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Environmental Health Intelligence New Zealand
Rapu Mātauranga Hauora mo te Taiao – Aotearoa

Related indicators

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Lower respiratory tract infection hospitalisation (0–4 years)

This factsheet presents information on lower respiratory tract infection (LRTI) hospitalisation rates among children aged 0–4 years in New Zealand.

The number of LRTI hospitalisations in 0–4 year olds returned to pre-Covid-19 levels in 2021.

The winter LRTI hospitalisation peak was higher than usual in 2021.

Infants (under one-year-old) continue to have the highest LRTI hospitalisation rates since 2001.

Pacific children had nearly twice the rate of LRTI hospitalisation as European/Other children in 2021.

Children living in the most deprived areas (NZDep 2018 quintile 5) had twice the rate of LRTI hospitalisation as children living in the least deprived areas (quintile 1).

Children living in urban areas had higher rates of LRTI hospitalisation than children in rural areas.

Poor indoor and outdoor air quality increases the risk of lower respiratory tract infections among children

Lower respiratory tract infections (LRTI) refer to infections of the windpipe (trachea), lungs, and airways (bronchi, bronchioles). These include pneumonia, bronchitis and bronchiolitis. Household crowding, second-hand smoke exposure (Baker et al 2013; U.S. Department of Health and Human Services 2007), indoor dampness and mould (Fisk et al 2010) and outdoor air pollution (Mehta et al 2013) increase the risk of lower respiratory tract infections in young children. Compared with other developed countries, New Zealand has high rates of LRTI hospitalisation among young children (Trenholme et al 2013). For more background information, please visit our website.

The COVID-19 pandemic

Throughout 2020 and 2021 the New Zealand Government pursued an elimination strategy for COVID-19. A four-level COVID-19 alert system was in place from March 2020 to December 2021 (New Zealand Government 2022). Measures used in the system included temporary border closures, quarantine requirements, community testing, school closures, contact tracing, and lockdowns.

A full national Level 4 lockdown was in place from 25 March 2020 to 27 April 2020 followed by Level 3 and Level 2 restrictions throughout much of the 2020 winter cold and flu season. These public health measures coincided with vastly reduced hospitalisation rates for lower respiratory tract infection (LRTI) in children 0–4 years in 2020 (Huang et al 2021; Trenholme et al 2021).

In 2021 the only full national Level 4 lockdown was between 17 August 2021 and 31 August 2021. Outside of this period, regional Level 4 and 3 restrictions were used (particularly in the Auckland region), but lower level restrictions were in place for much of the cold and flu season across the country.

Number of LRTI hospitalisations returned to pre-Covid-19 levels after a drop in 2020

