

## Supplementary materials

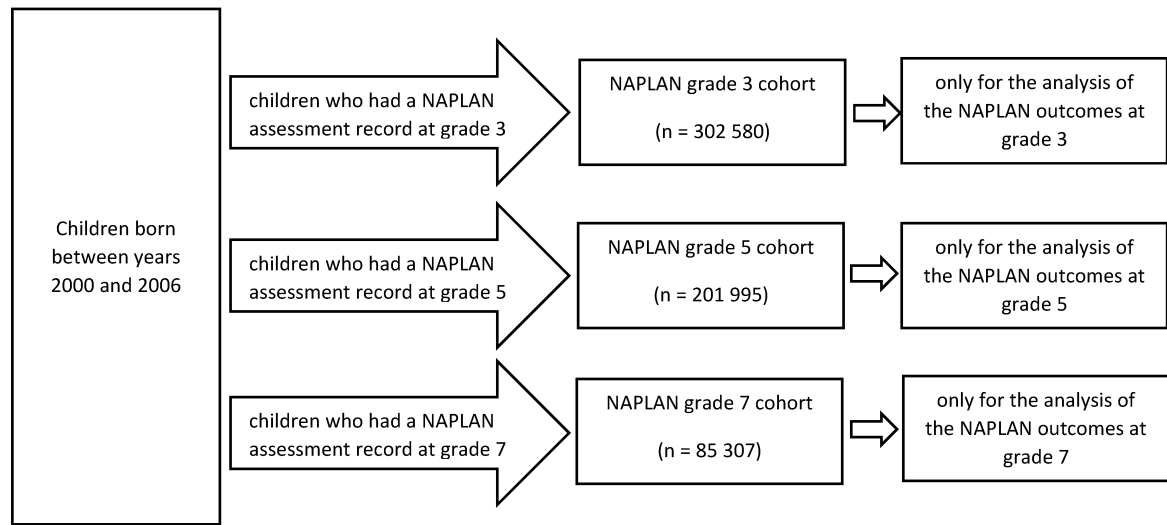
### Data linkage

Individual records for each child were linked across datasets of birth and perinatal circumstances (the Perinatal Data Collection, PDC), inpatient admissions hospital inpatient admissions (the Admitted Patient Data Collection, APDC), and school assessment (the National Assessment Program-Literacy and Numeracy, NAPLAN) using a probabilistic approach by the NSW Centre for Health Record Linkage with de-identified data provided to the researchers. A data quality review conducted in 2012 in NSW showed the rate of data linkage error was 3/1000 linkage keys.<sup>1</sup>

The researchers have examined the missing records and removed the duplicate records which were considered to occur when the records have the same patient ID and the same visit ID. In addition, hospital inpatient admissions were considered to represent a transferral episode if the admission start date is before the discharge date of the previous admission episode. The transferral episodes were not considered as a new episode of admissions in the analyses.

### NAPLAN data

NAPLAN data were unavailable for children who were absent (e.g., physically unwell on the testing day), exempt (e.g., significant intellectual disability that severely limits students' capacity to participate in a test), or withdrawn (e.g., parents holding religious or philosophical objections to testing) from the test. The National Report for NAPLAN 2014 shows that between 2009 and 2014 in NSW, 3.7-5.3% children performed BNMS in reading and 3.5-4.6% in numeracy in Grade 3; 3.2-8% and 4.5-6% in Grade 5 respectively; 4.6-5.3% and 4.5-6.2% in Grade 7 respectively.<sup>2</sup> These results are similar to our findings (Supplementary Tables 9-13). NAPLAN reports both continuous and band scores. We considered as the outcome the national minimum standard (NMS) derived from band scores, because it facilitates the interpretation of the policy and practical implications of the findings. Last, the NAPLAN results can be used to predict subsequent access to tertiary education.<sup>3</sup>

**Supplementary Figure 1** Study design flowchart

**Supplementary Table 1** Types of chronic condition identified using Hardelid et al.'s classification system.<sup>4</sup>

<b>Types of chronic condition</b>	<b>Sub-categories</b>
Mental health/behavioural	Substance abuse
	Self-harm
	Other mental health problems
	Behavioural/developmental disorders
Cancer/blood disorders	Neoplasms
	Immunological disorders
	Anaemia and other blood disorders
Chronic infections	HIV
	Tuberculosis
	Other
Respiratory	Asthma and chronic lower respiratory disease
	Cystic fibrosis
	Injuries
	Congenital anomalies
	Other
Metabolic/endocrine/digestive/renal/ genitourinary	Diabetes
	Other endocrine
	Metabolic
	Digestive
	Renal/GU
	Congenital anomalies of the digestive/renal/GU system
	Injuries
	Other/unspecific
Musculoskeletal/skin	Musculoskeletal/connective tissue
	Skeletal injuries/amputations
	Chronic skin disorders
	Congenital anomalies
Neurological	Epilepsy
	Cerebral palsy
	Injuries of brain, nerves, eyes or ears
	Chronic eye conditions
	Chronic ear conditions
	Perinatal conditions
	Congenital anomalies of neurological or sensory systems
	Other
Cardiovascular	Congenital heart disease
	Other
Codes indicating non-specific chronic condition	-

**Supplementary Table 2** Number and percentage of children born in each year included in each grade cohort

Year of birth	Number of children born in each year	School grade of NAPLAN assessment <sup>a</sup>					
		Grade 3 cohort		Grade 5 cohort		Grade 7 cohort	
		N <sup>b</sup>	Row %	N <sup>a</sup>	Row %	N <sup>a</sup>	Row %
<b>2000</b>	50411	34751	68.94	47222	93.67	37652	74.69
<b>2001</b>	49668	49662	99.99	46563	93.75	36412	73.31
<b>2002</b>	50071	49870	99.60	46541	92.95	11236	22.44
<b>2003</b>	67119	50054	74.58	47255	70.40	--	0.01
<b>2004</b>	56761	49569	87.33	14403	25.37	--	0.00
<b>2005</b>	52984	52422	98.94	6	0.01	--	0.00
<b>2006</b>	70155	16252	23.17	--	0.01	--	0.00

<sup>a</sup> NAPLAN data were available from 2009 to 2014.

<sup>b</sup> Number of children with a NAPLAN assessment record for each Grade cohort

-- Numbers from 1 to 5 are suppressed from presentation to protect individual confidentiality.

Supplementary Table 3 Characteristics of children with a NAPLAN record at grade 5

Factors	Children without recorded hospitalisations prior to NAPLAN assessment at Grade 5	Children hospitalised without any chronic conditions prior to NAPLAN assessment at Grade 5	Children hospitalised with a chronic condition prior to NAPLAN assessment at Grade 5
	n (Column %)	n (Column %)	n (Column %)
<b>All</b>	91673 (100)	74903 (100)	35419 (100)
<b>Child's sex</b>			
Male	41207 (45)	40972 (54.7)	20893 (59)
Female	50427 (55)	33904 (45.3)	14506 (41)
Unknown	39 (0)	27 (0)	20 (0.1)
<b>Child perinatal factors</b>			
Gestational age (weeks)			
Pre-term birth (gestational age $\leq$ 36)	4709 (5.1)	5228 (7)	3385 (9.6)
Term birth (gestational age: 37-41)	84358 (92)	67820 (90.5)	31212 (88.1)
Post-term birth (gestational age $\geq$ 42)	2599 (2.8)	1843 (2.5)	818 (2.3)
Missing	7 (0)	12 (0)	--
Birthweight by gestation			
Small for gestation (<10%)	9823 (10.7)	8718 (11.6)	4375 (12.4)
Birthweight by gestation: 10-90%	72664 (79.3)	58871 (78.6)	27350 (77.2)
Large for gestation ( $\geq$ 90%)	9058 (9.9)	7194 (9.6)	3609 (10.2)
Missing	128 (0.1)	120 (0.2)	85 (0.2)
Plurality			
Singleton	89233 (97.3)	72517 (96.8)	34134 (96.4)
Twins or others	2440 (2.7)	2386 (3.2)	1285 (3.6)
Apgar score (5 minutes)			
5 min Apgar: < 7	1006 (1.1)	985 (1.3)	681 (1.9)
5 min Apgar: 7-10	90450 (98.7)	73761 (98.5)	34653 (97.8)
Missing	217 (0.2)	157 (0.2)	85 (0.2)
<b>Maternal and familial socioeconomic factors</b>			
Maternal parity			
First born child	36017 (39.3)	30868 (41.2)	14960 (42.2)
Second born child	31884 (34.8)	24845 (33.2)	11721 (33.1)
Third born child or younger	23729 (25.9)	19134 (25.6)	8732 (24.7)
Missing	43 (0.1)	56 (0.1)	6 (0)
Gestational weeks at 1 <sup>st</sup> antenatal visit			
Antenatal care < 20 weeks	78729 (85.9)	64439 (86)	30398 (85.8)
Antenatal care $\geq$ 20 weeks	12288 (13.4)	9819 (13.1)	4665 (13.2)
Missing	656 (0.7)	645 (0.9)	356 (1)
Maternal smoking during pregnancy			
Yes	16161 (17.6)	16209 (21.6)	7713 (21.8)
No	75502 (82.4)	58683 (78.4)	27698 (78.2)
Unknown	10 (0)	11 (0)	8 (0)
Maternal age at child's birth (years)			
< 20	3952 (4.3)	4573 (6.1)	2017 (5.7)
20-24	13753 (15)	13491 (18)	6321 (17.9)
25-34	56024 (61.1)	44371 (59.2)	20961 (59.2)
35-39	14748 (16.1)	10279 (13.7)	5022 (14.2)
$\geq$ 40	3164 (3.5)	2157 (2.9)	1085 (3.1)
Missing	32 (0)	32 (0)	13 (0)
Maternal postcode-level residential socioeconomic disadvantage (IRSD) <sup>a</sup>			
$\leq$ 25% (most disadvantaged)	19958 (21.8)	17472 (23.3)	7776 (22)
25 <- 50%	22722 (24.8)	19806 (26.4)	8892 (25.1)
50 <- 75%	25066 (27.3)	19457 (26)	9353 (26.4)
> 75% (least disadvantaged)	23879 (26.1)	18132 (24.2)	9388 (26.5)

