

# Rate and Characteristics of Amputation Procedures in Sepsis Patients

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## BACKGROUND

There are approximately 50 million sepsis patients worldwide each year<sup>1</sup>

Sepsis is defined as organ dysfunction in the presence of infection<sup>2</sup>

Amputation is a rare but serious adverse outcome of sepsis with ongoing health and financial consequences for survivors

How many sepsis patients undergo amputation procedures in Australia?

This study aimed to investigate the prevalence, characteristics, and risk factors of amputations in Australian sepsis patients.

## METHODS

Retrospective cohort study with hospital admissions data

Analysis performed in Stata 18.0 (StataCorp LLC, TX)

Identified sepsis patients using ICD-10-AM coding and amputations using ACHI procedure codes

Included all sepsis hospital admissions in New South Wales (NSW), Australia from 1 Jan 2015 – 31 Jan 2021

Univariable logistic regression models were used to examine the association between demographic variables and a binary amputation variable. Chi<sup>2</sup> tests or Wilcoxon rank-sum tests were used to examine the association between amputation and clinical characteristics.

## RESULTS

Figure 1 – Patient selection

Note: For patients with amputations the first sepsis episode of care with an amputation was counted. For patients without amputations the first sepsis episode was counted.

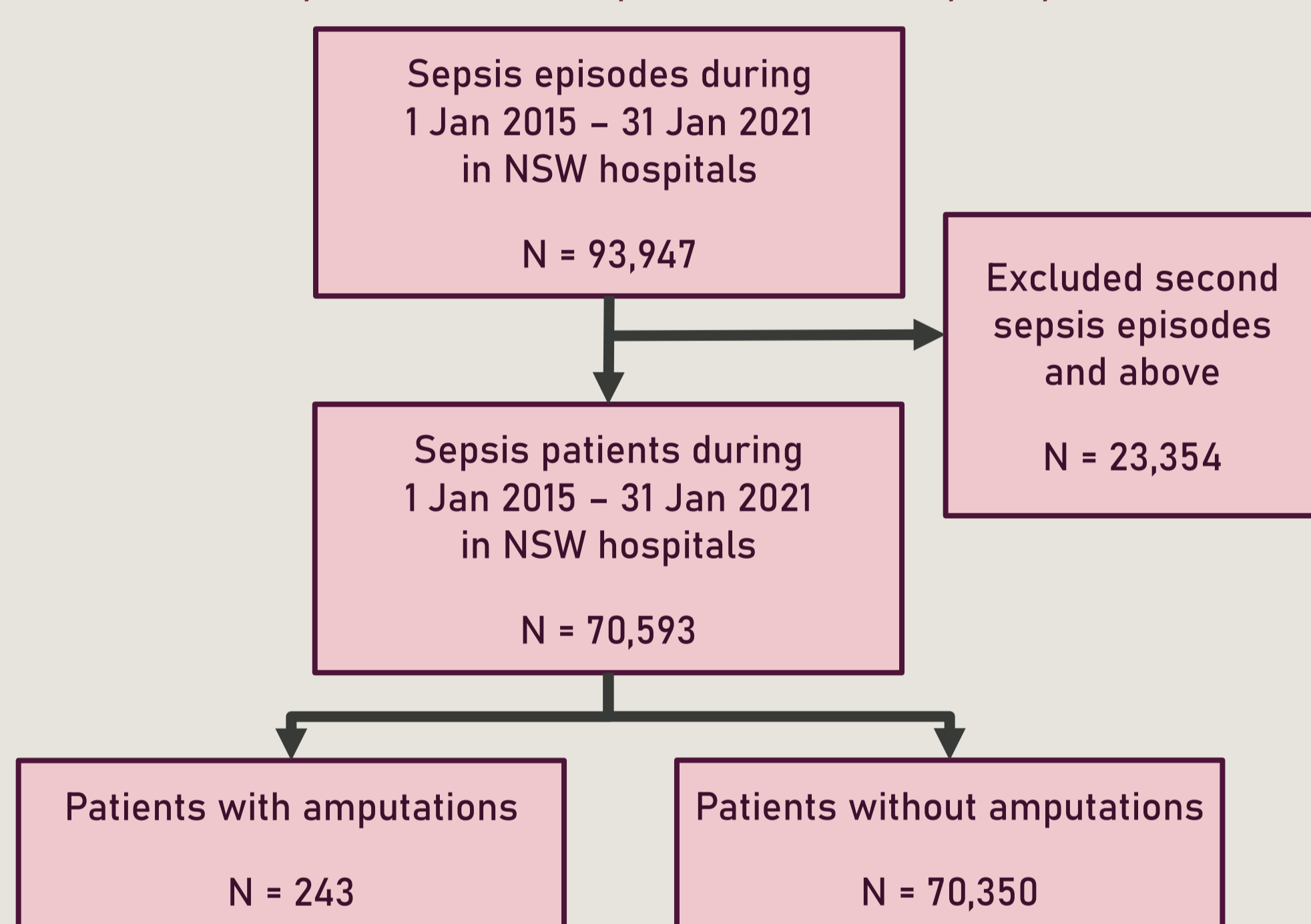


Table 1 – Demographic characteristics of sepsis patients with and without amputations

Demographic characteristic	No amputation, n (%)	Amputation, n (%)	Odds Ratio <sup>#</sup> (95% CI)	P-value <sup>#</sup>
Total	70,350	243		
Age group				<0.001
85+ years	15,716 (22.3)	26 (10.7)	Ref	
60 – 84 years	36,942 (52.5)	152 (62.6)	2.49 (1.64 – 3.77)	<0.001
