

**Annual Review of  
Drinking-Water Quality  
in New Zealand  
2006/07**

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# National Summary

## Background

This report spans the period January 2006 to June 2007 and covers the transition between calendar year reporting and financial year reporting. This transition was made at the request of local authorities (LAs) and district health boards (DHBs) to be more compatible with budgeting and workloads and to make the report more relevant by minimising the delay between the reporting period and publication. This report is the first one for which the *Drinking-Water Standards for New Zealand: 2005* (DWSNZ:2005) could be used to assess the microbiological and chemical quality of drinking-water. However, as the transition from the *Drinking-Water Standards for New Zealand: 2000* (DWSNZ:2000) to the DWSNZ:2005 is scheduled to take several years and drinking-water suppliers may elect which of these they are to operate under, compliance is assessed against the standard which the supplier has chosen to comply with. These standards are referred to collectively as DWSNZ.

The report comprises the following five sections: a general overview of the quality of drinking-water of all supplies within New Zealand; a summary of the nation's drinking-water quality, with supplies separated into LA-operated supplies, school- and early childhood centre (ECC)- operated supplies; an overview of drinking-water quality in each DHB area; a summary of the quality of drinking-water in each LA area; and, an appendix that shows microbiological and chemical compliance or non-compliance with the DWSNZ at the level of individual water supplies within each LA area.

The information on the quality of drinking-water was obtained through the public health units of the DHBs using questionnaires that sought data concerning surveillance and monitoring programmes carried out by DHBs and water suppliers, respectively. Water suppliers fall into two groups: LAs, including commercial water supply companies contracted by LAs, and private organisations or communities responsible for the operation of their own drinking-water supplies, of which schools have been considered separately. Water suppliers are responsible for water quality monitoring, whereas the DHBs carry out surveillance of the management of drinking-water quality in their health districts.

The survey sought information about both distribution zones and water treatment plants. In addition to microbiological and chemical quality information, the questionnaire sought information about the water treatment processes in use and the means used to demonstrate compliance with the DWSNZ.

To evaluate the public health significance of the water quality data contained in this report, the data are expressed primarily in terms of the population affected rather than the numbers of water supplies involved because of the different-sized populations served by different water supplies. The distribution zone figures refer to the percentage of the total population of New Zealand. However, because of the double-counting caused by many treatment plants supplying multiple zones, the plant percentages are estimates of the percentage of the population served by registered supplies.

The 2007 *Register of Community Drinking-water Supplies in New Zealand* (the Register) contained 2,303 distribution zones and 2,247 water treatment plants and

covered an estimated 92% of the New Zealand population. The microbiological and chemical quality of drinking-water was assessed against the DWSNZ using a survey of all treatment plants and distribution zones. Information was received from Health Protection Officers (HPOs) about all supplies, but 64 water suppliers could not be contacted and a further 27 were either unable or unwilling to provide monitoring data.

The microbiological health risk was assessed using compliance criteria based on two main microbiological reference organisms, *Escherichia coli* and *Cryptosporidium*. The chemical health risk for selected supplies was assessed with respect to those specifically-assigned chemical determinands which required monitoring.

The complete report can be viewed on the Ministry of Health website (<http://www.moh.govt.nz>).

## Key findings

The overall level of drinking-water quality in 2006/07 was as follows:

### ***E. coli* compliance**

Percentage of New Zealand population served by registered reticulated drinking-water supplies known to comply with the distribution zone <i>E. coli</i> requirements of the DWSNZ. [These are generally located in towns with populations in excess of 5,000 people.]	80%
Percentage of New Zealand population served by reticulated drinking-water supplies <u>not</u> compliant with the distribution zone <i>E. coli</i> requirements of the DWSNZ. [These are generally located in towns with populations of less than 5,000 people.]	12%
Percentage of New Zealand population not served by registered reticulated drinking-water supplies. [In most instances these people are in buildings that are self supplied with drinking-water eg. from a roof tank or bore.]	8%