Missing	48 (0.1)	36 (0.1)	10 (0)
<b>Maternal postcode-level residential remoteness (ARIA)<sup>b</sup></b>			
Major Cities of Australia	71804 (78.3)	55615 (74.3)	27256 (77)
Inner Regional Australia	14886 (16.2)	13857 (18.5)	5952 (16.8)
Outer Regional Australia	4537 (5)	4777 (6.4)	1916 (5.4)
Remote & Very Remote Australia	419 (0.5)	634 (0.9)	292 (0.8)
Unknown	27 (0)	20 (0)	--
<b>Maternal country of birth</b>			
Australia born	64393 (70.2)	56853 (75.9)	27080 (76.5)
Non-Australia born	27280 (29.8)	18050 (24.1)	8339 (23.5)
<b>Parental highest educational attainment<sup>c</sup></b>			
Year 12 or equivalent or below	19939 (21.8)	18401 (24.6)	8320 (23.5)
Certificate or Diploma	39702 (43.3)	33282 (44.4)	15670 (44.2)
Bachelor's degree or above	25593 (27.9)	17914 (23.9)	8933 (25.2)
Missing	6439 (7)	5306 (7.1)	2496 (7.1)
<b>Child's age at NAPLAN Grade 3 test</b>			
9 years	6470 (7.1)	4653 (6.2)	1828 (5.2)
10 years	75568 (82.4)	60831 (81.2)	28215 (79.7)
11 years	9604 (10.5)	9386 (12.5)	5346 (15.1)
Other	31 (0)	33 (0)	30 (0.1)
<b>Child's year of birth</b>			
2000	21394 (23.3)	17792 (23.8)	8036 (22.7)
2001	20572 (22.4)	17669 (23.6)	8322 (23.5)
2002	20973 (22.9)	17159 (22.9)	8409 (23.7)
2003	21695 (23.7)	17211 (23)	8349 (23.6)
2004	7034 (7.7)	5068 (6.8)	2301 (6.5)
2005	--	--	--
2006	--	--	--

<sup>a</sup> Maternal postcode-level residential socioeconomic disadvantage was measured using the Index of Relative Socioeconomic Disadvantage (IRSD) score.

<sup>b</sup> Maternal postcode-level residential remoteness was determined using the Accessibility/Remoteness Index of Australia (ARIA) classification.

<sup>c</sup> Parental highest educational attainment was measured at the time of the child's NAPLAN Grade 5 test.

-- Numbers from 1 to 5 are suppressed from presentation to protect individual confidentiality.

Supplementary Table 4 Characteristics of children with a NAPLAN record at grade 7

Factors	Children without recorded hospitalisations prior to NAPLAN assessment at Grade 7	Children hospitalised without any chronic conditions prior to NAPLAN assessment at Grade 7	Children hospitalised with a chronic condition prior to NAPLAN assessment at Grade 7
	n (Column %)	n (Column %)	n (Column %)
<b>All</b>	36320 (100)	33432 (100)	15555 (100)
<b>Child's sex</b>			
Male	15928 (43.9)	18123 (54.2)	9090 (58.4)
Female	20383 (56.1)	15297 (45.8)	6457 (41.5)
Unknown	9 (0)	12 (0)	8 (0.1)
<b>Child perinatal factors</b>			
Gestational age (weeks)			
Pre-term birth (gestational age $\leq$ 36)	1826 (5)	2387 (7.1)	1521 (9.8)
Term birth (gestational age: 37-41)	33395 (92)	30141 (90.2)	13645 (87.7)
Post-term birth (gestational age $\geq$ 42)	1098 (3)	896 (2.7)	388 (2.5)
Missing	--	8 (0)	--
Birthweight by gestation			
Small for gestation (<10%)	4060 (11.2)	3962 (11.9)	2022 (13)
Birthweight by gestation: 10-90%	28653 (78.9)	26177 (78.3)	11941 (76.8)
Large for gestation ( $\geq$ 90%)	3572 (9.8)	3237 (9.7)	1558 (10)
Missing	35 (0.1)	56 (0.2)	34 (0.2)
Plurality			
Singleton	35342 (97.3)	32364 (96.8)	15009 (96.5)
Twins or others	978 (2.7)	1068 (3.2)	546 (3.5)
Apgar score (5 minutes)			
5 min Apgar: < 7	411 (1.1)	474 (1.4)	295 (1.9)
5 min Apgar: 7-10	35820 (98.6)	32878 (98.3)	15228 (97.9)
Missing	89 (0.3)	80 (0.2)	32 (0.2)
<b>Maternal and familial socioeconomic factors</b>			
Maternal parity			
First born child	13728 (37.8)	13137 (39.3)	6291 (40.4)
Second born child	12560 (34.6)	11086 (33.2)	5040 (32.4)
Third born child or younger	10018 (27.6)	9188 (27.5)	4221 (27.1)
Missing	14 (0)	21 (0.1)	--
Gestational weeks at 1 <sup>st</sup> antenatal visit			
Antenatal care < 20 weeks	30877 (85)	28349 (84.8)	13091 (84.2)
Antenatal care $\geq$ 20 weeks	5140 (14.2)	4732 (14.2)	2282 (14.7)
Missing	303 (0.8)	351 (1.1)	182 (1.2)
Maternal smoking during pregnancy			
Yes	7297 (20.1)	8371 (25)	4028 (25.9)
No	29019 (79.9)	25055 (74.9)	11522 (74.1)
Unknown	--	6 (0)	--
Maternal age at child's birth (years)			
< 20	1730 (4.8)	2313 (6.9)	1065 (6.9)
20-24	5856 (16.1)	6569 (19.7)	3089 (19.9)
25-34	21909 (60.3)	19364 (57.9)	9046 (58.2)
35-39	5617 (15.5)	4272 (12.8)	1937 (12.5)
$\geq$ 40	1195 (3.3)	897 (2.7)	411 (2.6)
Missing	13 (0)	17 (0.1)	7 (0.1)
Maternal postcode-level residential socioeconomic disadvantage (IRSD) <sup>a</sup>			
$\leq$ 25% (most disadvantaged)	8907 (24.5)	8708 (26.1)	3851 (24.8)
25 <- 50%	9313 (25.6)	9375 (28)	4233 (27.2)
50 <- 75%	10062 (27.7)	8664 (25.9)	4116 (26.5)
> 75% (least disadvantaged)	8019 (22.1)	6674 (20)	3350 (21.5)

