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Testing the water: How councils report on drinking water quality

July 2024

Of the 78 local authorities, 67 city, district, and unitary councils and one regional council supply drinking water. They are required to report their compliance with the drinking water standards.[1]

In our upcoming *Insights into local government: 2023* report, we highlight that, overall, those councils achieved just under 60% of their targets for water supply measures in 2022/23. It is a lower result than for the previous two years, when about 66% of the targets were achieved.

The lowest performance in 2021/22 and 2022/23 was for the "safety of drinking water" measures. Councils achieved just 33% of the targets for these measures in 2022/23 – a significant decline from 2021/22, when councils achieved 48.3%.

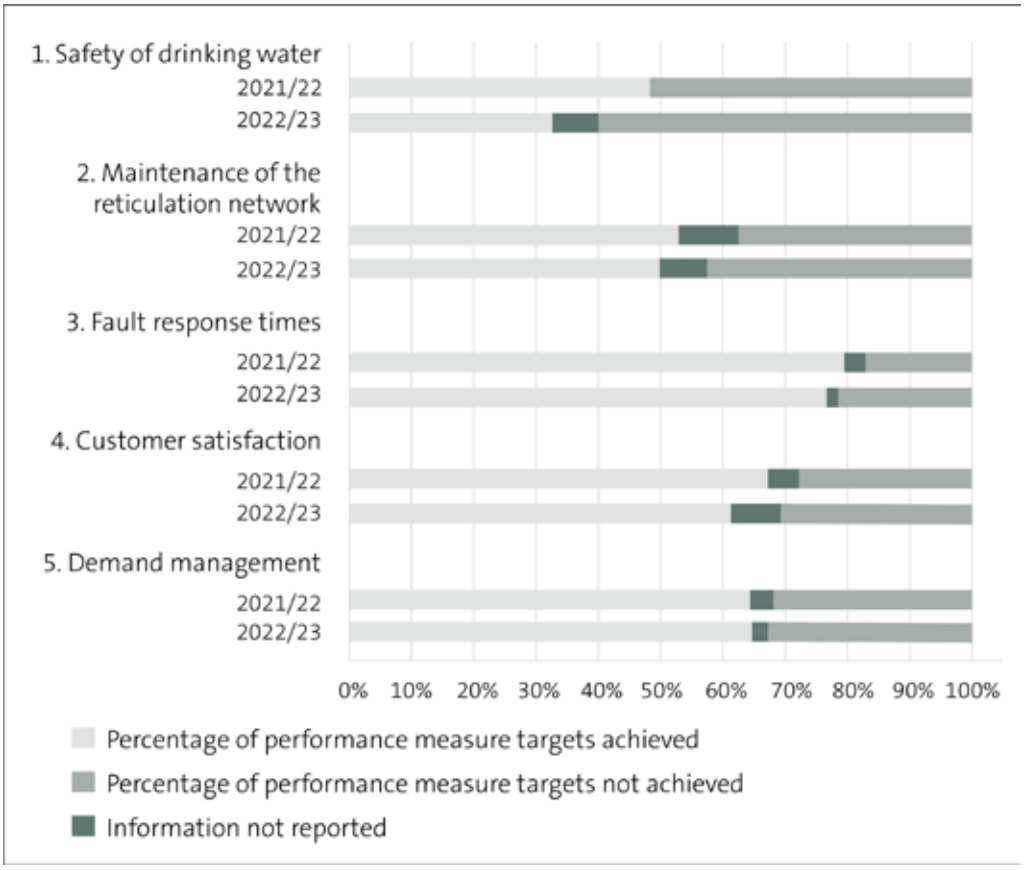
The targets for drinking water can be missed for a range of reasons. Our 2021 local government insights report noted that this does not necessarily mean there is an issue with water quality or that the water is unsafe to drink.[2] However, a missed target for drinking water supply can be a warning of potentially serious problems with water quality and safety.

We encourage councils to investigate the reasons for non-compliance with drinking water standards and prioritise remedial actions, particularly where this could affect water quality and safety. We also encourage councils to talk to the councils consistently achieving their targets. There could be practices they could adopt to help improve their own performance.

1 Buller District Council and Rotorua District Council are not included in our 2022/23 analysis because their 2022/23 annual reports had not been finalised at the time of our analysis.

