

Reporting of hospitalisation-related indicators on HealthStats NSW

Impact of changes to emergency department admissions

Overview

From 15 June 2017, emergency department (ED)-only episodes are no longer included as admitted patient records in NSW public hospitals. Consequently, the following changes have been made to the reporting of hospitalisation-related indicators on HealthStats NSW:

- To preserve the consistency of trends over time, ED-only episodes will be excluded from hospitalisations for indicators in HealthStats NSW. The number of ED-only episodes prior to 2016-17 will be additionally presented in downloadable data tables for indicators most affected by the policy change, such as injury hospitalisations.
- The definition of 'hospitalisations' in the Notes/Methods has been amended to specify that 'hospitalisations' exclude ED-only episodes.

Background

HealthStats NSW uses hospital admitted patient data from the Combined Admitted Patient Epidemiology Data (CAPED) dataset available through the Centre for Epidemiology and Evidence data warehouse, SAPHaRI. CAPED data are used to report on the health of NSW residents, including yearly trends for a range of health risk factors, diseases, locations, and specific populations.

To ensure consistency in the way hospital admissions are recorded across all NSW public hospitals, from 15 June 2017, ED-only episodes are no longer included as admitted patient records in NSW public hospitals (PD2017_015). As a result, from 2017-18 onwards, ED-only episodes are not included in CAPED. Admissions to Emergency Department Short Stay Units (also known as Emergency Management Units) are considered admitted patient records and continue to be included in CAPED.

Aims

- Outline the impact of this policy directive on the trends for hospital admissions in HealthStats NSW indicators
- Describe the HealthStats NSW approach for producing consistent trends when reporting indicators based on admitted patient data across the historic time series

Methods

We examined the impact of excluding ED-only episodes on NSW and Local Health District (LHD) trends for several key health indicators reported on HealthStats NSW. ED-only episodes were defined as those episodes coded as 'Entire episode within ED (for Level ≥ 3) only' or 'Entire episode within ED (for Level 1 or 2) only'. The following four 'Hospitalisations by category of cause' indicators were selected for this analysis because of their importance to public health, large numbers of hospitalisations, and proportion of ED-only episodes:

- Injury and poisoning
- Certain infectious and parasitic diseases
- Respiratory diseases
- Circulatory diseases

Further details on the methods are shown in Appendix 1.

Results

Across NSW, the number of episodes in CAPED decreased by 0.2% between 2016-17 and 2017-18, compared to a usual yearly increase of 2.8% in previous years (Figure 1 and Table 1). ED-only episodes account for a substantial proportion of CAPED episodes: 3.7% of episodes in 2016-17 and 5.3% of episodes for all years prior to 2017-18 combined (Table 1).

Figure 1. Hospitalisations in CAPED when including or excluding ED-only episodes by financial year, NSW 2001-02 to 2017-18

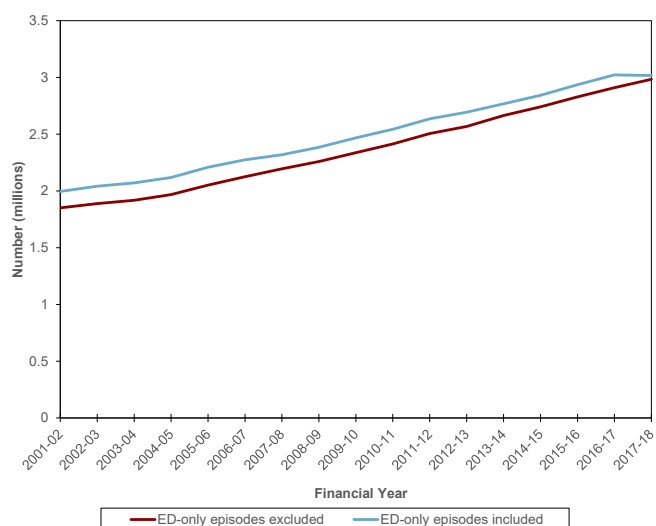


Table 1. Total and ED-only episodes in CAPED by financial year, NSW 2001-02 to 2017-18