Missing	19 (0.1)	11 (0)	--
<b>Maternal postcode-level residential remoteness (ARIA)<sup>b</sup></b>			
Major Cities of Australia	28438 (78.3)	24357 (72.9)	11713 (75.3)
Inner Regional Australia	5874 (16.2)	6521 (19.5)	2739 (17.6)
Outer Regional Australia	1838 (5.1)	2238 (6.7)	946 (6.1)
Remote & Very Remote Australia	161 (0.4)	310 (0.9)	154 (1)
Unknown	9 (0)	6 (0)	--
<b>Maternal country of birth</b>			
Australia born	24948 (68.7)	25178 (75.3)	11765 (75.6)
Non-Australia born	11372 (31.3)	8254 (24.7)	3790 (24.4)
<b>Parental highest educational attainment<sup>c</sup></b>			
Year 12 or equivalent or below	8456 (23.3)	8726 (26.1)	3996 (25.7)
Certificate or Diploma	17459 (48.1)	16636 (49.8)	7698 (49.5)
Bachelor's degree or above	9390 (25.9)	7115 (21.3)	3410 (21.9)
Missing	1015 (2.8)	955 (2.9)	451 (2.9)
<b>Child's age at NAPLAN Grade 3 test</b>			
11 years	6470 (7.1)	4653 (6.2)	1828 (5.2)
12 years	75568 (82.4)	60831 (81.2)	28215 (79.7)
13 years	9604 (10.5)	9386 (12.5)	5346 (15.1)
Other	31 (0)	33 (0)	30 (0.1)
<b>Child's year of birth</b>			
2000	16040 (44.2)	14755 (44.1)	6857 (44.1)
2001	15255 (42)	14387 (43)	6770 (43.5)
2002	5024 (13.8)	4285 (12.8)	1927 (12.4)
2003	0 (0)	--	--
2004	0 (0)	0 (0)	0 (0)
2005	--	0 (0)	0 (0)
2006	0 (0)	--	0 (0)

<sup>a</sup> Maternal postcode-level residential socioeconomic disadvantage was measured using the Index of Relative Socioeconomic Disadvantage (IRSD) score.

<sup>b</sup> Maternal postcode-level residential remoteness was determined using the Accessibility/Remoteness Index of Australia (ARIA) classification.

<sup>c</sup> Parental highest educational attainment was measured at the time of the child's NAPLAN Grade 7 test.

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**Supplementary Table 5** Most frequently reported health conditions among children hospitalised without any chronic conditions

<b>ICD-10-AM code</b>	<b>ICD-10-AM condition</b>
<b>K02</b>	Dental caries
<b>J21</b>	Acute bronchiolitis
<b>J35</b>	Chronic diseases of tonsils and adenoids
<b>A08</b>	Viral and other specified intestinal infections
<b>B34</b>	Viral infection of unspecified site
<b>A09</b>	Other gastroenteritis and colitis of infectious and unspecified origin
<b>S52</b>	Fracture of forearm
<b>J06</b>	Acute upper respiratory infections of multiple and unspecified sites
<b>J05</b>	Acute obstructive laryngitis [croup] and epiglottitis
<b>J18</b>	Pneumonia, organism unspecified
<b>R68</b>	Other general symptoms and signs
<b>Z41</b>	Procedures for purposes other than remedying health state
<b>S01</b>	Superficial injury of neck
<b>R56</b>	Convulsions, not elsewhere classified
<b>R50</b>	Fever of other and unknown origin
<b>K40</b>	Inguinal hernia
<b>H66</b>	Suppurative and unspecified otitis media
<b>J03</b>	Acute tonsillitis
<b>S42</b>	Fracture of shoulder and upper arm
<b>N39</b>	Other disorders of urinary system

**Supplementary Table 6** Proportion of children missing a NAPLAN test due to any reason

	Missing a NAPLAN test due to any reason					
	Grade 3 cohort		Grade 5 cohort		Grade 7 cohort	
	Total N	n (% of missing testing)	Total N	n (% of missing testing)	Total N	n (% of missing testing)
<b>Children without recorded hospitalisations prior to testing</b>	147456	5882 (3.99)	91673	3241 (3.54)	36320	1974 (5.44)
<b>Children hospitalised without any chronic conditions (CC) prior to testing</b>	105033	5367 (5.11)	74903	3676 (4.91)	33432	2493 (7.46)
<b>Children hospitalised with a CC prior to testing</b>	50091	4926 (9.83)	35419	3279 (9.26)	15555	1931 (12.41)
<b>Frequency of hospitalisations with a CC</b>						
1	31398	2167 (6.90)	22093	1399 (6.33)	9664	928 (9.60)
2-3	13084	1338 (10.23)	9223	885 (9.60)	4010	489 (12.19)
4-6	3326	580 (17.44)	2452	421 (17.17)	1114	234 (21.01)
≥ 7	2283	841 (36.84)	1651	574 (34.77)	767	280 (36.51)
<b>Duration of hospitalisations with a CC (bed-days)</b>						
1-2	30505	2146 (7.03)	21179	1426 (6.73)	8958	868 (9.69)
3-4	7852	734 (9.35)	5542	455 (8.21)	2489	273 (10.97)
5-7	5048	526 (10.42)	3701	363 (9.81)	1672	225 (13.46)
8-14	3466	500 (14.43)	2633	375 (14.24)	1272	214 (16.82)
≥ 15	3220	1020 (31.68)	2364	660 (27.92)	1164	351 (30.15)

<sup>a</sup>Total N represents the total number of children for each category of hospitalisation.

<sup>b</sup>n (%) represents the number (proportion) of children missing a NAPLAN test due to any reason.

**Supplementary Table 7** Frequency and duration of hospitalisations for any health conditions among children with and without a chronic condition (CC)

	Grade 3 cohort		Grade 5 cohort		Grade 7 cohort	
	Children hospitalised without CC	Children hospitalised with CC	Children hospitalised without CC	Children hospitalised with CC	Children hospitalised without CC	Children hospitalised with CC
	N <sup>a</sup> (Column %)	N (Column %)	N (Column %)	N (Column %)	N (Column %)	N (Column %)
<b>Total</b>	105033 (100)	50091 (100)	74903 (100)	35419 (100)	33432 (100)	15555 (100)
<b>Total frequency of hospitalisations for any health conditions prior to testing</b>						
1	65575 (62.43)	12721 (25.4)	44879 (59.92)	8268 (23.34)	19309 (57.76)	3339 (21.47)
2-3	33954 (32.33)	21432 (42.79)	25400 (33.91)	15010 (42.38)	11789 (35.26)	6485 (41.69)
4-6	5112 (4.87)	10864 (21.69)	4250 (5.67)	8179 (23.09)	2118 (6.34)	3787 (24.35)
≥ 7	392 (0.37)	5074 (10.13)	374 (0.5)	3962 (11.19)	216 (0.65)	1944 (12.5)
<b>Total duration of hospitalisations for any health conditions (bed-days) prior to testing</b>						
1-2	68032 (64.77)	17071 (34.08)	47547 (63.48)	11163 (31.52)	20823 (62.28)	4431 (28.49)
3-4	20231 (19.26)	10851 (21.66)	14829 (19.80)	7678 (21.68)	6840 (20.46)	3330 (21.41)
5-7	11342 (10.80)	9224 (18.41)	8395 (11.21)	6750 (19.06)	3757 (11.24)	3088 (19.85)
8-14	4503 (4.29)	7644 (15.26)	3410 (4.55)	5822 (16.44)	1639 (4.9)	2694 (17.32)
≥ 15	925 (0.88)	5301 (10.58)	722 (0.96)	4006 (11.31)	373 (1.12)	2012 (12.93)

<sup>a</sup> N represents the number of children included in each grade cohort who were or were not hospitalised with a chronic condition.

**Supplementary Table 8** Adjusted odds ratios (aOR) of children performing BNMS across NAPLAN domains at Grade 3, 5, and 7 for children hospitalised with a chronic condition prior to the test

