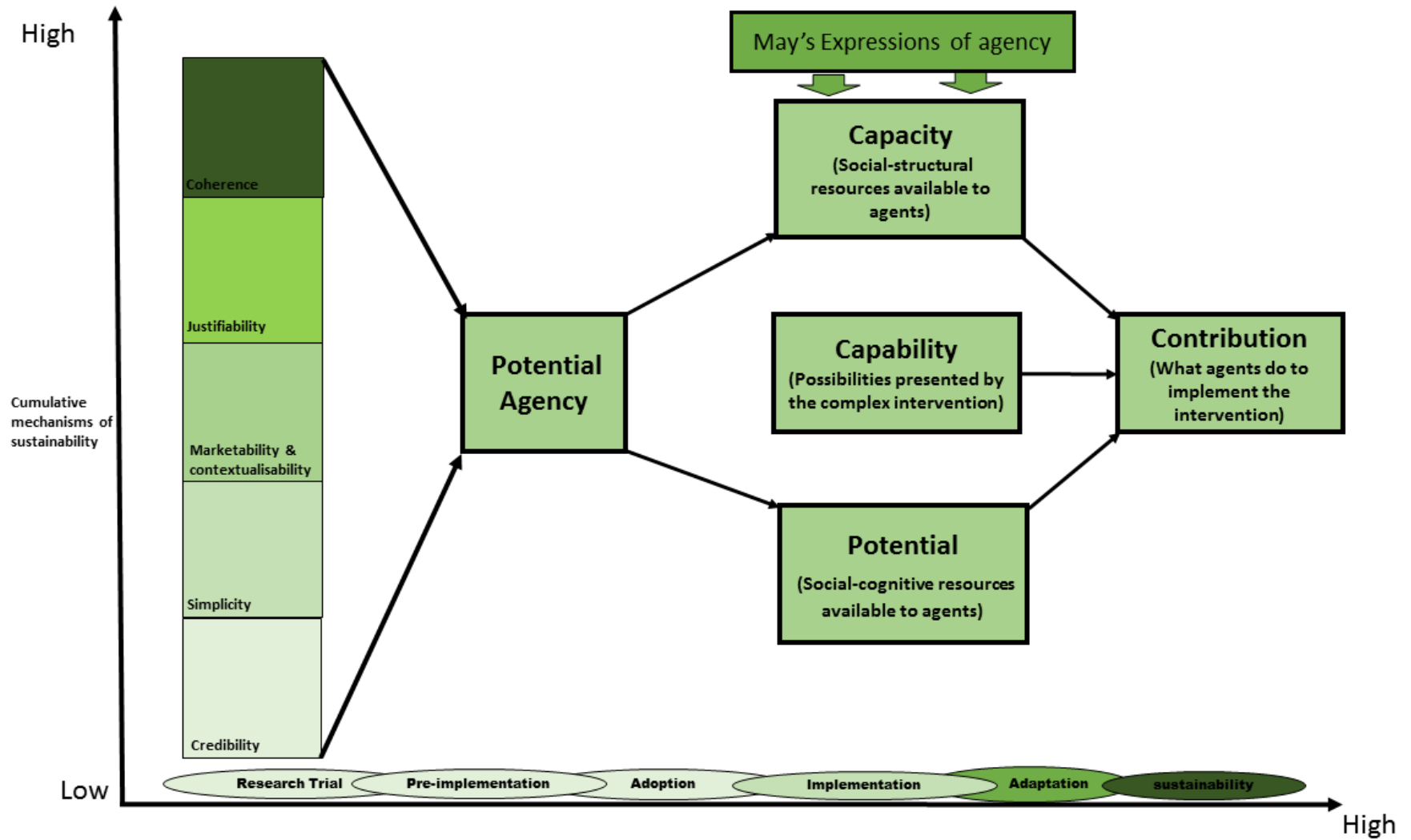
10.5 Conclusion

These findings have extended knowledge towards a potential general theory of implementation and sustainability, while offering empirical support to some of the findings from the research, which inspired this PhD project (Pearson et al. 2015a). In addition, they contribute to some of the knowledge gaps that were identified by (Proctor et al. 2011) and (Shelton, Cooper, and Stirman 2018) discussed in sections 2.3d) and 2.6c).The key contribution to knowledge is the typology of sustainability discussed in Chapter 9, and this contributes to the need to advance the theoretical base for sustainability research (Proctor 2011).

In addition, we can increase the studies of sustainability by adopting the proposed process-based conceptualisation of sustainability. This could also advance research designs for sustainability research. These findings also have a range of implications that require some changes in how community-based public health programmes and their benefits are communicated, disseminated, and evaluated, and they highlight some ethical challenges for peer education programmes that involve children. Finally, in embracing the conceptualisation of sustainability as both a stage of the implementation process and as a process in itself, the findings try to resolve the problem of conflating the concept of implementation and that of sustainability that was identified earlier in section 2.6b). Thus, the findings provide some clarity on how to separate the interconnected terms of implementation and sustainability.

Reflective note 9

I turn up at the school gate and I am greeted by an excited Millie. She says Mommy! I finished all my water! She holds her empty water bottle to my face! I say yay! well done! But inside I am so jealous of her. If only the hardest thing I had to do today was to drink water! And if only I had a right to go fishing for compliments for such an "impressive achievement" and if only people would go **WOW Thandie** you finished your water?! Impressive! However, today I had another interview, but I have stopped expecting anything out of them. So if anyone did better than I think I did this time, then I will have to re-evaluate my options, and those won't be to improve my interviews. So instead of dwelling on it, I just join Millie with a little dance on the occasion of her having drunk all her water! I say Well done Millie!

This is the last Friday that I pick up Callista and Millie from school, and go back to writing this thesis. I have been looking forward to Friday pick-ups because Millie gets her spelling test results and Callista her times tables. We have a pact. If she gets all eight spellings then they get a usual kiss plus eight more at bedtime. The goal is not to lose a single kiss. She has been bringing eight kisses back each week since her first test, in which we did not practice and she only got four. I felt guilty and selfish for focusing on my own education. I had to make time for that. So it has been a joy to see her collect her super speller certificates since. I however, finish this thesis never having mastered how to spell at least two names from my key reference list, but I still expect that PhD certificate! As for Callista, her school has just reminded me that I haven't made her secondary school choices yet. She wants to go to the same school as a certain friend. I want to avoid that school for exactly the same reason! The pair are not good together. I may have a battle on my hands butI will have time for it.

So, the last six months have felt as long as the entire length of the PhD. I am as tired of looking at this as everyone around me is of seeing me glued to my computer. I think my reader is also tired of reading. So it has to end. I hope these little notes have lightened the load of reading though the 000's of words. So before I conclude, I hope they have spiced up what is otherwise a dry topic, and captured what else, apart from academic endeavours went into the development of this thesis. But every story needs a good ending. A call on the last interview has just comes through. This time it's a **YES!** I have just booked a night out with my friend, but my dancing kit and shoes are four years out of fashion.. …

Lesson 9

In this journey I have learnt a lot about the state of "nothing"' But I hope my readers have learnt "something" not only about programme sustainability, but also about 'resilience,' and how to sustain a career when you are a woman, a mother, a wife, and from a diverse background. It has been worth every minute.

Chapter 11 Conclusions and Limitations

In this PhD project, I set out to answer two questions:

1. What is the nature and character of the processes that make successfully implemented community-based public health programmes?
2. With reference to a school-based public health programme, how is sustainability achieved over time?

These questions have been answered through a series of four linked studies. In addition, the findings from these studies have been integrated to make the PhD's key contribution to knowledge, the typology of sustainability (chapter 9). This chapter has three objectives. Firstly, to summarise the key findings and conclusions of each of the four studies (sections 11.1). Secondly, to draw the overall conclusions from the studies for the PhD (section 11.2). The third objective is to identify the strengths and weaknesses of this PhD thesis so that an informed assessment of the applicability of these findings can be made (section 11.3).

11.1 The summary of findings and conclusions

11.1.1 The nature of the implementation process: Study I

The purpose of the review of reviews was to understand the state of knowledge around successful implementation of community-based public health programmes and to identify any knowledge gaps. The study described the implementation process, and it identified its key aspects. It also discussed the factors that are thought to support or hinder successful implementation. The following findings and conclusions were drawn from this study:

a) The implementation process is a staged yet interconnected process, which involves *pre-implementation activities, programme adoption, implementation, adaptation, and sustainability*.
b) Nine aspects of implementation were identified namely: adaptation, participant responsiveness, fidelity, dose received/delivered, quality of

delivery, programme differentiation, reach, theory, and programme design.

c) The stages and the aspects of the implementation process are embedded in its social-cultural environment.

d) The CFIR does not adequately reflect the social-cultural environment in which community-based public health programmes are typically implemented.

e) There was limited research on the measures of the identified aspects of implementation.

f) There was limited research on the sustainability of community-based public health programmes.

The lack of research on measures of implementation meant that I could no longer proceed with the original PhD plan to develop a framework for measures and indicators of the implementation of community-based public health programmes. At the same time, the identification of a knowledge gap in the sustainability of community-based public health programmes provided a new avenue that I could explore further.

Therefore, through the triangulation of the evidence from across the studies and of their conclusions, the subsequent studies II III and IV sought to a) extend the findings relating to the character of the implementation process for public health programmes delivered in community settings, and b) to fill the knowledge gap on the sustainability of community-based public health programmes.