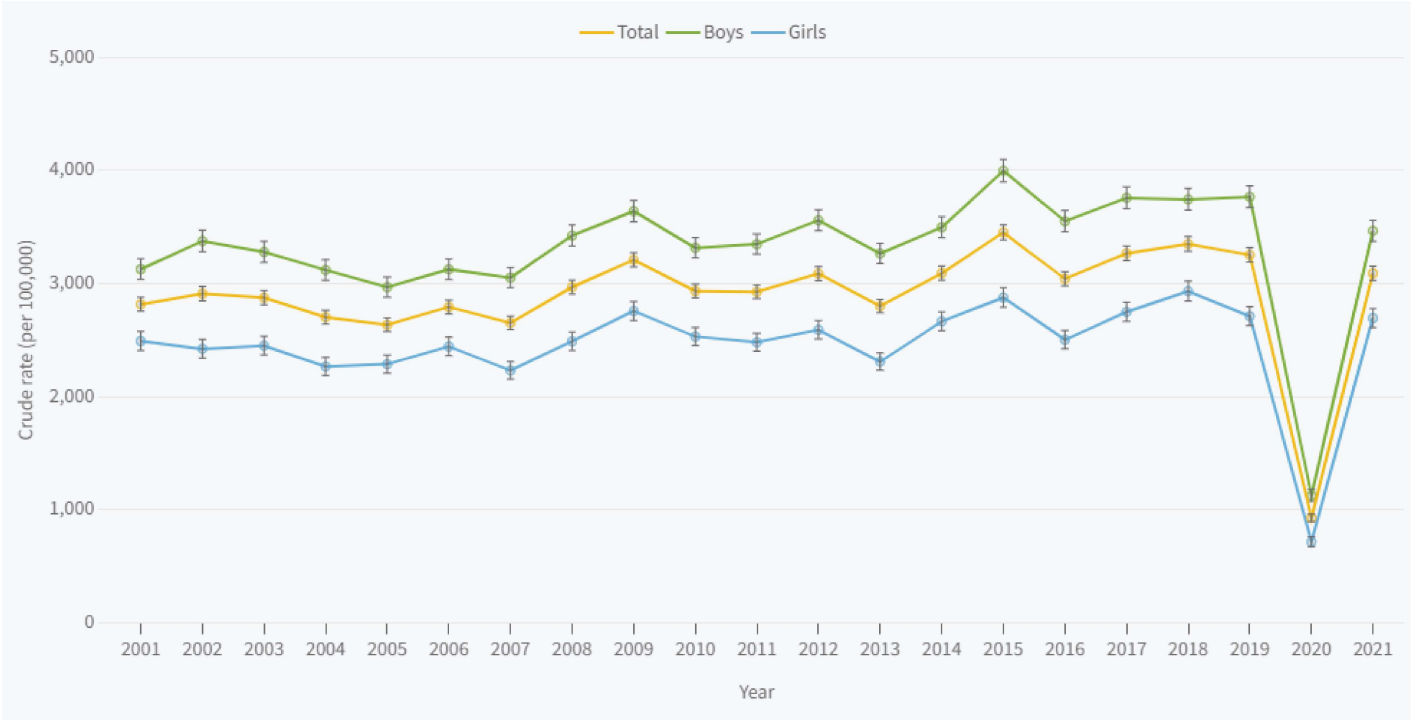
In 2021, there were 9422 LRTI hospitalisations in children under five years old, up from 2852 in 2020. When compared with the last year prior to the COVID-19 pandemic, LRTI hospitalisations in 2021 were five percent lower (518 hospitalisations) than in 2019 (Figure 1).

Figure 1 Number of lower respiratory tract infection hospitalisations in children aged 0-4 years, 2001-2021

Source: National Minimum Dataset, Ministry of Health 2022

LRTI hospitalisation rates in children increased in 2021 (3088.4 per 100,000) after a substantial drop in 2020 (926.5 per 100,000). This drop coincided with the nationwide COVID-19 lockdown that began on 25 March 2020 (Figure 2). However, as COVID-19 restrictions have eased over time, hospitalisation rates have almost returned to pre-COVID-19 levels.

Figure 2 Lower respiratory tract infection hospitalisations in children aged 0–4 years, by sex, 2001-2021 (crude rate per 100,000)



Note: 95% confidence intervals have been presented as error bars.