	Grade 3 cohort		Grade 5 cohort		Grade 7 cohort	
	N. (%) of children BNMS <sup>a</sup>	Adjusted OR (95%CI) <sup>b</sup>	N. (%) of children BNMS	Adjusted OR (95%CI)	N. (%) of children BNMS	Adjusted OR (95%CI)
<b>NAPLAN Reading</b>						
Children hospitalised without any chronic conditions (CC) prior to testing (comparison)	4999 (4.95)	Reference	5366 (7.42)	Reference	2013 (6.33)	Reference
Children hospitalised with a CC prior to testing	2588 (5.64)	1.18 (1.13, 1.25)	2783 (8.51)	1.18 (1.12, 1.23)	1105 (7.85)	1.22 (1.13, 1.32)
<b>NAPLAN Writing</b>						
Children hospitalised without CC prior to testing (comparison)	3448 (3.41)	Reference	5759 (7.97)	Reference	4089 (12.85)	Reference
Children hospitalised with a CC prior to testing	1911 (4.17)	1.24 (1.16, 1.31)	3237 (9.91)	1.25 (1.20, 1.31)	2268 (16.07)	1.24 (1.17, 1.31)
<b>NAPLAN Spelling</b>						
Children hospitalised without CC prior to testing (comparison)	5158 (5.10)	Reference	4632 (6.40)	Reference	2438 (7.65)	Reference
Children hospitalised with a CC prior to testing	2702 (5.88)	1.19 (1.13, 1.25)	2451 (7.48)	1.17 (1.11, 1.23)	1317 (9.30)	1.19 (1.11, 1.28)
<b>NAPLAN Grammar &amp; punctuation</b>						
Children hospitalised without CC prior to testing (comparison)	6713 (6.63)	Reference	5913 (8.17)	Reference	3530 (11.07)	Reference
Children hospitalised with a CC prior to testing	3310 (7.20)	1.13 (1.08, 1.18)	3180 (9.71)	1.21 (1.16, 1.27)	1908 (13.47)	1.21 (1.14, 1.28)
<b>NAPLAN Numeracy</b>						
Children hospitalised without CC prior to testing (comparison)	4864 (4.83)	Reference	4568 (6.35)	Reference	1422 (4.51)	Reference
Children hospitalised with a CC prior to testing	2619 (5.73)	1.24 (1.18, 1.31)	2507 (7.70)	1.26 (1.19, 1.33)	802 (5.75)	1.25 (1.14, 1.37)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> The adjusted odds ratios (aORs) were derived from the multivariable logistic regression analyses controlling for school-level clustering effect and *all* the groups of confounders including child's sex, child's perinatal factors (gestational age, birthweight by gestation, plurality, Apgar score), maternal and familial socioeconomic factors (maternal parity, gestation of first antenatal care, maternal smoking, maternal age at child's birth, maternal country of birth, Aboriginality, maternal postcode-level residential socioeconomic status and remoteness at child's birth, and parental highest educational attainment), child's age at the NAPLAN test, child's year of birth, as well as the total length of duration of hospitalisations (due to any health conditions).

**Supplementary Table 9** Adjusted odds ratios (aOR) of children performing BNMS in reading in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with and without a chronic condition prior to the test

	<b>Below the National Minimum Standard (BNMS) in NAPLAN reading</b>					
	<b>Grade 3 cohort</b>		<b>Grade 5 cohort</b>		<b>Grade 7 cohort</b>	
	N. (%) of children BNMS <sup>a</sup>	Adjusted OR (95%CI) <sup>b</sup>	N. (%) of children BNMS	Adjusted OR (95%CI)	N. (%) of children BNMS	Adjusted OR (95%CI)
<b>Children without recorded hospitalisations prior to testing (comparison group)</b>	5319 (3.71)	Reference	4955 (5.54)	Reference	1520 (4.33)	Reference
<b>Children hospitalised without any chronic conditions (CC) prior to testing</b>	4999 (4.95)	1.13 (1.08, 1.19)	5366 (7.42)	1.15 (1.09, 1.21)	2013 (6.33)	1.19 (1.10, 1.29)
<b>Children hospitalised with a CC prior to testing</b>	2588 (5.64)	1.35 (1.28, 1.42)	2783 (8.51)	1.35 (1.28, 1.42)	1105 (7.85)	1.49 (1.38, 1.61)
<b>Total frequency of hospitalisations with a CC prior to testing</b>						
1	1555 (5.24)	1.25 (1.18, 1.33)	1652 (7.86)	1.25 (1.17, 1.33)	650 (7.23)	1.37 (1.25, 1.51)
2-3	704 (5.90)	1.43 (1.31, 1.55)	759 (8.93)	1.46 (1.34, 1.59)	311 (8.53)	1.62 (1.42, 1.85)
4-6	198 (7.07)	1.69 (1.45, 1.97)	217 (10.42)	1.59 (1.36, 1.86)	86 (9.39)	1.75 (1.40, 2.18)
≥ 7	131 (8.72)	1.97 (1.61, 2.42)	155 (13.83)	2.12 (1.75, 2.57)	58 (11.18)	2.10 (1.54, 2.85)
<b>Total duration of hospitalisations with a CC (bed-days) prior to testing</b>						
1-2	1463 (5.09)	1.28 (1.20, 1.35)	1536 (7.66)	1.29 (1.21, 1.37)	578 (6.95)	1.38 (1.25, 1.52)
3-4	428 (5.91)	1.38 (1.24, 1.54)	420 (8.13)	1.25 (1.12, 1.39)	181 (7.89)	1.44 (1.22, 1.71)
5-7	277 (6.01)	1.34 (1.18, 1.52)	312 (9.17)	1.39 (1.23, 1.57)	116 (7.76)	1.39 (1.14, 1.69)
8-14	230 (7.60)	1.66 (1.44, 1.91)	246 (10.63)	1.54 (1.33, 1.78)	121 (11.06)	1.98 (1.60, 2.44)
≥ 15	190 (8.34)	1.63 (1.38, 1.93)	269 (15.23)	1.97 (1.69, 2.30)	109 (12.49)	2.17 (1.73, 2.71)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> The adjusted odds ratios (aOR) were derived from the multivariable logistic regression analyses controlling for school-level clustering effect and *all* groups of confounders including child's sex, child's perinatal factors (gestational age, birthweight by gestation, plurality, Apgar score), maternal and familial socioeconomic factors (maternal parity, gestation of first antenatal care, maternal smoking, maternal age at child's birth, maternal country of birth, Aboriginality, maternal postcode-level residential socioeconomic status and remoteness at child's birth, and parental highest educational attainment), child's age at the NAPLAN test, and child's year of birth.

**Supplementary Table 10** Adjusted odds ratios (aOR) of children performing BNMS in writing in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with and without a chronic condition prior to the test

	<b>Below the National Minimum Standard (BNMS) in NAPLAN writing</b>					
	<b>Grade 3 cohort</b>		<b>Grade 5 cohort</b>		<b>Grade 7 cohort</b>	
	N. (%) of children BNMS <sup>a</sup>	Adjusted OR (95%CI) <sup>b</sup>	N. (%) of children BNMS	Adjusted OR (95%CI)	N. (%) of children BNMS	Adjusted OR (95%CI)
<b>Children without recorded hospitalisations prior to testing (comparison group)</b>	3387 (2.37)	Reference	4915 (5.50)	Reference	3125 (8.9)	Reference
<b>Children hospitalised without any chronic conditions (CC) prior to testing</b>	3448 (3.41)	1.11 (1.04, 1.17)	5759 (7.97)	1.18 (1.12, 1.24)	4089 (12.85)	1.14 (1.08, 1.21)
<b>Children hospitalised with a CC prior to testing</b>	1911 (4.17)	1.43 (1.34, 1.52)	3237 (9.91)	1.47 (1.40, 1.54)	2268 (16.07)	1.44 (1.36, 1.54)
<b>Total frequency of hospitalisations with a CC prior to testing</b>						
1	1132 (3.82)	1.32 (1.23, 1.42)	1925 (9.17)	1.35 (1.28, 1.43)	1375 (15.23)	1.37 (1.28, 1.47)
2-3	501 (4.20)	1.43 (1.30, 1.58)	851 (10.04)	1.51 (1.40, 1.63)	583 (15.97)	1.43 (1.29, 1.58)
4-6	156 (5.56)	1.84 (1.55, 2.19)	249 (12.00)	1.69 (1.47, 1.95)	183 (19.85)	1.82 (1.54, 2.15)
≥ 7	122 (8.18)	2.77 (2.24, 3.42)	212 (19.05)	3.02 (2.53, 3.60)	127 (24.71)	2.40 (1.93, 2.99)
<b>Total duration of hospitalisations with a CC (bed-days) prior to testing</b>						
1-2	1054 (3.67)	1.33 (1.24, 1.43)	1738 (8.67)	1.34 (1.26, 1.42)	1244 (14.88)	1.38 (1.28, 1.48)
3-4	297 (4.10)	1.36 (1.20, 1.55)	508 (9.84)	1.43 (1.29, 1.58)	347 (15.14)	1.30 (1.14, 1.48)
5-7	213 (4.62)	1.46 (1.26, 1.69)	369 (10.86)	1.54 (1.37, 1.73)	245 (16.31)	1.44 (1.24, 1.68)
8-14	170 (5.61)	1.74 (1.47, 2.06)	284 (12.34)	1.70 (1.48, 1.96)	210 (19.13)	1.60 (1.35, 1.88)
≥ 15	177 (7.80)	2.19 (1.84, 2.62)	338 (19.24)	2.55 (2.22, 2.94)	222 (25.66)	2.40 (2.04, 2.82)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> The adjusted odds ratios (aORs) were derived from the multivariable logistic regression analyses controlling for school-level clustering effect and *all* the groups of confounders including child's sex, child's perinatal factors (gestational age, birthweight by gestation, plurality, Apgar score), maternal and familial socioeconomic factors (maternal parity, gestation of first antenatal care, maternal smoking, maternal age at child's birth, maternal country of birth, Aboriginality, maternal postcode-level residential socioeconomic status and remoteness at child's birth, and parental highest educational attainment), child's age at the NAPLAN test, and child's year of birth.