Year	Total		ED-only episodes	
	Number	Percentage increase over previous year	Number	Percentage of total annual episodes
2001-02	1,995,704	-	144,499	7.2
2002-03	2,041,732	2.3	153,104	7.5
2003-04	2,071,614	1.5	153,520	7.4
2004-05	2,118,620	2.3	150,679	7.1
2005-06	2,208,468	4.2	156,649	7.1
2006-07	2,273,924	3.0	147,925	6.5
2007-08	2,318,419	2.0	122,888	5.3
2008-09	2,384,750	2.9	125,538	5.3
2009-10	2,468,335	3.5	131,257	5.3
2010-11	2,543,675	3.1	130,552	5.1
2011-12	2,635,966	3.6	130,819	5.0
2012-13	2,693,605	2.2	125,180	4.6
2013-14	2,767,546	2.7	103,201	3.7
2014-15	2,842,274	2.7	100,880	3.5
2015-16	2,935,808	3.3	106,259	3.6
2016-17	3,022,633	3.0	112,402	3.7
2017-18	3,016,537	-0.2	32,658	1.1
2001-02 to 2016-17	39,323,073	2.8	2,095,352	5.3

The exclusion of ED-only episodes differentially affects reported trends for certain categories of hospitalisation such as those for *injury and poisoning* (16.5% of episodes are ED-only), *certain infectious and parasitic diseases* (14.0% of episodes are ED-only), *respiratory diseases* (7.9% of episodes are ED-only), and *circulatory diseases* (6.9% of episodes are ED-only) (Table 2).

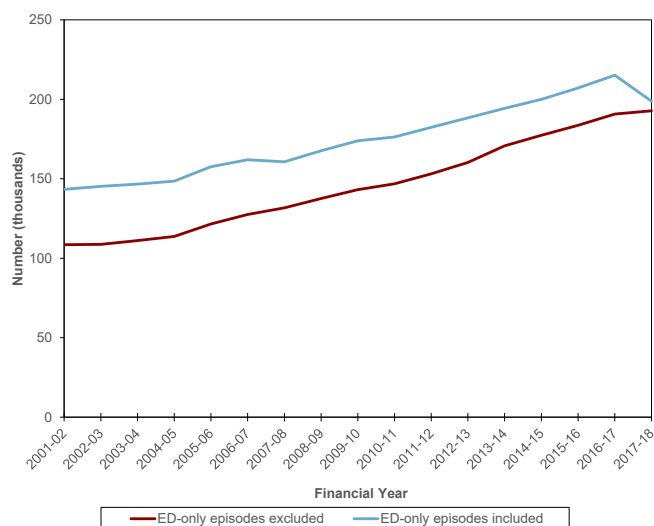
Table 2. Total and ED-only episodes in CAPED by category, 2001-02 to 2017-18

Hospitalisations by category of primary diagnosis	Total episodes	ED-only episodes
	Number	Percentage of total episodes
Injury and poisoning	2,968,436	16.5
Symptoms, signs, and abnormal findings	3,002,288	16.2
Certain infectious and parasitic diseases	689,288	14.0
Respiratory diseases	2,112,743	7.9
Mental and behavioural disorders	1,935,238	7.5
Circulatory diseases	2,479,440	6.9
Skin and subcutaneous tissue diseases	690,134	5.5
Endocrine diseases	640,320	5.0
Genitourinary diseases	2,165,050	4.8
Digestive system diseases	4,687,042	3.4
Musculoskeletal and connective tissue disorders	2,178,270	3.2
Nervous system and sense organ disorders	2,845,387	2.9
Blood and immune system diseases	500,576	2.6
Maternal, neonatal, and congenital causes	3,284,826	1.2
Malignant neoplasms (Cancers)	1,779,802	0.8
Other neoplasms	937,741	0.3
Dialysis	5,161,226	<0.1
Total	42,339,610	5.0

Note: Total includes all episodes

The number of hospitalisations for *injury and poisoning* decreased by 7.6% between 2016-17 and 2017-18, compared to a usual yearly increase of 2.8% (Figure 2; Table 3). When ED-only episodes are excluded, the number of hospitalisations increased by 1.1% between 2016-17 and 2017-18, compared to a usual yearly increase of 3.8% (Table 3).

