

Supporting Information

Supplementary methods and results

This appendix was part of the submitted manuscript and has been peer reviewed. It is posted as supplied by the authors.

Appendix to: Tse WC, Sanfilippo P, Lam T, et al. Community pharmacy naloxone supply, before and after rescheduling as an over-the-counter drug: sales and prescriptions data, 2014–2018. *Med J Aust* 2020; doi: 10.5694/mja2.50524.

Summary of PBS naloxone codes

1. Email from PBS Statistics Team (5 July 2019):

The following PBS items are for Naloxone (as monotherapy) listed and delisted (As of July 5th, 2019):
Delisted: 1670X, 1751E, 1752F, 1753G, 2192J, 2196N, 2200T, 3481F, 3482G, 5173G, 5174H, 5175J
Currently listed: 10783M, 10786Q, 10787R, 11077B, 11078C, 11233F

2. PBS General Schedule and Prescriber Bag

General Schedule: 10783M, 10787R, 11078C, 2192J, 2196N, 1753G, 5175J

Prescriber Bag: 10786Q, 11233F, 2200T, 3481F, 3482G

3. PBS Naloxone Database: Standardising Dosages 0.4 mg/mL; 1 mL = one standard dose

Method: Search was done of PBS from January 2012 to 5 July 2019. Unavailable codes were prior to January 2012

Naloxone HCl, Injection 40 micrograms in 2 mL Standard Dose/ Divide by 20

Delisted as of 5 July 2019:

- 1670X (until 2005): naloxone hydrochloride, Injection 40 micrograms in 2 mL (Narcan Neonatal) (Max quantity: 5)

Naloxone HCl, Injection 400 micrograms in 1 mL (5&10) Standard Dose (but multiplied by 5/10)

Currently listed as of 5 July 2019:

- 10783M (D): naloxone hydrochloride 400 microgram/mL injection, 5 x 1 mL ampoules
- 10786Q (D): naloxone hydrochloride 400 microgram/mL injection, 5 x 1 mL ampoules
- 10787R (D): naloxone hydrochloride 400 microgram/mL injection, 5 x 1 mL ampoules
- 11233F (D): naloxone hydrochloride 400 microgram/mL injection, 10 x 1 mL ampoules

Naloxone HCl, Injection 400 micrograms in 1 mL Standard Dose

Delisted as of 5 July 2019:

- 2192J (D): naloxone hydrochloride 400 microgram/mL injection, 1 x 1 mL syringe (Naloxone minijet)
- 2196N (D): naloxone hydrochloride 400 microgram/mL injection, 1 x 1 mL syringe (Naloxone minijet)
- 2200T (D): naloxone hydrochloride 400 microgram/mL injection, 1 x 1 mL syringe (Naloxone minijet)

Unavailable:

- 1751E (until 2006): naloxone hydrochloride, Injection 400 micrograms in 1 mL (Naloxone Min-I-Jet)
- 5173G (1999 and 2005 only): naloxone hydrochloride, Injection 400 micrograms in 1 mL (Naloxone Min-I-Jet) (Max quantity: 1)

Naloxone HCl, Injection 800 micrograms in 2 mL Standard Dose

Delisted as of 5 July 2019:

- 3481F (D): naloxone hydrochloride, Injection 800 micrograms in 2 mL (Naloxone Min-I-Jet) (Max quantity: 5)
- 5174H (Only till 2004): naloxone hydrochloride, Injection 800 micrograms in 2 mL (Naloxone Min-I-Jet) (Max quantity: 1)

Unavailable:

- 1752F (until 2009): naloxone hydrochloride, Injection 800 micrograms in 2 mL (Naloxone Min-I-Jet)

Naloxone HCl, Injection 2 mg in 5 mL 5x Standard dose

Delisted as of 5 July 2019:

- 1753G (D): naloxone hydrochloride, Injection 2 mg in 5 mL (Naloxone Min-I-Jet)
- 5175J (D): naloxone hydrochloride, Injection 2 mg in 5 mL (Naloxone Min-I-Jet) (Max quantity: 1)
- 3482G (D): naloxone hydrochloride, Injection 2 mg in 5 mL (Naloxone Min-I-Jet) (Max quantity: 2)

Naloxone HCl, Injection 1 mg in 2 mL 1.25x Standard dose

Currently Listed as of 5 July 2019:

- 11078C (D): naloxone hydrochloride 1 mg/mL injection, 2 mL syringe

Unavailable:

11077B (Unable, dental prescriber): naloxone hydrochloride 1 mg/mL injection, 2 mL syringe

4. IQVIA Sales Database: Standardising Dosages (Same as PBS) 0.4 mg/mL; 1 mL = one standard dose

Method: Based on the provided MTH data (subsection of IQVIA data: units of naloxone supplied per month), data was extracted from January 2014-December 2018. Unavailable codes were prior to January 2014 and after December 2018. MTH data was taken from the profit data pivot as explained that it was a month by month data representation of naloxone sales. MAT data was not used as it was a sum of 12 MTH sales:

MAT (short for Moving Annual Total) is the sum of the 12 MTH sales data to the relevant time-point (e.g. MAT Patient Treatments for Sep-18 is the sum of the 12 months of MTH Patient Treatments from Oct-17 up to Sep-18). I created the pivot tables to test the data to make sure that both data sources from IQVIA were consistent. You can change the variable in the "Values" section of the pivot table to see the monthly variability or use the MAT measure to smooth out the trend. (Email from Billy Henderson, July 9, 2019)

MAT Data included April 2010-March 2019 and a total of 9 drugs; three of these drugs were not included in this study:

Included:

- 1433901 NALOXONE JUNO AMPOULES 400 Y 5 X 1 mL (5 x 400 µg units per pack)
- 417506 NALOXONE AMPS 0.4 mg 5 X 1 mL (5 x 400 µg units per pack)
- 419003 NARCAN AMPS 0.4 mg 10 X 1 mL (Represents 10x 400 µg units per pack)
- 1532801 PRENOXAD PRE-FILL SYR 2 mg 2 mL (5 x 400 µg units per pack)
- 417609 NALOXONE HCL M/JET AMPS 0.4 mg/mL 2 mL (5 x 400 µg units per pack)
- 1157405 NALOXONE MINIJET PRE-FILL SYR 0.4 mg/mL 1 mL (1 x 400 µg unit per pack)

Excluded:

- 2696801 NYXOID NASAL SPRAY 1.8 mg 2 X 0.1 mL Not in MTH: Started on 2/2019
- 417612 NALOXONE HCL M/JET AMPS 0.4 mg/mL 5 mL Not in MTH: Discontinued prior to 1/2014
- 417506 NALOXONE AMPS 400 Y 5 X 1 mL Not in MTH: Identical codes

Table 1. Population-adjusted rates for monthly naloxone supply (total), Australia, 2014–2018, by jurisdiction

	Mean monthly population-adjusted supply rate (naloxone units per 100 000 population) (95% CI)				
	2014	2015	2016	2017	2018
Australia	22.12 (16.90–27.34)	15.76 (14.24–17.28)	26.00 (20.83–31.17)	29.78 (21.23–38.33)	33.96 (31.35–36.57)
New South Wales/ACT	19.14 (14.63–23.65)	12.93 (11.30–14.55)	23.00 (17.89–28.11)	25.14 (17.74–32.55)	26.28 (24.11–28.45)
Victoria	22.73 (16.70–28.77)	17.68 (15.76–19.60)	28.97 (23.34–34.59)	35.01 (24.99–45.04)	49.11 (42.64–55.59)
Queensland	24.63 (18.57–30.70)	17.75 (15.61–19.89)	27.02 (21.39–32.65)	30.66 (20.74–40.57)	30.97 (27.76–34.18)
South Australia	21.73 (15.05–28.40)	14.91 (11.26–18.56)	25.18 (19.54–30.82)	27.92 (19.48–36.36)	29.13 (24.89–33.37)
Western Australia	23.26 (17.63–28.89)	16.63 (13.72–19.55)	24.83 (19.28–30.38)	28.73 (19.77–37.68)	28.89 (24.45–33.32)
Tasmania	24.86 (18.87–30.86)	16.16 (12.64–19.68)	28.88 (18.24–39.52)	29.68 (19.58–39.77)	28.01 (22.91–33.11)
Northern Territory	40.53 (30.65–50.40)	18.98 (14.15–23.81)	44.13 (29.50–58.77)	58.58 (38.06–79.10)	59.98 (34.45–85.52)