11.1.2   The interview study: Study II

This study sought perspectives from the key individuals who were involved in implementing the ASSIST, about the factors which may have contributed to the sustainability of the ASSIST programme in LA (A) and how. In addition, the study was used to assess the empirical validity of some of the findings of the review of reviews (Study I).

The key findings and conclusions of the interview study II were as follows:

a) The study extended the description of the nature and character of the implementation process from Study I, by adding the idea that the stages of implementation are not only sequential, but they are also recurrent throughout the process, and so systemic.

b) The sustainability of the ASSIST programme at LA (A) can be attributed to a range of factors from the social-community environment of the programme (e.g. type of school or type of children), and the design of the programme. These factors also influence how the programme is implemented.

c) The factors that influence sustainability are embedded in the implementation process.

d) Some decision makers had unrealistic expectations of the possibility of demonstrating the local impact of the programme, and this is relevant to decisions to sustain the programme.

e) The study draws a similar conclusion to the preceding Study I, that the social-cultural environment surrounding the process of implementing the programme, including the relationships between people implementing it, the personal and reflective views of those individuals, their shared values, their agency, their relationship with decision makers, and with the programme itself play an important role in sustaining the programme.

11.1.3   The Observational study : Study III

This study offered observational insight into the implementation process of the ASSIST programme, and it was also a means of triangulating the findings of the review of reviews (Study I) and the interview Study II. The Study validated the finding regarding the barriers and facilitators of implementation that were identified in Studies I and II. It also concluded that some of the factors of sustainability are embedded in the social environment surrounding the process of implementing the programme, as well as in the implementation process. These include the relationships between the people implementing it, the personal and reflective views of those individuals, their shared values, their agency, their relationship with decision makers, and with

the programme itself. In addition, the following new findings and conclusions were made from this study:

a) The large size of the organisation which was contracted to implement the ASSIST (OWL) contributed to the programme's sustainability. However, there was limited evidence regarding the role of organisation specific factors such as its structure, or communication, or leadership.

b) The study highlighted low implementation rates of the intervention by the children, and difficulties in relating to the concept of prevention. This could have implications of the future viability of the programme.

11.1.4   The questionnaire study : Study IV

This was a secondary analysis of questionnaire data, and it was intended to support an understanding of how the children implemented the ASSIST in their peer circles, their thoughts on the programme; and if possible, some perspective on the social-cultural environment in which they implemented the programme, and whether or how these influenced programme sustainability. The study complemented many of the findings of the observational and the interview studies such as low rates of implementation and the children's perceived peer environment. In addition, it made the following new findings and conclusions:

a) The children's perceptions of the intervention (whether correct or not) were relevant to whether and how they implemented the intervention.

b) The children's perception of the implementation environment was more negative than the environment actually was, but regardless, their perceptions influenced their decisions to implement the intervention among their peers.

c) The children's social-cultural environments (e.g. the type of school they went to or their neighbourhood) was relevant to the programme's sustainability

d) The Study reinforces the conclusion of studies I, II and III that the factors of sustainability are also embedded in the social environment surrounding the process of implementing the programme.

11.2 Summary of findings

With reference to Figure 14, over time, the interactive relationship between the cumulative mechanisms of sustainability and the progressive process of implementation results in the development of four types of sustainability. The first type is *potential sustainability.* This is inherent in the trial design, and it is related to the results. Therefore, it is most important during the early stages of p*re-implementation* and *adoption.* The second is *foundational sustainability.* This is related to the programme having properties that can be promoted to its implementers and the participants and other stakeholders being able to recognise these properties in relation to themselves and their contexts (marketability and contextualisability). Therefore, it is built up during the stages of adoption and implementation. The third type is *operational sustainability.* This is dependent on the programme being considered so worthwhile *(justifiability)* that emerging barriers to implementation are resolved, including adapting the programme where necessary. Therefore, this type is built up throughout the stages of implementation and adaptation.

However, these three forms of sustainability are temporary or non-stable in nature because the absence of any one of them can trigger programme stoppage. This means that a programme can fail to achieve actual sustainability because for example, it lost its justifiability or it had poor marketability. Consequently, stable or *long-term sustainability* is actualised when the mechanisms of sustainability are *consistently* present across the progressive implementation process, when they are present in multiple domains, (e.g. the individuals, the organisational, and the social environment), and when they are perceived as present by those involved in the implementation process, i.e. a *consistent* presence of the theories.

11.3 Overall conclusions for the PhD

The following overarching conclusions can now be drawn from the general findings and conclusions of the four studies. These respond to the two overarching questions of the PhD project.

a) **Research question 1: What is the character and nature of the implementation of community-based public health programmes?**

The implementation of community-based public health programmes is characterised by an interactive chain of the stages of the implementation process, namely, 1) p*re-implementation activities,* 2) *the* process of *adopting* the programme*, 3)* the actual *implementation,* 4) any necessary *adaptations* to the programme and 5) sustainability. These components are interactive and so they influence each other to feedback onto the process. In addition, the process of implementation is also influenced by nine aspects of implementation namely *adaptation, participant responsiveness, fidelity, and dose received/delivered, quality of delivery, programme differentiation, reach, theory, and programme design.* These aspects also interact with factors related to the context, including the social-cultural environment in which the intervention is implemented. Further, these factors are not adequately reflected in the Consolidated Framework for Implementation Research (CFIR) (Damschroder et al. 2009).

b) **Research question 2: How are public health programmes sustained over time?**

The *sustainability* of the programme is embodied in the implementation process, and it progresses with it. Thus, sustainability is not just an end stage of a successfully implemented programme; it is also part of it. Higher forms of sustainability are achieved through the prolonged interaction between a progressing implementation process and the mechanisms of sustainability

Some mechanisms are more crucial at particular points of the implementation than at others, but as it is with the stages of the implementation process, the mechanisms of sustainability also influence and extend into each other. For example, the most important theoretical attributes before a programme is *adopted* are its *credibility and simplicity.* On the other hand*, contextualisability and marketability* are most crucial during *implementation.*

Justifiability is crucial for maintaining the *implementation*, but like all other theories, it is also required throughout the entire process (*consistency).*

The interaction of the mechanisms of sustainability and a progressing implementation process result in a gradient of a typology of sustainability namely; 1) potential sustainability (present at trial and during adoption), 2) foundational sustainability (emergent during adoption and implementation), 4) operational sustainability (emergent during implementation and adaptation) and 5) actual sustainability (the end-product).

Therefore, through this thesis, I have added new insight into the nature and character of the process of implementation of community-based public health programmes, and I have developed a new way of conceptualising the sustainability of those programmes. In addition, I have attempted to bridge the knowledge gap on sustainability that some of the supervisory team (Pearson et al. 2015a) found, including how sustainability happens and where it is located. I have also contributed to known gaps of sustainability such as the development of the theoretical base of sustainability research, and the conceptualisation of sustainability and these have the potentially to enhance the development of a type of sustainability studies that happen as early as the trial stage. This can potentially enhance the designs of sustainability research. These gaps in knowledge were also identified by (Proctor et al. 2015) and (Shelton, Cooper, and Stirman 2018).

With reference to the ASSIST case study, then using the typology of sustainability that has been developed, the children's low rates of implementation, suggest that that, the ASSIST may have achieved *operational* sustainability at LA (A), but it is unlikely to have achieved *actual* sustainability (See typology of sustainability Figure 14). This is because it appears that reasons for the children's low rates of implementation suggest that almost all of the mechanisms of sustainability such as simplicity, credibility, justifiability, marketability, and contextualisability were weak for the children.

Finally, the findings of this thesis need to be considered in the context of the key limitations of the overall project and of the composite studies. With reference to the study methods and the triangulation of evidence and conclusions, (Figure 3), the original overall plan was to do a comparative case study of two Local Authorities: LA (A) which was still implementing the programme, and LA (B) which had stopped it. Under this plan I would conduct only two main studies, Study I and Study II, but Study II would have had two arms, one for LA (A) and the other for LA (B). However, that plan was abandoned because it was not possible to trace an adequate number of the required individuals at LA (B). This loss of case means that the project was unable to gain the perspective of a Local Authority that had decided to abandon the programme (i.e. non-sustainability versus sustainability), and it was not possible to compare the findings from the two local authorities.

However, this loss of a case study was compensated by a deeper investigation of Local Authority A through the addition of an observational study of the implementation process and its organisational environment, and the questionnaire study of the children who had participated in the programme. Thus, although case study B was lost to the project, the addition of Studies III and IV provided a different avenue of investigation and so they provided insight, which would not have been possible if I had retained the original comparative study design. Therefore, the loss of the case study does not necessarily represent a weakening of the studies but rather, it represents a different way of handling the investigation.

However, Study I was limited by its status as a review of reviews so I could only answer the research questions to the extent that the included studies had the relevant information. The insights in study II were limited by the fact that interviewees report from their own perspectives, while those of Study III were prone to my biases as the researcher. The questionnaire study was also limited by the fact that it was a secondary study, and I was unable to improve the quality of some of the questions in it. Therefore, given these inherent weaknesses, the triangulation of the findings from the different

studies strengthen the construct validity of the methods used this case study project (Yin 2014). Thus, a key strength of this thesis is in the fact that the findings have been triangulated from, multiple methods of studying the same phenomenon. Therefore, although my synthesis was challenged by terminological diversity, the consistency of the findings across different studies with different methods cannot be dismissed.

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Appendices

Appendix 1 : Extract from the ethics application

Thandiwe Hara-Msulira
PhD Student
University of Exeter Medical School
E: th373@exeter.ac.uk
T: 01392 722 762
13th November 2016

To: The Chair Research and Ethics Committee

RE: Request for approval of application

On 1st September 13th June 2016, I submitted a full application for approval by the Research Ethics Committee, reference **16/06/098Δ1**.