**Supplementary Table 11** Adjusted odds ratios (aOR) of children performing BNMS in spelling in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with and without a chronic condition prior to the test

	<b>Below the National Minimum Standard (BNMS) in NAPLAN spelling</b>					
	<b>Grade 3 cohort</b>		<b>Grade 5 cohort</b>		<b>Grade 7 cohort</b>	
	N. (%) of children BNMS <sup>a</sup>	Adjusted OR (95%CI) <sup>b</sup>	N. (%) of children BNMS	Adjusted OR (95%CI)	N. (%) of children BNMS	Adjusted OR (95%CI)
<b>Children without recorded hospitalisations prior to testing (comparison group)</b>	5080 (3.54)	Reference	3883 (4.34)	Reference	1802 (5.13)	Reference
<b>Children hospitalised without any chronic conditions (CC) prior to testing</b>	5158 (5.10)	1.17 (1.11, 1.22)	4632 (6.40)	1.24 (1.18, 1.31)	2438 (7.65)	1.21 (1.12, 1.30)
<b>Children hospitalised with a CC prior to testing</b>	2702 (5.88)	1.40 (1.34, 1.47)	2451 (7.48)	1.42 (1.35, 1.50)	1317 (9.30)	1.46 (1.35, 1.57)
<b>Total frequency of hospitalisations with a CC prior to testing</b>						
1	1593 (5.36)	1.28 (1.21, 1.36)	1457 (6.92)	1.32 (1.24, 1.40)	781 (8.63)	1.36 (1.24, 1.49)
2-3	720 (6.02)	1.45 (1.34, 1.58)	650 (7.64)	1.47 (1.35, 1.61)	350 (9.56)	1.51 (1.32, 1.72)
4-6	218 (7.75)	1.79 (1.55, 2.07)	198 (9.49)	1.71 (1.45, 2.02)	109 (11.76)	1.78 (1.44, 2.20)
≥ 7	171 (11.35)	2.73 (2.30, 3.25)	146 (13.01)	2.40 (1.98, 2.92)	77 (14.69)	2.27 (1.72, 2.99)
<b>Total duration of hospitalisations with a CC (bed-days) prior to testing</b>						
1-2	1499 (5.21)	1.32 (1.24, 1.40)	1341 (6.68)	1.34 (1.25, 1.42)	712 (8.49)	1.37 (1.25, 1.50)
3-4	395 (5.45)	1.24 (1.12, 1.39)	373 (7.19)	1.33 (1.19, 1.48)	218 (9.49)	1.49 (1.27, 1.74)
5-7	311 (6.73)	1.48 (1.31, 1.67)	259 (7.59)	1.35 (1.18, 1.54)	133 (8.81)	1.33 (1.11, 1.60)
8-14	249 (8.20)	1.80 (1.56, 2.08)	228 (9.86)	1.75 (1.51, 2.03)	118 (10.74)	1.56 (1.26, 1.92)
≥ 15	248 (10.85)	2.12 (1.83, 2.46)	250 (14.16)	2.24 (1.92, 2.61)	136 (15.47)	2.25 (1.81, 2.79)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> The adjusted odds ratios (aORs) were derived from the multivariable logistic regression analyses controlling for school-level clustering effect and *all* the groups of confounders including child's sex, child's perinatal factors (gestational age, birthweight by gestation, plurality, Apgar score), maternal and familial socioeconomic factors (maternal parity, gestation of first antenatal care, maternal smoking, maternal age at child's birth, maternal country of birth, Aboriginality, maternal postcode-level residential socioeconomic status and remoteness at child's birth, and parental highest educational attainment), child's age at the NAPLAN test, and child's year of birth.

**Supplementary Table 12** Adjusted odds ratios (aOR) of children performing BNMS in grammar & punctuation in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with and without a chronic condition prior to the test

	Below the National Minimum Standard (BNMS) in NAPLAN grammar & punctuation					
	Grade 3 cohort		Grade 5 cohort		Grade 7 cohort	
	N. (%) of children BNMS <sup>a</sup>	Adjusted OR (95%CI) <sup>b</sup>	N. (%) of children BNMS	Adjusted OR (95%CI)	N. (%) of children BNMS	Adjusted OR (95%CI)
<b>Children without recorded hospitalisations prior to testing (comparison group)</b>	6829 (4.76)	Reference	5147 (5.75)	Reference	2735 (7.78)	Reference
<b>Children hospitalised without any chronic conditions (CC) prior to testing</b>	6713 (6.63)	1.16 (1.11, 1.21)	5913 (8.17)	1.22 (1.16, 1.28)	3530 (11.07)	1.21 (1.14, 1.28)
<b>Children hospitalised with a CC prior to testing</b>	3310 (7.20)	1.32 (1.26, 1.38)	3180 (9.71)	1.45 (1.38, 1.53)	1908 (13.47)	1.47 (1.38, 1.56)
<b>Total frequency of hospitalisations with a CC prior to testing</b>						
1	2033 (6.84)	1.26 (1.19, 1.32)	1944 (9.24)	1.38 (1.30, 1.47)	1135 (12.53)	1.36 (1.27, 1.47)
2-3	847 (7.08)	1.32 (1.22, 1.42)	827 (9.72)	1.49 (1.37, 1.61)	526 (14.37)	1.58 (1.42, 1.76)
4-6	275 (9.78)	1.76 (1.54, 2.01)	240 (11.50)	1.63 (1.40, 1.91)	150 (16.18)	1.76 (1.49, 2.07)
≥ 7	155 (10.29)	1.82 (1.52, 2.18)	169 (15.06)	2.17 (1.81, 2.62)	97 (18.51)	1.99 (1.55, 2.55)
<b>Total duration of hospitalisations with a CC (bed-days) prior to testing</b>						
1-2	1877 (6.52)	1.26 (1.20, 1.33)	1746 (8.69)	1.38 (1.29, 1.46)	1030 (12.29)	1.38 (1.28, 1.49)
3-4	507 (6.99)	1.24 (1.13, 1.37)	516 (9.95)	1.46 (1.32, 1.62)	315 (13.72)	1.46 (1.29, 1.65)
5-7	371 (8.03)	1.37 (1.22, 1.54)	358 (10.50)	1.49 (1.32, 1.69)	197 (13.06)	1.38 (1.18, 1.62)
8-14	299 (9.85)	1.65 (1.47, 1.87)	262 (11.33)	1.50 (1.31, 1.72)	192 (17.47)	1.80 (1.52, 2.13)
≥ 15	256 (11.20)	1.66 (1.44, 1.91)	298 (16.88)	2.05 (1.76, 2.39)	174 (19.8)	2.05 (1.70, 2.47)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> The adjusted odds ratios (aORs) were derived from the multivariable logistic regression analyses controlling for school-level clustering effect and *all* the groups of confounders including child's sex, child's perinatal factors (gestational age, birthweight by gestation, plurality, Apgar score), maternal and familial socioeconomic factors (maternal parity, gestation of first antenatal care, maternal smoking, maternal age at child's birth, maternal country of birth, Aboriginality, maternal postcode-level residential socioeconomic status and remoteness at child's birth, and parental highest educational attainment), child's age at the NAPLAN test, and child's year of birth.