Figure 2. Hospitalisations for injury and poisoning when including or excluding ED-only episodes by financial year, NSW 2001-02 to 2017-18



The number of hospitalisations for *certain infectious and parasitic diseases* decreased by 2.6% between 2016-17 and 2017-18, compared to a usual yearly increase of 4.0% (Figure 3; Table 4). When ED-only episodes are excluded, the number of hospitalisations increased by 5.0% between 2016-17 and 2017-18, compared to a usual yearly increase of 4.6% (Table 4).

Figure 3. Hospitalisations for certain infectious and parasitic diseases when including or excluding ED-only episodes by financial year, NSW 2001-02 to 2017-18



Table 3. Hospitalisations for injury and poisoning when including or excluding ED-only episodes, and percentage increases over previous year, by financial year

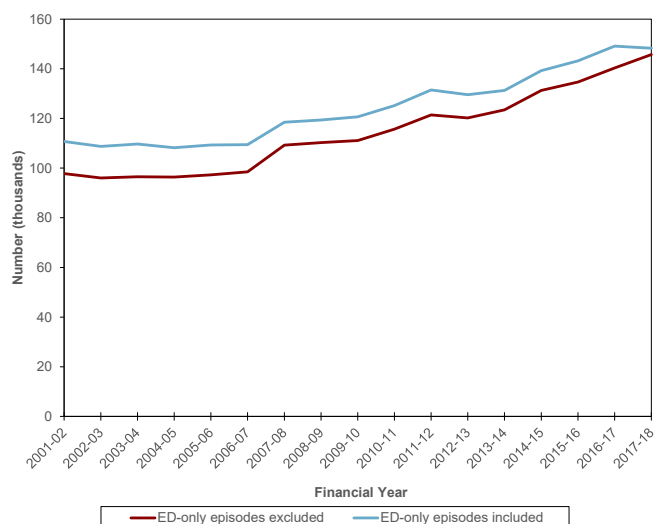
Year	Including ED-only episodes		Excluding ED-only episodes	
	Number	Percentage increase over previous year	Number	Percentage increase over previous year
2001-02	143,349	-	108,518	-
2002-03	145,262	1.3	108,711	0.2
2003-04	146,620	0.9	111,136	2.2
2004-05	148,568	1.3	113,672	2.3
2005-06	157,636	6.1	121,572	6.9
2006-07	161,948	2.7	127,563	4.9
2007-08	160,700	-0.8	131,764	3.3
2008-09	167,602	4.3	137,556	4.4
2009-10	173,913	3.8	143,204	4.1
2010-11	176,275	1.4	146,852	2.5
2011-12	182,394	3.5	153,061	4.2
2012-13	188,296	3.2	160,272	4.7
2013-14	194,329	3.2	170,709	6.5
2014-15	200,004	2.9	177,380	3.9
2015-16	207,104	3.5	183,683	3.6
2016-17	215,173	3.9	190,691	3.8
2017-18	198,775	-7.6	192,773	1.1
2001-02 to 2016-17	2,769,173	2.8	2,286,344	3.8

Table 4. Hospitalisations for certain infectious and parasitic diseases when including or excluding ED-only episodes, and percentage increases over previous year, by financial year

Year	Including ED-only episodes		Excluding ED-only episodes	
	Number	Percentage increase over previous year	Number	Percentage increase over previous year
2001-02	32,848	-	26,601	-
2002-03	34,331	4.5	27,033	1.6
2003-04	34,523	0.6	27,082	0.2
2004-05	30,192	-12.5	24,323	-10.2
2005-06	34,676	14.9	27,591	13.4
2006-07	33,979	-2.0	27,895	1.1
2007-08	30,487	-10.3	26,368	-5.5
2008-09	37,538	23.1	31,932	21.1
2009-10	40,311	7.4	33,920	6.2
2010-11	41,259	2.4	35,209	3.8
2011-12	42,030	1.9	35,751	1.5
2012-13	46,697	11.1	40,155	12.3
2013-14	45,381	-2.8	40,261	0.3
2014-15	45,229	-0.3	40,553	0.7
2015-16	49,966	10.5	45,018	11.0
2016-17	55,648	11.4	50,150	11.4
2017-18	54,182	-2.6	52,670	5.0
2001-02 to 2016-17	635,095	4.0	539,842	4.6

The number of hospitalisations for *respiratory diseases* decreased by 0.6% between 2016-17 and 2017-18, compared to a usual yearly increase of 2.0% (Figure 4; Table 5). When ED-only episodes are excluded, the number of hospitalisations increased by 3.8% between 2016-17 and 2017-18, compared to a usual yearly increase of 2.5% (Table 5).

