Access to safe drinking-water

This factsheet presents information on the population who have access to safe drinking-water in New Zealand. Access to safe drinking water is measured by access to bacteriological, protozoal and chemical compliant water. Boil-water notices may be issued to residents if there is a risk of microbial contamination in drinking water.

Key facts

In the 2019/20 reporting period, over 4 million New Zealanders (81.4% of the population) received water from registered drinking-water supplies.

Within the population on registered supplies, 78.6% (3.2 million people) received drinking-water that met all bacteriological, protozoal and chemical safety requirements.

Smaller drinking-water supplies were less likely to meet the bacteriological and protozoal safety standards than larger supplies.

Permanent boil-water notices were issued to 27 drinking-water supplies, affecting an estimated 7,771 people in 2019/20.

What determines 'safe' drinking-water?

Safe drinking-water is vital for human health. The presence of pathogens or chemicals in a water supply may render that water unsafe to drink. Safe source selection and treatment of drinking-water supplies can ensure the water is safe to drink. Registered drinking water supplies in New Zealand must be regularly tested for microbiological and chemical compliance with the Drinking-water Standards for New Zealand.

Whether or not a drinking water supply complies with the prescribed quality standards is based on three measures (Ministry of Health 2021):

- **Bacteriological** compliance is determined through monitoring whether a supply contains *E.coli* or similar bacteria.
- **Protozoal** compliance is determined by whether water treatment processes have resulted in an acceptable level of inactivation and/or removal of protozoa such as *Cryptosporidium*.
- **Chemical** compliance is determined by the adequacy of monitoring chemical hazards in the water and whether these chemicals exceed a concentration that would pose a health risk to consumers.

A ‘boil-water notice’ may be issued to residents by a supplier if there is a heightened risk of microbial contamination. This notice indicates tap water may not be safe to drink or use to prepare food and brush teeth, so residents must boil water before consuming it. Temporary boil-water notices are issued to protect public health if there is a short-term heightened risk of microbial contamination, as can happen following extreme weather events. Permanent boil water notices indicate there is a longstanding heightened risk of microbial contamination.

About three-quarters of New Zealanders on registered supplies received drinking-water that met all the requirements of the standards

About 4.1 million New Zealanders (81.4% of the population) received water from registered drinking-water supplies during the 2019/20 reporting period. The remainder (an estimated 944,000 people) received water from very small community supplies (typically serving fewer than 100 people) or sourced their own water from ‘self-supplies’, e.g. rainwater tanks.

Of the population on registered supplies, 95.2% (3.9 million) received water that complied with the bacteriological standard, 80.0% (3.3 million) with water that met the protozoal standard, and 99.1% (4.09 million) with chemically-complaint drinking-water. In the 2019/20 reporting period, 78.6% (3.2 million) were supplied with drinking-water that met all three requirements (Table 1).

Table 1: Population on registered community drinking-water supplies that had access to safe drinking-water, during the 2019/20 reporting period