2 See Controller and Auditor-General (2022), *Insights into local government: 2021*, at oag.parliament.nz.

Figure 1
Percentage of targets achieved for water supply performance measures, 2021/22 and 2022/23



Source: Councils' annual reports.
Note: "Information not reported" means councils have not measured that aspect of their performance.

Safety of drinking water measures

The safety of drinking water measures show the extent to which a council's drinking water supply complies with:

- part 4 of the drinking water standards (bacteria compliance criteria); and
- part 5 of the drinking water standards (protozoa compliance criteria).[3]

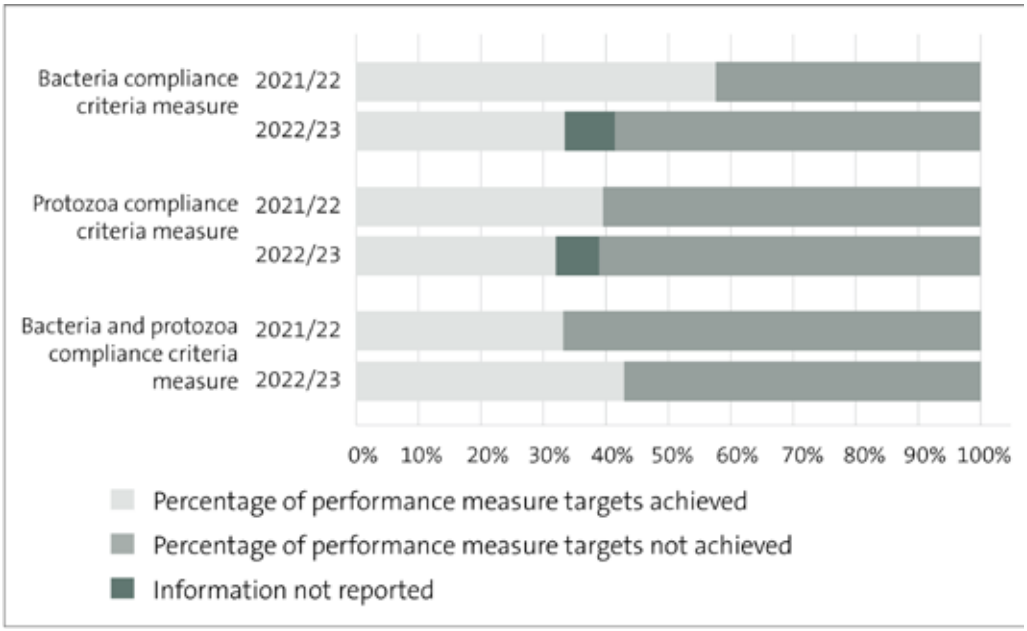
This matters because excessive levels of bacteria or protozoa in drinking water supplies increase the risk of exposure to waterborne diseases such as campylobacteriosis, giardiasis, and cryptosporidiosis. Parts 4 and 5 refer to the *New Zealand Drinking Water Standards 2005 - Revised 2018* (DWS 2005).

These standards were withdrawn in November 2022 and replaced with the *Water Services (Drinking Water Standards for New Zealand) Regulations 2022* (DWS 2022) and the *Drinking Water Quality Assurance Rules 2022* (DWQAR 2022). Together, they cover the provisions of parts 4 and 5 of the DWS 2005. Therefore, 2022/23 was the transition year to the new drinking water standards. We discuss the potential effect of this later in this article.

3 See the "Local Government Policy" section on the Department of Internal Affairs website, at dia.govt.nz.

Figure 2 shows councils' performance against the safety of drinking water measures by each standard assessed (some councils combine the bacteria and protozoa measures).[4] We saw a significant decline in the number of bacteria compliance criteria targets achieved, dropping from 58% in 2021/22 to 34% in 2022/23. In 2022/23, 32% of the protozoa compliance criteria targets were achieved, down from 40% in 2021/22. Where councils combined these two measures, 43% of targets were achieved in 2022/23 – up from 33% in 2021/22.

Figure 2
Percentage of targets achieved for the safety of drinking water measures, 2021/22 and 2022/23



Source: Councils' annual reports.
Note: "Information not reported" means councils have not measured that aspect of their performance.