Figure 4. Hospitalisations for respiratory diseases when including or excluding ED-only episodes by financial year, NSW 2001-02 to 2017-18



The number of hospitalisations for *circulatory diseases* decreased by 1.1% between 2016-17 and 2017-18, compared to a usual yearly increase of 1.2% (Figure 5; Table 6). When ED-only episodes are excluded, the number of hospitalisations increased by 3.5% between 2016-17 and 2017-18, compared to a usual yearly increase of 1.4% (Table 6).

Figure 5. Number of hospitalisations for circulatory diseases when including or excluding ED-only episodes by financial year, NSW 2001-02 to 2017-18

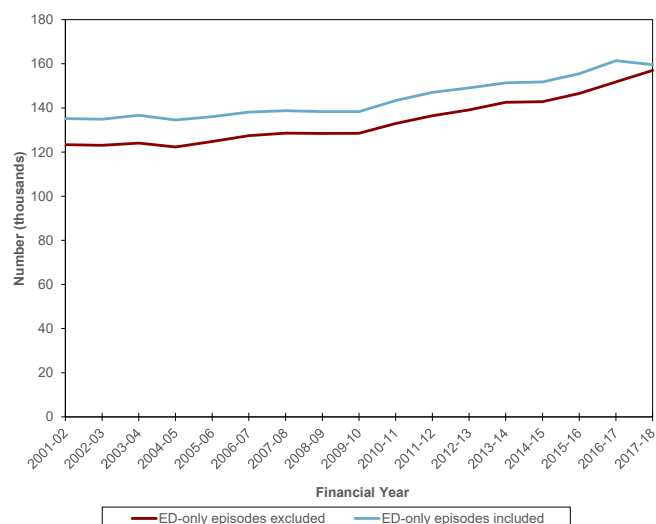


Table 5. Hospitalisations for respiratory diseases when including total episodes or excluding ED-only episodes, and percentage increases over previous year, by financial year

Year	Total		Excluding ED-only episodes	
	Number	Percentage increase over previous year	Number	Percentage increase over previous year
2001-02	110,728	-	97,788	-
2002-03	108,760	-1.8	96,035	-1.8
2003-04	109,722	0.9	96,537	0.5
2004-05	108,218	-1.4	96,375	-0.2
2005-06	109,329	1.0	97,303	1.0
2006-07	109,437	0.1	98,481	1.2
2007-08	118,502	8.3	109,325	10.9
2008-09	119,411	0.8	110,305	1.0
2009-10	120,692	1.1	111,128	0.7
2010-11	125,183	3.7	115,665	4.1
2011-12	131,514	5.1	121,446	5.0
2012-13	129,593	-1.5	120,227	-1.0
2013-14	131,316	1.3	123,458	2.7
2014-15	139,231	6.0	131,276	6.3
2015-16	143,191	2.8	134,660	2.6
2016-17	149,142	4.2	140,356	4.2
2017-18	148,303	-0.6	145,732	3.8
2001-02 to 2016-17	1,963,969	2.0	1,800,275	2.5

Table 6. Number of hospitalisations for circulatory diseases when including or excluding ED-only episodes, and percentage increases over previous years, by financial year