### **Protozoal compliance**

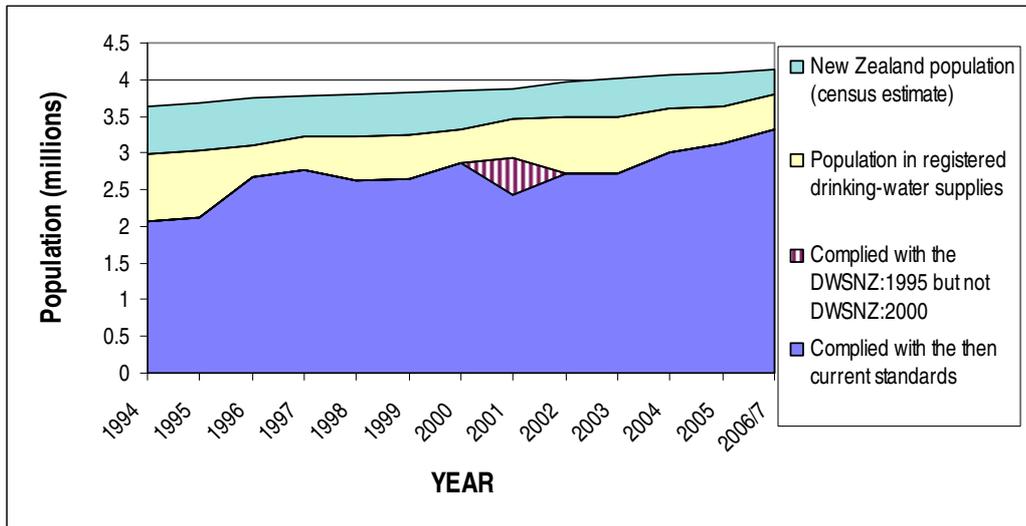
Percentage of New Zealand population served by registered reticulated drinking-water supplies known to comply with the protozoan requirements of the DWSNZ. [These are generally located in towns with populations in excess of 5,000 people.]	75%
Percentage of New Zealand population served by reticulated drinking-water supplies <u>not</u> compliant with the protozoan requirements of the DWSNZ. [These are generally located in towns with populations less than 5,000 people.]	16%
Percentage of New Zealand population not served by registered reticulated drinking-water supplies. [In most instances these people are in buildings that are self supplied with drinking-water eg. from a roof tank or bore.]	9%

During 2006/07, water supplies to 80% of New Zealanders were served by community drinking-water supplies that complied with the *E. coli* criteria of the DWSNZ. This represents an improvement of 4% since 2005.

Most large communities were served by water supplies which demonstrated microbiological compliance with the DWSNZ during 2006/07. However, many smaller communities were supplied with microbiologically non-compliant drinking-water.

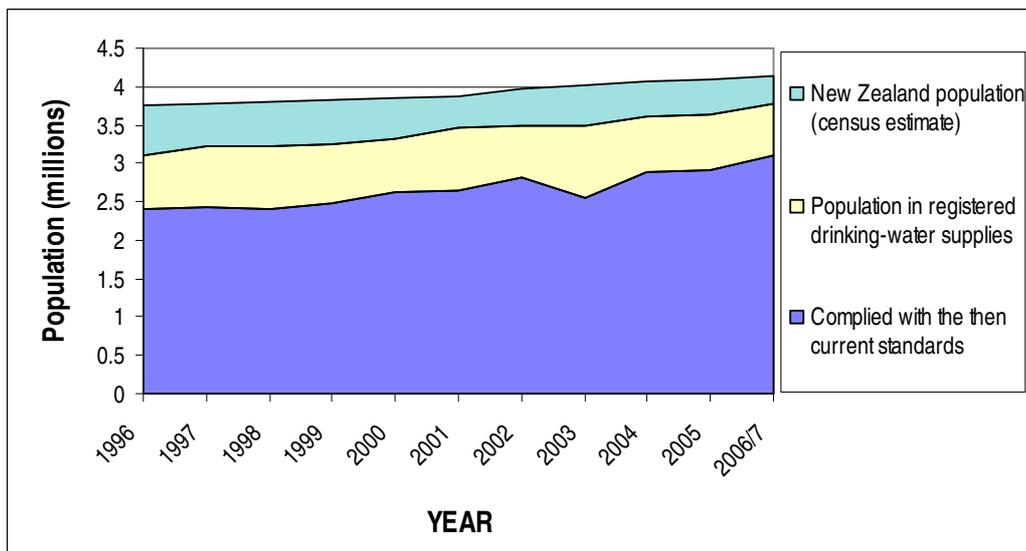
The general trend in bacteriological compliance is best assessed at the distribution zone and is shown in Figure 1 which shows the changes since the Ministry of Health drinking-water quality surveys commenced in 1994.