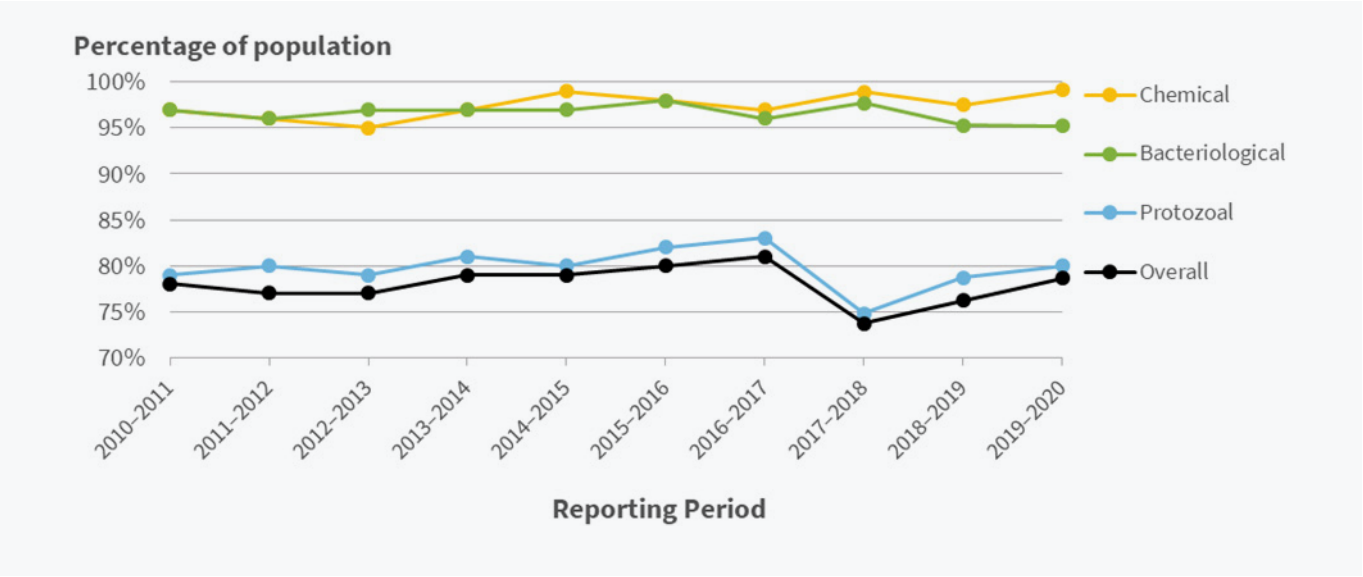
Access to safe drinking-water	Estimated population	Percent (of those on registered supplies)
Bacteriological compliance	3,924,540	95.2%
Protozoal compliance	3,311,419	80.0%
Chemical compliance	4,094,610	99.1%
Overall compliance (all standards met)	**3,246,369**	**78.6%**

Source: Ministry of Health 2021

Bacteriological and chemical compliance has remained consistently above 95%, from the 2010/11 reporting period onward (Figure 1). Protozoal compliance peaked in 2016/17 (83%), but dropped to its lowest value (75%) in 2017/18 due to several large supplies losing 'secure bore water' status.