Is there a relationship between performance and investment levels?

Figure 3 shows that seven councils achieved the bacteria performance measure target in all three years, 10 councils achieved the protozoa performance measure target in all three years, and five achieved both bacteria and protozoa targets in all three years.

Figure 3 also shows the amount these councils spent on water supply asset renewals as a proportion of depreciation. We compare renewals expenditure with annual depreciation to assess whether councils are adequately reinvesting in their assets. Ideally, assets would be renewed at the same rate they are "run down". Therefore, if the percentage shown is less than 100%, it might indicate that a council is not adequately reinvesting in its assets. For context, in 2022/23, capital expenditure for renewals was 76% of depreciation for councils as a whole. This means that for every $1 of assets "run down", councils have reinvested 76 cents.

4 These are Chatham Islands Council, Hauraki District Council, Kawerau District Council, Matamata-Piako District Council, Nelson City Council, Queenstown-Lakes District Council, Rotorua District Council, and Whangarei District Council.

Figure 3
Councils that achieved the bacteria, protozoa, or both performance measure targets in 2020/21, 2021/22, and 2022/23 and their average water supply renewals spending as a proportion of depreciation for those years

Council name	Council type	Achieved bacteria performance measure targets	Achieved protozoa performance measure targets	Average water supply renewals spending as a proportion of depreciation
Nelson City Council	Provincial	√	√	59%
Horowhenua District Council	Provincial		√	62%
Auckland Council	Auckland	√	√	67%
Stratford District Council	Rural	√	√	69%
Tauranga City Council	Metro	√	√	77%
Hamilton City Council	Metro		√	84%
Waikato District Council	Provincial	√		85%
Whanganui District Council	Provincial		√	92%
Wairoa District Council	Rural	√		96%
New Plymouth District Council	Provincial		√	97%
Upper Hutt City Council	Metro		√	97%
Invercargill City Council	Provincial	√	√	104%

Source: Councils' annual reports.

In contrast, 17 councils did not achieve the bacteria performance measure target in all three years, 36 councils did not achieve the protozoa performance measure target in all three years and 16 did not achieve either target in all three years.

Figure 4 lists those 16 councils and shows their level of renewals spending.

Figure 4
Councils where both the bacteria and protozoa measures' targets were not achieved in 2020/21, 2021/22, and 2022/23 and their average water supply renewals spending as a proportion of depreciation for those years

Council name	Council type	Average water supply renewals spending as a proportion of depreciation
Chatham Islands Council	Rural	10%
Westland District Council	Rural	59%
Waimakariri District Council	Provincial	68%
Central Otago District Council	Provincial	81%
Whakatāne District Council	Provincial	86%
Christchurch City Council	Metro	98%
Dunedin City Council	Metro	101%
Southland District Council	Provincial	125%
Carterton District Council	Rural	141%
Taupō District Council	Provincial	151%
Tasman District Council	Provincial	180%
Waitaki District Council	Provincial	207%
South Wairarapa District Council	Rural	215%
Central Hawke's Bay District Council	Rural	222%
Mackenzie District Council	Rural	254%
Timaru District Council	Provincial	439%

Source: Councils' annual reports.

There is no clear pattern to the type of council and their performance, with a mixture of metropolitan, provincial, and rural councils appearing in both the "Achieved" (Figure 3) and "Not achieved" (Figure 4) tables.

The average spending on water supply renewals as a proportion of depreciation is significantly higher for councils not achieving the bacteria and protozoa performance measure targets than for those achieving them. Spending by councils that achieved both targets in all three years ranged between 59% and 104%, averaging 82%. In contrast, spending by the 16 councils that did not achieve either target in all three years ranged from 10% to 439%, averaging 152%.

This suggests that councils not currently achieving the targets are investing more in their water supply assets now to improve their performance against the drinking water standards in the future.

As we previously noted, our comparison of investment against performance measure targets is an indicator only. Although increased investment might allow for improvements in performance, it is not necessarily a direct causal relationship. There might also be a time lag between increased investment and an improvement in performance. When we revisit this analysis, we hope to see an improvement by councils that have increased their investment in recent years. However, we are mindful that there are other factors that could influence the outcomes.

Why were drinking water safety standards not being met?