The complete details of distribution zone compliance for each health district are given in Appendix 1.



**Figure 1: Trend in bacteriological compliance at the distribution zone**

The general trend in protozoal compliance is assessed at treatment plants only and is shown in Figure 2. The proportion of the population supplied by DWSNZ-compliant plants has increased by 4% to 75% since 2005.



**Figure 2: Trend in protozoal compliance at the treatment plant**

There was a general trend for the percentage of distribution zones complying bacteriologically within a population band to decrease as the population of the band

decreased (*ie.* the smaller the community water supply, the less likely it is to comply with the DWSNZ).

Approximately 811,000 (20%)<sup>1</sup> of New Zealanders were supplied with drinking-water that either failed to comply bacteriologically with the criteria of the DWSNZ or for which there are no data because they were self-supplied. The causes of non-compliance and the number of people affected are listed below:

- 92,000 (2%) were served by registered supplies with unacceptable levels of *E. coli*.
- 29,000 (0.7%) were served by registered supplies where water suppliers failed to take appropriate corrective action once *E. coli* had been found.
- 72,000 (2%) were served by registered supplies where *E. coli* monitoring was either not carried out or where monitoring data were not available.
- 356,000 (9%) were served by registered supplies that did not comply bacteriologically with the DWSNZ because the frequency of sampling during the year was insufficient to demonstrate *E. coli* compliance according to the DWSNZ.
- 8,500 (0.2%) were served by registered supplies that did not comply bacteriologically because the compliance testing was not analysed by a laboratory registered by the Ministry of Health for drinking-water compliance testing.
- 333,000 (8%) were self-supplied (*ie.* not from registered supplies).

The number of people in zones with unacceptable levels of *E. coli*, inadequate corrective actions following bacteriological transgressions or that were not or were inadequately monitored fell since 2005. However, in 2006/07 there was an increase in the number of people in supplies that were monitored by laboratories not recognised by the MoH and so produced results that cannot be used to demonstrate compliance.

There is a perception that water that is shown to contain *E. coli* is a greater risk to public health than water that is not tested. The reality is that, apart from groundwater from a confined aquifer, all source waters are faecally-contaminated and so will contain the faecal indicator bacterium *E. coli* unless the water is adequately treated. To discourage the practice by some water suppliers of attempting to avoid scrutiny by ceasing monitoring, details of the 80 supplies that ceased monitoring in 2006/07 are given in Appendix 2.

One of the reasons for monitoring is to identify hazards and remedy them rapidly if they occur. The number of people served by supplies in which *E. coli* transgressions occurred and that were not appropriately followed up by immediate corrective action decreased markedly between 2005 and 2006/07. However, this issue remains of concern because failure to remedy the cause of a transgression subjects the population to prolonged exposure to faecally-contaminated drinking-water and imposes an unacceptable risk of waterborne disease on the community. Details of the LA-run supplies that failed to take appropriate corrective action in 2006/07 are given in Appendix 3. Of the 26 of these LA-run supplies, eight were also reported for the

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<sup>1</sup> Some people supplied with water that failed to comply bacteriologically with the DWSNZ fell into more than one of the non-compliance categories.