More stringent requirements for water quality monitoring came into effect on the 1st of August 2019. A principal effect of these was to make compliance with the three standards compulsory, rather than only requiring suppliers to 'take all practicable steps' to comply (Ministry of Health 2020). These do not yet appear to have had a noticeable impact on compliance rates. Whether compliance increases in future will indicate the effectiveness of the new requirements.

Figure 1: Percentage of the population on registered community drinking-water supplies with access to safe drinking-water, 2010–2020



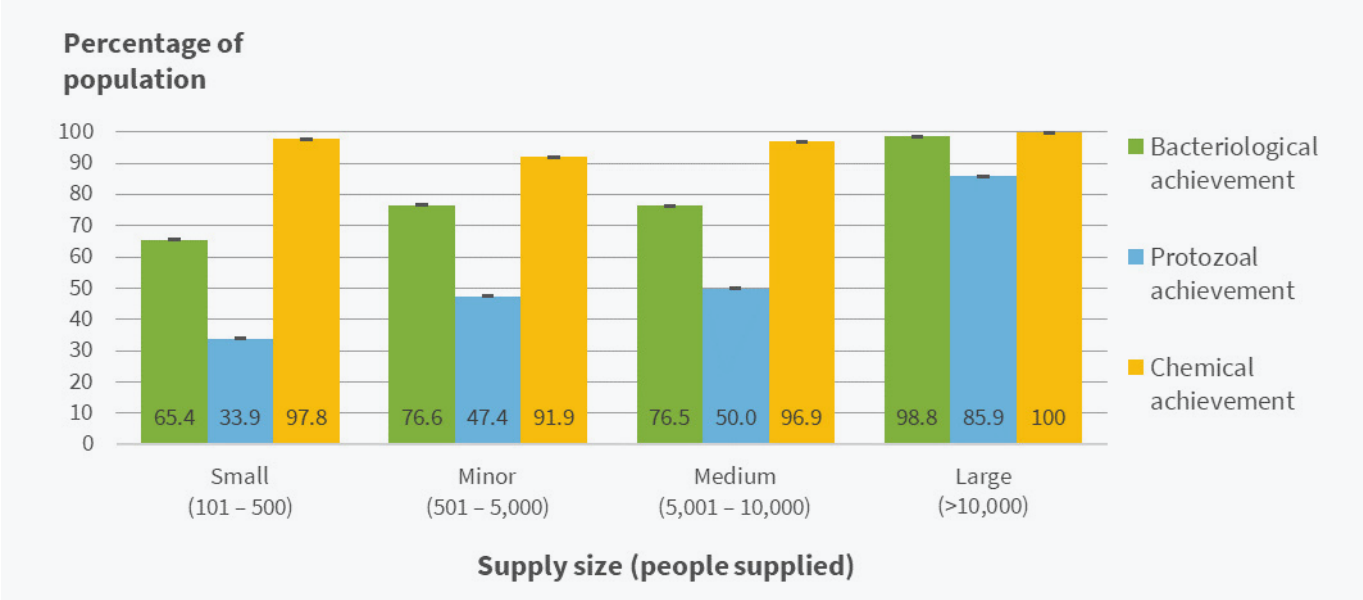
Note: The 95% confidence intervals for this graph are small and too close to the values plotted to be displayed.
Source: Ministry of Health 2021