Feedback received: Strands 2 and 3:

(i)   *Note taking during ethnographic observations*
The Committee requires an assurance that participants will be forewarned that they will be observed and notes taken. Details of how the security and transportation of notes is to be managed are required.

My response:
- I have now amended all information sheets to warn participants that I will be taking notes during the session (See Appendices 2A 2B 2C 2D 2E 3A and 3C).

(ii)   *Opting-Out process*
The Committee recommends that the need for parental consent for the child trainers should be revisited and suggests that advice be sought from the Child Mental Health Group (CMHG). As the observation focuses on the trainer not the children, giving children the option to opt out on the day (individually not as a group to avoid coercion) may be a simpler option for this element of the project.

Response:
On the basis of this feedback I consulted CMHG Tamsin Ford, Katrina Wyatt and Abby Russell. A key consideration in their advice was that, getting the children to opt out on the day, presents a high risk of the project failing at the last minute if one child opted out and that would have big implications for the rest of the PhD. Given that the project itself posed a very low risk of harming its participants, the risk of the project failing was considered needlessly high.

Advice:
With good clear information the young people and parents can make an informed choice which would be for most of them that it matters not if there is an observer and that a formal process is neither necessary nor proportionate and actually might increase anxiety and undermine young people's autonomy to opt out. The full details of everything that was considered to come to this conclusion are outlined in **section 22** of the form.

New process
The new consenting process is less formal and relies on transparency and communication rather than on formally signed forms. Parents and children will be advised that their child has been selected to take part in the ASSIST programme, which was also being evaluated via observations (Appendix 2D/2E). This means parents and children will be accepting to take part in a programme that was under evaluation. There is no need for a second wave of consenting process for the evaluation part of the project.

UEMS REC V2 Dec 2015   1

The transparency process will be as below:

1. At the time of first introducing the project, liaison teachers and trainers will explain to children what the ASSIST project is, how it will work and that it is being evaluated through observation (Appendix 2D and 2E).
2. Before the training date, the parents and the children will be given information about the ASSIST programme and information sheets about the evaluation study (Appendix 2D).
3. I will have a pre-training briefing session with the trainers about the project and what I will be observing. This will help them to be able to clarify any matters that the children may raise with them.
5. Immediately before the session starts, I or the trainer (whichever was more suitable according to the trainer) will remind the children of my presence and purpose in a friendly manner.
6. I will wear a large badge identifying me as a researcher throughout the day.
7. Children will have opportunity to ask me questions during break times or after the session.

Other changes to consenting process

Trainer of Trainers
On the basis of the advice from the CMHG, I reviewed the consenting process for the rest of the project and I concluded that the previous consenting process for the trainer of trainers was also inappropriate for exactly the same reasons. This is because the risk of one participant trainer withholding consent was higher than that of the project harming the participants. Therefore, in the new process, participants will be fully advised that they had agreed to take part in the ASSIST project which was being evaluated. The objectives of the process will be made very clear throughout the process (Appendix 2C), and the trainer of the session will give a formal written consent (Appendix 2B).

Other Amendments: In the previous application the ethnographic observation was of the public Health team XXX Council. However, since that application was made, I have started the strand 1 interviews and more detail of the setup of the programme has emerged. This information has necessitated the following 3 adjustments to this part of the plan:

i) **Placing the observations at OWL rather than XXX Council Public Health Team.** Unlike in the previous arrangements, the XXX Public Health team now maintains a purely commissioning and monitoring role, while the delivery activity is now the full responsibility of the commissioned organisation, OWL. Therefore, it makes more sense for me to observe XXX as the implementing organisation rather than XXX City council the commissioner. Both organisations are in support of the new plan. The objectives and the methods have not changed, just the setting.

ii) **Clarity and flexibility of activity:** Section 7 now clarifies that I will be observing XXX as the implementing organisation. The previous application may have implied that this part of the observations would be restricted to ASSIST related activity. This clarification will enable me to observe general phenomena applicable to the ASSIST. For example, observing a planning or a review session of another health promotion project (e.g. a physical activity one) may clarify how sustainability as a phenomena is handled in the organisation, while observing a problem solving

meeting for a different programme may reveal how barriers to sustainability are dealt with etc.

iii)   **Clarity on implemtation:** The second small amendment is closely related to the above, and is to clarify that I will be observing the implementation of the programme live in action. The previous application may have implied that I was observing just the training parts of it. This clarification will allows me to take flexible decisions to observe non-training activity which may emerge in the processes of the implementation (e.g. a planning session, or a problem solving meeting).

I am now hopeful that this is a robust and appropriate consenting process. In addition, given the latest information on the programme, the additional amendments are not substantial changes to the project, but that they are both appropriate and necessary. I look forward to your considerations.

Yours Sincerely

Thandiwe Hara-Msulira

Appendix 2: Letter and certificate of project approval

UNIVERSITY OF EXETER | MEDICAL SCHOOL

Our Ref: RG/CB/16/06/098Δ1

6 October 2016

Please reply to:
Ruth Garside, PhD
Chair, UEMS Research Ethics Committee
University of Exeter Medical School
c/o Carol Barkle
Administrator to UEMS REC
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Thandiwe Hara-Msulira
PhD Researcher
University of Exeter Medical School
South Cloisters
University of Exeter
St Luke's Campus
Heavitree Road
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EX1 2LU

Dear Ms Hara-Msulira

Application Number: 16/06/098Δ1
Project Title: Evaluation of the sustainability of a school based Public Health programme

I am writing to confirm that I am now happy that you have addressed all the points made by the UEMS Research Ethics Committee relating to the above project. I have approved this project under Chair's Action with immediate effect and have pleasure in enclosing your Certificate of Approval.

Approval of this study will be formally ratified by the University of Exeter Medical School Research Ethics Committee at its next meeting on the 24th November 2016.

Good luck with your study.

Yours sincerely

Ruth Garside, PhD
Chair
University of Exeter Medical School Research Ethics Committee

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Interim Pro Vice Chancellor and Dean **Professor Angela Shore**

University of Exeter Medical School
Research Ethics Committee

Certificate of Ethical Approval

Research Institute/Centre: Institute of Health Research

Title of Project: Evaluation of the sustainability of a school based Public Health programme – Strand 1

Name(s) of Project Research Team member(s): Thandiwe Hara-Msulira, Prof Rob Anderson, Dr Mark Pearson and Dr Sarah Dean

Project Contact Point: Thandiwe Hara-Msulira

This project has been approved for the period

From: October 2016

To: September 2017

University of Exeter Medical School
Research Ethics Committee approval reference: Oct16/B/098Δ1

Signature: *RGarside*

Date: 6 October 2016

Name of Chair:
Ruth Garside, PhD

Your attention is drawn of the attached paper "Guidance for Researchers when Ethics Committee approval is given", which reminds the researcher of information that needs to be observed when Ethics Committee approval is given.

Application Reference Number 16/06/098Δ1

Appendix 3: **Master search strategy used in the Thomson Coon study**

Database: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) <1946 to Present> --
1 exp "diffusion of innovation"/ (14285)
2 Health Plan Implementation/ (3399)
3 action research.ti,ab. (1993)
4 healthcare innovation.ti,ab. (28)
5 "bench to bedside".ti,ab. (1478)
6 "barriers and facilitators".ti,ab. (1151)
7 (barriers and facilitators).ti. (496)
8 implementation science.ti,ab. (166)
9 implementation strateg*.ti,ab. (1221)
10 (implementation adj3 method*).ti,ab. (1895)
11 (implementing adj3 program*).ti,ab. (2069)
12 (implementation adj3 program*).ti,ab. (4390)
13 implementation research.ti,ab. (271)
14 (effective* and implementation).ti,ab. (20980)
15 (implementation adj4 review*).ti,ab. (751)
16 (implementation adj2 guidelines).ti,ab. (855)
17 (implementation adj2 system*).ti,ab. (1082)
18 (translational adj (medicine or science or research)).ti,ab. (4359)
19 (effectiveness research and implement*).ti,ab. (129)
20 exp Comparative Effectiveness Research/ and implement*.ti,ab. (90)
21 (information adj3 dissemination).ti,ab. (1573)
22 knowledge management/ or organizational innovation/ (19930)
23 exp Knowledge Management/ (111)
24 Organizational Innovation/mt [Methods] (8)
25 knowledge management.ti,ab. (643)
26 knowledge adoption.ti,ab. (5)
27 (knowledge adj (brokering or communication)).ti,ab. (92)
28 (knowledge adj (cycle or development or application)).ti,ab. (443)
29 (knowledge adj (diffusion or exchange)).ti,ab. (205)
30 (knowledge adj (mobili*ation or synthesis)).ti,ab. (84)
31 (knowledge adj (transfer or translation or transformation)).ti,ab. (1340)
32 (knowledge adj (update or utili*ation)).ti,ab. (92)
33 "know do gap".ti,ab. (29)
34 integrated knowledge.ti,ab. (158)
35 integrating knowledge.ti,ab. (102)
36 "knowledge to action".ti,ab. (312)
37 "linkage and exchange".ti,ab. (17)
38 organi?ational innovation.ti,ab. (53)
39 (research adj (capacity or utili?ation)).ti,ab. (1125)
40 technology transfer.ti,ab. (698)
41 (translational adj (medicine or research or science)).ti,ab. (4359)
42 "transmission of knowledge".ti,ab. (179)
43 "research into practice".ti,ab. (480)
44 (research adj2 integration).ti,ab. (336)
45 (research adj2 utili?ation).ti,ab. (913)
46 or/1-45 (79300)
47 (systematic adj2 review*).ti,ab. (43534)
48 (evidence adj2 synthes*).ti,ab. (2230)
49 Health Services Research/mt (4430)
50 systematic approach.ti,ab. (5241)
51 (qualitative and review).ti,ab. (7093)
52 47 or 48 or 49 or 50 or 51 (59892)
53 46 and 52 (2003)
54 53 not protocol.ti. (1954)
55 limit 54 to yr="2000 - 2013" (1731)