There are various reasons why a council might not fully comply with the drinking water standards. Each standard contains multiple criteria. For example, where continuous monitoring of the water is required, a council might be non-compliant if it could not demonstrate this or if data were missing for a short period. This reason for non-compliance would not necessarily mean there were any issues with water quality.

Figures 5 and 6 show the reasons for councils reporting their bacteria and/or protozoa performance measure targets as "not achieved" in 2020/21, 2021/22, and 2022/23.

Figure 5
The main reasons given by councils for not achieving the bacteria performance measure targets in 2020/21, 2021/22, and 2022/23

	2020/21	2021/22	2022/23
Boil notice	3	5	6
Change in drinking water standards	0	0	13
Cyclone Gabrielle	0	0	3
E. coli sample	5	8	5
High turbidity*	5	8	7
Inadequate treatment	2	7	17
Lost secure bore status	0	1	1
Plant fault	1	3	0
Technical	12	19	30
Unclear	5	8	4

* Turbidity is the measure of the suspended particles in a sample that cause lack of clarity by scattering light. If the water has high turbidity, the increase in suspended particles blocks some of the UV light getting through the water, reducing the effectiveness of UV water treatment.
Source: Councils' annual reports.
Note: Each council can provide more than one reason for not complying with the bacteria measure.

Figure 6
The main reasons given by councils for not achieving the protozoa performance measure targets in 2020/21, 2021/22, and 2022/23

	2020/21	2021/22	2022/23
Awaiting verification	2	5	0
Boil notice	0	1	4
Change in drinking water standards	0	0	2
Cyclone Gabrielle	0	0	5
E. coli sample	0	1	0
High turbidity*	6	10	8
Inadequate treatment	12	13	16
Lost secure bore status	1	1	3
Lost secure ground-water status	2	1	2
No protozoa barrier	0	0	8
Plant fault	4	3	2
Technical	16	18	25
Unclear	7	9	5
Upgrades required	11	15	20

* Turbidity is the measure of the suspended particles in a sample that cause lack of clarity by scattering light. If the water has high turbidity, the increase in suspended particles blocks some of the UV light getting through the water, reducing the effectiveness of UV water treatment.
Source: Councils' annual reports.
Note: Each council can provide more than one reason for not complying with the protozoa measure.

In both tables we can see that "Technical" is the most common reason given by councils for not achieving the bacteria and protozoa performance measure targets. Examples of technical non-compliance include inadequate/missing records, issues with sampling techniques and/or timing, and breaches of limits or tolerance levels. Just one technical non-compliance on one occasion during the year can lead to the council not achieving the performance measure targets overall.

Technical non-compliance does not necessarily mean there were any issues with water quality. Instead, it can indicate that a council needs to improve its processes and controls to prevent future water quality issues.

Some councils have given the change of drinking water standards in 2022 as the reason for not meeting the standards in 2022/23. For example, Waitaki District Council explained in its annual report that the new drinking water standards "impose much stricter requirements on water supplies. Some water supplies which were compliant under the previous legislation are now non-compliant under the new legislation. The change in status does not represent a decline in performance of the supplies."[5]

5 Waitaki District Council (2023), *2022-23 Annual Report*, page 70.

The change in drinking water standards is related to some of the other reasons given for not meeting them (for example, "no protozoa barrier" and "upgrades required") as it takes time, resources, and funding for councils to make the required changes to meet the new standards. When investigating cases of cryptosporidium (a type of protozoa) in Queenstown in September 2023, Taumata Arowai (the drinking water regulator) found Queenstown-Lakes District Council to be in breach of the new drinking water standards by not having a protozoa barrier in place for some water supplies.

Taumata Arowai has since published a list of 27 councils that have water supplies with no protozoa barrier,[6] and is working with these councils to make the required improvements within specified timeframes.

"Boil notices" and "E. coli" are other reasons given for not achieving the bacteria and protozoa performance measure targets. These are examples of water quality issues for which councils had to take remedial actions because the water might have been unsafe to drink.

It is important that councils understand the reasons for their non-compliance with drinking water standards and prioritise remedial actions if this is an indication of a more serious problem with the quality and safety of their communities' drinking water.

6 See "Council supplies without a protozoa barrier", at taumataarowai.govt.nz.