Table 2. Population-adjusted rates for monthly naloxone supply (individual prescriptions), Australia, 2014–2018, by jurisdiction

	Mean monthly population-adjusted supply rate (naloxone units per 100 000 population) (95% CI)				
	2014	2015	2016	2017	2018
Australia	0.120 (0.063–0.176)	0.181 (0.138–0.224)	0.455 (0.221–0.688)	1.232 (1.124–1.340)	1.613 (1.302–1.924)
New South Wales/ACT	0.037 (0.012–0.061)	0.062 (0.026–0.099)	0.207 (0.055–0.360)	0.282 (0.169–0.395)	0.411 (0.169–0.654)
Victoria	0.397 (0.184–0.609)	0.599 (0.438–0.760)	1.259 (0.688–1.830)	3.503 (3.117–3.889)	4.544 (3.342–5.745)
Queensland	0.030 (0.012–0.048)	0.040 (0.022–0.058)	0.201 (0.066–0.337)	0.531 (0.350–1.371)	0.705 (0.481–0.928)
South Australia	0.010 (–0.004 to 0.025)	0.005 (–0.006 to 0.016)	0.268 (–0.033 to 0.570)	0.882 (0.394–1.371)	1.140 (0.657–1.622)
Western Australia	0.013 (0.001–0.025)	0.013 (–0.003 to 0.029)	0.064 (–0.039 to 0.167)	0.638 (0.367–0.909)	0.674 (0.371–0.978)
Tasmania	0.016 (–0.019 to 0.052)	0.000	0.000	0.080 (–0.096 to 0.256)	0.256 (–0.041 to 0.553)
Northern Territory	0.000	0.034 (–0.041–0.109)	0.170 (–0.204 to 0.545)	0.000	0.421 (–0.124 to 0.966)

Table 3. Population-adjusted rates for monthly naloxone supply (prescriber bag), Australia, 2014–2018, by jurisdiction

	Mean monthly population-adjusted supply rate (naloxone units per 100 000 population) (95% CI)				
	2014	2015	2016	2017	2018
Australia	3.76 (2.80–4.72)	2.88 (2.32–3.45)	10.11 (6.57–13.64)	17.28 (13.19–21.38)	18.92 (15.07–22.77)
New South Wales/ACT	3.83 (2.63–5.03)	3.25 (2.59–3.90)	10.24 (6.94–13.54)	17.45 (13.85–21.05)	18.22 (16.41–20.03)
Victoria	4.06 (3.01–5.12)	3.22 (2.42–4.01)	11.66 (6.30–17.02)	18.05 (13.26–22.85)	23.28 (12.90–33.66)
Queensland	3.38 (2.38–4.39)	2.35 (1.73–2.97)	8.49 (5.97–11.01)	16.29 (11.19–21.38)	17.36 (14.60–20.12)
South Australia	3.73 (2.65–4.80)	3.12 (2.48–3.76)	11.77 (7.84–15.69)	20.63 (16.12–25.13)	19.82 (17.32–22.32)
Western Australia	3.69 (2.58–4.79)	1.99 (1.48–2.50)	8.11 (5.67–10.55)	15.70 (10.82–20.38)	13.82 (11.20–16.44)
Tasmania	3.82 (2.56–5.08)	2.87 (2.09–3.65)	11.17 (6.01–16.33)	16.24 (10.71–21.77)	18.23 (14.70–21.75)
Northern Territory	2.31 (1.09–3.53)	1.26 (0.81–1.71)	6.87 (4.34–9.40)	8.64 (4.98–12.29)	9.44 (6.27–12.60)