Source: National Minimum Dataset, Ministry of Health 2022

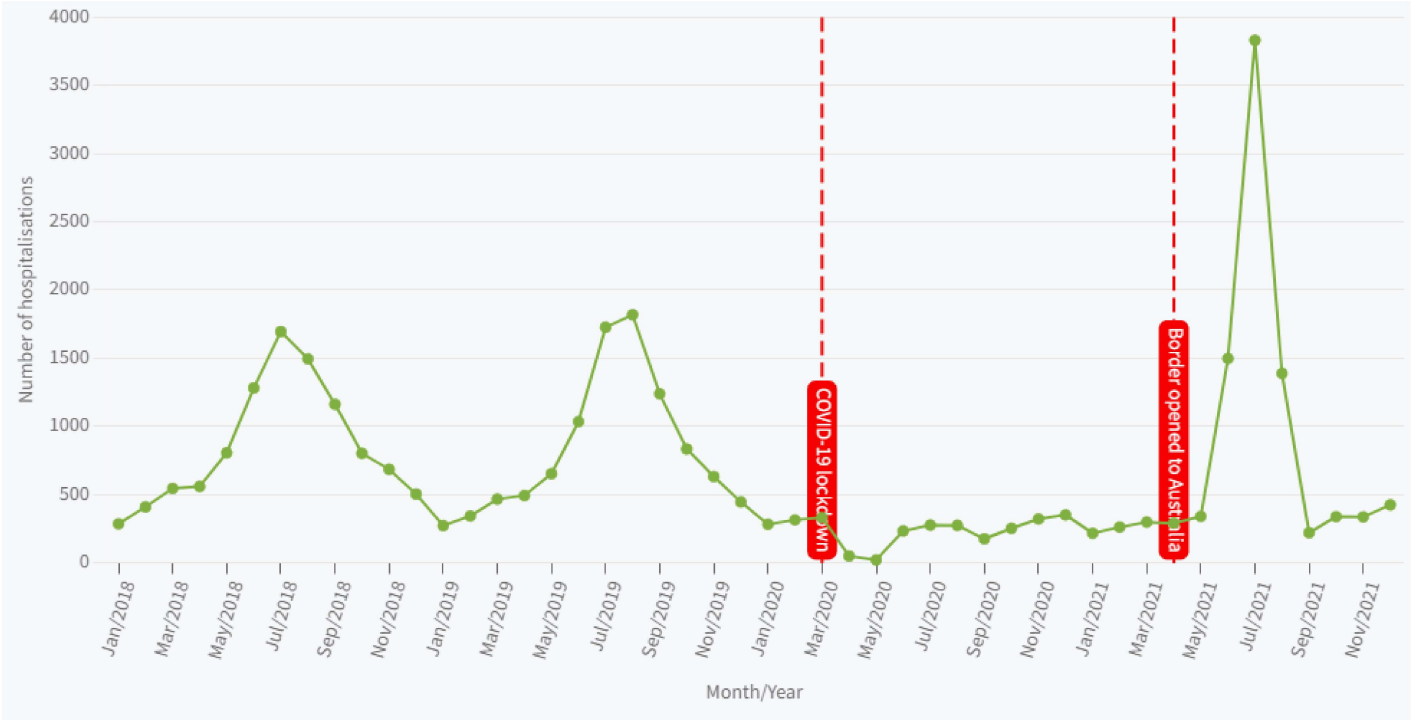
As with other childhood respiratory illnesses such as asthma (Fuseini and Newcomb 2017), boys have higher LRTI hospitalisation rates than girls. In 2021, the rate for boys was 3463.4 per 100,000 compared with 2692.3 per 100,000 for girls (Figure 2).

Usual winter LRTI hospitalisation peak returned in 2021

The number of LRTI hospitalisations rebounded quite quickly in New Zealand and overseas following the easing of COVID-19 restrictions (Foley et al 2021; Kim et al 2022; Ujiie et al 2021).

There was a surge in LRTI hospitalisations during the 2021 winter season, surpassing pre-pandemic trends (Figure 3). There were 3832 LRTI hospitalisations in July 2022, up from 274 in 2020, 1726 in 2019, and 1694 in 2018. It is thought that one driver of the higher LRTI hospitalisations in 2021 was lower than usual levels of immunity among young children to respiratory syncytial virus (RSV) due to the reduced incidence of RSV and other seasonal viruses in 2020 (Britton et al 2020; Groves et al 2021). Border changes in April 2021 allowed quarantine-free travel between New Zealand and Australia and RSV cases quickly increased, peaking in July 2021 (Hatter et al 2021).

Figure 3 Number of lower respiratory tract hospitalisations in children aged 0-4 years, by month, 2018-2021 (counts)