Appendix 4: Studies that were excluded and the reasons for their exclusion

ID	Author/Year	Interventions targeting populations or groups of people?	Interventions are of prevention of ill health or promotion of good health.	Interventions took place in a community setting?	Comments
1	(Addington 2010)		No	No	Study focused on primary care and not preventative care. The focus was on the implementation of quality measures rather than on a public Health intervention
2	(Barwick 2012)	No	No		The study focused on the behaviour change for practitioners and it specifically excluded those papers that focused on members of the public
3	(Baskerville 2012)	No	No	No	The focus was on practice facilitation studies that identified evidence based guideline implementation within primary care
4	(Bostrom 2012)		No		The focus was on the care of older adults rather than on implementation and the outcome of interest was physician behaviour. Most of the articles were reported to have focused on translating knowledge to physicians in the treatment of diseases while for the patients the emphasis was on immunization and screening.
5	(Bywood 2009)	No	No	No	The focus was on the impact of Opinion Leaders on health care professional behaviour/ the outcomes of interests were about the professionals' in health care provider settings rather than the community.

ID	Author/Year	Interventions targeting populations or groups of people?	Interventions are of prevention of ill health or promotion of good health.	Interventions took place in a community setting?	Comments
6	(Bywood 2008)	No	No	No	The focus was on evaluation of the effectiveness of professional practice change interventions. The outcomes of interests were about the professionals' in health care provider settings rather than the community.
7	(Clayton 2012)	No		No	Reviewed Government initiatives focused on changing the behaviour of employers rather than employees.
8	(Chaudoir 2013)	No		No	There was no specific intervention in the community. The paper is a SR of measures of implementation and so theoretical in nature.
9	Contandriopoulos (2010)	No	No	No	The focus was on the knowledge exchange process in organisations and Policy arenas and not a Public Health Program situated in the community.
10	Davies (2010)	No	No	No	The focus was on the Use of theory in the studies evaluating clinical practice guideline dissemination and implementation strategies and not any Public Health program.
11	Davies (2011)	No	No	No	The focus was practitioners and on the approached facilitative of treatment rather than a specific Public Health intervention.
12	Dexheimer (2008)	No		No	The focus was not a Public Health intervention in the community but on preventative care delivered in clinical settings such as vaccinations during primary care visits.

ID	Author/Year	Interventions targeting populations or groups of people?	Interventions are of prevention of ill health or promotion of good health.	Interventions took place in a community setting?	Comments
13	Ehiri (2006)	No			The focus was on the effectiveness of the types of interventions as opposed to the implementation aspects of the intervention. The comparator was another intervention as opposed to another group
14	Ellis (2003)	No	No		Paper looked at the diffusion of evidence based strategies for disseminating Cancer control interventions, so not a specific Public Health intervention.
15	Ellis (2005)	No			Paper looked at studies evaluating the diffusion and dissemination of Cancer control interventions that promote behaviour change in physicians so not a specific Public Health intervention.
16	Goodwin (2011)	No			Although this study looked at community dwelling older people the focus was on how health care professionals' can implement fall prevention strategies as part of clinical practice. The outcomes investigated ere on health care professionals' and only two included papers were reported as looking at Peer/community based interventions but even these only looked at intervention effectiveness and not the implementation process.
17	Hage (2013)	No	No		The focus was on the adoption of E-health programmes in rural settings. Not a particular Public heath intervention.
18	Huis (2012)	No	No	No	Focused on hospital-acquired infections within treatment centres.

ID	Author/Year	Interventions targeting populations or groups of people?	Interventions are of prevention of ill health or promotion of good health.	Interventions took place in a community setting?	Comments
19	Helmsely –Brown (2004)	No	No	No	Focus on the use of research evidence by managers in education, health care and business. There was no focus on community based Public Health specific interventions.
20	Jackson (2010)	.	No	No	The focus is on treatment and providers are medical professionals in treatment settings. The intervention is screening for alcohol misuse.
21	Kaplan (2009)	No	No	No	The focus was on contextual factors that affect the Quality Improvement (QI) success. There is no specific Public Health intervention and setting. The focus is on the organizational aspects of QI.
22	Kukafka (2003)	No	No	No	He focus is on implementation of information technology. There is no specific Public Health intervention.
23	La Rocca (2012)	No	No		Focus was on Effectiveness of Knowledge Transfer strategies rather than the implementation.
24	Lawrence (2012)		No		The focus was on making psychosocial interventions (i.e. treatment) work in care homes.
25	Mitton 2007	No	No		Focused on KE strategies and aimed to summarise the current evidence base for Knowledge Transfer and Exchange in relation to health policy. There was no community based Public Health interventions

ID	Author/Year	Interventions targeting populations or groups of people?	Interventions are of prevention of ill health or promotion of good health.	Interventions took place in a community setting?	Comments
26	O'Campo (2011)		No	No	The focus was on Intimate Partner violence screening programmes in health care settings. Interventions in non-health care settings were excluded.
27	Orton 2011	No	No	No	The focus was on how research evidence is used by Public Health Decision makers. No specific Public Health intervention
28	Pedrana (2011)		No		The focus was HIV testing which is classified as screening for treatment.
29	Roen (2006)	No	No		Although the study appeared to meet the inclusion criteria, the focus was on methodology and how Systematic reviews can better incorporate studies of implementation. It assessed SRs on implementation of community initiatives and reported on how these studies were reported as opposed to how the implementation of the studies.
30	Rees (2004)		No		Although this study appears to satisfy all the inclusion criteria it fosses on the barriers and facilitators of HIV related sexual health for men who have sex with men/ the focus was on their experience of Sexual health in light of HIV as opposed to the implementation of programmes for this population.

ID	Author/Year	Interventions targeting populations or groups of people?	Interventions are of prevention of ill health or promotion of good health.	Interventions took place in a community setting?	Comments
31	Shepherd (2006)	No			The focus was on the wider determinants and barriers/facilitators of healthy eating among young people. It sought to explain what prevents adoption of healthy eating as opposed to barriers and facilitators of the implementation process.
32	Stacey (2010)	No	No		The focus is on strategies for the translation of evidence based knowledge for fitness trainers. There is no specific Public Health intervention. The focus is on the practitioner and not the public. It is focused on knowledge uptake rather than implementation
33	Stone (2012)		No		The focus was on Palliative Care and prison based Hospice care so is treatment based.
34	Weening-Verbree (2013)	No			The Target population was health care professionals involved the implementation of oral health care for older people in nursing homes and long term care facilities.

Appendix 5: Summarised data extraction sheet for Study I

Author	Process/stage	Process facilitators/barriers	Aspect of implementation
Child (2012)	▪ Adaptation	▪ Cultural appropriateness ▪ Communication ▪ Practicality issues ▪ Social Meaning of Intervention of Fall prevention programs ▪ Self-agency ▪ Choice offering - Social vs cultural norms of expectation ▪ Perceptions about the intervention. ▪ Identity	▪ Engagement of participants
Clayton (2011) (a)	▪ Flexibility	▪ Participants views need to align with program purpose ▪ Participant trust	▪ Design
Clayton (2011) (b)	▪ Adaptation/Tailoring/ Flexibility	▪ Access to Intervention ▪ The social meaning of interventions ▪ The stigma attached to interventions ▪ Social work/identity was affected by subsidised jobs ▪ Programme purpose to align with participants	▪ Greater control by participants
Durlak (2008)	▪ Adaptation	▪ Program Champion ▪ Contextual appropriateness ▪ Staff ▪ Training ▪ Technical Assistance ▪ Provider Skill ▪ Technical Assistance ▪ Coordination with other agencies ▪ Funding ▪ Accurate Monitoring and feedback ▪ Infrastructure	▪ Fidelity ▪ Dose ▪ Quality ▪ Participant responsiveness ▪ Programme differentiation ▪ Monitoring of comparison situation ▪ Reach ▪ Implementation is affected by features related to communities, providers and innovations
Dusenbury (2003)		▪ Time ▪ Training ▪ Money ▪ Resources ▪ Program complexity ▪ Program manuals ▪ Organisation characteristics ▪ Teacher characteristics ▪ Leadership	▪ Adherence ▪ Dose ▪ Quality ▪ Participant Responsiveness ▪ Program Differentiation

