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TITLE The Cardiorenal Metabolic Foot: Insights from Hospitalisation Data in Aotearoa New Zealand

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ABSTRACT (maximum 450 words. Please use the following or similar headings: Background/Methods/Results/Conclusions)

Background
Diabetes-related foot disease (DFD) is increasingly recognised as a marker of multisystem systemic disease, particularly within the emerging framework of the cardiorenal metabolic syndrome. In Aotearoa New Zealand (NZ) linked national health administrative data offers a unique opportunity to investigate DFD-caused hospitalisations, identifying potential clinical risk factors and broader health disparities. We aimed to examine clinical and sociodemographic factors associated with new cases of DFD-caused hospitalisations and assess inequities in incidence and outcomes between Māori and non-Māori.
Methods
A national cohort of individuals aged ≥16 years with diabetes, identified via the Virtual Diabetes Register and alive on 31 December 2016, was followed for five years (2017–2021) using linked administrative health data. Non-NZ residents and individuals with a prior DFD hospitalisation in the preceding 10-years were excluded. DFD hospitalisations were identified via ICD-10-AM codes. We examined demographic, socioeconomic, and clinical variables including gender, age, ethnicity, deprivation (Index of Multiple Deprivation 2018, excluding health domain), rurality (Geographic Classification for Health), comorbidity (Measuring Multimorbidity Index (M3)), 5-year CVD risk (sex and ethnicity adjusted), smoking status, ESRD, diabetes medications, and gout medications. Multivariable regression assessed associations between ethnicity and DFD hospitalisation, adjusting for confounders.
Results
Of the 260,517 individuals assed for eligibility 4,991 were excluded due to a prior DFD-caused hospitalisation. Among the 241,862 eligible individuals, 4,893 (Māori n=1060) experienced a total of 11,888 DFD-caused hospitalisations over five years, a rate of 1.08 (95% CI: 1.06, 1.10) per 100 person-years. Māori had a 1.7-fold higher unadjusted risk than non-Māori with higher hospitalisation rates across most demographic and all clinical variables. The univariate analysis showed strong correlation between increasing five-year CVD risk (grouped <5%, 5-9%,10-14%, >15%) and elevated rates of DFD-caused hospitalisation from lowest CVD risk 0.33 (0.31, 0.36) per 100 person-years to highest 2.04 (1.98, 2.10). In the multivariate analysis, after adjusting for all demographic, socioeconomic, and clinical variables, the strongest predictors of DFD-caused hospitalisation were ESRD HR 2.63 (95% CI:2.42, 2.85), M3 highest burden category 2.23 (2.13, 2.34), >15% CVD-risk 1.43 (1.39, 1.47), insulin 1.25 (1.23, 1.27) and gout medication 1.14 (1.12, 1.16).
Conclusion
Our cohort study results highlight the correlation of DFD-hospitalisation with cardiorenal metabolic syndrome (including gout), and co-morbidity burden. These conditions disproportionately affected Māori compared to non-Māori. In NZ future research, leveraging electronic health records, should focus on developing and validating predictive algorithms informed by these findings. This approach would identify individuals at elevated risk of DFD-caused hospitalisation, with the goal of enabling more targeted and equitable preventative care.