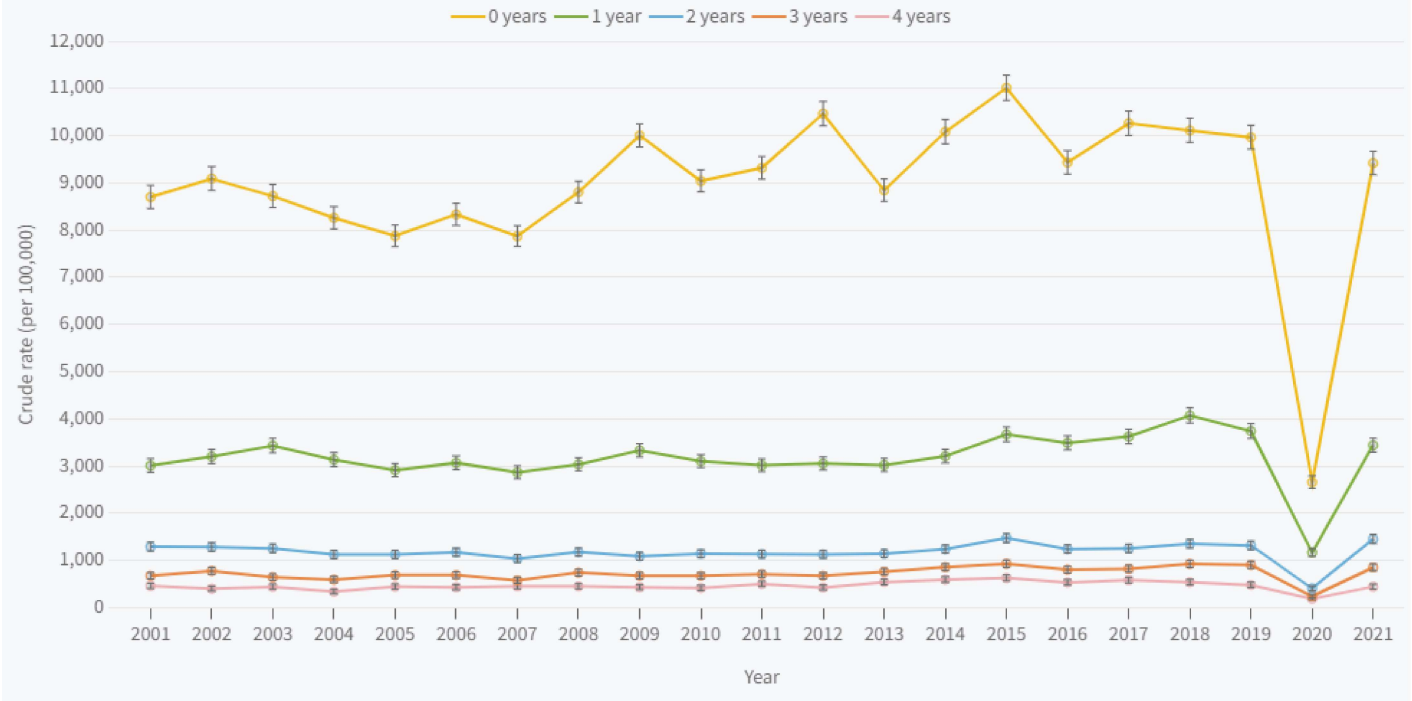
Note: 95% confidence intervals have been presented as error bars.

Source: National Minimum Dataset, Ministry of Health 2022

Infants continued to have the highest LRTI hospitalisation rates

In 2021, infants (under one-year-old) had the highest rate (9416.3 per 100,000) of LRTI hospitalisations compared to children aged 1-4 years (Figure 4).

Figure 4 Lower respiratory tract hospitalisations in children aged 0-4 years, by age, 2001-2021 (crude rate per 100,000)