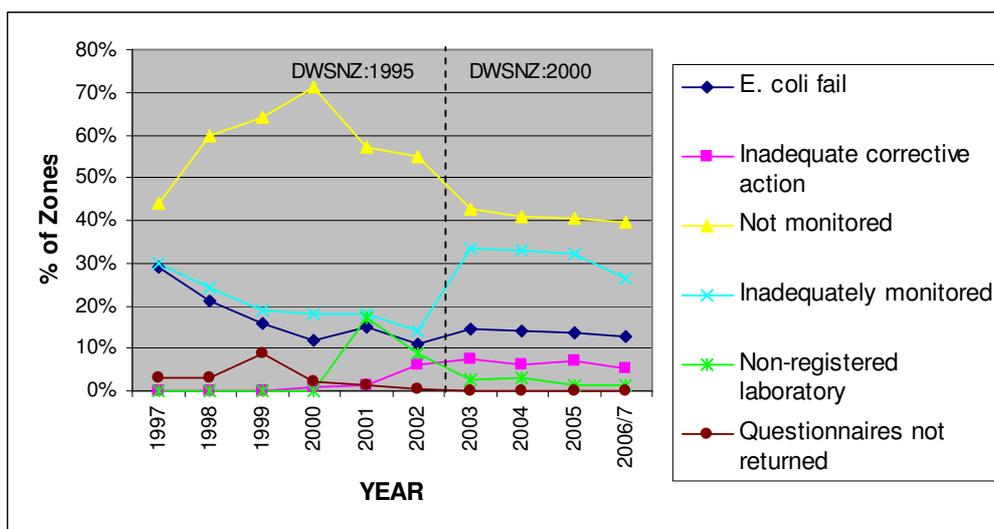
same poor practice in the previous review. It is strongly recommended that the Kawerau, Tararua, South Wairarapa, Buller, Westland, Hurunui and Waitaki District Councils urgently review and improve their corrective action procedures following bacteriological transgressions.

A further 370,000 people were supplied with drinking-water from 97 zones that failed to comply bacteriologically with the criteria of the DWSNZ for technical reasons. These fell into two groups. Supplies serving less than 500 people that failed only to comply with the minimum number of days-of-the-week sampling requirement of the DWSNZ:2000 were deemed to comply because there is no such requirement in the DWSNZ:2005. Supplies serving communities of 500 or more people that were adjudged by the Drinking Water Assessor (DWA) to have addressed the deficiency were deemed to have complied with the DWSNZ. Details of the latter group are given in Appendix 4.

There were 124 supplies, serving a total of approximately 170,000 people, that complied bacteriologically in 2005 but not in 2006/07. Details of these supplies are given in Appendix 5.

The overall level of compliance with the chemical criteria of the DWSNZ for those distribution zones where Priority 2 (P2) chemical determinands (other than fluoride) have been assigned was poor. Compliance was achieved for approximately 106 (34%) of the 311 assignments, which represents a slight decrease from 2005.

The trends in the causes of bacteriological non-compliance of distribution zones are displayed in Figure 3. Overall, there is a steady downward trend in the number of zones that are not monitored or are inadequately monitored and those that use non-recognised laboratories for compliance monitoring. The former reflects the slow but sustained updating of monitoring programmes to comply with the procedures specified in the DWSNZ. The increased number of supplies that ceased monitoring during 2006/07 is offset by a greater number of the newly-registered supplies being monitored. Very few water supplies – and none of the LA-run supplies – are now tested by non-recognised laboratories due to the continued education of water suppliers.



### Figure 3: Trend in the causes of distribution zone non-compliance

The large increase in the number of inadequately monitored supplies between 2000 and 2001 was caused by the increased stringency in monitoring requirements prescribed in the DWSNZ 2000 compared to the requirements of the DWSNZ 1995, particularly regarding the minimum days-of-the-week and maximum interval between successive samples criteria. While this aspect of compliance has steadily improved since 2001, many water suppliers have still not yet updated their monitoring programmes.

This survey cannot distinguish between the two main reasons for inadequate monitoring: poor understanding of the DWSNZ monitoring requirements, or a reluctance to address the monitoring deficiencies. The establishment of the Drinking-Water Assistance Programme (DWAP) is expected to reduce the number of supplies that are unfamiliar with the requirements of the DWSNZ. The inclusion of the DWSNZ in the recently amended Health (Drinking-water Amendment) Act 2007 is likely to be an effective incentive for water suppliers who have been reluctant to update their monitoring programmes.

All of the trends show a consistent improvement in compliance, as evidenced by the similar slopes since 2001. The failure to take appropriate corrective action immediately following *E. coli* transgressions is a serious cause of concern because of the grave public health consequences that could follow if the failure coincided with elevated pathogen concentrations in the source water. Failure to reduce this risk by increased disinfection or by taking appropriate steps to reduce the hazard (*ie.* closing or changing the supply) or exposure (*ie.* ensuring that people do not drink unboiled water) increases the likelihood of waterborne disease. Inadequate corrective action is indicative either of the failure of the water supplier to recognise this issue or to accept that it poses a potentially serious health risk. Numerous waterborne disease outbreaks have occurred in New Zealand in recent years. During 2006/07, 27 waterborne outbreaks involving 184 cases were recorded (see Appendix 6), of which untreated or contaminated supplies were identified as a contributing factor in most of them. It is unlikely that this situation will change appreciably while so many drinking-water supplies, particularly those serving small communities, do not employ adequate risk management practices including treatment.