Author	Process/stage	Process facilitators/barriers	Aspect of implementation
Garside (2010)	• Pre-implementation activities	• Time • Cost • Lack of knowledge in providers • Workload • Interference with daily life • Family Support • Self-Efficacy • Identity • Stigma and labelling – e.g. of both the intervention and those who get the disease. (irresponsible) • Perceptions (+ve or –ve) of the Intervention • Social values and expectations (e.g. Tan • Risk perceptions	
Greenhalgh (2007)	• Pilot Interventions (pre-implementation activities).	• Consultation • Partnerships • Awareness • Interaction with Social Factors – meal substitution • Historical/Policy contexts • A shifting social Context • Intervention theory	• Adaptation • Fidelity
Ingram (2011)	• Adaptation/Tailored A education • Pre-implementation activities	• Partnership working • Relevance to participant • Targeting groups • Culture • Awareness • Interaction with social context • Differential Impact • Social Meaning of intervention (stigma of interacting with intervention or Authorities • Self-Efficacy • Trust	• Theory
Maxine Johnson (2011)	• Adaptability (e.g. timing to fit religious calendar). • Pre-implementation activities	• Cultural awareness of implementers • Social Cultural norms affecting Behaviour change • Access to facilities • Cost • Time • Appropriate support • Communication/language • Cultural norms as a resistance change (e.g. fatalism)	• Acceptability

Author	Process/stage	Process facilitators/barriers	Aspect of implementation
		• Perceptions of the intervention e.g. association of obesity with good health.	
McIness (2004)	• Sustainability • Pre-implementation activities	• Consultation – what aspects are individuals willing to modify • Views of patients may be indicators of factors that promote adherence and acceptability. • Social Value – need to promote social value of interventions. • Alignment of participant views with intervention • Programs that promote social aspects facilitated success. • Intervention conferring social stigma • Social aspects of interventions can be a selling point • Interventions can alienate • Denial of illness • Embarrassment • Participant preferences • Participant Perception of risk	• Adherence • Acceptability
McMahon (2012)	• Feasibility • Adoption • Implementation • Maintenance	• Cultural and contextual perspectives and characteristics of target populations • Partnership • Critical program content • Social context • Complexity of human responses to fall risk – the complexity of diverse practice setting and the relational elements in health prom activities.	• Acceptability • Reach • Theory
Murta (2007)	• Implementation	• Managerial support • Context • Participant attitudes	• Dose • Monitoring • Fidelity • Recruitment
Parker Fielbelkon (2012)	• Adoption • Pre-implementation activities	Understanding of: • existing behaviours • cultural practices • Social context • Behaviour Change theories • Cultural relevance	• Design

Author	Process/stage	Process facilitators/barriers	Aspect of implementation
Peres Escamilla (2012)	- Pre-implementation e.g. Assessment of broad landscape - Sustainability - Adaptation - Innovation	- Partnership - Political will - Advocacy - Mass media campaigns - Social mobilisation - Training - Communication - Incentives - Support groups. - Social meaning of the intervention - Context	- Receptivity/acceptability - Engagement - Design
Amudha-Poobalan (2009)		- Training - Incorporation of the values of relationship - Cultural fit - Cost - Attitudes of deliverers - Targeting specific behaviours - Targeted age/gender	- Duration - Engagement
Borsika Rabin (2010)	- Adoption - Implementation - Maintenance	- Strategy - Moderators: - Intervention characteristics - Adopter characteristics - Contextual factors - Outcomes - Effectiveness.	- Theory - Reach
Semenic (2012)	Pre-implementation activities e.g. building awareness	- Endorsement by Govt political leaders - Leadership - Training - Contextual Features - Organisational Context - Culture - Time - Education/Awareness - Interpersonal relationships - Environmental complexity - Resources	

Author	Process/stage	Process facilitators/barriers	Aspect of implementation
		- Resistance to change - Establishment of formal and informal networks of engagement between diff professional groups and key agencies in the community to support continues BF post hospital. - Support services	
Dwayne Van Eerd (2010)	- Adaptation - Pre-implementation activities e.g. organisational training	- Resources - Training - Organisation Training - Communication - Successful communication - Skilled People - Worker involvement and inclusion - Teams with Appropriate members - Team work - Training	
Smithson (2011)	Adjusting Interventions	- Cost - Barriers identified at Organisational Environmental and Personal levels - Trust - Suspicion of free offers from strangers - Fatalism & attitudes	
Williams (2011)	- Tailoring - Context	- Participatory methods - Lack of understanding of values/norms - Challenging moral values - Competing church priorities. - Trust - Stigma/Identity	
Arai (2005)	- Adaptation - Pre-implementation activities	- Program needs strong central theme - Active involvement of key stakeholders - Local key figures/community leaders - Partnership working - Cultural appropriateness - Communication - Awareness	- Connection to social context. - Participant views and trust - Perceptions of the intervention

Appendix 6 : Extracted data mapped into the dimensions of the CFIR

Intervention characteristics	Outer Setting	Inner Setting	Characteristics of Individuals	Process
1. Program with a strong central theme 2. Cultural appropriateness/relevance 3. Contextual appropriateness 4. Time 5. Program complexity 6. Cost 7. Relevance to participants 8. Targeting groups 9. Language 10. Views of participants on intervention 11. Resources 12. Participant resistance to change 13. Relevance of outcomes 14. Effectiveness	1. Access to intervention facilities 2. Political will 3. Contextual Factors/features 4. Endorsement by Govt leaders 5. Support services in the community (e.g. with breast feeding) 6. Environmental factors 7. Competing priorities	1. Communication 2. Training 3. Technical Assistance 4. Funding 5. Leadership 6. Workload 7. Awareness of context 8. Incentives 9. Skilled people	1. Cultural Awareness of implementers 2. Provider skill 3. Teacher characteristics 4. Family support for individual participant 5. Attitudes of deliverers 6. Adopter characteristics 7. Personal level factors	1. Partnership working 2. Local key figures/community leader involvement 3. Program champion 4. Monitoring and feedback 5. Consultation 6. Mass media campaigns 7. Advocacy 8. Social mobilisation 9. Communication 10. Support groups 11. Targeting specific rather than multiple behaviours 12. Strategy 13. Education/Awareness 14. Interpersonal relationships 15. Worker involvement 16. Group consultation 17. Community Based Participatory methods 18. Challenging moral values

Appendix 7 : CFIR Constructs with short definitions

These definitions of the constructs are as reported by Damschroder (2009) and they are made available for free downloading on the official CFIR website here https://cfirguide.org/constructs/

CONSTRUCT	DESCRIPTION
I. INTERVENTION CHARACTERISTICS	
A Intervention Source	Perception of key stakeholders about whether the intervention is externally or internally developed.
B Evidence Strength & Quality	Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes.
C Relative advantage	Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution.
D Adaptability	The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.
E Trialability	The ability to test the intervention on a small scale in the organization [8], and to be able to reverse course (undo implementation) if warranted.
F Complexity	Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement
G Design Quality and Packaging	Perceived excellence in how the intervention is bundled, presented, and assembled
H Cost	Costs of the intervention and costs associated with implementing that intervention including investment, supply, and opportunity costs.
II. OUTER SETTING	
A Patient Needs & Resources	The extent to which patient needs, as well as barriers and facilitators to meet those needs are accurately known and prioritized by the organization.
B Cosmopolitanism	The degree to which an organization is networked with other external organizations.
C Peer Pressure	Mimetic or competitive pressure to implement an intervention; typically because most or other key peer or competing organizations have already implemented or in a bid for a competitive edge.
D External Policy & Incentives	A broad construct that includes external strategies to spread interventions including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaborative, and public or benchmark reporting.

III. INNER SETTING	
A Structural Characteristics	The social architecture, age, maturity, and size of an organization.
B Networks & Communications	The nature and quality of webs of social networks and the nature and quality of formal and informal communications within an organization.
C Culture	Norms, values, and basic assumptions of a given organization.
D Implementation Climate	The absorptive capacity for change, shared receptivity of involved individuals to an intervention and the extent to which use of that intervention will be rewarded, supported, and expected within their organization.
1 Tension for Change	The degree to which stakeholders perceive the current situation as intolerable or needing change.
2 Compatibility	The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals' own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems.
3 Relative Priority	Individuals' shared perception of the importance of the implementation within the organization.
4 Organizational Incentives & Rewards	Extrinsic incentives such as goal-sharing awards, performance reviews, promotions, and raises in salary and less tangible incentives such as increased stature or respect.
5 Goals and Feedback	The degree to which goals are clearly communicated, acted upon, and fed back to staff and alignment of that feedback with goals.
6 Learning Climate	A climate in which: a) leaders express their own fallibility and need for team members' assistance and input; b) team members feel that they are essential, valued, and knowledgeable partners in the change process; c) individuals feel psychologically safe to try new methods; and d) there is sufficient time and space for reflective thinking and evaluation.
E Readiness for Implementation	Tangible and immediate indicators of organizational commitment to its decision to implement an intervention.
1 Leadership Engagement	Commitment, involvement, and accountability of leaders and managers with the implementation.
2 Available Resources	The level of resources dedicated for implementation and on-going operations including money, training, education, physical space, and time.
3 Access to knowledge and information	Ease of access to digestible information and knowledge about the intervention and how to incorporate it into work tasks.

IV. CHARACTERISTICS OF INDIVIDUALS	
A Knowledge & Beliefs about the Intervention	Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.
B Self-efficacy	Individual belief in their own capabilities to execute courses of action to achieve implementation goals.
C Individual Stage of Change	Characterization of the phase an individual is in, as he or she progresses toward skilled, enthusiastic, and sustained use of the intervention.
D Individual Identification with Organization	A broad construct related to how individuals perceive the organization and their relationship and degree of commitment with that organization.
E Other Personal Attributes	A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style
V. PROCESS	
A Planning	The degree to which a scheme or method of behaviour and tasks for implementing an intervention are developed in advance and the quality of those schemes or methods.
B Engaging	Attracting and involving appropriate individuals in the implementation and use of the intervention through a combined strategy of social marketing, education, role modelling, training, and other similar activities.
1 Opinion Leaders	Individuals in an organization who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the intervention
2 Formally appointed internal implementation leaders	Individuals from within the organization who have been formally appointed with responsibility for implementing an intervention as coordinator, project manager, team leader, or other similar role.
3 Champions	"Individuals who dedicate themselves to supporting, marketing, and 'driving through' an [implementation]", overcoming indifference or resistance that the intervention may provoke in an organization.
4 External Change Agents	Individuals who are affiliated with an outside entity who formally influence or facilitate intervention decisions in a desirable direction.
C Executing	Carrying out or accomplishing the implementation according to plan.
D Reflecting & Evaluating	Feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience.