Table 4. Population-adjusted rates for monthly naloxone supply (non-dispensed), Australia, 2014–2018, by jurisdiction

	Mean monthly population-adjusted supply rate (naloxone units per 100 000 population) (95% CI)				
	2014	2015	2016	2017	2018
Australia	18.24 (13.70–22.78)	12.69 (11.33–14.05)	15.44 (9.47–21.41)	11.27 (6.94–15.59)	13.42 (11.17–15.68)
New South Wales/ACT	15.27 (11.20–19.35)	9.62 (8.20–11.03)	12.56 (6.75–18.36)	7.41 (3.63–11.19)	7.65 (6.10–9.20)
Victoria	18.27 (12.92–23.62)	13.87 (12.26–15.47)	16.05 (8.66–23.44)	13.46 (6.90–20.02)	21.29 (11.97–30.61)
Queensland	21.22 (16.08–26.37)	15.36 (13.35–17.36)	18.33 (12.50–24.16)	13.84 (7.87–19.81)	12.90 (10.67–15.14)
South Australia	17.99 (12.17–23.81)	11.78 (8.47–15.10)	13.14 (6.63–19.65)	6.41 (1.99–10.84)	8.17 (5.28–11.06)
Western Australia	19.56 (14.71–24.41)	14.63 (12.07–17.20)	16.66 (10.82–22.50)	12.49 (7.93–17.05)	14.40 (12.31–16.49)
Tasmania	21.03 (15.86–26.19)	13.29 (10.32–16.26)	17.71 (10.23–25.19)	13.36 (8.05–18.67)	9.53 (5.45–13.60)
Northern Territory	38.22 (29.20–47.23)	17.68 (13.50–21.86)	37.09 (22.78–51.40)	49.95 (33.48–66.41)	50.12 (27.06–73.19)

Table 5. Population-adjusted naloxone supply, Australia, 2014–2018, by jurisdiction, with mean monthly rates and annual changes

