6.8 Diabetes-related lowerlimb amputation hospitaladmissions 18 years and over

Context

This data item examines hospital admission rates for diabetes-related lower limb amputations for people aged 18 years and over. Hospital admission data are sourced from the Admitted Patient Care National Minimum Data Set, includes both public and private hospitals and relate to the number of admissions per 100,000 people. Repeat admissions for one person and transfers between hospitals are both counted as separate admissions.

Diabetes is the fastest-growing chronic disease in Australia. It is a condition where healthy glucose levels are not maintained in the blood. In people with diabetes, the body no longer produces insulin or it produces insufficient amounts, resulting in high blood glucose levels.

The three main types of diabetes are type one, type two and gestational diabetes. All types of diabetes are increasing in prevalence in Australia. Aboriginal and Torres Strait Islander peoples are about three times more likely to have diabetes¹, 10 times more likely to be admitted for diabetic foot complications² and about 30 times more likely to have diabetes-related lower limb amputations than non-Indigenous people.²

If any type of diabetes is not well managed, patients risk developing diabetic foot disease. This occurs in people who have peripheral vascular disease (a decreased blood supply) and peripheral neuropathy (nerve damage causing insensitivity). Both are caused by diabetes and can be exacerbated by smoking, hypertension and obesity. Ulceration and infection in limbs can occur. In the most severe cases, this can lead to amputation of the affected toes, foot or lower leg. Diabetic foot problems require urgent attention. A delay in diagnosis and management increases morbidity and mortality, and the likelihood and severity of amputations.³

The data presented here report total diabetes-related lower limb amputations per resident adult population, and include both minor amputations (procedures below the ankle) as well as major amputations (procedures above the ankle). Minor and major amputation procedures are often done for different reasons – minor amputations may be undertaken as a 'prophylactic' procedure to prevent progression of foot disease leading to a major amputation. Rates of initial or first amputations may reflect the effectiveness of primary prevention, with recurrent amputations reflecting treatment and secondary prevention approaches.⁴

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High-risk patients need regular preventive foot care from a podiatrist with an interest in diabetes, and early assessment and intensive intervention to treat foot ulcers. Evidence-based prevention strategies include foot care education, podiatry involvement and wearing appropriate footwear.⁵

Best-practice management of diabetes-related foot ulceration requires coordinated multidisciplinary input, including access to a podiatrist, orthopaedic surgeon, vascular surgeon and endocrinologist.

Five-year survival rates for those who have had a limb amputation, as compared to a toe amputation, are poor, with mortality rates ranging from 39 to 80 per cent.⁶ Diabetes-related foot complications are more prevalent in those with a longer duration of diabetes.

Magnitude of variation

In 2012–13, there were 4,402 diabetes-related lower limb amputation admissions to hospital, representing 23 admissions per 100,000 people aged 18 years and over (the Australian rate).

The number of diabetes-related lower limb amputation admissions to hospital across 80* local areas (SA4s) ranged from 8 to 91 per 100,000 people aged 18 years and over. The number of admissions was **11.4 times higher** in the area with the highest rate compared to the area with the lowest rate. The average number of admissions varied across states and territories, from 19 per 100,000 people aged 18 years and over in Tasmania, to 65 in the Northern Territory.

After excluding the highest and lowest results, the diabetes-related lower limb amputation hospital admission rate across the 70 remaining local areas was **2.5 times higher** in one local area compared to another.

Interpretation

Diabetes-related lower limb amputation numbers were small, so chance fluctuations and repeat procedures in some individuals could have influenced the geographic patterns seen. Other potential reasons for the variation include differences in:

- risk factors for diabetes-related amputations of the lower limb, including the Indigenous population, socioeconomic status⁷ and geographical remoteness
- accuracy of coding, for example, at episode level if diabetes was included as a diagnosis for the admission for the amputation procedure
- the distribution of Indigenous people, who are about three times more likely to have diabetes,¹
 10 times more likely to be admitted for diabetic foot complications² and about 30 times more likely than non-Indigenous people to have diabetes-related lower limb amputations
- smoking rates, with smoking being a risk factor in developing diabetic foot disease and a known predictor for foot ulceration and amputation⁸
- access to appropriate primary, secondary and tertiary services, particularly:
 - multidisciplinary foot clinics⁹
 - vascular, endocrine and orthopaedic specialists¹⁰
 - high-risk foot clinics, particularly in public hospitals¹
- timing of presentation for care as earlier intervention in foot disease has better outcomes
- quality of diabetes care.

