

# Emergency Department Recidivism Due to Skin Lesions Among the Homeless Population

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## Introduction

- Over 560,000 Americans were homeless at a single point in time in January 2017.<sup>1</sup> Approximately two-thirds (65%) of the homeless reside in sheltered locations. The other one-third (35%) reside in unsheltered locations. 24% of homeless are chronically homeless.<sup>1</sup>
- There is a myriad of research that supports a correlation between homelessness and poor health. Dermatological health problems are no exception, with homeless people frequently suffering skin trauma, cellulitis, impetigo, tinea infections, gas gangrene, immersion foot, frostbite, pediculosis, and scabies, usually at a higher rate than non-homeless people.<sup>2</sup>
- Studies have concluded that the greater prevalence of skin conditions among the homeless population is due to poor hygiene conditions, exposure to harmful environmental agents, and inconsistent or lack of access to healthcare.<sup>3</sup>
- In many areas of country, increased sun exposure and subpar skin cancer prevention resources and behaviors predispose homeless people to developing skin cancers, emphasizing the importance of preventative education and increasing access to skin screenings.<sup>4</sup>
- Research has demonstrated that homeless patients comprise a large portion of emergency department visits. Analysis of the 2005 and 2006 NHAMCS-ED dataset revealed that homeless individuals from all age groups made 550,000 emergency department visits annually.<sup>5</sup>
- A 2002 study interviewed 2,578 homeless and found that 40.4% had 1 or more emergency department encounter in previous year and 7.9% had more than 3 visits to an emergency department.<sup>6</sup>
- A more recent 2015 study examined the frequency of emergency department visits of 6,494 homeless people with Medicaid in Massachusetts. Approximately two-thirds of the sample population had 1 or more emergency department visit and 70% of the total emergency department visits were incurred by 21% of the two-thirds, implying significant recidivism.<sup>7</sup>
- Studies have demonstrated that skin lesions are a substantial contributing factor to emergency department utilization in the general population.
- According to 2014 NHAMCS data, diseases of the skin and subcutaneous tissue were the tenth most common primary diagnoses at an emergency department visit.<sup>8</sup> Skin rashes were the fourth most common reason for emergency department visits for females under the age of fifteen and the fifth most common reason for males under the age of fifteen.
- Symptoms involving the skin and other integumentary tissue were among the twenty leading emergency visit diagnoses for both males and females under 15 and for males age 65 and over.<sup>8</sup>

## Aims and Objectives

This study aims to assess how the interaction between homelessness and dermatological health contributes to ED recidivism.

## Methods

### Data Collection

- Data was drawn from the 2011-2015 National Hospital Ambulatory Medical Care Survey (NHAMCS) dataset, a weighted probability sample of more than 675 million patient encounters (130,219 actual visits)
- Cases were excluded if they were missing data on recidivism, dermatological health diagnoses, and a recorded type of residence.
- Residence was coded as homeless versus non-homeless (including housed or nursing home patients). Recidivism was coded as having returned to the emergency department within 72 hours of a previous visit.
- Patients were assessed for whether they had a dermatological diagnosis during their encounter. The selected dermatology International Classification of Disease 9<sup>th</sup> edition (ICD-9) codes are listed in Table1.

### Statistical Analysis

- Multivariate logistic regression was utilized to examine the relationship between skin condition and homeless status independently, while controlling for the other.
- An interaction term was added to the multivariate logistic regression model to assess the effect of the relationship of the two variables on the independent of each.
- Bivariate logistic regression examining each variable subgroup was performed. The subgroups are outlined in Table 2.