All P2<sup>2</sup> chemical determinand assignments (apart from intentionally-added fluoride) that were monitored, except one, were monitored using Ministry of Health-recognised laboratories.

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<sup>2</sup> Chemical substances or determinands that are present in a water supply at potentially health-significant concentrations (usually greater than 50% of their MAV) are the only chemical determinands that must be monitored to comply with the chemical criteria of the DWSNZ:2005. These chemical determinands are known as Priority 2 (P2) determinands and are of two types: determinands introduced in treatment chemicals, including intentionally-added fluoride, (P2a); and determinands from any other source (P2b). At present, P2 classifications are only notified in the Register for distribution zones with populations of 500 or more people. Water supplies that have not been assigned a P2 determinand are classed as compliant with the chemical requirements of the DWSNZ:2005. Where a supply has no P2 assignment because the supply has not been assessed with respect to its chemical contaminants the safety of the supply with respect to chemical determinands is uncertain. The relative softness of New Zealand's water sources results in a general tendency for our drinking waters to dissolve metals from plumbing fittings: a property termed plumbosolvency in the DWSNZ:2005. All drinking waters are designated as plumbosolvent unless the water

Approximately 49% of the Priority 2b (P2b) chemical determinand assignments were not monitored at all, or were inadequately monitored, with the result that unsatisfactory monitoring was a major reason for non-compliance with the chemical criteria of the DWSNZ.

Exceedences of the maximum acceptable values (MAVs) were reported in 19% of P2b chemical determinand assignments, and the HPOs considered corrective actions to be inadequate for 59% of these assignments.

Monitoring for fluoride as a Priority 2a (P2a) determinand was required at 47 treatment plants where fluoride was intentionally added – these treatment plants supplied a combined population of approximately 2,183,000 people. Water from treatment plants complying with the fluoride MAV specified in the DWSNZ was provided to almost 100% of this population, an increase of two percentage points on 2005.

Every attempt is made to minimise the delay between the end of the reporting period (30 June 2007) and the publication of this report. The shift from calendar year to financial year reporting period has been very effective and has reduced this delay by several months. However, two avoidable delays remain. The first is the failure of some water suppliers and DWAs to deliver their survey data in a timely manner. This was a particular problem for the LA water suppliers that did not have their monitoring data on WINZ. The second and more serious problem was the provision of inaccurate monitoring data by some water suppliers that required considerable follow-up action and were costly to resolve in both time and dollars.

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supplier can show they are not. Metals arising from plumbosolvency do not have to be monitored, provided the public is advised to flush their taps before drawing water for consumption.

## Detailed summary of survey data

To evaluate the public health significance of the water quality data contained in this report, summary statistics are expressed in terms of the population affected. Since expression of the zone numbers may be of more value for regulation and water supply management, data are summarised in both ways.

Information was received for each of the 2,303 distribution zones and 2,247 water treatment plants listed in the Register as at June 2007 covering approximately 3,806,000 people. The remaining 333,000 people were not connected to a registered supply. During 2006/07, the number of registered zones increased by 34, and the number of people served by registered supplies rose by 168,000 due to new registrations and revised distribution zone population estimates.

## Distribution zone bacteriological monitoring and compliance

Less bacteriological monitoring was carried out in smaller supplies than in larger supplies, both in terms of the percentage of zones monitored and the percentage of zones adequately monitored.

During 2006/07, 98% of the population served by registered supplies lived in distribution zones where some monitoring was conducted. This situation has not changed since 2005.

