



Epidemiology of Occupational Skin Conditions in the Emerging U.S. Green Collar Workforce

Kevin J. Moore¹, Charles Chen¹, David J. Lee, PhD¹, William G. LeBlanc, PhD¹, Lora E. Fleming, MD, PhD, MPH, MSc^{1,2}, and Alberto J. Caban-Martinez, DO, PhD, MPH¹

¹Department of Public Health Sciences, University of Miami, School of Medicine, Miami, FL

²European Centre for Environment and Human Health and University of Exeter Medical School, Knowledge Spa, Royal Cornwall Hospital, Truro, Cornwall, United Kingdom

To the Editor

Occupational skin diseases, including contact dermatitis, rank as the most commonly reported occupational injuries worldwide¹. Skin injuries lead to decreased worker productivity, decreased worker self-esteem, and long-term complications including skin cancer². Focusing on environmental sustainability and eco-friendliness, the new “green collar” workforce includes occupations that preserve or restore the environment³. The Green collar workforce encompasses a variety of industries and professions including organic farmers, renewable energy engineers, and recycling center attendants in addition to numerous other occupations⁴. We report the rates of dermatological conditions, work-related dermatological injuries, and skin treatment-seeking behaviors among the emerging green collar U.S. workforce.

Analysis was performed by linking data from the 2010 Occupational Health Supplement (OHS) of the National Health Interview Survey (NHIS) to the Occupational Information Network (O*NET). NHIS is a nationally representative, multistage household survey of the civilian, non-institutionalized U.S. population that includes unique OHS questions administered to adults who were employed within the past 12 months. O*NET is a national database with occupational classification based on respondent interviews. The linkage allowed us to classify the occupational class (green vs. non-green) of the NHIS respondents. Among the 1,110 occupational job families listed in O*NET, 169 occupations are classified as Green occupations.

The main study variables on occupational dermatological conditions were derived from three NHIS OHS questions: 1) “During the past 12-months, have you had dermatitis,

Corresponding Author: Dr. Alberto J. Caban-Martinez, Department of Public Health Sciences, University of Miami, Miller School of Medicine, 1120 N.W. 14th Street, R-669, Clinical Research Building, Office #1025, Miami, Florida 33136, Phone: 305-243-7565 | Fax: 305-243-3651 | acaban@med.miami.edu.

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eczema, or any other red, inflamed skin rash?"; 2) "Have you ever been told by a doctor or other health professional that your skin condition was probably work-related?"; 3) "Have you ever seen a doctor or other health professional for your skin condition?" Prevalence estimates of socio-demographic and dermatological variables were calculated using SUDAAN taking into account the NHIS complex sampling design.

Total study sample included 14,805 workers; 2,588 green collar (18.7%) and 12,217 (81.2%) non-green collar workers (Table 1). Green collar workers reported similar higher rates of dermatitis, eczema, or red inflamed skin conditions within the past year compared to non-green (9.7% vs. 9.5%). However, in terms of work-related dermatological conditions, non-green collar had higher rates than green collar workers (6.7% vs. 5.9%, respectively). Green and non-green workers had comparable rates of seeking medical treatment for their dermatological conditions (76.5% and 76.3%, respectively).

Green workers showed similar rates of dermatitis, eczema, or red inflamed skin conditions when compared to other occupational classes, while work-related dermatological injuries were higher for non-green workers. As the green industry expands, it is important to identify workforce sectors that are at greatest risk for occupational dermatological conditions. Green and non-green workers showed similar rates of medical treatment sought for dermatological conditions. Further research into socio-demographics subsets of both occupational classes and treatment seeking habits is necessary to identify groups that are potentially under-treated for dermatological injuries. This study is limited by the cross-sectional design, the NHIS self-reported data, and the broadness of the dermatological conditions assessed in the survey. This study is the first to report dermatological conditions in green collar workers. As the green industry becomes an increasingly ubiquitous component of the American workforce, identifying high-risk worker groups remains an important concern to public health dermatology.

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Table 1

Socio-demographic characteristics and dermatological conditions of green and non-green collar workers: the 2010 National Health Interview Survey