16 – 59 years	14,838 (21.1)	65 (26.8)	2.65 (1.68 – 4.18)	<0.001
< 16 years	2,854 (4.1)	0 (0)	*	
Sex				
Female	33,048 (47.0)	61 (25.1)	Ref	
Male	37,302 (53.0)	182 (74.9)	2.64 (1.98 – 3.53)	<0.001
Obstetric sepsis	2,119 (3.0)	0 (0)		
Diabetes comorbidity	19,875 (28.3)	197 (81.1)	10.88 (7.89 – 15.00)	<0.001
Socio-Economic Indexes for Areas (SEIFA) <sup>^</sup>				0.011
> 80 <sup>th</sup> percentile	11,017 (15.7)	23 (9.5)	Ref	
60 – 80 <sup>th</sup> percentile	9,238 (13.1)	28 (11.5)	1.45 (0.84 – 2.52)	0.186
40 – 60 <sup>th</sup> percentile	13,652 (19.4)	44 (18.1)	1.54 (0.93 – 2.56)	0.092
20 – 40 <sup>th</sup> percentile	18,054 (25.7)	65 (26.8)	1.72 (1.07 – 2.78)	0.025
< 20 <sup>th</sup> percentile	18,389 (26.1)	83 (34.2)	2.16 (1.36 – 3.43)	0.001
Geographical remoteness				0.011
Major city	48,702 (69.2)	189 (77.8)	Ref	
Inner regional	17,072 (23.3)	41 (16.9)	0.62 (0.44 – 0.87)	0.005
Outer regional, remote, or very remote	4,576 (6.5)	13 (5.4)	0.73 (0.42 – 1.29)	0.277

<sup>#</sup>The p-values and odds ratios are calculated from logistic regression models with amputation as the binary dependant variable.  
<sup>\*</sup>This group was not included in the age univariate model as there are no amputations in patients younger than 16. All patients in this group (n = 2,854) were excluded from the model, which consequently only investigates the unadjusted association between age and amputations in adult (≥16 years) sepsis patients.  
<sup>^</sup>Used the Index of Relative Socio-Economic Disadvantage (IRSD)

Table 2 – Clinical characteristics of sepsis patients with and without amputations

Clinical characteristics	No amputation	Amputation	P-value
Total	70,350	243	
ICU admission, n(%)	10,664 (15.2)	96 (39.5%)	<0.001*
Hours in ICU, median (IQR)	53 (23 – 109)	76.5 (28.5 – 203)	<0.001 <sup>^</sup>
Died in-hospital, n(%)	7,937 (11.3)	36 (14.8)	0.08*