**Table 1: Summary of microbiological compliance in distribution zones and treatment plants for all Health Districts**

Health District <sup>#</sup>	Distribution Zones				Treatment Plants				
	No. Zones	Total Pop.	<i>E. coli</i> complied		No. TPs	<i>E. coli</i> complied		Protozoa complied	
			zones	Pop.		TPs	Pop.	TPs	Pop.
Northland	289	114,918	15%	77%	288	82%	94%	3%	79%
Auckland	301	1,297,609	28%	98%	275	48%	99%	5%	98%
Waikato	196	286,699	37%	78%	187	35%	79%	3%	44%
Tauranga	54	135,239	20%	97%	56	64%	99%	18%	95%
Whakatane	55	47,577	9%	10%	53	38%	35%	0%	0%
Rotorua	87	99,680	34%	34%	83	39%	18%	0%	0%
Gisborne	66	34,394	12%	92%	67	36%	49%	0%	0%
Taranaki	75	85,658	37%	96%	66	88%	82%	6%	63%
Hawke's Bay	159	136,692	16%	89%	179	41%	98%	15%	97%
Wanganui	57	58,423	28%	86%	54	59%	82%	9%	67%
Manawatu	93	144,982	26%	49%	94	57%	71%	7%	65%
Hutt Valley	64	385,277	63%	99%	44	50%	100%	18%	98%
Wairarapa	34	36,621	24%	81%	38	53%	78%	3%	36%
Nelson	63	68,290	44%	92%	68	41%	52%	4%	46%
Marlborough	81	37,793	9%	88%	83	31%	91%	0%	0%
West Coast	78	26,769	18%	42%	74	39%	40%	3%	1%
Canterbury	246	507,253	40%	89%	254	41%	90%	10%	62%
S. Canterbury	60	54,549	38%	85%	59	53%	61%	5%	48%
Otago	164	153,449	31%	85%	149	67%	87%	2%	69%
Southland	81	93,970	54%	76%	76	71%	74%	7%	54%
<b>All Regist *</b>	<b>2,303</b>	<b>3,806,442</b>	<b>29%</b>	<b>87%</b>	<b>2,247</b>	<b>52%</b>	<b>91%</b>	<b>6%</b>	<b>82%</b>
<b>All NZ ‡</b>		<b>4,139,800</b>		<b>80%</b>			<b>84%</b>		<b>75%</b>

# For details of names and locations of the DHBs in each health district see Appendix 7.

\* Populations as served by Registered community drinking-water supplies.

‡ Populations as per New Zealand Census estimate.

Water supplied to 82% of the New Zealand population, or 34% of distribution zones, was adequately monitored as per the requirements of the DWSNZ. This represents an improvement of 7% in population terms since 2005.

During 2006/07, 80% of the population lived in distribution zones supplied with drinking-water that complied with the distribution zone *E. coli* criterion, a 4% increase since 2005 (Table 1). By the end of the 2006/07 period there were 54 graded supplies listed in the Register.

### **Treatment plant microbiological compliance**

An estimated 75% of the population, supplied by 6% of treatment plants<sup>3</sup> was supplied with drinking-water that fully complied with the microbiological criteria of the DWSNZ during 2006/07. Bacteriological compliance was unchanged in 2006/07 with 52% of treatment plants demonstrating *E. coli* compliance. In terms of the population served, there was a 3% improvement, which means that an estimated 84% of the population was served by bacteriologically-compliant treatment plants. *Cryptosporidium* compliance was demonstrated in 6% of treatment plants supplying an estimated 75% of the population on registered water supplies (Table 1).

Treatment plants serving small supplies tended to be less adequately monitored and a smaller proportion complied with the DWSNZ.

### **Surveillance**

Surveillance is carried out by DHBs either by auditing or surveillance testing of selected water supplies. During 2006/07, *E. coli* was detected by surveillance testing in 25 supplies (Appendix 8) that were reported by the water supplier as bacteriologically compliant with the DWSNZ. This is indicative of a likely problem with some aspect of zone monitoring and should be investigated by the water supplier.

### **Validity of compliance monitoring**

All compliance testing for LA-run supplies is now being carried out by Ministry of Health-recognised laboratories. However, 33 non-LA supplies are still using other laboratories to analyse compliance samples. Laboratories seeking to be included on this register should apply to:

International Accreditation New Zealand  
Private Bag 28908  
Remuera, Auckland 1136  
Ph: (09) 525 6655  
Fax: (09) 525 2266  
Email: info@ianz.govt.nz

Use of non-recognised laboratories will automatically result in the water supply not being in compliance with the DWSNZ. If the water supplier cannot access a recognised laboratory, the DWA should be consulted about possible options.