To explore this variation, further analysis could focus on:

- differentiating between toe, foot and leg amputations to determine whether the variation indicates unequal quality of care and timing of presentation for diabetic patients
- exploring and monitoring the diabetes-related lower-limb amputation hospital admissions data for the diabetic population 18 years and over.

*There are 88 SA4s. For this item, data were suppressed for 8 SA4s. This is because of confidentiality requirements given the small numbers of admissions in these areas.



Figure 135: Number of diabetes-related lower limb amputation admissions to hospital per 100,000 people aged 18 years and over, age standardised, by local area, 2012–13

Notes:

Rates are standardised based on the age structure of the Australian population in 2001.

State/territory and national rates are based on the total number of admissions and people in the geographic area.

The term local area refers to an ABS standard geographic region known as a Statistical Area Level 4 (SA4).

Includes all public hospitals, private hospitals and day hospital facilities.

For more technical information please refer to the Technical Supplement.

Sources: National Health Performance Authority analysis of Admitted Patient Care National Minimum Data Set 2012–13 (data supplied 09/04/2014) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.

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Figure 136: Number of diabetes-related lower limb amputation admissions to hospital per 100,000 people aged 18 years and over, age standardised, by local area, 2012–13



Sources: National Health Performance Authority analysis of Admitted Patient Care National Minimum Data Set 2012–13 (data supplied 09/04/2014) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.





Notes:

Rates are standardised based on the age structure of the Australian population in 2001.

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Resources

- National Health and Medical Research Council. National evidence-based guideline on prevention, identification and management of foot complications in diabetes (part of the guidelines on management of type 2 diabetes). 2011. Available at: www.nhmrc.gov.au/_files_nhmrc/ publications/attachments/diabetes_foot_full_ guideline_23062011.pdf.
- National Institute for Health and Clinical Excellence. *Diabetic foot problems: prevention* and management. 2015. Available at: www.nice.org.uk/guidance/ng19.
- International Working Group on the Diabetic Foot and International Diabetes Federation. *Diabetes* and Foot Care: Time to Act. 2005. Available at: www.idf.org/webdata/docs/T2A_Introduction.pdf.
- NSW Agency for Clinical Innovation (ACI). Standards for High Risk Foot Services in NSW. 2014. Available at: www.aci.health.nsw.gov. au/__data/assets/pdf_file/0004/248323/ACI_ Standards_for_High_Risk_Foot_Services.pdf.
- Diabetes Australia. *Foot Care*. Available at: www.diabetesaustralia.com.au/foot-care.

¹ Australian Institute of Health and Welfare. Diabetes: Australian facts 2008. Diabetes series no. 8. Cat. no. CVD 40. Canberra: AIHW, 2008.

Norman PE, Schoen DE, Gurr JM, Kolybaba ML. High rates of amputation among Indigenous people in Western Australia. MJA 2010;192(7):421.
Ramsey SD, Newton K, Blough D, McCulloch DK, Sandhu N, Reiber GE et al. Incidence, outcomes, and cost of foot ulcers in patients with diabetes.

Diabetes care 1999;22(3):382–7.

⁴ Kurowski JR, Nedkoff L, Schoen DE, Knuiman M, Norman PE, Briffa TG. Temporal trends in initial and recurrent lower extremity amputations in people with and without diabetes in Western Australia from 2000 to 2010. Diabetes Res Clin Pract. 2015 May;108(2):280–7.

⁵ National Health and Medical Research Council. National evidence-based guideline on prevention, identification and management of foot complications in diabetes (part of the guidelines on management of type 2 diabetes). Melbourne: NHMRC, 2011.

⁶ Moulik PK, Mtonga R, Gill GV. Amputation and mortality in new-onset diabetic foot ulcers stratified by etiology. Diabetes care 2003;26(2):491–4.

⁷ Bergin SM, Brand CA, Colman PG and Campbell DA. The impact of socio-economic disadvantage on rates of hospital separations for diabetes-related foot disease in Victoria, Australia. Journal of Foot and Ankle Research 2011;4:17.

⁸ Moss SE, Klein R, Klein BE. The prevalence and incidence of lower extremity amputation in a diabetic population. Archives of internal medicine 1992;152(3):610–6.

⁹ Quinlivan E, Jones S, Causby R, Brown D. Reduction of amputation rates in multidisciplinary foot clinics – a systematic review (online). Wound Practice & Research: Journal of the Australian Wound Management Association 2014;22(3):155–62.

¹⁰ Eskelinen E, Eskelinen A, Alback A, Lepantalo M. Major amputation incidence decreases both in non-diabetic and in diabetic patients in Helsinki. SJS 2006;95(3):185-9.