Year	Total		Excluding ED-only episodes	
	Number	Percentage increase over previous year	Number	Percentage increase over previous year
2001-02	135,150	-	123,367	-
2002-03	134,909	-0.2	123,032	-0.3
2003-04	136,705	1.3	124,095	0.9
2004-05	134,547	-1.6	122,310	-1.4
2005-06	136,062	1.1	124,768	2.0
2006-07	138,119	1.5	127,409	2.1
2007-08	138,751	0.5	128,589	0.9
2008-09	138,358	-0.3	128,406	-0.1
2009-10	138,356	0.0	128,499	0.1
2010-11	143,316	3.6	132,947	3.5
2011-12	147,035	2.6	136,433	2.6
2012-13	149,093	1.4	139,083	1.9
2013-14	151,339	1.5	142,584	2.5
2014-15	151,811	0.3	142,807	0.2
2015-16	155,522	2.4	146,585	2.6
2016-17	161,409	3.8	151,760	3.5
2017-18	159,584	-1.1	157,001	3.5
2001-02 to 2016-17	2,290,482	1.2	2,122,674	1.4

In respect to comparisons by LHD of residence, excluding ED-only episodes has a differential impact on the percentage of hospitalisations removed for individual LHDs (Table A1), but does not change comparisons among LHDs for *injury and poisoning, certain infectious and parasitic diseases, respiratory diseases, and circulatory diseases* hospitalisations (Figures A1-A4).

Discussion

Exclusion of ED-only episodes results in a 'smoothing' of the trends between 2001-02 and 2017-18 for the four 'Hospitalisations by category of cause' indicators examined, and avoids the presentation of artefactual sudden drops in the number of hospitalisations from 2016-17 to 2017-18 that may be misinterpreted as genuine reductions. Consequently, the following changes have been made to the reporting of hospitalisation-related indicators on HealthStats NSW:

- To preserve the consistency of trends over time, ED-only episodes will be excluded from hospitalisations for indicators in HealthStats NSW. The number of ED-only episodes prior to 2016-17 will be additionally presented in downloadable data tables for indicators most affected by the policy change, such as injury hospitalisations.
- The definition of 'hospitalisations' in the Notes/Methods has been amended to specify that 'hospitalisations' exclude ED-only episodes.

Further reading

- NSW Health Admission Policy Directive PD2017_015. Health System Information & Performance Reporting, NSW Government. Available at: https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2017_015.pdf Accessed 20 February 2019.
- ED Mode of Separation Code Set Update 2017/18. Information Bulletin IB2017_028. Health System Information & Performance Reporting, NSW Government. Available at: https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/IB2017_028.pdf
- Emergency Department Short Stay Units Policy Directive PD2014_040. System Relationships and Frameworks, NSW Government. Available at: https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2014_040.pdf
- Australian Institute of Health and Welfare, Australian Government. Variation in hospital admission policies and practices. Available at: <https://www.aihw.gov.au/getmedia/0bb1bc5f-deb9-4938-b346-a2b3978d16f0/aihw-hse-193.pdf.aspx?inline=true> Accessed 20 February 2019.

Appendices

Appendix 1

Methods

First, we examined the number and percentage of episodes in CAPED classified as ED-only and how this varies across years, 'Hospitalisations by category of cause', and LHD of residence:

- ED-only episodes include those episodes with ED status codes 1 'Entire episode within ED (for Level >=3) only' or 4 'Entire episode within ED (for Level 1 or 2) only'.
- Hospitalisations by category of cause were defined using principal ICD-10-AM diagnoses. Details on the definition and selection criteria for these categories can be found in the Codes section at: http://www.healthstats.nsw.gov.au/Indicator/bod_hos_cat
- Episodes were extracted on 14 February 2019 from CAPED using snapshot 19, excluding rehabilitation hospitalisations and duplicate episodes for contracted care, and limited to hospitalisations for NSW residents.

Second, we investigated the impact of including or excluding ED-only episodes on four 'Hospitalisations by category of cause' indicators because of their importance to public health, their large numbers of hospitalisations, and high proportions of ED-only episodes (Table 2):

- Injury and poisoning
- Certain infectious and parasitic diseases
- Circulatory diseases
- Respiratory diseases

Appendix 2

Results: LHD tables

Table A1 presents the percentage of total hospitalisations, and those for selected categories of cause, that are ED-only episodes among LHDs from 2001-02 to 2017-18. This table shows that, on average, Illawarra Shoalhaven and Western Sydney LHDs have the highest percentage of ED-only episodes for circulatory diseases, injury and poisoning, certain infectious and parasitic diseases, and respiratory diseases, as well as overall hospitalisations. Therefore, these LHDs are most impacted by the exclusion of ED-only episodes. By contrast, Hunter New England LHD has the lowest percentage of ED-only episodes in these categories, as well as overall hospitalisations, and therefore is least impacted by the exclusion of ED-only episodes.