Appendix 8: Information sheets to participants: Children

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TITLE OF PROJECT: EVALUATION OF THE SUSTAINABILITY OF A SCHOOL BASED PUBLIC HEALTH PROGRAMME

UEMS REC REFERENCE NUMBER: Oct16/B/098/1

</div>

Introduction
My name is Thandie Hara. I am a research student at the University of Exeter Medical School. I am sending you this information because have been selected to take part in the ASSIST smoking prevention programme which I am studying. I would like to understand the way in which the programme is being done in schools and why many schools and pupils have continued to be involved in it for a long time. This will involve me observing how the programme is done. This means I may observe a training sessions in which you may be present. This information is to enable you understand my project and what I will do.

What will I do?
I will observe how your training session is done. I will not ask you any questions but I will quietly make some notes in my notebook while your session is happening. After the training, the notebook will be transported securely with me and when it is not in use, it will be kept in a lockable space in my office. The notes will be typed up and saved on a password protected computer. You do not need to do anything else during my observation of the session.

What will I observe?
I will observe how the training is done, how you trainers help you understand about smoking prevention, and how they help you to be able to pass on what you learn to your friends.

What will I do with the information?
I will use the information I observes to write a report on how the programme is done and how that could help with many schools and pupils to continue to be involved in the programme. The report of the training session will be part of a bigger report that I am required to write up for my exams. I may also write it up and publish it in scientific journals for other people to know about the results of her study.

Will I mention any names in you report?
No, I will not need to mention anyone in my report and I do not need to know your personal details. I will only report on what I see during the training.

Time commitment
You will not need to any more time than that required to attend the session.

What if I have any questions?
You are free to ask me any questions during break times or at the end of the training session if you wish. You can also ask you trainer and teacher about the project and they will contact me for you. If you have any questions my project, after the training session, you can contact either me:- Thandie Hara, email: Th373@exeter.ac.uk Tel: 01392 722762 **Or** Professor Rob Anderson, who is supervising this project:-
R.Anderson@exeter.ac.uk 01392 726058

Complaints
If you have any complaints about the way in which I observed your session please tell your teacher or parents and they may contact the Co-chair of the University of Exeter Medical School Research Ethics Committee:- Ruth Garside, PhD   Co-chair of the UEMS Research Ethics Committee Email: uemsethics@exeter.ac.uk
This project has been reviewed and approved by the University of Exeter Medical

School Research Ethics Committee

Appendix 9: Information sheet to Parents

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TITLE OF PROJECT: EVALUATION OF THE SUSTAINABILITY OF A SCHOOL BASED PUBLIC HEALTH PROGRAMME

UEMS REC REFERENCE NUMBER: Oct16/B/098/1

</div>

Introduction

My name is Thandie Hara, a PhD research student at the University of Exeter Medical School. I am sending you this information because your child has been selected to take part in the ASSIST anti-smoking programme which I am evaluating. In the evaluation, I would like to understand the way in which the programme is being done in schools and why many schools and pupils have continued to be involved in it for a long time. This will involve me observing the programme live in action. This means I may observe a training sessions in which your child is present. This information is to enable you understand my project and what I will do.

What is the aim of the project?

This project is part of a PhD research project at the University of Exeter Medical School, in which I am evaluating the sustainability of the ASSIST smoking prevention programme in which your child will be trained as a peer educator.

The key aim is to understand how and under what conditions school-based public health programmes are sustainable. The ASSIST programme was chosen because it is evidence-based, it has been widely adopted across schools, and it has been running for over five years.

What will your child be asked to do?

Apart from attending the training session for the ASSIST programme, your child will not need to do anything else. I have enclosed a separate information sheet for your child to look at. Please go through it together with your child.

What data or information will be collected and what use will be made of it?

The observation will be of the training in action and not of your child as an individual in it. I may for example record a discussion point that took place in the session and how it was resolved, the techniques that the trainer used to train the group, or the issues that trainers raised during training. I will observe how the trainers are delivering the sessions, their interaction with the children, and the strategies they used to deliver the programme. I will wear a clear badge indicating that I am a researcher, so that the children can distinguish me from their trainers. I will not collect any personal data on the children, but I will record my observations in a note book for later analysis. The notebook will be transported securely with me and when it is not in use, it will be kept in a lockable space in my office. The notes will also be typed up and saved on a computer with passwords.

I will also analyse the feedback forms that the children fill in for the programme. These forms are filled in anonymously so that there is no way of knowing which child filled in which form.

All the information will later be analysed for my PhD, and it may be published in an academic journal. However no children can be named or identified from it.

The data collected will be securely stored in such a way that only my supervisors (Prof. Rob Anderson, Prof. Sarah Dean, and Dr Mark Pearson) and I will be able to gain access to it.

Why my child?

Your child will be part of this project because they and their school (Insert School) have agreed to take part in the ASSIST smoking cessation programme which the research is evaluating.

What if I am concerned about my child being observed?

This project has been assessed for its ethical principles and approved by the University of Exeter Research Ethics Committee. The observations are not about the children as individuals in the programme but rather how the programme is delivered in practice and how that may be

linked to its sustainability. There will be no need to report on any individual child or to collect any data from them. If you have any other concerns about this project, please contact me on th373@exeter.ac.uk or the programme coordinator (XXXX) or the school liaison teacher on XXXX for further clarification.

What if participants have any questions?
If you have any questions about our project, either now or in the future, please feel free to contact either:-

Thandiwe Hara
Th373@exeter.ac.uk
01392 722762
Or Professor Rob Anderson, who is supervising this project:-
R.Anderson@exeter.ac.uk
01392 726058

Complaints
If you have any complaints about the way in which this study has been carried out please contact the Co-chair of the University of Exeter Medical School Research Ethics Committee:-

Ruth Garside, PhD Co-chair of the UEMS Research Ethics Committee
Email: uemsethics@exeter.ac.uk

**This project has been reviewed and approved by the
University of Exeter Medical School Research Ethics Committee**

Appendix 10: - Information sheets to interviewees - PI

TITLE OF PROJECT: EVALUATION OF THE SUSTAINABILITY OF A SCHOOL-BASED PUBLIC HEALTH PROGRAMME

UEMS REC REFERENCE NUMBER: Oct16/B/098/1

Introduction
Thank you for showing an interest in this project. Please read this information sheet carefully as it will assist you to make a decision on your participation in the project.

What is the aim of the project?
This project is part of my PhD at the University of Exeter Medical School, in which I am investigating the processes which are crucial to the successful implementation and sustainability of school-based public health programmes.

The key aim is to understand how and under what conditions school-based public health programmes are sustained beyond their trial period. The objective is to investigate whether there are indicators of programme sustainability, suitable for use in the evaluation of the programmes. The ASSIST programme was chosen because it is evidence-based, it has been widely adopted across many schools, and it has been running for over five years.

Why me?
You are being asked to help with this project because you were the Principal Investigator during the research trial of the ASSIST smoking cessation programme.

Description of participants required
This is a case study project in which the implementation of the ASSIST programme will be compared across the two Local Authority areas A and B. Interviews will be conducted with individuals who have been involved in developing and implementing the programme, such as you the Principal Investigators of the original trial. Local Authority Area A was chosen because it has been delivering the programme for nearly five years and it is still delivering it. Local Authority Area B was chosen because it implemented the programme for three years and then stopped. The project will study the differences related to the sustainability of the two programmes.

What will participants be asked to do?
Should you agree to participate in this project, you will be asked to take part in an interview with me (Thandie Hara) the researcher, lasting about 1 hour. The interview questions will be related to your role as the Principal Investigator of the ASSIST trial, its implementation and your views about the programme's sustainability.

The interviews will be recorded and the information synthesised and written up for the PhD. It may also be published in academic journals. Please note that, the information you give will be analysed with reference to the role of Principal Investigator of the ASSIST trial, as a result some results might be identifiable to you. However, where possible, I will take all precaution to anonymise information.

Payment/reward to volunteers/interviewees
I will travel to you for the interview, so apart from your time I do not anticipate that you will incur any other costs from being involved in the project.

Time commitment
The interviews will last up to 1 hour and will be scheduled around your availability.

What data or information will be collected and what use will be made of it?

I will ask you questions regarding your role in the trial including any information on the design and implementation of ASSIST. The information will contribute to an understanding of the implementation and sustainability of the programme in school settings.

This project involves an open-questioning technique where the precise nature of the questions asked has not been determined in advance, but will depend on the way in which the interview develops. Consequently, although the University of Exeter Medical Schools' Research Ethics Committee is aware of the general areas to be explored in the interview, the committee has not been able to review the precise questions to be used.

In the event that the line of questioning does develop in such a way that you feel hesitant or uncomfortable, you have the right to decline to answer particular question(s), or to withdraw from the project at any stage without any disadvantage to yourself. The data collected will be securely stored in such a way that only my supervisors (Prof. Rob Anderson, Prof. Sarah Dean, and Dr Mark Pearson) and I will be able to gain access to it. All electronic data is stored on encrypted devices or on secure servers under the University of Exeter's IT security systems. If you wish, I can send you a summary of my research findings.