Small supplies were less likely to meet bacteriological standards than larger supplies

Supplies in the 'small' category that serve 101–500 people were less likely to provide water that met the bacteriological or protozoal requirements than larger supplies (Figure 2). Only 65.4% of the population on small supplies received water that met the bacteriological standard and just 33.9% received water that met the protozoal standard, compared with 98.8% and 85.9% respectively of the population on large supplies. Chemical compliance was achieved for at least 90% of the population across all supply sizes.

As bacteriological and protozoal compliance improved with increasing supply size, there may be an issue with increased compliance costs per capita in smaller supplies (Ministry of Health 2021). Small supplies tend to be in small rural settlements. In contrast, the largest supplies serve New Zealand's major cities.

Figure 2: Percentage of population with access to safe drinking water during the 2019/20 reporting period, by supply size



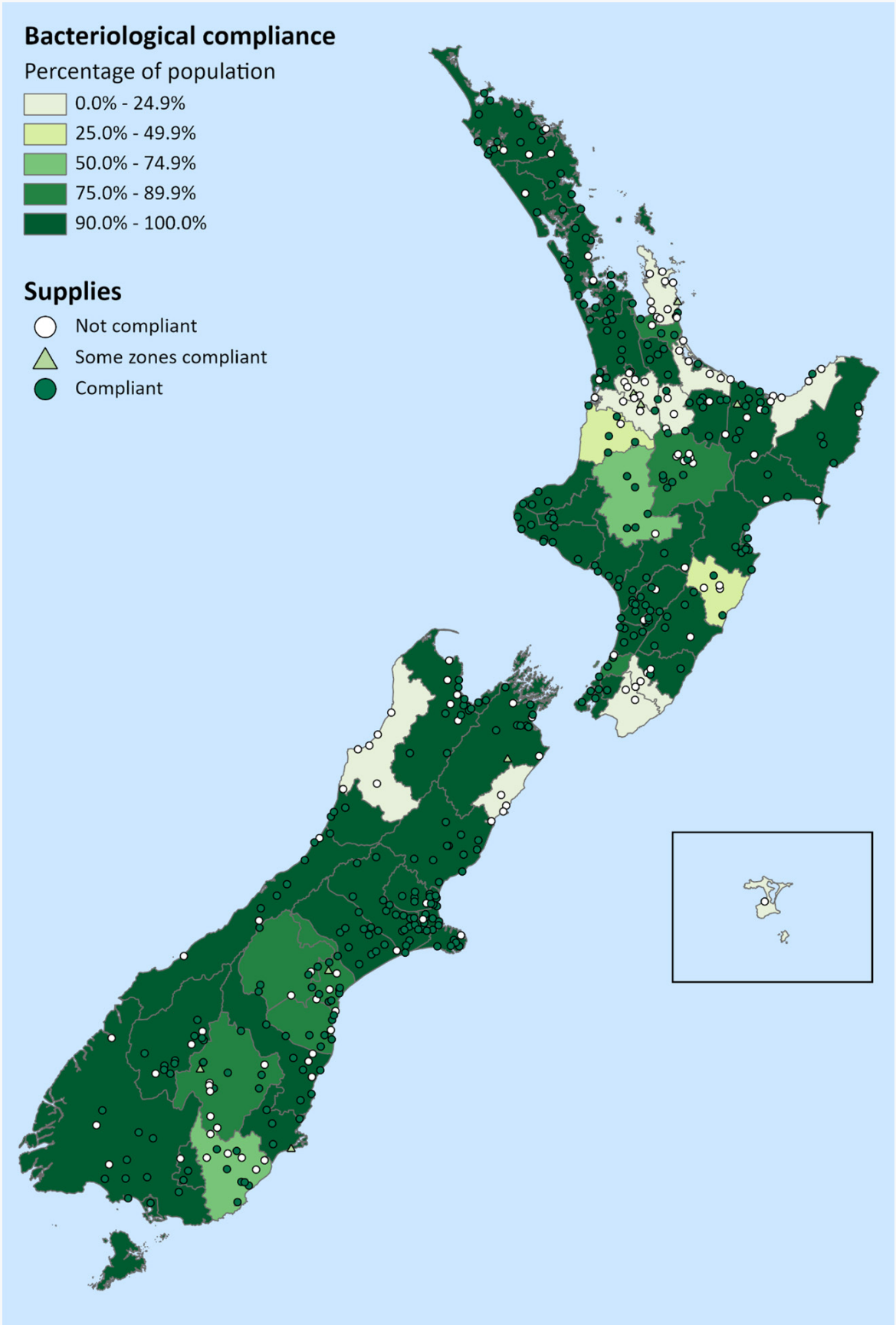
Note: 95% confidence intervals have been presented as error bars.
Source: Ministry of Health 2021