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<sup>3</sup> A treatment plant is defined as the point where water enters the distribution system, irrespective of whether the water is treated or not.

## **School and early childhood centre drinking-water supplies**

Compliance with the DWSNZ at school and ECC supplies was about the same as in 2005. The 607 school/ECC supplies comprised approximately one-quarter of all registered drinking-water supplies in 2006/07. During 2006/07, 413 (68%) of the schools/ECCs with their own water supplies conducted some bacteriological monitoring, 48 more than in 2005. Of these, 98 supplies (16%) complied with the bacteriological criteria of the DWSNZ, 3% more than in 2005. Compliance of state school supplies was 14% compared with 5% for other school/ECC supplies for which the Ministry of Education is not responsible.

Many of the schools have installed ultraviolet (UV) treatment in conjunction with cartridge filtration in recent years. Most UV treatment devices used provide adequate treatment to kill bacteria and therefore reduce the likelihood of bacteriological transgressions. However, a greater dose of UV is required to kill some viruses and protozoan parasites. At present, none of the school supplies achieve protozoal compliance.

It is possible that some of the UV devices installed will not be adequate to comply with the new drinking-water standards for protozoa. It is recommended that all school water treatment systems be assessed against the new compliance requirements at the earliest convenience.

## **Private drinking-water supplies**

There were 1,003 distribution zones designated as private supplies during 2006/07, supplying water to approximately 141,000 people. Of these, 9%, serving 23% of people connected to private supplies complied bacteriologically with the DWSNZ.

## **Hospital and health services drinking-water supplies**

At the end of the 2006/07 period, 10 hospitals and health services were not connected to municipal drinking-water supplies. Of these, seven complied bacteriologically with the DWSNZ. Of the three that failed to comply bacteriologically with the DWSNZ, the Ostend Medical Centre supply transgressed the *E. coli* standard, the Princess Margaret Hospital failed to take appropriate corrective action following *E. coli* transgression and Hawke's Bay Hospital was inadequately monitored. Of the hospital/health service supplies, the Waiheke Health Trust and Ashburton supplies have improved since the previous report.

## **Corrective actions**

The DWSNZ prescribes that any transgression is immediately followed by a corrective action and is documented.

Corrective actions following transgressions in 61 zones were inadequate and/or tardy and were probably not carried out in a further 61 zones. This aspect has improved markedly since 2005.

**Note:** Section 69ZF of the Health (Drinking Water) Amendment Act 2007 requires the drinking-water supplier to take remedial (corrective) action if drinking-water standards are breached.

## Disinfection

Several methods of drinking-water disinfection have been reported in New Zealand, comprising chlorination, ozonation and UV irradiation. Chlorination remains the most popular means of drinking-water disinfection and served an estimated 80% of people connected to registered drinking-water supplies or 25% of treatment plants. Secure groundwater supplies are used by an estimated 14% of people connected to registered drinking-water supplies; these comply with the DWSNZ without the need for disinfection.

Bacteriological compliance was demonstrated in supplies to an estimated 93% of the population on chlorinated supplies or 61% of treatment plants using chlorination. This represents a significant improvement since 2005. Most of the non-compliance in chlorinated supplies was caused by lack of monitoring, although 52 were contaminated with *E. coli* during 2006/07, which is an increase of four since 2005.

The number of treatment plants using UV treatment increased by 15 during 2006/07. UV treatment is particularly popular for treating small community supplies, particularly schools, probably because of the low costs associated with their installation and operation. Of the 682 UV-treated supplies, 55% complied bacteriologically with the DWSNZ. This represents a slight decrease in bacteriological compliance of UV-treated supplies compared with 2005. Non-compliance mostly resulted from inadequate or no monitoring, although *E. coli* were detected in 20 of these supplies during 2006/07, two more than in 2005. In excess of 100 treatment plants were reported to use UV without filtration. While this can be acceptable treatment it is unusual for UV disinfection to be effective unless the water is filtered. Consequently, it is likely that many of these plants will have been either misreported or require filtration.

Eight of the 21 treatment plants using ozone treatment complied microbiologically with the DWSNZ during 2006/07, with lack of monitoring being the cause of non-compliance in all cases. The percentage of plants using ozone that complied microbiologically<sup>4</sup> with the DWSNZ has increased from 27% in 2005 to 38% in 2006/07, which continues the upward trend in this respect.