\*Chi<sup>2</sup> test performed for categorical variables  
<sup>^</sup>Wilcoxon rank-sum test performed for non-normal continuous variables

Figure 3 – Number of amputations in sepsis patients by sex

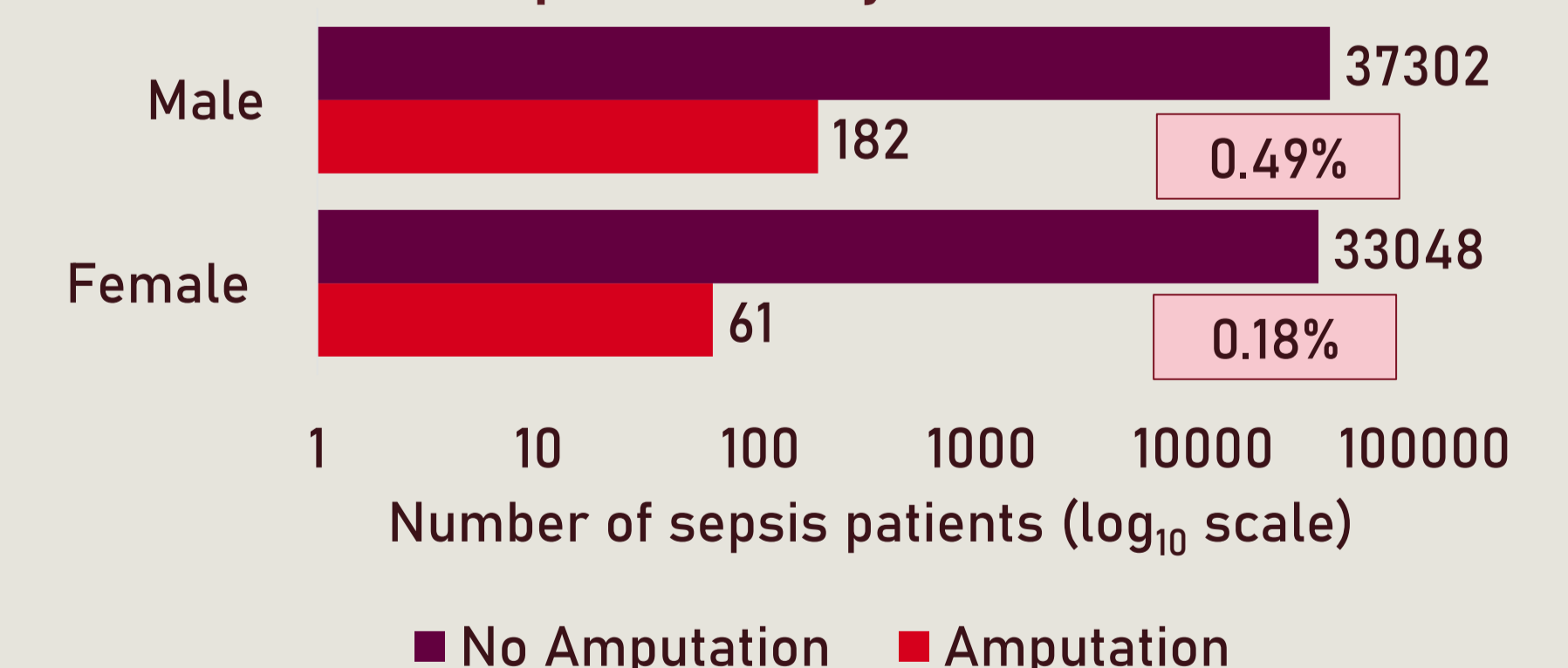
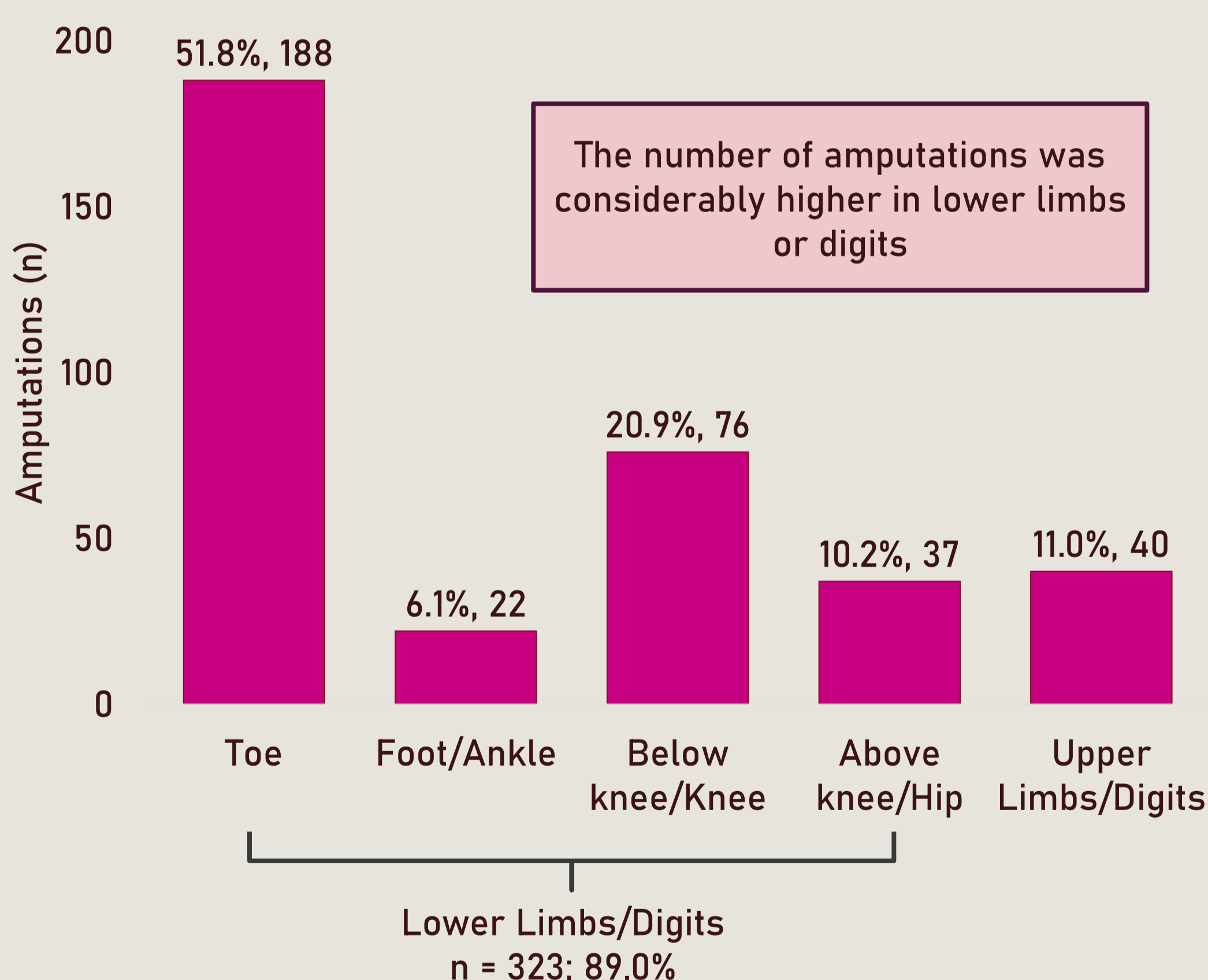


Figure 2 – The body location of each amputation procedure reported (n = 363)

Note: Amputation procedure codes are counted by each limb or digit amputated and therefore add up to more than the number of patients with amputations.



Amputation procedures occurred more commonly in men, in patients with diabetes, in patients between 60 and 84 years old, and in lower limbs

## ACKNOWLEDGEMENTS

The data used in this study was provided by NSW Ministry of Health and linked by the Centre for Health Record Linkage (CHeReL)

References:  
 1. Rudd, K. et al. (2020). *Lancet*, 395(10219):200-11.  
 2. Singer, M. et al. (2016). *JAMA*, 315(8):801-10.