Compliance around New Zealand

Bacteriological compliance was low for some supplies, primarily outside major urban areas (Figure 3). Protozoal compliance was low for supplies located in rural areas, particularly in the South Island (Figure 4). Chemical compliance was lowest in the Central North Island, with several incompliant supplies near the Taupo Volcanic Zone (Figure 5). The most common determinand in this area was arsenic, for which the Maximum Acceptable Value was exceeded in seven supplies, affecting 9,093 people. Arsenic can occur naturally in soil or water due to geothermal activity (Robinson et al 2004) and is associated with an elevated risk of some cancers (Smith et al 1998).

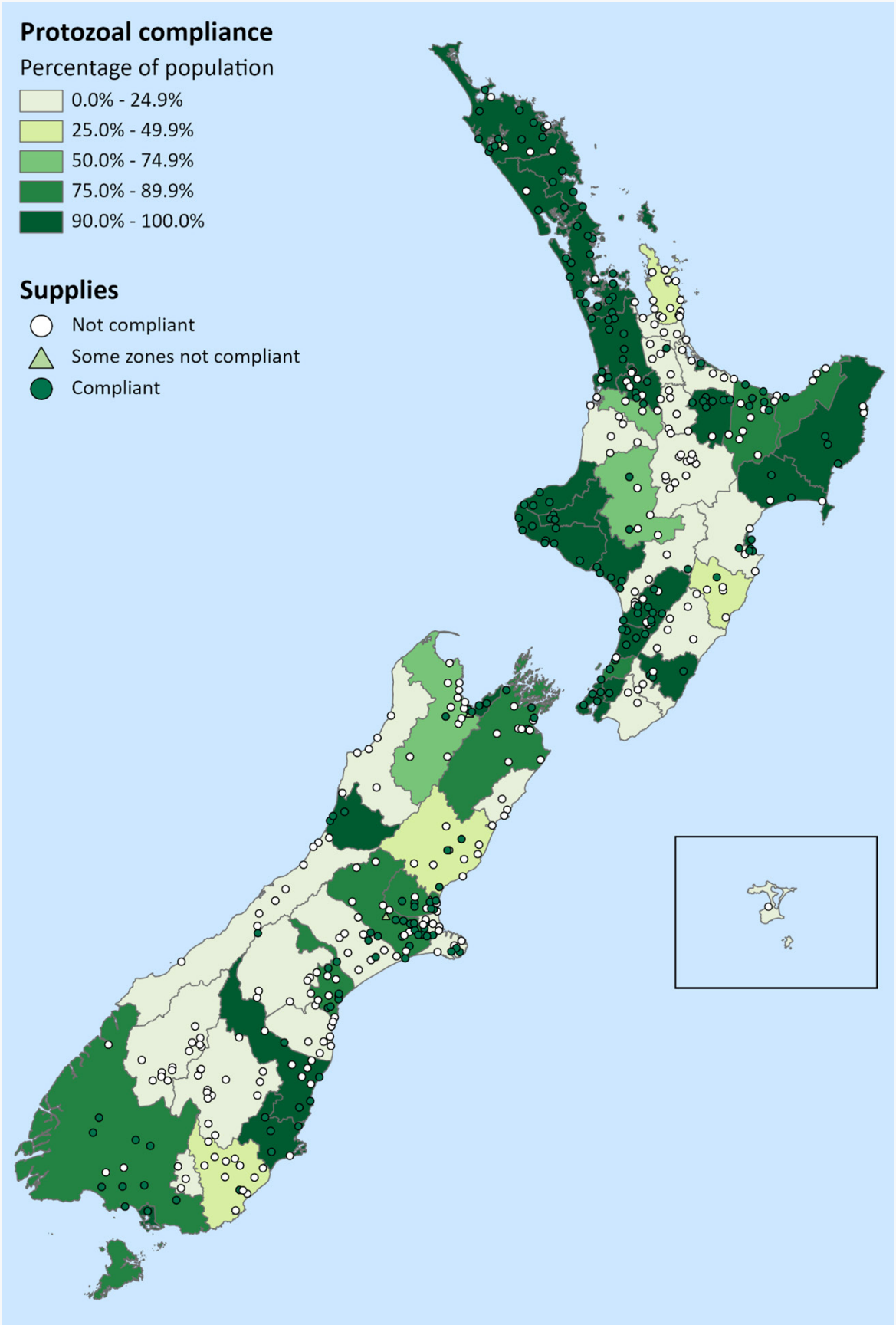
Elsewhere, excessive levels of, or failure to adequately monitor, by-products of the chemicals used to disinfect drinking-water resulted in 13 supplies failing to comply, affecting 45,560 people.