Can I be anonymous?
Due to the uniqueness of your role in the project, it will not be possible for me to anonymise all your responses. However the following steps will be taken to improve confidentiality:

- The interviews will take place in a private room
- You have a right to decline responding to any questions that you feel are too sensitive
- You will have an opportunity to see how the results of your interview have been written up and you can ask for any parts of what you say to be removed and destroyed
- You do not need to answer every question, and can withdraw from the research at any time without any disadvantage to you
- You have the right to warn me about which parts of your responses you would like to be kept anonymous and if not possible, to be deleted from the transcript

What if I decide not to take part?
You have a right to decide not to take part in the interview at any time without disadvantage to you.
What if I have any questions?
If you have any questions about our project, either now or in the future, please feel free to contact either:-
Thandiwe Hara
Th373@exeter.ac.uk
01392 722762
Or Professor Rob Anderson, who is supervising this project:-
R.Anderson@exeter.ac.uk
01392 726058
Complaints
If you have any complaints about the way in which this study has been carried out please contact the Co-chair of the University of Exeter Medical School Research Ethics Committee:-
Ruth Garside, PhD
Co-chair of the UEMS Research Ethics Committee
Email: uemsethics@exeter.ac.uk

This project has been reviewed and approved by the

University of Exeter Medical School Research Ethics Committee

Appendix 11: Information sheet to interviewees – DI Ltd

> **TITLE OF PROJECT: EVALUATION OF THE SUSTAINABILITY OF A SCHOOL BASED PUBLIC HEALTH PROGRAMME**
>
> **UEMS REC REFERENCE NUMBER: Oct16/B/098/1**

Introduction
Thank you for showing an interest in this project. Please read this information sheet carefully as it will assist you to make your decision on your participation in the project.

What is the aim of the project?
This project is part of a PhD at the University of Exeter Medical School, in which I am investigating the processes which are crucial to the successful implementation and sustainability of school-based public health programmes.

The key aim is to understand how and under what conditions school-based public health programmes are sustained beyond their trial period. The objective is to investigate whether there are indicators of programme sustainability, suitable for use in the evaluation of the programmes. The ASSIST programme was chosen because it is evidence based, it has been widely adopted across schools, and it has been running for over five years.

Description of participants required
This is a case study project in which the implementation of the ASSIST programme will be compared across the Local Authority areas of Local Authority Area A and B. Interviews will be conducted with all individuals who have played a key role in the implementation of the programme, such as you, the staff of DECIPHer Impact Ltd (DI). Local Authority Area A was chosen because it has been delivering the programme for nearly five years and it is still delivering it. Local Authority Area B was chosen because it implemented the programme for three years and then stopped. The project will study the differences related to the sustainability of the two programmes.

Why me?
You are being asked to help with this project because you and your organisation are in charge of rolling out the ASSIST programme across the UK.

What will participants be asked to do?
Should you agree to participate in this project, you will be invited to take part in a face to face or telephone interview with me (Thandie Hara) the researcher lasting about 1 hour. You will be asked questions relating to your role at DI and on the implementation and sustainability of the programme. The interviews will be recorded so that they can be listened to analysed and written up afterwards. It may also be published in academic journals. Please note that, the information you give will be analysed with reference to the organisation and your role as its staff. As a result some results might be identifiable to you.

Payment/reward to volunteers/interviewees
I will travel to you for the interview, so apart from the time commitment for the interview, I do not anticipate that you will incur other costs related to this project.

Time commitment
Interviews will last up to 1 hour and will be scheduled around your availability. You do not need to answer all of the questions, and where you feel uncomfortable, you can withdraw from the process at any time.

What data or information will be collected and what use will be made of it?
I will ask you questions regarding your organisation, its staff, and its role in the roll-out and implementation of the ASSIST programme in the UK. The information will contribute to the understanding of the implementation and sustainability of the programme.

This project also involves an open-questioning technique where the precise nature of the questions asked has not been determined in advance, but will depend on the way in which the interview develops. Consequently, although the University of Exeter Medical School's Research Ethics Committee is aware of the general areas to be explored in the interview, the Committee has not been able to review the precise questions to be used, but they are aware of the general topics that we will explore.

In the event that the line of questioning does develop in such a way that you feel hesitant or uncomfortable, you may decline to answer any particular question(s) and you may withdraw from the project at any stage without any disadvantage to yourself of any kind."

The data collected will be securely stored in such a way that only my supervisors (Prof. Rob Anderson, Prof. Sarah Dean, and Dr Mark Pearson) and I will be able to gain access to it. All electronic data is stored on encrypted devices or on secure servers under the University of Exeter's IT security systems.

Can I be anonymous?
Due to the uniqueness of your role in the project, it will not be possible for me to anonymise all your responses. However, the following steps will be taken to improve confidentiality:

- The interviews will take place in a private room
- You have a right to decline responding to any questions that you feel are too sensitive
- You will have an opportunity to see how the results of your interview have been written up and you can ask for any parts of what you say to be removed and destroyed
- You do not need to answer every question, and can withdraw from the research at any time without any disadvantage to you
- You have the right to warn me about which parts of your responses you would like to be kept anonymous and if this is not possible, to be deleted from the transcript

What if I decide not to take part?
You have a right to decide not to take part in the interview including declining to answer certain questions or to stop the interview at any time without disadvantage to you.

What if participants have any questions?
If you have any questions about this project, either now or in the future, please feel free to contact either:-
Thandiwe Hara

Th373@exeter.ac.uk 01392 722762/07888712327

Or Professor Rob Anderson, who is supervising this project:-

R.Anderson@exeter.ac.uk Tel:01392 726058

Complaints
If you have any complaints about the way in which this study has been carried out please contact the Co-chair of the University of Exeter Medical School Research Ethics Committee:-
Ruth Garside, PhD Co-chair of the UEMS Research Ethics Committee
Email: uemsethics@exeter.ac.uk

**This project has been reviewed and approved by the
University of Exeter Medical School Research Ethics Committee**

Appendix 12: Information sheet to interviewees – School liaison teachers

TITLE OF PROJECT: EVALUATION OF THE SUSTAINABILITY OF A SCHOOL BASED PUBLIC HEALTH PROGRAMME

UEMS REC REFERENCE NUMBER: Oct16/B/098/1

Introduction
Thank you for showing an interest in this project. Please read this information sheet carefully as it will assist you and/or your school's authority to make a decision on your participation in the project.

What is the aim of the project?
This project is part of a PhD at the University of Exeter Medical School, in which I am investigating the processes which are crucial to the successful implementation and sustainability of school-based public health programmes.
The key aim is to understand how and under what conditions school-based public health programmes are sustained (or continue to be delivered) beyond their trial period. The objective is to investigate whether there are indicators of programme sustainability, (or continuation) suitable for use in the programmes.

The ASSIST programme was chosen because it is evidence based, it has been widely adopted across schools, and it has been running for over five years.

Why me?
You are being asked to help with this project because you are the liaison teacher for the programme in your school.

Description of participants required
This is a case study project in which I will compare the implementation of the ASSIST in the Local Authority areas A ans B. Interviews will be conducted with individuals who have been involved implementing the programme, such school liaison teachers. Local Authority Area A was chosen because it has been delivering the programme for nearly five years and it is still delivering it. Local Authority area B was chosen because it implemented the programme for three years and then stopped. The project will study the differences related to the sustainability of the two programmes.

What will participants be asked to do?
Should you agree to participate in this project, you will take part in a semi structured interview with me (Thandie Hara) the researcher, lasting about 1 hr. You will be asked questions relating to your role as your school's programme liaison teacher, how the programme has worked in your school, and its sustainability.
The interview will be recorded so that it can be listened to analysed and written up afterwards. The information may also be published in academic journals. Please note that, the information you give will be analysed with reference to the role of school liaison teacher which you occupy. Your responses will be anonymised but where the information you give is specific, it may be identifiable to you or your school. You have a right not to answer any questions which you feel are sensitive or to ask that sensitive responses be removed from the interview transcript.

What data or information will be collected and what use will be made of it?
I will ask you questions regarding your role, the school environment, the community, and your perception and engagement with the ASSIST programme. This information will contribute to the understanding of the implementation and sustainability of the programme.

This project involves an open-questioning technique where the precise nature of the questions asked has not been determined in advance, but will depend on the way in which the interview develops. Consequently, although the School Research Ethics Committee is aware of the

general areas to be explored in the interview, the Committee has not been able to review the precise questions to be used.

In the event that the line of questioning does develop in such a way that you feel hesitant or uncomfortable, you may decline to answer any particular question(s) and also that you may withdraw from the project at any stage without any disadvantage to yourself.

The data collected will be securely stored in such a way that only my supervisors (Prof. Rob Anderson, Prof. Sarah Dean, and Dr Mark Pearson) and I will be able to gain access to it. All electronic data is stored on encrypted devices or on secure servers under the University of Exeter's IT security systems. If you wish, I can send you a summary of my research findings.

Can I be anonymous?
Due to the uniqueness of your role in the project and your school, it may not be possible for me to anonymise all of your responses. However in the interview I will not ask any sensitive questions and you do not need to answer all of the questions. The following steps will be taken to improve anonymity and confidentiality:

- The interviews will take place in a private room
- You have a right to decline responding to any questions that you feel are too sensitive
- You will have an opportunity to see how the results of your interview have been written up and you can ask for any parts of what you say to be removed and destroyed
- You do not need to answer every question, and can withdraw from the research at any time without any disadvantage to you
- You have the right to warn me about which parts of your responses you would like to be kept anonymous and if not possible, to be deleted from the transcript

Can I or my school change mind and withdraw from the Project?
Yes you and or your school have the right to withdraw at any time.