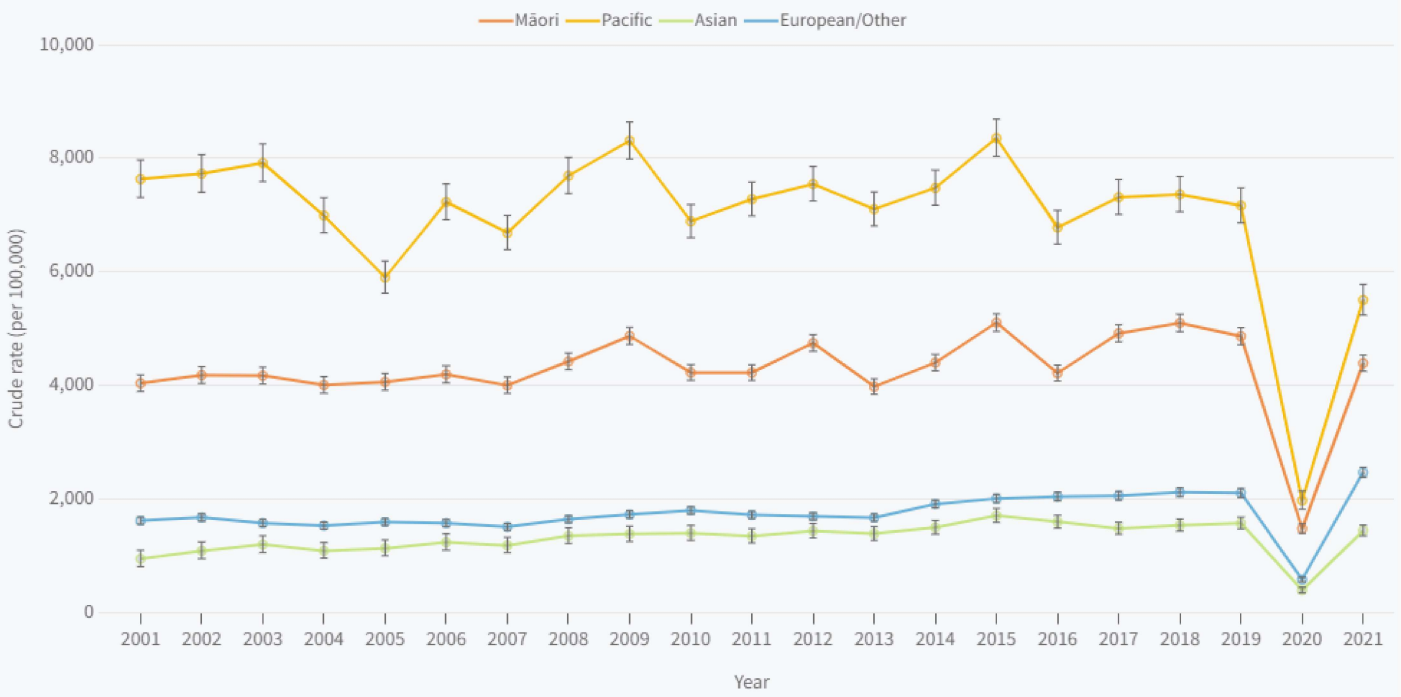
Note: 95% confidence intervals have been presented as error bars.

Source: National Minimum Dataset, Ministry of Health 2022

Pacific and Māori children were disproportionately affected by LRTI

Rates of LRTI for Pacific and Māori children have been consistently higher than those for European/Other children since 2001 (Figure 5). In 2021, the LRTI hospitalisation rate was twice as high for Pacific children aged 0–4 years (5505.1 per 100,000) than European/Other children (2470.6 per 100,000).

Figure 5 Lower respiratory tract infection hospitalisations in children aged 0-4 years, by ethnic group (prioritised), 2001-2021 (crude rate per 100,000)