Figure 3: Percentage of population with access to bacteriologically–compliant drinking water during the 2019/20 reporting period, by territorial authority



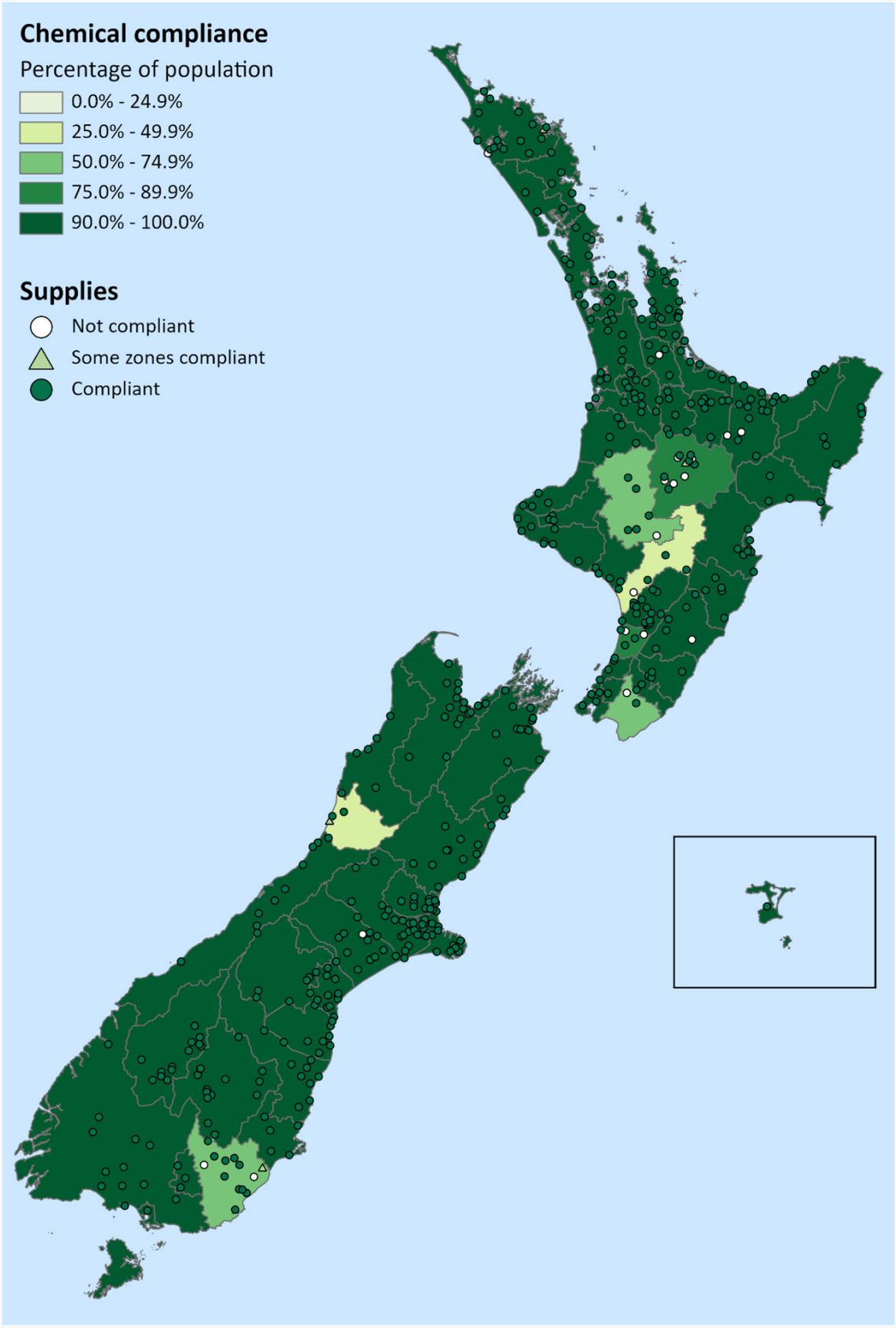
Source: Ministry of Health 2021

Figure 4: Percentage of population with access to protozoal–compliant drinking water during the 2019/20 reporting period, by territorial authority



Source: Ministry of Health 2021

Figure 5: Percentage of population with access to chemically-compliant drinking water during the 2019/20 reporting period, by territorial authority



Source: Ministry of Health 2021

Boil-water notices were mainly confined to smaller supplies

In the 2019/20 reporting period, 78 supplies issued a boil-water notice (Table 2). Of these, 27 were permanent boil-water notices, nearly all of which were for minor supplies and affected an estimated 7,771 people in total. The largest supply that issued a permanent notice was Awatere, in the Marlborough region, which supplied around 1,300 people (Figure 6).

A further 51 temporary notices were issued, affecting up to 486,632 people. However, this may be an overestimate, as 335,500 of these were from a single supply – Christchurch City. It is probable that only a few zones within this supply would have been affected (though the Annual Report on Drinking-water Quality does not specify which), making the actual number of people required to boil their drinking-water likely to be considerably less than this.