Table A1. Percentage of total episodes that are ED-only episodes for selected categories of hospitalisation by Local Health District of residence, NSW 2001-02 to 2017-18

Local Health District	Injury and poisoning	Certain infectious and parasitic disease	Respiratory disease	Circulatory disease	All hospitalisations
	Per cent	Per cent	Per cent	Per cent	Per cent
Sydney	15.0	12.7	6.5	5.2	4.1
South Western Sydney	16.8	12.1	7.2	6.3	4.9
South Eastern Sydney	12.3	12.3	6.0	3.9	3.2
Illawarra Shoalhaven	25.0	22.8	13.2	10.7	9.1
Western Sydney	24.8	25.1	16.9	8.1	8.3
Nepean Blue Mountains	17.8	18.5	9.4	7.1	6.7
Northern Sydney	13.0	10.4	5.1	4.9	3.4
Central Coast	18.4	18.9	10.8	7.5	6.0
Hunter New England	7.8	4.5	2.9	3.7	2.0
Northern NSW	21.6	13.7	8.5	11.4	7.3
Mid North Coast	19.8	15.3	8.0	6.2	6.1
Southern NSW	17.5	17.0	8.1	8.1	6.5
Murrumbidgee	25.5	19.0	8.5	9.4	8.4
Western NSW	17.1	10.1	5.8	7.8	5.5
Far West	12.7	16.9	5.6	6.9	4.7
Total NSW	16.5	14.0	7.9	6.9	5.0

Note: Red and green cells respectively have higher and lower percentages of ED-only episodes compared to other Local Health Districts

Figures A1 to A4 compare the number of hospitalisations by LHD during 2016-17 for the four selected categories of cause when excluding or including ED-only episodes. These figures show that although excluding ED-only episodes reduces the total hospitalisations for *injury and poisoning*, *certain infectious and parasitic diseases*, *respiratory diseases*, and *circulatory diseases* for all LHDs, the comparisons among LHDs are minimally affected.

Figure A1. Hospitalisations for injury and poisoning when excluding or including ED-only episodes by Local Health District, NSW 2016-17

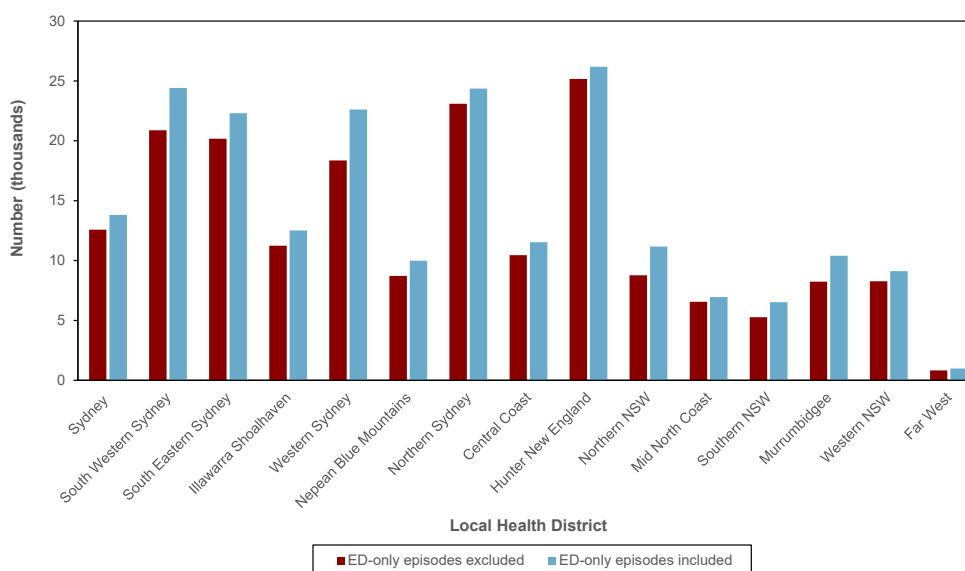


Figure A2. Hospitalisations for certain infectious and parasitic diseases when excluding or including ED-only episodes by Local Health District, NSW 2016-17

