

People listed in aged residential care (ARC) dispensed one or more systemic antibiotics in a year, rate per 100

Technical information	
Indicator name (short)	People listed in ARC dispensed one or more systemic antibiotics in a year.
Description	This measure details the rate per 100 of people listed in an aged residential care facility (ARC) dispensed one or more systemic antibiotics in a year.
Rationale	Research in Aotearoa New Zealand has found higher rates of community antibiotic use for older people in general and especially high rates for people living in ARC due to multimorbidity and frailty.^{1,2} Higher rates of antibiotic-resistant organisms are also found in ARC residents.³ This indicator looks specifically at antibiotic use in people who were living in ARC. This indicator only counts one antibiotic dispensing per person per year and only includes people if they visited primary care in the year. Not all community antibiotics will have been prescribed through primary health care. Prescriptions may have come from hospital outpatient clinics, emergency departments and on hospital discharge. Antibiotics dispensed using practitioner supply orders are not included. 1. Norris P, Horsburgh S, Keown S, et al. 2011. Too much and too little? Prevalence and extent of antibiotic use in a New Zealand region. <i>J Antimicrob Chemother</i> 66(8): 1921–6. 2. Beckett CL, Harbarth S, Huttner B. 2015. Special considerations of antibiotic prescription in the geriatric population. <i>Clin Microbiol Infect</i> 21(1): 3–9. 3. Moor CT, Roberts SA, Simmons G, et al. 2008. Extended-spectrum betalactamase (ESBL)-producing Enterobacteria: factors associated with infection in the community setting, Auckland, New Zealand. <i>J Hosp Infect</i> 68(4): 355–62.
Numerator	People aged 65 and over living in an ARC facility dispensed one or more systemic antibiotics.
Denominator	People aged 65 and over who had a GP consultation in a year listed in the ARC database.
Inclusions	Antibiotics included, chemical ID– note fusidic acid only includes one formulation: • Cephalosporins and cephamycins: cefaclor monohydrate 1228, cefazolin 1236, ceftriaxone 1232, cefuroxime axetil 1081, cefuroxime sodium 1233, cefalexin monohydrate 1234

	• Macrolides: azithromycin 1178, clarithromycin 2809, erythromycin ethyl succinate 6026, erythromycin lactobionate 6028, erythromycin stearate 6027, roxithromycin 2790 • Penicillins: amoxicillin 1072, amoxicillin with clavulanic acid 1070, benzathine benzylpenicillin tetrahydrate 1120, benzylpenicillin sodium (penicillin G) 1136, flucloxacillin 1512, phenoxymethylpenicillin (penicillin V) 1970, procaine penicillin 2046 • Tetracyclines: doxycycline 2529, minocycline hydrochloride 1828, tetracycline 3999 • Other antibiotics: ciprofloxacin 2819, clindamycin 1303, colistin sulphomethate 1346, co-trimoxazole 1361, fusidic acid 1546 – formulation id 154601, gentamicin sulphate 1554, moxifloxacin 3925, paromomycin 3998, pyrimethamine 3992, sulfadiazine sodium 3993, tobramycin 2274, vancomycin 2314 • Urinary tract infections: hexamine hippurate 1594, nitrofurantoin 1867, norfloxacin 1874, trimethoprim 2300
Exclusions	• Ciprofloxacin 2819 formulation id: 281904 (eye) • Gentamicin sulphate 1554: 155405 (eye) • Tobramycin 2274 formulation ids: 227425 (inhalation), 227404 (eyedrops) and 227405 (eye ointment)
Note for calculation	Unit of measure: Rate Adjustment applied: None District health board (DHB) assignment: Domicile
Data sources	Pharmaceutical Collection; aged residential care (ARC) funding; primary health organisation (PHO), Ministry of Health.
Suppression rule	Data is not presented where the counts are less than 10.
Notes	<i>See appendix for more details.</i>

Appendix 1. Interpretation notes

Units reported and denominator used

In developing this Atlas domain, we explored different metrics. We decided not to use defined daily doses (DDD) because they are based on adult doses so don't apply well to children. We trialled reporting prescription items dispensed per 1,000 population per day but decided not to progress with this because it does not account for the duration of treatment. This means that an antibiotic dispensed for one day is counted the same as an antibiotic with a 90-day supply. Instead, we chose to report people who were dispensed an antibiotic one or more times in a year.

We explored different denominator populations and elected to use one based on those who attended primary care in the year of interest. Our analysis found that using the denominator of people attending primary care in the year was the best measure for DHB variation because it accounts for need. For example, a DHB with a younger or older age structure is likely to have a greater proportion of its population attend primary care in a year. Other denominators explored were the primary health organisation (PHO) enrolled population and the Statistics New Zealand DHB resident population.

Confidence intervals

Data for each DHB are presented as rate per 1,000 population. Upper and lower confidence intervals were calculated to 95 percent level of confidence.

Practitioner supply order (PSO)

Several antibiotics included in our analysis are also available on PSO. PHARMAC defines this as a written order made by a prescriber for the funded supply of pharmaceuticals for emergency use, teaching and demonstration purposes and for provision to certain patient groups where an individual prescription is not practicable.

Antibiotics given to people using a PSO cannot be included in this Atlas domain because they are not linked to an NHI number.

Te Kāwanatanga o Aotearoa
New Zealand Government