	400 µg units supplied 2014–2018, annual mean	Mean monthly population- adjusted rate, units per 100 000 population (95% CI)	Mean annual change, 2014–2018 (95% CI)	Incidence rate ratio, per year (95% CI)
Total naloxone				
Australia	74 470.2	25.52 (22.90–28.14)	16.2% (–21.4% to 53.8%)	1.15 (1.09–1.22)
New South Wales/ACT	20 894.6 (28.1%)	21.30 (19.08–23.52)	14.8% (–30.3% to 60.0%)	1.13 (1.06–1.20)
Victoria	22 852.8 (30.7%)	30.70 (26.87–34.53)	25.7% (–10.0% to 61.4%)	1.24 (1.17–1.32)
Queensland	15 320.4 (20.6%)	26.21 (21.07–26.47)	9.7% (–22.9% to 42.3%)	1.10 (1.04–1.17)
South Australia	4888.0 (6.6%)	23.77 (21.07–26.47)	13.2% (–27.5% to 53.9%)	1.12 (1.05–1.20)
Western Australia	7609.8 (10.2%)	24.47 (21.89–27.04)	9.3% (–22.5% to 41.0%)	1.10 (1.03–1.17)
Tasmania	1593.4 (2.1%)	25.52 (22.27–28.77)	10.2% (–37.3% to 57.7%)	1.08 (1.00–1.17)
Northern Territory	1311.2 (1.8%)	44.44 (36.80–52.08)	28.6% (–47.7% to 105%)	1.18 (1.07–1.31)
Individually prescribed naloxone				
Australia	2128.7	0.72 (0.55–0.89)	101% (32.2% to 170%)	2.05 (1.86–2.26)
New South Wales/ACT	198.4 (9.3%)	0.20 (0.13–0.27)	95.8% (5.7% to 186%)	1.87 (1.53–2.28)
Victoria	1561.6 (73.3%)	2.06 (1.56–2.56)	92.3% (27.0% to 158%)	1.95 (1.77–2.16)
Queensland	178.9 (8.4%)	0.30 (0.21–0.39)	58.0% (–12.3% to 328%)	2.41 (2.04–2.85)
South Australia	95.6 (4.5%)	0.46 (0.28–0.64)	1394% (–1205% to 3994%)	3.88 (2.52–5.96)
Western Australia	87.1 (4.1%)	0.28 (0.17–0.39)	325% (–92.4% to 743%)	3.47 (2.54–4.73)
Tasmania	4.45 (0.21%)	0.07 (0.00–0.14)	32.1% (–100% to 164%)	2.54 (1.05–6.16)
Northern Territory	3.7 (0.17%)	0.13 (0.00–0.25)	86.2% (–127% to 299%)	2.22 (1.05–4.70)
Prescriber bag naloxone				
Australia	31 168.2	10.59 (8.50–12.69)	76.9% (–42.8% to 197%)	1.63 (1.50–1.78)
New South Wales/ACT	10 487.6 (33.6%)	10.60 (8.68–12.52)	68.7% (–33.5% to 171%)	1.61 (1.48–1.75)
Victoria	9074.4 (29.1%)	12.05 (9.04–15.07)	81.4% (–40.9% to 204%)	1.66 (1.50–1.84)
Queensland	5654.6 (18.1%)	9.57 (7.59–11.56)	82.3% (–45.0% to 210%)	1.66 (1.52–1.82)
South Australia	2439.6 (7.8%)	11.81 (9.54–14.09)	83.1% (–49.8% to 216%)	1.68 (1.54–1.84)
Western Australia	2687.6 (8.6%)	8.64 (6.88–10.40)	85.7% (–70.5% to 242%)	1.57 (1.42–1.73)
Tasmania	656 (2.1%)	10.47 (8.26–12.67)	80.6% (–58.7% to 220%)	1.60 (1.45–1.78)
Northern Territory	168.4 (0.54%)	5.70 (4.39–7.01)	109% (–113% to 331%)	1.56 (1.37–1.78)
Non-dispensed naloxone				
Australia	41173.3	14.21 (12.32–16.11)	–4.2% (–32.0% to 23.7%)	0.93 (0.85–1.01)
New South Wales/ACT	10 208.6 (24.8%)	10.50 (8.69–12.32)	–11.0% (–44.6% to 22.5%)	0.85 (0.75–0.96)
Victoria	12 217.9 (29.7%)	16.59 (13.59–19.58)	8.4% (–28.2% to 45.1%)	1.03 (0.86–1.23)
Queensland	9486.9 (23.0%)	16.33 (14.16–18.50)	–9.9% (–31.0% to 11.2%)	0.90 (0.83–0.97)
South Australia	2352.8 (5.7%)	11.50 (9.14–13.86)	–11.7% (–48.1% to 24.7%)	0.81 (0.67–0.98)
Western Australia	4835.1 (11.7%)	15.55 (13.58–17.51)	–5.3% (–27.7% to 17.2%)	0.93 (0.85–1.01)
Tasmania	933.0 (2.3%)	14.98 (12.46–17.51)	–14.2% (–45.6% to 17.2%)	0.85 (0.75–0.97)
Northern Territory	1139.1 (2.8%)	38.61 (31.36–45.86)	22.8% (–44.3% to 89.9%)	1.15 (1.01–1.30)

Figure. Population-adjusted prescriber bag naloxone supply rates, Australia, 2014–2018, by jurisdiction