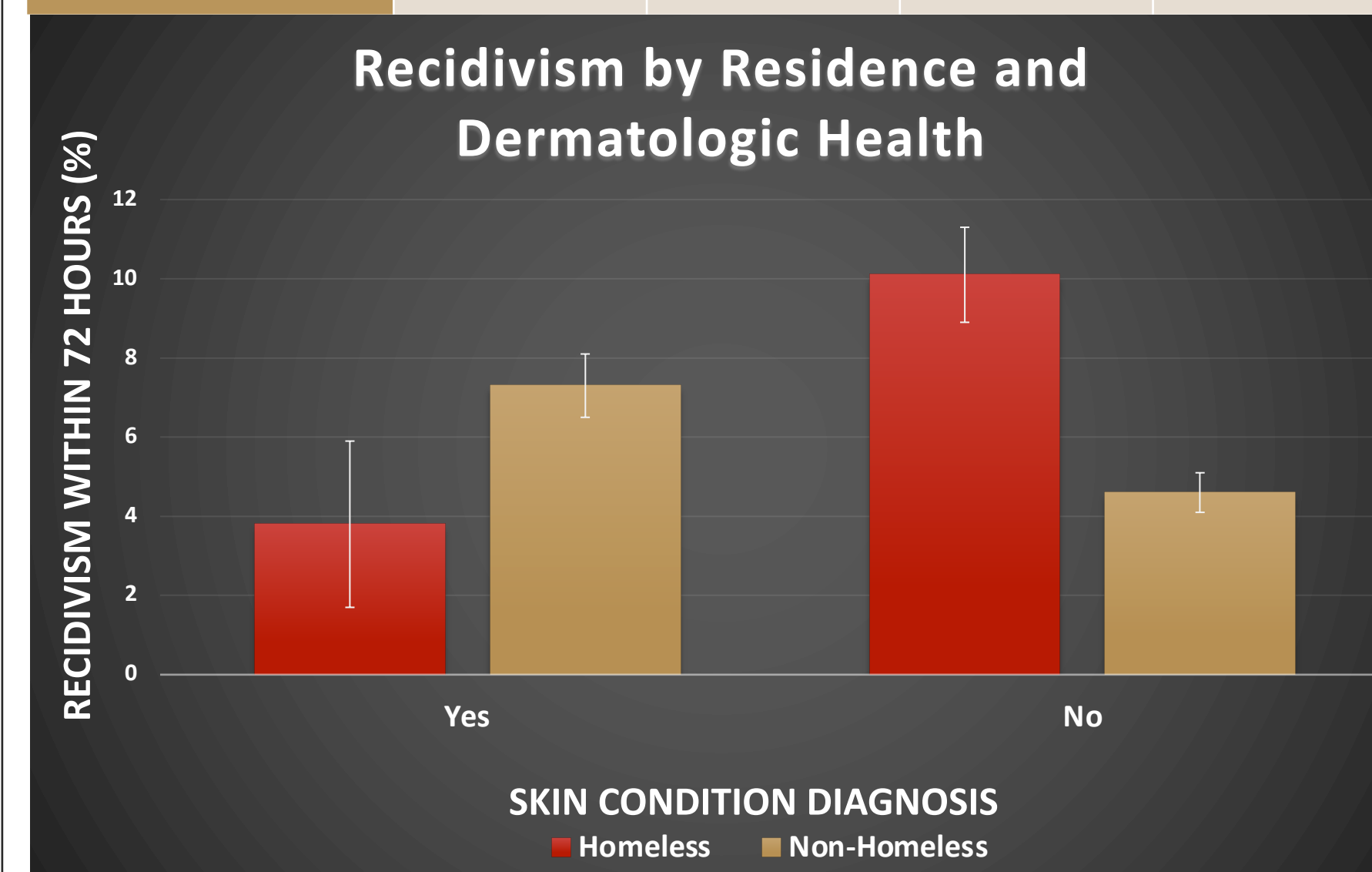
**Table 1.** ICD-9 Code groups selected to capture patients with dermatologic diagnoses  
Abbreviations: International Classification of Diseases Ninth Revision (ICD-9)

Diagnosis	ICD-9 Code
Malignant melanoma	172
Other and unspecified malignant neoplasm of the skin	173
Kaposi's sarcoma	176
Carcinoma in situ of the skin	232
Carbuncle and furuncle	680
Cellulitis and abscess	681-682
Acute lymphadenitis	683
Impetigo	684
Pilonidal cyst	685
Other local infections of the skin and subcutaneous tissue	686
Erythematousquamous dermatosis	690
Atopic dermatitis and related conditions	691
Contact dermatitis and other eczema	692
Dermatitis due to substances taken internally	693
Bullous dermatoses	694
Erythematous conditions	695
Psoriasis and similar disorder	696
Lichen	697
Pruritis and similar disorders	698
Corns and callosities	700
Other hypertrophic and atrophic conditions of the skin	701
Other dermatoses	702
Diseases of nail	703
Diseases of hair and hair follicles	704
Disorder of sweat glands	705
Disease of sebaceous glands	706
Chronic ulcer	707
Urticaria	708
Other disorders of skin and subcutaneous tissue	709

## Results

**Table 2.** Descriptive statistics for frequencies of residence and skin condition statuses

	Raw Count	Percent	Valid Percent	Cumulative Percent
Skin Condition, Homeless	71	0.1	0.1	0.1
No Skin Condition, Homeless	1145	0.9	0.9	1.0
Skin Condition, Housed	5968	4.6	4.9	5.9
No Skin Condition, Housed	115234	88.5	94.1	100.0
Total	122418	94.0	100.0	



**Figure 1.** Percent of patients returning to the ED within 72 hours based upon the dichotomous interaction between residence and skin condition status. Standard error bars shown.

- 122,418 encounters were analyzed (Table 2).
- Both those with skin conditions and those who are homeless have significantly greater odds of being recidivistic to the emergency department.
- Specifically, those with skin conditions were 1.61 time more likely to be recidivistic (95% CI = 1.33, 1.97; p<.001).
- Those who are homeless are 2.16 times more likely to be recidivistic (95% CI = 1.59, 2.93; p<.001).
- With an interaction term added to the multivariate model, neither homelessness nor the presence of a skin condition is significantly associated with emergency department recidivism.
- Subgroup analysis reveals that homeless individuals with skin conditions are not more likely than housed individuals without skin conditions to exhibit emergency department recidivism (OR = .824, 95% CI = .258, 2.63; p=.743).
- Homeless individuals *without* skin conditions (OR = 2.35, 95% CI = 1.73, 3.18; p<.001), and housed persons *with* skin conditions (OR = 1.64, 95% CI = 1.35, 2.00; p<.001) who tend to be significantly more likely to be recidivistic.

## Conclusions

Homeless individuals with skin conditions are not especially recidivistic. While this study did not yield a statistically significant finding demonstrating that homeless patients with skin conditions contribute to emergency department recidivism, it does not negate the need for improvement of the dermatologic health of homeless patients.

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