

Predictors of Prolonged Care Prior to Limb Loss: The Role of Demographics, Co-Morbidities, and Social Determinants of Health

Mia Angelo B.S.¹, James Aulds B.S.¹, Paul Mayeux B.S.¹, Natalie Bujard B.S.¹, Sherry Dymond B.S.¹, Jessica Rivera, M.D., PhD²

¹ School of Medicine, ² Department of Orthopaedics, Louisiana State University Health Sciences Center – New Orleans

Introduction

- Non-traumatic lower limb amputations represent a significant public health burden, most commonly associated with diabetes and peripheral artery disease (PAD).
- These clinical risk factors do not operate in isolation.
- Increasing evidence shows that demographic characteristics and social determinants of health (SDOH) independently influence the progression from chronic wounds to limb loss.
- Race and socioeconomic status are linked to higher amputation rates even when comorbidities are similar.
- These findings highlight the combined impact of demographics, SDOH, and comorbid conditions on wound care duration and amputation incidence.

Objective and Significance

As demonstrated by the map below, our region has a disproportionate clustering of amputations secondary to comorbid disease.

The purpose of this project is to determine whether demographics, co-morbid disease, or social determinants of health are most predictive of prolonged wound care prior to limb loss.

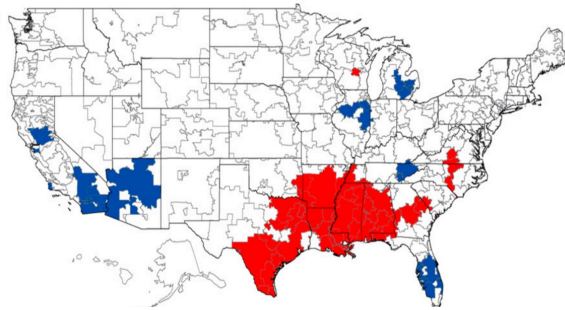


Figure 1. Geographic clustering of lower-extremity amputation among Medicare beneficiaries with diabetes in the United States. Margolis DJ, Hoffstad O, Allen-Taylor J. Location, location, location: geographic clustering of lower-extremity amputation among Medicare beneficiaries with diabetes. *Diabetes Care*. 2011;34(11):2363–2367.

Methods

- Retrospective cohort study with manual chart abstraction of 26 patients treated at University Medical Center–New Orleans for lower extremity limb loss.
- Data collected
 - Demographics: age, sex, race, ethnicity
 - Comorbid diseases: diabetes, peripheral vascular disease, chronic renal disease, body mass index (BMI)
 - Area Deprivation Index (ADI): reported by state decile and national percentile
 - Wound care metric: frequency × duration
- Statistical analysis
 - Negative binomial regression used to test associations between wound care episodes and demographics, comorbidities, or ADI
 - Sequential model fit evaluated using Akaike Information Criterion (AIC)

Results

- Wound care utilization data were available for 26 patients.
- The average wound care episode count was 28 visits per patient.
- The maximum number of visits recorded was 112.
- Regression analysis of these preliminary data showed **no significant associations** (Table 1 below) between wound care visit count and:
 - Area Deprivation Index (ADI)
 - Demographic variables
 - Comorbid diseases
- The lowest AIC was observed in the analysis examining the association between wound care utilization and ADI, indicating potential best fit model.

Table 1: Nested negative binomial regression for counts of wound care episodes

	Model 1 β [95% CI]	Model 2 β [95% CI]	Model 3 β [95% CI]
Demographics			
Age	-0.02 [-0.05-0.01]	0.00 [-0.06-0.06]	0.01 [-0.06-0.08]
Sex (ref. male)	0.38 [-0.84-1.59]	1.27 [-0.50-3.05]	1.45 [-0.45-3.36]
Race (ref. White)	0.34 [-0.67-1.36]	0.16 [-0.82-1.14]	0.37 [-0.76-1.51]
Comorbidities			
Diabetes		-1.13 [-2.96-0.70]	-1.19 [-3.28-0.90]
PVD		-0.62 [-1.95-0.72]	-0.80 [-2.18-0.58]
Renal Disease		1.06 [-0.56-2.68]	0.85 [-1.00-2.71]
BMI		-0.05 [-0.14-0.04]	0.05 [-0.15-0.06]
ADI			
State Decile			-0.01 [-1.13-1.11]
National Percentile			-0.01 [-0.15-0.12]
AIC	212.64	216.99	211.07

Discussion and Limitations

- Small sample size limits statistical power, but the lowest AIC in the ADI model suggests that social deprivation may influence wound care utilization.
- This finding is consistent with prior studies showing that socioeconomic factors independently affect access to care and amputation risk, even when controlling for comorbidities.
- Larger sample sizes are needed to clarify whether social determinants of health more strongly predict prolonged wound management than clinical factors alone.
- Understanding these relationships may help target interventions, improve access, reduce care delays, and prevent avoidable limb loss in high-risk populations.
- Additional data collection is ongoing.

Conclusion

- Determining the most predictive factors of health care utilization or outcomes helps identify key risks.
- Understanding these risks can inform which modifiable factors have the greatest influence.
- **Although preliminary data were insufficient for definitive statistical conclusions, findings suggest the importance of social deprivation as a potential factor. Influence burden of care required to limb threatening wounds.**

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