**Supplementary Table 13** Adjusted odds ratios (aOR) of children performing BNMS in numeracy in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with and without a chronic condition prior to the test

	Below the National Minimum Standard (BNMS) in NAPLAN numeracy					
	Grade 3 cohort		Grade 5 cohort		Grade 7 cohort	
	N. (%) of children BNMS <sup>a</sup>	Adjusted OR (95%CI) <sup>b</sup>	N. (%) of children BNMS	Adjusted OR (95%CI)	N. (%) of children BNMS	Adjusted OR (95%CI)
<b>Children without recorded hospitalisations prior to testing (comparison group)</b>	5001 (3.50)	Reference	4232 (4.75)	Reference	1102 (3.16)	Reference
<b>Children hospitalised without any chronic conditions (CC) prior to testing</b>	4864 (4.83)	1.20 (1.14, 1.27)	4568 (6.35)	1.20 (1.13, 1.26)	1422 (4.51)	1.24 (1.13, 1.36)
<b>Children hospitalised with a CC prior to testing</b>	2619 (5.73)	1.51 (1.43, 1.59)	2507 (7.70)	1.50 (1.41, 1.58)	802 (5.75)	1.58 (1.43, 1.74)
<b>Total frequency of hospitalisations with a CC prior to testing</b>						
1	1555 (5.26)	1.39 (1.31, 1.48)	1470 (7.03)	1.36 (1.27, 1.45)	458 (5.13)	1.42 (1.26, 1.60)
2-3	666 (5.59)	1.49 (1.37, 1.62)	689 (8.15)	1.64 (1.50, 1.80)	224 (6.23)	1.72 (1.47, 2.02)
4-6	229 (8.21)	2.14 (1.85, 2.47)	210 (10.14)	1.88 (1.59, 2.23)	66 (7.28)	1.98 (1.53, 2.57)
≥ 7	169 (11.34)	2.83 (2.37, 3.38)	138 (12.40)	2.31 (1.88, 2.85)	54 (10.63)	2.85 (2.05, 3.98)
<b>Total duration of hospitalisations with a CC (bed-days) prior to testing</b>						
1-2	1428 (4.98)	1.40 (1.31, 1.49)	1356 (6.79)	1.40 (1.31, 1.50)	420 (5.09)	1.47 (1.30, 1.67)
3-4	397 (5.51)	1.39 (1.25, 1.55)	379 (7.35)	1.38 (1.23, 1.56)	125 (5.52)	1.46 (1.20, 1.78)
5-7	316 (6.88)	1.74 (1.53, 1.98)	290 (8.58)	1.58 (1.38, 1.82)	86 (5.78)	1.51 (1.19, 1.92)
8-14	236 (7.82)	1.83 (1.59, 2.10)	229 (9.95)	1.76 (1.51, 2.04)	84 (7.78)	2.04 (1.61, 2.59)
≥ 15	242 (10.66)	2.19 (1.88, 2.54)	253 (14.43)	2.29 (1.95, 2.69)	87 (10.15)	2.39 (1.84, 3.11)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> The adjusted odds ratios (aORs) were derived from the multivariable logistic regression analyses controlling for school-level clustering effect and *all* the groups of confounders including child's sex, child's perinatal factors (gestational age, birthweight by gestation, plurality, Apgar score), maternal and familial socioeconomic factors (maternal parity, gestation of first antenatal care, maternal smoking, maternal age at child's birth, maternal country of birth, Aboriginality, maternal postcode-level residential socioeconomic status and remoteness at child's birth, and parental highest educational attainment), child's age at the NAPLAN test, and child's year of birth.

**Supplementary Table 14** Adjusted odds ratios (aOR) of children performing BNMS in reading in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with and without different types of chronic condition prior to the test

	Below the National Minimum Standard (BNMS) in NAPLAN reading					
	Grade 3 cohort		Grade 5 cohort		Grade 7 cohort	
	N. (%) of children BNMS <sup>a</sup>	Adjusted OR (95%CI) <sup>b</sup>	N. (%) of children BNMS	Adjusted OR (95%CI)	N. (%) of children BNMS	Adjusted OR (95%CI)
<b>Children without recorded hospitalisations prior to testing (comparison group)</b>	5319 (3.71)	Reference	4955 (5.54)	Reference	1520 (4.33)	Reference
<b>Children hospitalised without any chronic conditions (CC) prior to testing</b>	4999 (4.95)	1.13 (1.08, 1.19)	5366 (7.42)	1.15 (1.09, 1.21)	2013 (6.33)	1.19 (1.10, 1.29)
<b>Children hospitalised with a CC prior to testing</b>	2588 (5.64)	1.35 (1.28, 1.42)	2783 (8.51)	1.35 (1.28, 1.42)	1105 (7.85)	1.49 (1.38, 1.61)
<b>Types of CC</b>						
Mental health/behavioural	217 (11.19)	2.45 (2.09, 2.87)	255 (16.22)	2.45 (2.11, 2.84)	122 (14.01)	2.65 (2.14, 3.28)
Cancer/blood disorders	139 (7.04)	1.44 (1.19, 1.73)	142 (9.99)	1.34 (1.11, 1.62)	48 (7.41)	1.24 (0.91, 1.68)
Chronic infections	25 (8.80)	1.93 (1.28, 2.91)	22 (9.65)	1.29 (0.83, 2.01)	10 (8.62)	1.37 (0.72, 2.60)
Respiratory	1350 (5.66)	1.26 (1.18, 1.35)	1403 (8.38)	1.24 (1.16, 1.32)	587 (8.26)	1.46 (1.33, 1.61)
Metabolic <sup>c</sup>	325 (5.30)	1.30 (1.16, 1.47)	400 (8.58)	1.42 (1.27, 1.59)	153 (7.14)	1.39 (1.17, 1.66)
Musculoskeletal/skin	192 (5.53)	1.36 (1.17, 1.57)	231 (8.54)	1.37 (1.18, 1.58)	91 (6.56)	1.28 (1.04, 1.59)
Neurological	896 (6.10)	1.62 (1.51, 1.74)	945 (9.26)	1.62 (1.51, 1.75)	376 (9.19)	1.86 (1.65, 2.09)
Cardiovascular	126 (7.05)	1.66 (1.37, 2.02)	156 (11.77)	1.88 (1.56, 2.27)	60 (10.66)	2.06 (1.52, 2.80)
Non-specific chronic condition	147 (6.95)	1.79 (1.50, 2.14)	165 (13.00)	2.23 (1.86, 2.67)	63 (12.50)	2.35 (1.78, 3.11)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> The adjusted odds ratios (aORs) were derived from the multivariable logistic regression analyses controlling for school-level clustering effect and *all* the groups of confounders including child's sex, child's perinatal factors (gestational age, birthweight by gestation, plurality, Apgar score), maternal and familial socioeconomic factors (maternal parity, gestation of first antenatal care, maternal smoking, maternal age at child's birth, maternal country of birth, Aboriginality, maternal postcode-level residential socioeconomic status and remoteness at child's birth, and parental highest educational attainment), child's age at the NAPLAN test, and child's year of birth.

<sup>c</sup> Metabolic/endocrine/digestive/renal/genitourinary conditions

**Supplementary Table 15** Adjusted odds ratios (aOR) of children performing BNMS in writing in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with and without different types of chronic condition prior to the test

	Below the National Minimum Standard (BNMS) in NAPLAN writing					
	Grade 3 cohort		Grade 5 cohort		Grade 7 cohort	
	N. (%) of children BNMS <sup>a</sup>	Adjusted OR (95%CI) <sup>b</sup>	N. (%) of children BNMS	Adjusted OR (95%CI)	N. (%) of children BNMS	Adjusted OR (95%CI)
<b>Children without recorded hospitalisations prior to testing (comparison group)</b>	3387 (2.37)	Reference	4915 (5.50)	Reference	3125 (8.90)	Reference
<b>Children hospitalised without any chronic conditions (CC) prior to testing</b>	3448 (3.41)	1.11 (1.04, 1.17)	5759 (7.97)	1.18 (1.12, 1.24)	4089 (12.85)	1.14 (1.08, 1.21)
<b>Children hospitalised with a CC prior to testing</b>	1911 (4.17)	1.43 (1.34, 1.52)	3237 (9.91)	1.47 (1.40, 1.54)	2268 (16.07)	1.44 (1.36, 1.54)
<b>Types of CC</b>						
Mental health/behavioural	240 (12.49)	3.97 (3.40, 4.64)	369 (23.67)	3.66 (3.19, 4.20)	283 (31.98)	3.27 (2.77, 3.86)
Cancer/blood disorders	98 (4.97)	1.47 (1.17, 1.84)	170 (11.90)	1.51 (1.27, 1.79)	94 (14.53)	1.27 (1.01, 1.59)
Chronic infections	13 (4.56)	1.15 (0.65, 2.06)	33 (14.54)	2.03 (1.37, 3.01)	29 (25.22)	2.49 (1.60, 3.88)
Respiratory	975 (4.08)	1.30 (1.20, 1.40)	1618 (9.69)	1.32 (1.24, 1.41)	1152 (16.19)	1.35 (1.25, 1.46)
Metabolic <sup>c</sup>	235 (3.84)	1.29 (1.12, 1.49)	440 (9.45)	1.45 (1.31, 1.60)	318 (14.78)	1.33 (1.17, 1.52)
Musculoskeletal/skin	158 (4.55)	1.71 (1.45, 2.02)	264 (9.75)	1.53 (1.32, 1.76)	199 (14.38)	1.37 (1.17, 1.61)
Neurological	680 (4.63)	1.78 (1.62, 1.95)	1152 (11.30)	1.86 (1.73, 2.00)	736 (17.90)	1.71 (1.57, 1.86)
Cardiovascular	101 (5.65)	1.98 (1.60, 2.46)	150 (11.42)	1.61 (1.34, 1.94)	116 (20.90)	2.08 (1.67, 2.59)
Non-specific chronic condition	122 (5.78)	2.16 (1.78, 2.63)	187 (14.76)	2.42 (2.04, 2.87)	119 (23.56)	2.20 (1.76, 2.76)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> The adjusted odds ratios (aORs) were derived from the multivariable logistic regression analyses controlling for school-level clustering effect and *all* the groups of confounders including child's sex, child's perinatal factors (gestational age, birthweight by gestation, plurality, Apgar score), maternal and familial socioeconomic factors (maternal parity, gestation of first antenatal care, maternal smoking, maternal age at child's birth, maternal country of birth, Aboriginality, maternal postcode-level residential socioeconomic status and remoteness at child's birth, and parental highest educational attainment), child's age at the NAPLAN test, and child's year of birth.