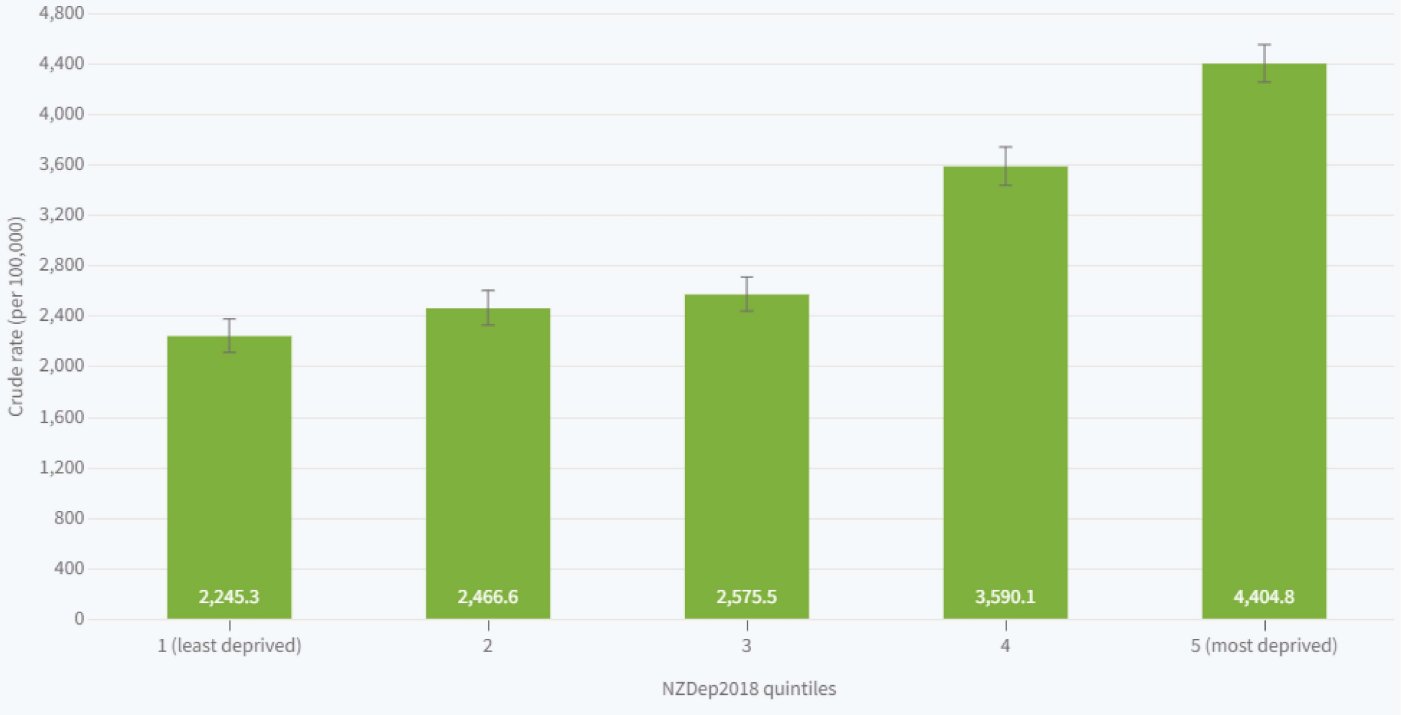
Note: 95% confidence intervals have been presented as error bars.

Source: National Minimum Dataset, Ministry of Health 2022

Higher LRTI hospitalisaton rates in more deprived areas

In 2021, LRTI hospitalisation rates were much higher in more socioeconomically deprived areas (Figure 6). Children living in the most deprived areas (NZDep2018 quintile 5) had about two times the rate of LRTI hospitalisation as children living in the least deprived areas (quintile 1) (rate ratio = 1.96, 95% confidence interval 1.83–2.10).

Figure 6 Lower respiratory tract infection hospitalisations in children aged 0-4 years, by NZDep 2018 quintiles, 2021 (crude rate per 100,000)