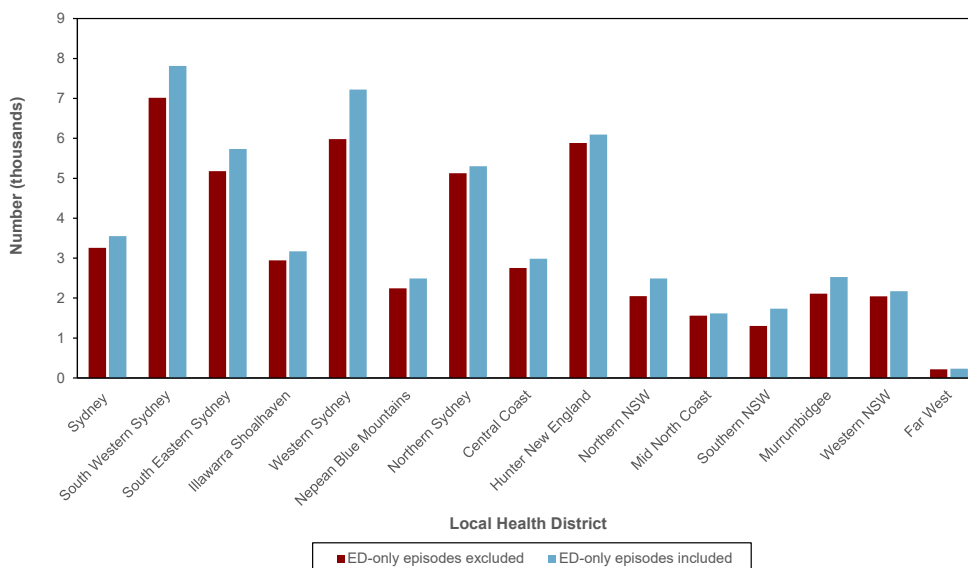


Figure A3. Hospitalisations for respiratory diseases when excluding or including ED-only episodes by Local Health District, NSW 2016-17

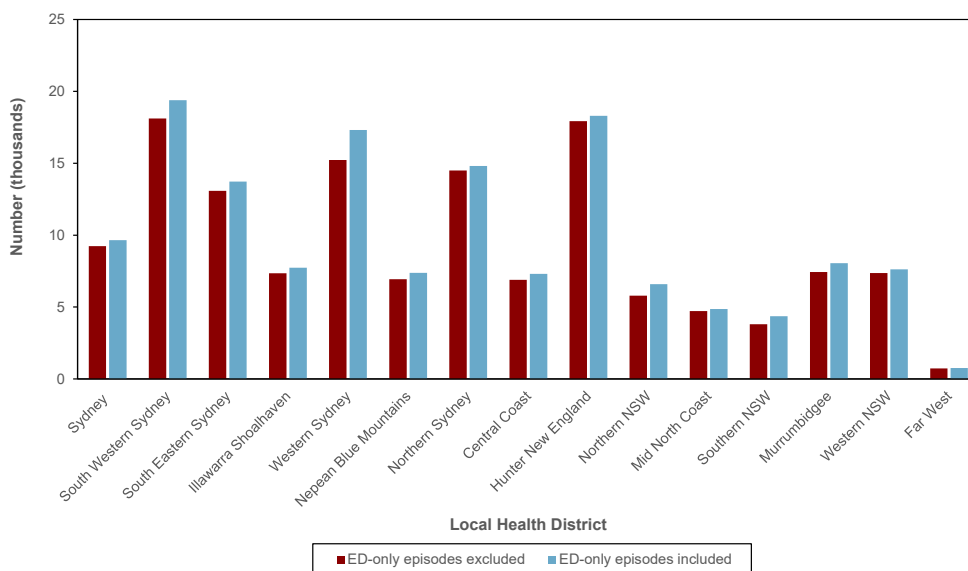


Figure A4. Hospitalisations for circulatory diseases when excluding or including ED-only episodes by Local Health District, NSW 2016-17