<sup>c</sup> Metabolic/endocrine/digestive/renal/genitourinary conditions

**Supplementary Table 16** Adjusted odds ratios (aOR) of children performing BNMS in spelling in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with and without different types of chronic condition prior to the test

	Below the National Minimum Standard (BNMS) in NAPLAN spelling					
	Grade 3 cohort		Grade 5 cohort		Grade 7 cohort	
	N. (%) of children BNMS <sup>a</sup>	Adjusted OR (95%CI) <sup>b</sup>	N. (%) of children BNMS	Adjusted OR (95%CI)	N. (%) of children BNMS	Adjusted OR (95%CI)
<b>Children without recorded hospitalisations prior to testing (comparison group)</b>	5080 (3.54)	Reference	3883 (4.34)	Reference	1802 (5.13)	Reference
<b>Children hospitalised without any chronic conditions (CC) prior to testing</b>	5158 (5.10)	1.17 (1.11, 1.22)	4632 (6.40)	1.24 (1.18, 1.31)	2438 (7.65)	1.21 (1.12, 1.30)
<b>Children hospitalised with a CC prior to testing</b>	2702 (5.88)	1.40 (1.34, 1.47)	2451 (7.48)	1.42 (1.35, 1.50)	1317 (9.30)	1.46 (1.35, 1.57)
<b>Types of CC</b>						
Mental health/behavioural	253 (13.02)	2.79 (2.41, 3.22)	242 (15.34)	2.60 (2.21, 3.07)	178 (19.91)	3.08 (2.52, 3.75)
Cancer/blood disorders	129 (6.52)	1.28 (1.04, 1.57)	125 (8.74)	1.40 (1.15, 1.71)	47 (7.24)	1.04 (0.76, 1.41)
Chronic infections	26 (9.15)	1.91 (1.28, 2.83)	24 (10.43)	1.72 (1.10, 2.69)	9 (7.69)	1.01 (0.53, 1.91)
Respiratory	1451 (6.06)	1.36 (1.28, 1.45)	1232 (7.35)	1.30 (1.21, 1.39)	656 (9.18)	1.35 (1.23, 1.48)
Metabolic <sup>c</sup>	353 (5.75)	1.42 (1.27, 1.59)	332 (7.11)	1.40 (1.25, 1.56)	194 (8.98)	1.42 (1.22, 1.65)
Musculoskeletal/skin	228 (6.55)	1.64 (1.43, 1.89)	204 (7.51)	1.47 (1.27, 1.71)	111 (7.95)	1.27 (1.05, 1.55)
Neurological	915 (6.22)	1.63 (1.51, 1.76)	860 (8.41)	1.73 (1.60, 1.88)	455 (11.03)	1.81 (1.62, 2.03)
Cardiovascular	130 (7.25)	1.69 (1.40, 2.04)	128 (9.73)	1.82 (1.48, 2.23)	67 (11.96)	1.96 (1.50, 2.55)
Non-specific chronic condition	171 (8.05)	2.04 (1.71, 2.43)	144 (11.29)	2.22 (1.82, 2.72)	77 (15.04)	2.33 (1.73, 3.13)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> The adjusted odds ratios (aORs) were derived from the multivariable logistic regression analyses controlling for school-level clustering effect and *all* the groups of confounders including child's sex, child's perinatal factors (gestational age, birthweight by gestation, plurality, Apgar score), maternal and familial socioeconomic factors (maternal parity, gestation of first antenatal care, maternal smoking, maternal age at child's birth, maternal country of birth, Aboriginality, maternal postcode-level residential socioeconomic status and remoteness at child's birth, and parental highest educational attainment), child's age at the NAPLAN test, and child's year of birth.

<sup>c</sup> Metabolic/endocrine/digestive/renal/genitourinary conditions

**Supplementary Table 17** Adjusted odds ratios (aOR) of children performing BNMS in grammar & punctuation in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with and without different types of chronic condition prior to the test

	<b>Below the National Minimum Standard (BNMS) in NAPLAN grammar &amp; punctuation</b>					
	<b>Grade 3 cohort</b>		<b>Grade 5 cohort</b>		<b>Grade 7 cohort</b>	
	N. (%) of children BNMS <sup>a</sup>	Adjusted OR (95%CI) <sup>b</sup>	N. (%) of children BNMS	Adjusted OR (95%CI)	N. (%) of children BNMS	Adjusted OR (95%CI)
<b>Children without recorded hospitalisations prior to testing (comparison group)</b>	6829 (4.76)	Reference	5147 (5.75)	Reference	2735 (7.78)	Reference
<b>Children hospitalised without any chronic conditions (CC) prior to testing</b>	6713 (6.63)	1.16 (1.11, 1.21)	5913 (8.17)	1.22 (1.16, 1.28)	3530 (11.07)	1.21 (1.14, 1.28)
<b>Children hospitalised with a CC prior to testing</b>	3310 (7.20)	1.32 (1.26, 1.38)	3180 (9.71)	1.45 (1.38, 1.53)	1908 (13.47)	1.47 (1.38, 1.56)
<b>Types of CC</b>						
Mental health/behavioural	276 (14.20)	2.44 (2.12, 2.80)	305 (19.33)	2.80 (2.40, 3.26)	213 (23.83)	2.76 (2.30, 3.30)
Cancer/blood disorders	168 (8.49)	1.32 (1.11, 1.56)	184 (12.86)	1.66 (1.40, 1.96)	75 (11.56)	1.16 (0.90, 1.50)
Chronic infections	20 (7.04)	1.02 (0.65, 1.62)	29 (12.61)	1.58 (1.06, 2.38)	23 (19.66)	2.12 (1.32, 3.41)
Respiratory	1747 (7.30)	1.26 (1.19, 1.33)	1592 (9.50)	1.31 (1.23, 1.40)	959 (13.42)	1.36 (1.26, 1.47)
Metabolic <sup>c</sup>	381 (6.21)	1.14 (1.02, 1.26)	418 (8.95)	1.38 (1.24, 1.54)	278 (12.87)	1.44 (1.26, 1.65)
Musculoskeletal/skin	251 (7.21)	1.36 (1.20, 1.55)	253 (9.31)	1.40 (1.21, 1.61)	165 (11.82)	1.35 (1.13, 1.61)
Neurological	1127 (7.66)	1.57 (1.47, 1.68)	1068 (10.45)	1.74 (1.61, 1.87)	637 (15.44)	1.77 (1.61, 1.96)
Cardiovascular	162 (9.03)	1.61 (1.35, 1.92)	162 (12.31)	1.78 (1.48, 2.15)	90 (16.07)	1.82 (1.45, 2.29)
Non-specific chronic condition	190 (8.94)	1.82 (1.54, 2.14)	176 (13.80)	2.17 (1.81, 2.60)	101 (19.73)	2.19 (1.76, 2.72)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> The adjusted odds ratios (aORs) were derived from the multivariable logistic regression analyses controlling for school-level clustering effect and *all* the groups of confounders including child's sex, child's perinatal factors (gestational age, birthweight by gestation, plurality, Apgar score), maternal and familial socioeconomic factors (maternal parity, gestation of first antenatal care, maternal smoking, maternal age at child's birth, maternal country of birth, Aboriginality, maternal postcode-level residential socioeconomic status and remoteness at child's birth, and parental highest educational attainment), child's age at the NAPLAN test, and child's year of birth.