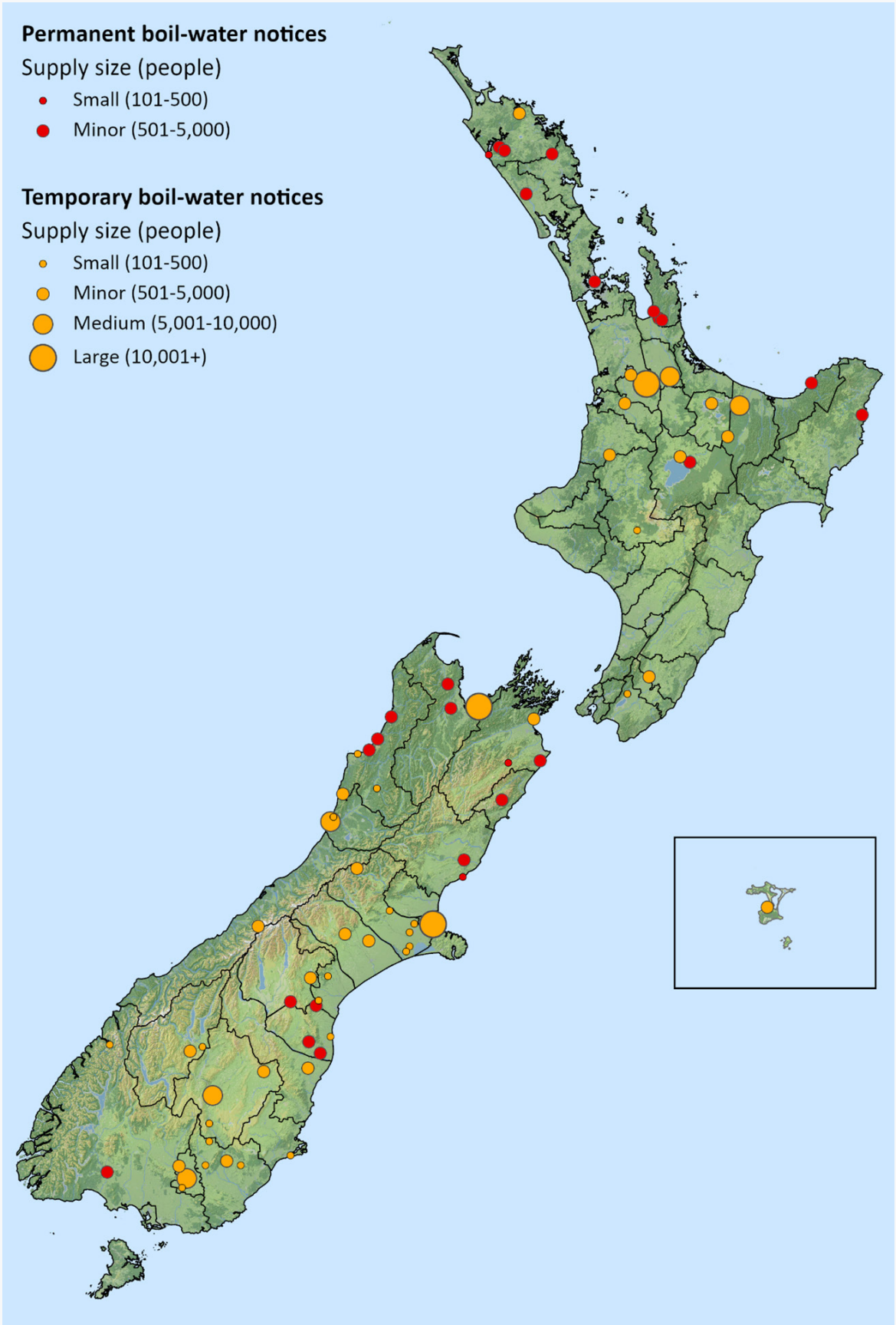
Two other large supplies also issued temporary notices: Nelson City, affecting up to 52,400 people and Cambridge, affecting up to 20,833 people.

Table 2: Population affected by permanent or temporary boil-water notices during the 2019/20 reporting period, by supply size

Supply Size	Supplies that issued a permanent notice	People affected by permanent notices	Supplies that issued a temporary notice	People affected by temporary notices
Small	24	4,857	21	5,081
Minor	3	2,914	22	36,354
Medium	0	0	5	36,464
Large	0	0	3	408,733
Total	**27**	**7,771**	**51**	**486,632**

Source: Ministry of Health 2021

Figure 6: Supplies that issued permanent or temporary boil-water notices during the 2019/20 reporting period, by size



Source: Ministry of Health 2021

Data for this indicator

This indicator presents information based on analysis of data published in the *Annual Report on Drinking-water Quality 2019–2020*, published by the New Zealand Ministry of Health in June 2021.

Unless otherwise stated, all differences mentioned in the text between two values are statistically significant at the 5% level or less.

For additional information, see the metadata link below.

References

Ministry of Health. 2020. *Annual Report on Drinking-water Quality 2018–2019*. Wellington: Ministry of Health.

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Robinson B, Clothier B, Bolan N, Mahimairaja S, Greven M, Moni C, Marchetti M, Dijssel C, Milne G. 2004. *Arsenic in the New Zealand environment*. URL: **https://www.researchgate.net/publication/228591523_Arsenic_in_the_New_Zealand_environment** (accessed 6 August 2021).

Smith AH, Goycolea M, Haque R, Biggs ML. 1998. Marked increase in bladder and lung cancer mortality in a region of Northern Chile due to arsenic in drinking water. *American Journal of Epidemiology* 147(7): 660-669.

Other related topics include:

Waterborne diseases related to drinking-water

Access to fluoridated drinking-water

Oral health of children

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Further information

For descriptive information about the data Metadata Sheet

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