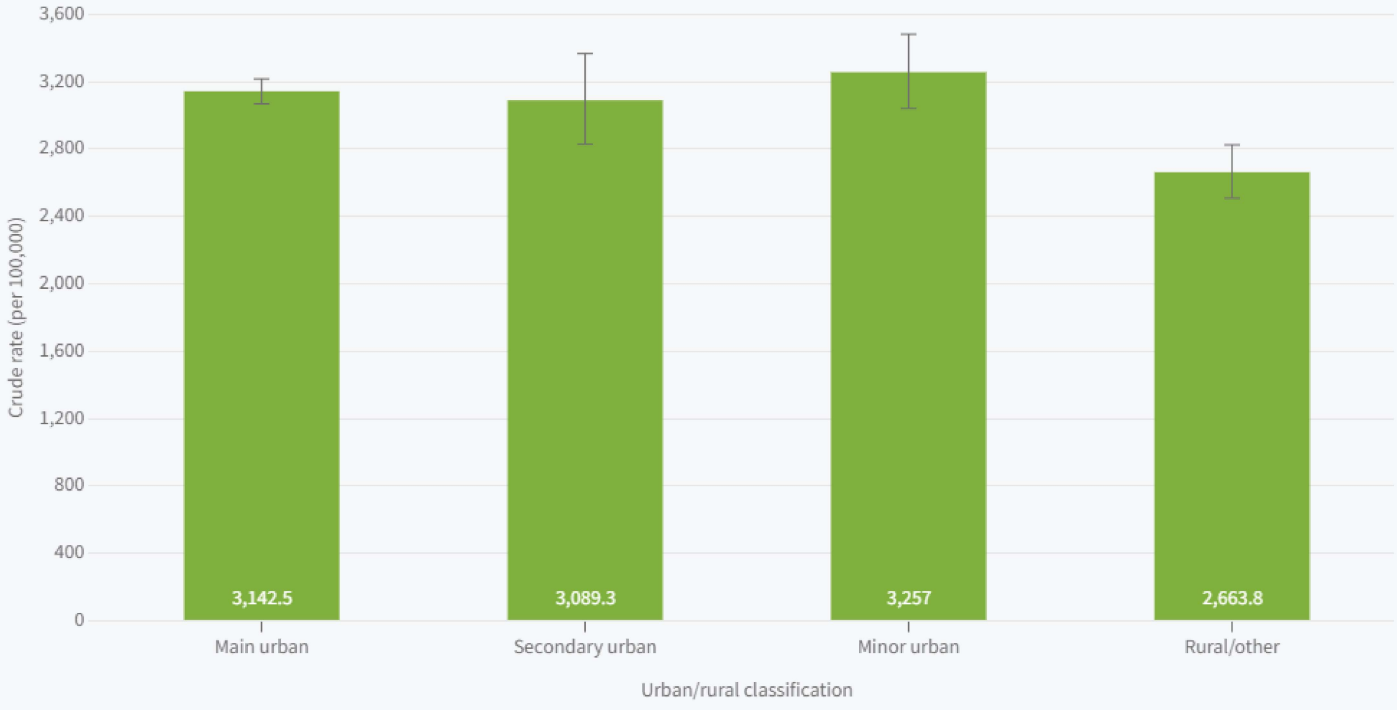
Note: 95% confidence intervals have been presented as error bars.

Source: National Minimum Dataset, Ministry of Health 2022

Higher LRTI rates in urban areas

In 2021, children living in urban areas had a significantly higher LRTI rate than children living in rural areas (rate ratio 1.18, 1.11–1.26). The rates for children living in each of the urban categories (main, secondary and minor urban) were all above 3,000 per 100,000, compared with a rate of 2,664 per 100,000 for children living in rural areas (Figure 7).

Figure 7 Lower respiratory tract infection hospitalisations in children aged 0–4 years, by urban-rural classification, 2021 (crude rate per 100,000)



Notes: 95% confidence intervals have been presented as error bars. The Statistics New Zealand urban-rural classification for 2013 has been used. Main urban areas are major towns and cities with a population of 30,000 or more. Secondary urban areas are smaller towns with a population of 10,000–29,999 people. Minor urban areas are towns with a population of 1,000–9,999. Rural areas include rural centres, and rural areas outside of these.

Source: National Minimum Dataset, Ministry of Health 2022

Continue to read this factsheet at the District level

Interactive regional dashboard

Data for this indicator

This indicator is an analysis of the most recent data available from the National Minimum Dataset, provided to EHINZ by the Ministry of Health in August 2021.

This indicator reports on LRTI hospitalisations among children aged 0–4 years with a primary diagnosis in the following ICD-10AM codes:

- pneumonia (J12, J13, J14, J15, J16, J18)
- bronchitis (J20)
- bronchiolitis (J21)
- unspecified acute lower respiratory tract infection (J22).

For additional information, see the metadata link below.

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Other related topics include:

Second-hand smoke exposure | Health burden due to second-hand smoke exposure | Household crowding | Particulate matter

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Further information

For descriptive information about the data Metadata Sheet

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