

Mortality Rate in Diabetic Foot Ulcers

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ABSTRACT

Diabetic foot complications, especially ulcers and their subsequent amputations, are associated with a significantly increased risk of mortality. Approximately half of patients with diabetic foot ulcers die within five years, with mortality rates rising sharply with advancing age, comorbidities, and social determinants of health. Key factors influencing prognosis include cardiovascular disease, renal impairment, race/ethnicity, socioeconomic status, and severity of foot pathology. Mortality is predominantly driven by cardiovascular events and infections, and disparities persist across demographic groups, highlighting the need for early intervention and equitable healthcare access. Recognizing these risk factors can inform targeted prevention strategies and improve outcomes for high-risk populations.

KEYWORDS: Diabetic foot, Foot ulcers, Amputation, Mortality, Cardiovascular disease, Socioeconomic disparities, Risk factors, Diabetes complications, Peripheral artery disease, Social determinants of health

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INTRODUCTION

Diabetic foot, particularly in the context of diabetic foot ulcers (DFUs), is associated with a markedly elevated mortality rate. Large-scale meta-analyses and cohort studies consistently report that approximately 50% of patients with a DFU will die within 5 years of diagnosis, with 1-year mortality rates around 13–15%, 3-year rates near 33%, and 10-year mortality exceeding 75% in some populations.[1-6] A recent meta-analysis of over 120,000 patients estimated 1-year, 3-year, 5-year, and 10-year survival rates at 86.9%, 66.9%, 50.9%, and 23.1%, respectively, corresponding to mortality rates of 13.1%, 33.1%, 49.1%, and 76.9% at those time points.[6] These findings are corroborated by large national registry data and population-based studies from multiple regions.[1-2][7]

Short-term mortality is also significant: in a recent cohort of over 70,000 patients with new DFUs, mortality was 4.2% at 12 weeks, 8.2% at 26 weeks, and 14.4% at 1 year.[1] Mortality risk is further increased in patients with comorbidities such as chronic kidney disease, cardiovascular disease, and those requiring renal replacement therapy, where 2-year mortality can exceed 70%.[8] Amputation, particularly major amputation, is a marker of even higher risk, with 5-year mortality rates after diabetes-related amputation also exceeding 70%.[8]

The leading causes of death in this population are cardiovascular disease and infection.[6] The presence of a DFU more than doubles the expected mortality compared to patients with diabetes without a foot ulcer.[8][7] These mortality rates are comparable to, or worse than, those seen in many common malignancies.[8][9]



Figure 1. Diabetic foot ulcers

The mortality rate associated with diabetic foot disease demonstrates significant variation across demographic groups, influenced by age, sex, race/ethnicity, and socioeconomic status.

Age: Mortality increases substantially with advancing age. In a large cohort, 26-week mortality after new diabetic foot ulcer (DFU) presentation exceeded 25% in 11.5% of those aged 65 years and older, and 22.1% in those aged 80 years and above, compared to lower rates in younger cohorts.[1-2]

Sex: There are nuanced sex differences. While men are more likely to develop diabetic foot disease, women with DFU or after amputation often have lower overall survival probabilities. In some cohorts, men had an 18% higher mortality risk after initial DFU hospitalization compared to women, particularly after major amputation. However, among those with a history of prior DFU hospitalizations, this sex difference in mortality risk diminishes, likely due to increased frailty and older age among women in this subgroup.[3]

Race/Ethnicity: Racial and ethnic minorities, including Black, Hispanic, and Native American populations, experience disproportionately higher risks of DFU, amputation, and subsequent mortality compared to White patients. These disparities are attributed to a combination of

higher prevalence of peripheral artery disease, neuropathy, and social determinants such as reduced access to preventive and specialty foot care. Indigenous populations, such as Māori in New Zealand, also have higher postoperative mortality after lower-limb amputation.[4-6]

Socioeconomic Status: Socioeconomic deprivation is an independent predictor of both DFU incidence and mortality. Individuals in the highest quintile of deprivation are significantly more likely to develop DFU and have higher mortality rates after ulceration, even after adjusting for other risk factors. The risk of death increases by 14% per quintile of deprivation, and the presence of a DFU confers a 48% increased risk of mortality independent of deprivation index and other comorbidities.[7]

Other Factors: Comorbidities such as chronic kidney disease, heart failure, and ischemia further increase mortality risk in all demographic groups.[1-2]

In summary, older age, female sex (in some contexts), racial/ethnic minority status, and socioeconomic deprivation are all associated with higher mortality rates following diabetic foot complications, with social determinants and comorbidities playing central roles in these disparities.[4][6][7]

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Key factors and their impact on mortality in patients with diabetic foot disease:

Factor	Impact on Mortality	Notes
Age	Higher mortality with increasing age	>25% 6-month mortality in patients aged ≥65; >22% in those ≥80
Sex	Men generally have higher mortality risk, especially after amputation	Women may experience lower survival but are often older or frailer
Race/Ethnicity	Disproportionately higher risk in minorities (Black, Hispanic, Indigenous)	Higher prevalence of peripheral artery disease and limited access to care
Socioeconomic Status	Increased mortality with greater deprivation	Risk increases by 14% per deprivation quintile; higher DFU incidence in deprived groups
Comorbidities	Elevated risk with renal impairment, heart failure, ischemia	Significantly worsens prognosis, especially with renal failure or cardiovascular disease
Severity of Foot Disease	More severe ulcers or need for major amputation increase mortality	Major amputations associated with >70% 5-year mortality rate

CONCLUSION

In conclusion, diabetic foot disease, particularly when complicated by ulcers or amputations, is associated with a profoundly elevated risk of mortality, with approximately 50% of affected patients dying within five years. Mortality rates are further influenced by factors such as age, sex, race, ethnicity, and socioeconomic status, as well as the presence of comorbidities like cardiovascular disease and renal impairment. These disparities underscore the importance of early prevention, comprehensive management, and targeted interventions aimed at vulnerable populations to reduce mortality and improve quality of life. Addressing social determinants and ensuring equitable access to preventive and specialized foot care are essential steps toward mitigating the high mortality burden associated with diabetic foot complications.

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