	Total Worker Population				Green			Non-green		
	US Estimated Population	N	Percent [95% CI]	US Estimated Population	n	Percent [95% CI]	US Estimated Population	n	Percent [95% CI]	
Total	131,296,970	14,805	100	24,614,939	2,588	18.7 (18.0–19.4)	106,682,031	12,217	81.2 (80.5–81.9)	
Gender										
Male	69,814,890	7,306	53.1 (52.1–54.1)	18,777,269	1,900	76.2 (74.5–78.0)	51,037,621	5,406	47.8 (46.7–48.9)	
Female	61,482,080	7,499	46.8 (45.8–47.8)	5,837,670	688	23.7 (21.9–25.4)	55,644,410	6,811	52.1 (51–53.2)	
Race										
White	107,663,727	11,224	82 (81–82.9)	20,600,991	2,018	83.6 (81.8–85.4)	87,062,736	9,206	81.6 (80.7–82.5)	
Black	15,246,774	2,349	11.6 (10.8–12.3)	2,621,791	365	10.6 (9.1–12.1)	12,624,983	1,984	11.8 (11–12.5)	
Other	8,386,469	1,232	6.3 (5.8–6.9)	1,392,157	205	5.6 (4.6–6.6)	6,994,312	1,027	6.5 (5.9–7.1)	
Age (Years)										
18–24	16,733,678	1,559	12.7 (11.9–13.5)	2,260,000	210	9.1 (7.7–10.6)	14,473,678	1,349	13.5 (12.6–14.4)	
25–64	109,210,100	12,552	83.1 (82.3–84)	21,453,941	2,279	87.1 (85.4–88.8)	87,756,159	10,273	82.2 (81.3–83.2)	
65+	5,353,192	694	4.0 (3.7–4.4)	900,998	99	3.6 (2.8–4.4)	4,452,194	595	4.1 (3.7–4.5)	
Ethnicity										
Non-Hispanic	112,465,426	11,865	85.6 (84.8–86.4)	21,076,884	2,110	85.6 (84.1–87.1)	91,388,542	9,755	85.6 (84.8–86.4)	
Hispanic	18,831,544	2,940	14.3 (13.5–15.1)	3,538,055	478	14.3 (12.8–15.8)	15,293,489	2,462	14.3 (13.5–15.1)	
Education										
HS+	85,961,694	9,479	65.6 (64.5–66.7)	14,887,531	1,537	60.7 (58.2–63.2)	71,074,163	7,942	66.7 (65.6–67.9)	
HS	32,367,120	3,574	24.7 (23.8–25.6)	7,176,915	731	29.2 (27–31.5)	25,190,205	2,843	23.6 (22.7–24.6)	
<HS	12,585,494	1,713	9.6 (9–10.2)	2,440,156	310	9.9 (8.7–11.1)	10,145,338	1,403	9.5 (8.8–10.2)	
Health Insurance										
Not Insured	22,946,866	2,899	17.5 (16.6–18.4)	3,569,671	437	14.5 (12.9–16.2)	19,377,195	2,462	18.2 (17.2–19.2)	
Insured	107,795,448	11,863	82.4 (81.5–83.3)	20,934,477	2,142	85.4 (83.7–87)	86,860,971	9,721	81.7 (80.7–82.7)	
Worker Residence										
Northeast	23,415,050	2,326	17.8 (16.7–18.9)	4,458,522	407	18.1 (16.1–20.1)	18,956,528	1,919	17.7 (16.6–18.9)	
Midwest	31,050,486	3,295	23.6 (22.4–24.8)	5,971,088	608	24.2 (22.2–26.2)	25,079,398	2,687	23.5 (22.2–24.7)	
South	46,202,248	5,456	35.1 (33.8–36.5)	8,365,611	923	33.9 (31.8–36.1)	37,836,637	4,533	35.4 (34–36.9)	

	Total Worker Population				Green				Non-green			
	US Estimated Population	N	Percent [95% CI]	US Estimated Population	n	Percent [95% CI]	US Estimated Population	n	Percent [95% CI]			
West	30,629,186	3,728	23.3 (22.1–24.5)	5,819,718	650	23.6 (21.6–25.6)	24,809,468	3,078	23.2 (21.9–24.5)			
Dermatological Conditions												
DRMYR¹												
Yes	23,305,971	2,641	10.1 (9.7–10.6)	2,109,337	221	9.7 (7.8–12.0)	10,302,780	1,132	9.5 (8.8 – 10.3)			
DRMWKREL²												
Yes	848,934	98	7.0 (5.5–8.8)	121,677	11	5.9 [†] (3.2–10.9)	551,417	67	6.7 (5.0 – 9.0)			
DRMTRET³												
Yes	11,510,108	1,266	76.9 (74.3–79.3)	1,549,711	162	76.3 (69.8–81.8)	7,806,008	866	76.5 (73.1 – 79.6)			

[†] Estimate does not meet National Center for Health Statistic's standard of reliability or precision given the relative standard error was greater than 30%.

* Variables DRMYR, DRMWKREL, DRMTRET from 2010 NHIS Occupational Health Questionnaire

¹ DRMYR = During the past 12 months, have you had dermatitis, eczema, or any other, red, inflamed skin condition?

² DRMWKREL = Have you been told by a doctor or other health professional that your skin condition was probably work-related?

³ DRMTRET = Have you ever seen a doctor or other health professional for your skin condition?