Payment/reward to volunteers/interviewees

I will travel to you as the researcher so apart from your time, I do not anticipate that you will incur any other financial costs related to this project.
Time commitment
Interviews will last approximately one hour.
What if I have any questions?
If you have any questions about our project, either now or in the future, please feel free to contact either:-
Thandiwe Hara, email: Th373@exeter.ac.uk Tel: 01392 722762
Or Professor Rob Anderson, who is supervising this project:-
R.Anderson@exeter.ac.uk 01392 726058
Complaints
If you have any complaints about the way in which this study has been carried out please contact the Co-chair of the University of Exeter Medical School Research Ethics Committee:-
Ruth Garside, PhD   Co-chair of the UEMS Research Ethics Committee
Email: uemsethics@exeter.ac.uk
This project has been reviewed and approved by the

University of Exeter Medical School Research Ethics Committee

Appendix 13: Samples of consent forms

TITLE OF PROJECT: EVALUATION OF THE SUSTAINABILITY OF A SCHOOL BASED PUBLIC HEALTH PROGRAMME

UEMS REC REFERENCE NUMBER: Oct16/B/098/1

I have read the information sheet about this project and I understand what the project is about. I know that should I have further questions, I can request further information or clarification of the information sheet from the researcher or their supervisor at any stage. I understand that should I have any concerns on the conduct of the research, I am free to contact the chair of the ethics committee whose contact details have been supplied to me.

I know that (please circle):

1. My participation in the project is entirely voluntary;   Yes / No

2. I am free to withdraw from the project at any time without any disadvantage;   Yes / No
    and that should I wish to do so I can request that any recordings and
    information collected from me are destroyed

3. The data will be retained in secure storage   Yes / No

4. The results of the project may be published in academic journals or presented   Yes / No
     to academic conferences.

5. I understand that since the ASSIST programme and my organisation are   Yes/No
     unique and identifiable, it may not be possible to completely preserve the
     anonymity of me and my organisation in such publications

6. Steps will be taken to maintain confidentiality and security of information   Yes/No

7. My organisation is aware of the nature of this project and of my involvement   Yes/No

.   I have been given details of my options on ensuring that any information   Yes/No
8.   that comes out of the interview that I feel is sensitive is not published

(Printed name of participant)   (Signature)   (Date)……….
(Organisation)

Thandie Hara   …………………   ....
(Researcher)   (Signature)   (Date)

This project has been reviewed and approved by the University of Exeter Medical School Research Ethics Committee

Appendix 14: Sample topic guide - programme lead

TITLE OF PROJECT: EVALUATION OF THE SUSTAINABILITY OF A SCHOOL BASED PUBLIC HEALTH PROGRAMME

UEMS REC REFERENCE NUMBER: Oct16/B/098/1

Introductory script

I am interested in studying the implementation and the sustainability of the ASSIST anti-smoking programme, which is being implemented in your council under your leadership. I would like your perspectives, views, recollection of facts, knowledge, or experiences, on a number of topics relating to tphe implementation of the programme.

Before we start, I would like to remind you that you have a right to decide not to take part in the interview at any time, or to decline to answer particular questions in the interview without disadvantage to you. Can I also confirm that you have read and understood the information sheet?

I would like to know a bit more information regarding a number of topic areas

Section A: Introductory questions

- Your professional skills, background and experience
  Prompt: Explore
    - ❖ Length of involvement with the programme
    - ❖ Thinking about the programme and your role in it what skills and attributes have supported you in delivering this programme?
    - ❖ Explore the responses

- The Background to the programme
  Prompt: Explore
    - ❖ The history of the setup of the programme
    - ❖ What was your exact role in the setup of the programme?
- The links between the programme and wider council public health strategies
  Prompt:
    - ❖ Explore other health promotion work in schools and their relationship to the ASSIST

Section B: Resources

- Detail of the resources required to deliver the programme

  Prompt: Explore
    - ❖ Staff
    - ❖ Skills required
    - ❖ Budget and funding
    - ❖ Time

Section C: Implementation and Delivery

- The programme model
  Prompt: Explore
    - ❖ The detail of the account of the local model
    - ❖ Rationale of the model
    - ❖ Partnerships and coordination required

- Programme installation
  Prompt: Explore

  - ❖ Details of the delivering contractor
  - ❖ Reasons for using a contractor
  - ❖ Reasons for choice this contractor
  - ❖ The contract process
  - ❖ Managing the contract – processes and accountabilities
  - ❖ The challenges and opportunities of using a contractor
- Training the trainers
  Prompt:

  - o Details of you role in the training delivery
  - ❖ Role in the recruitment and identification of trainers
  - ❖ Role in the recruitment of schools

Section D : Sustainability

- Thinking about all that we have covered so far what do you think are the key reasons that have contributed to LAs sustained delivery of the programme?
  Prompt: To think about factors related to
  - ❖ the programme design
  - ❖ the people involved
  - ❖ the resources required
  - ❖ the processes
  - ❖ the local delivery model
  - ❖ the local community and public health demographics

- Now thinking about the future say (3 years) what are the council's plans for ongoing delivery?

Prompt: Think about

  - ❖ The resources
  - ❖ Future public health issues and needs
  - ❖ The process
  - ❖ The model

Section E: Reflection on programme implementation

Any reflections on:
  - ❖ Lessons learnt from the implementation process
  - ❖ Challenges in the implementation process
  - ❖ Is there anything in the way you implemented the ASSIST programme that you think may play a role in the sustainability of the programme?
  - ❖ Any other challenges

Section F: End of Interview

Prompt: Say thank you!

Appendix 15 : Sample topic guide - Trainers

Introductory script

I am interested in studying the implementation and the sustainability of the ASSIST anti-smoking programme in Plymouth for which you are a trainer. I would like your perspectives, views, recollection of facts, knowledge or experiences, on a number of topics relating to the implementation of the programme.

Before we start, I would like to remind you that you have a right to decide not to take part in the interview at any time, or to decline to answer particular questions in the interview without disadvantage to you. Can I also confirm that you have read and understood the information sheet?

Prompt:

- ❖ Explore any areas of concern raised about the information sheet and/or the consent form.
- ❖ Complete the consent form if not already done.

I would like to know a bit more information regarding a number of topic areas

Section A: Introductory questions

- ▪ Your professional skills, background and experience
  Prompt:
  - ❖ How long have you been involved with the project?
  - ❖ Thinking about the programme and your role as a trainer what skills and attributes support you in delivering the programme?
  - ❖ Explore the responses

- ▪ The Background of your organisation
  Prompt:
  - ❖ Its structure
  - ❖ Its activities in the area of health promotion
  - ❖ the history of how your organisation got involved

- ▪ The trainer role
  - ❖ How you get to become a trainer? i.e. were you approached, did you volunteer? Did you respond to an advert or were you referred by employer?
  - ❖ Support received from the programme and from own organisation
  - ❖ How it fits within your other roles

Section B: Resources

- Details of the resources to deliver the programme

Prompt: Explore

- ❖ Skills
- ❖ Time

Section C: Implementation and Delivery

- Training received
  - ❖ Skills achieved from it
- The delivery plan
  - ❖ Scheduling of training
  - ❖ How it fits in within your other activities

  Prompt
  - ❖ Details of how you deliver the training
  - ❖ Partnerships and coordination required

- Challenges

Section D: Sustainability

- Trainer retention
  - ❖ What factors affect your continued involvement in the programme?
  - ❖ What factors support your continued involvement
  - ❖ How likely are you to continue to be involved in the programme?

Section E: Reflection on programme implementation

- ❖ Challenges in the implementation process
- ❖ Lessons learnt

Section F: End of the Interview

- ❖ Any questions?

  - o **Prompt:** Thank you and reminder of the rights of the interviewee, the process, and of the information in the information sheet.

Appendix 16: Wave 1 Questionnaire

TITLE OF PROJECT: EVALUATION OF THE SUSTAINABILITY OF A SCHOOL BASED PUBLIC HEALTH PROGRAMME

UEMS REC REFERENCE NUMBER: Oct16/B/098/1

1.   The Activity I enjoyed the most was…

2.   Some things that I learned about myself from working on this course are….

3.   My main concern about talking to my peers about smoking is

4.   My main achievement on the training course was…

5.   One thing I would change about the course is….

6.   To be a peer supporter I need more help with….

7.   I contributed to the course by……

8.   After the training I have more confidence in being able to……

Appendix 17 : Wave 2 Questionnaire

TITLE OF PROJECT: EVALUATION OF THE SUSTAINABILITY OF A SCHOOL BASED PUBLIC HEALTH PROGRAMME

UEMS REC REFERENCE NUMBER: Oct16/B/098/1

1. Approximately how many conversations did you have with people in your year about smoking while you were a peer supporter?

2. Overall did you find the conversation easy or hard

3. If so Why?

4. I haven't had a conversation with anyone in my year about smoking since the training because …….

5. If you have had conversations which fact did you use most? If you did not which fact is your favourite?

6. The learning activity that I enjoyed the most during the follow up session was

7. One thing I would change about follow up session is

8. Are you happy that you were chosen to be a peer supporter and do you feel positive about your role?

9. Would you recommend this programme to other students in your year