<sup>c</sup> Metabolic/endocrine/digestive/renal/genitourinary conditions

**Supplementary Table 18** Adjusted odds ratios (aOR) of children performing BNMS in numeracy in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with and without different types of chronic condition prior to the test

	Below the National Minimum Standard (BNMS) in NAPLAN numeracy					
	Grade 3 cohort		Grade 5 cohort		Grade 7 cohort	
	N. (%) of children BNMS <sup>a</sup>	Adjusted OR (95%CI) <sup>b</sup>	N. (%) of children BNMS	Adjusted OR (95%CI)	N. (%) of children BNMS	Adjusted OR (95%CI)
<b>Children without recorded hospitalisations prior to testing (comparison group)</b>	5001 (3.50)	Reference	4232 (4.75)	Reference	1102 (3.16)	Reference
<b>Children hospitalised without any chronic conditions (CC) prior to testing</b>	4864 (4.83)	1.20 (1.14, 1.27)	4568 (6.35)	1.20 (1.13, 1.26)	1422 (4.51)	1.24 (1.13, 1.36)
<b>Children hospitalised with a CC prior to testing</b>	2619 (5.73)	1.51 (1.43, 1.59)	2507 (7.70)	1.50 (1.41, 1.58)	802 (5.75)	1.58 (1.43, 1.74)
<b>Types of CC</b>						
Mental health/behavioural	242 (12.47)	3.07 (2.65, 3.58)	274 (17.54)	3.59 (3.07, 4.21)	104 (11.89)	3.40 (2.70, 4.27)
Cancer/blood disorders	129 (6.57)	1.41 (1.17, 1.70)	132 (9.27)	1.50 (1.24, 1.81)	39 (6.12)	1.51 (1.07, 2.14)
Chronic infections	24 (8.48)	1.95 (1.29, 2.95)	23 (10.13)	1.74 (1.08, 2.79)	11 (9.48)	2.49 (1.34, 4.62)
Respiratory	1348 (5.67)	1.40 (1.31, 1.49)	1232 (7.41)	1.34 (1.25, 1.44)	401 (5.70)	1.46 (1.29, 1.65)
Metabolic <sup>c</sup>	363 (5.94)	1.62 (1.45, 1.81)	330 (7.10)	1.44 (1.28, 1.62)	112 (5.27)	1.53 (1.27, 1.85)
Musculoskeletal/skin	208 (6.01)	1.62 (1.39, 1.89)	209 (7.75)	1.47 (1.26, 1.71)	76 (5.55)	1.58 (1.22, 2.04)
Neurological	942 (6.42)	1.90 (1.76, 2.05)	886 (8.72)	1.89 (1.74, 2.06)	283 (7.00)	2.05 (1.80, 2.34)
Cardiovascular	134 (7.53)	1.83 (1.51, 2.22)	168 (12.78)	2.42 (2.02, 2.90)	40 (7.33)	2.04 (1.43, 2.90)
Non-specific chronic condition	172 (8.12)	2.35 (1.99, 2.78)	154 (12.21)	2.34 (1.94, 2.83)	54 (10.80)	2.78 (2.07, 3.75)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> The adjusted odds ratios (aORs) were derived from the multivariable logistic regression analyses controlling for school-level clustering effect and *all* the groups of confounders including child's sex, child's perinatal factors (gestational age, birthweight by gestation, plurality, Apgar score), maternal and familial socioeconomic factors (maternal parity, gestation of first antenatal care, maternal smoking, maternal age at child's birth, maternal country of birth, Aboriginality, maternal postcode-level residential socioeconomic status and remoteness at child's birth, and parental highest educational attainment), child's age at the NAPLAN test, and child's year of birth.

<sup>c</sup> Metabolic/endocrine/digestive/renal/genitourinary conditions

**Supplementary Table 19** Percentage (%) of children performing BNMS in **reading** in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with different length of duration by types of chronic conditions

Total duration of hospitalisations with a CC (bed-days) prior to testing	Grade 3 cohort	Grade 5 cohort	Grade 7 cohort
	N. (%) of children BNMS <sup>a</sup>	N. (%) of children BNMS	N. (%) of children BNMS
<b>Mental health/behavioural</b>			
1-2	128 (13.05)	146 (18.84)	61 (14.63)
3-7	52 (7.41)	68 (12.39)	34 (11.56)
≥ 8	37 (14.45)	41 (16.53)	27 (16.88)
<b>Cancer/blood disorders</b>			
1-2	34 (5.13)	29 (6.03)	8 (3.92)
3-7	64 (9.88)	54 (11.87)	22 (9.95)
≥ 8	41 (6.18)	59 (12.14)	18 (8.07)
<b>Respiratory</b>			
1-2	860 (5.13)	874 (7.59)	363 (7.61)
3-7	345 (6.32)	357 (9.03)	147 (8.46)
≥ 8	145 (8.83)	172 (13.53)	77 (12.92)
<b>Metabolic</b>			
1-2	160 (4.61)	206 (7.88)	72 (6.23)
3-7	96 (5.84)	93 (7.52)	44 (7.47)
≥ 8	69 (6.79)	101 (12.45)	37 (9.3)
<b>Musculoskeletal/skin<sup>b</sup></b>			
1-2	99 (5.18)	116 (7.6)	47 (6.08)
3-7	47 (5.27)	55 (8.1)	20 (5.73)
≥ 8	46 (6.85)	60 (12.02)	24 (9.06)
<b>Neurological</b>			
1-2	621 (5.62)	631 (8.43)	241 (8.28)
3-7	161 (6.17)	190 (9.89)	84 (10.69)
≥ 8	114 (10.99)	124 (15.6)	51 (13.01)
<b>Cardiovascular</b>			
1-2	25 (5.56)	27 (8.39)	9 (6.34)
3-7	39 (6.85)	45 (10.44)	19 (10.67)
≥ 8	62 (8.07)	84 (14.69)	32 (13.17)
<b>Non-specific chronic condition</b>			
1-2	48 (6.91)	57 (12.78)	24 (14.2)
3-7	52 (5.33)	54 (9.73)	23 (10.8)
≥ 8	47 (10.56)	54 (20.15)	16 (13.11)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> Metabolic/endocrine/digestive/renal/genitourinary conditions

**Supplementary Table 20** Percentage (%) of children performing BNMS in numeracy in a NAPLAN test at Grade 3, 5, and 7 for children hospitalised with different length of duration by types of chronic conditions

Total duration of hospitalisations with a CC (bed-days) prior to testing	Grade 3 cohort	Grade 5 cohort	Grade 7 cohort
	N. (%) of children BNMS <sup>a</sup>	N. (%) of children BNMS	N. (%) of children BNMS
<b>Mental health/behavioural</b>			
1-2	137 (13.92)	155 (19.97)	53 (12.62)
3-7	69 (9.84)	72 (13.24)	25 (8.5)
≥ 8	36 (14.06)	47 (19.42)	26 (16.15)
<b>Cancer/blood disorders</b>			
1-2	22 (3.33)	21 (4.38)	7 (3.54)
3-7	65 (10.08)	52 (11.35)	20 (9.09)
≥ 8	42 (6.39)	59 (12.14)	12 (5.48)
<b>Respiratory</b>			
1-2	809 (4.85)	756 (6.6)	245 (5.18)
3-7	360 (6.64)	324 (8.24)	98 (5.7)
≥ 8	179 (10.87)	152 (12.09)	58 (9.88)
<b>Metabolic</b>			
1-2	191 (5.5)	172 (6.6)	60 (5.24)
3-7	100 (6.1)	79 (6.42)	24 (4.07)
≥ 8	72 (7.18)	79 (9.71)	28 (7.14)
<b>Musculoskeletal/skin<sup>b</sup></b>			
1-2	99 (5.2)	91 (6)	37 (4.84)
3-7	52 (5.88)	62 (9.16)	14 (4.08)
≥ 8	57 (8.46)	56 (11.16)	25 (9.58)
<b>Neurological</b>			
1-2	611 (5.54)	574 (7.7)	170 (5.9)
3-7	219 (8.4)	190 (9.9)	64 (8.17)
≥ 8	112 (10.83)	122 (15.4)	49 (12.83)
<b>Cardiovascular</b>			
1-2	22 (4.93)	30 (9.38)	10 (7.19)
3-7	32 (5.57)	47 (11.01)	13 (7.51)
≥ 8	80 (10.53)	91 (16.02)	17 (7.26)
<b>Non-specific chronic condition</b>			
1-2	58 (8.29)	56 (12.56)	25 (14.62)
3-7	54 (5.53)	53 (9.72)	18 (8.61)
≥ 8	60 (13.61)	45 (16.67)	11 (9.17)

<sup>a</sup> The denominators used to calculate the percentages (%) were the number of children who sat in the NAPLAN test (i.e., excluding children who were absent, exempt, or withdrawn from the test).

<sup>b</sup> Metabolic/endocrine/digestive/renal/genitourinary conditions



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