## P2 chemical determinand monitoring

The population supplied by distribution zones that complied with the chemical requirements of the DWSNZ has increased by seven percentage points since 2005. Since 2002, the number of zones that were either not monitored or inadequately monitored for their assigned P2 determinands has fallen markedly from 72% to 36%.

Compliance with the requirements of the DWSNZ for chemical determinands (including fluoride) was achieved by distribution zones supplying *ca.* 3,322,000 people or 80% of the population<sup>5</sup>. Approximately 2,682,000 people lived in distribution zones to which P2 chemical determinands were assigned and which required monitoring according to the DWSNZ. Fifty-one percent of the distribution zones to which P2 chemical determinands were assigned complied with the chemical

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<sup>4</sup> The term *microbiological* compliance includes both bacteriological and protozoal compliance. The term *bacteriological* compliance is used when it is not appropriate to use microbiological compliance (*eg.* in relation to UV and chlorine, which are effective treatments for bacteria but not protozoa).

<sup>5</sup> This includes registered zones that have no P2 assignments and those with assignments that have demonstrated compliance.

criteria of the DWSNZ, which represents a combined population of approximately 2,011,00 people. As has been found in previous years, the primary reason for distribution zones not complying with the chemical criteria of the DWSNZ was inadequate, or no monitoring.

P2 determinands (including intentionally-added fluoride) were assigned to 252 distribution zones. However, as more than one P2 determinand can be assigned to a distribution zone, a total of 502 P2 determinand assignments were made to water supplies throughout the country. Three hundred and eleven of these were made for P2b determinands; the remaining assignments were for intentionally-added fluoride. The P2b chemical determinands were mostly heavy metals and disinfection by-products<sup>6</sup>. Of the P2b chemical determinand assignments, a total of 153 (49%) were not monitored at all, or inadequately monitored. The remaining assignments were adequately monitored, although they may have failed to comply for other reasons. Non-compliance with the DWSNZ also resulted from the MAV for some P2 chemical determinands being exceeded. This occurred for 19% (58) of the P2b chemical determinand assignments and potentially affects 182,700 people. HPOs considered corrective actions to be inadequate in 59% of assignments in which the MAV for P2b determinands was exceeded.

Monitoring for fluoride as a P2a chemical determinand was required at 47 treatment plants that add fluoride intentionally, of which 35 (74%) complied. These 47 treatment plants provided water to 122 distribution zones supplying a combined population of approximately 2,183,000 people. Inadequate monitoring was the main reason for non-compliance, but exceedence of the MAV was the reason for non-compliance in two treatment plants serving approximately 5,700 people.

Supplies with plumbosolvent water serving 1,000 or more people are required to advise their consumers to flush their taps before drawing water to drink. Of the 283 supplies in this category, approximately 61% reported they had advised their consumers to flush their taps. The reason for the low percentage is unclear. It may arise in part because of water suppliers with metals assigned as P2 determinands still believing that they are only required to undertake monitoring of the metals. Advice to consumers to flush sufficient water from the tap to eliminate metals leached from the fittings needs to be provided by all suppliers, unless they have undertaken the necessary testing to show their water is not plumbosolvent. In supplies where metals have been assigned as P2 determinands, the supplier should aim to undertake sufficient monitoring to demonstrate that the metals do not exceed 50% of their MAV in the reticulated water. If this can be shown, the metal can be reassigned as a P3 determinand, and monitoring can cease.

## **Status of Public Health Risk Management Plans**

Public Health Risk Management Plans (PHRMPs) are recommended for reasons of good practice. Following the passing of the Health (Drinking Water) Amendment Bill in October 2007, the Health Act includes a provision to require each water supply serving more than 500 people to be covered by a quality assurance programme in the form of a PHRMP by the year 2013. By the end of the 2006/07 period, work had been initiated on 419 PHRMPs, which comprised 18% of supplies and included proportionally more of the larger supplies. Of these, 115 (2%) have been submitted and 52 of those verified or implemented.

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<sup>6</sup> Substances formed as a result of the disinfection process

## Key Issues

A number of important issues are highlighted in this review. These are listed below.

- Overall compliance has increased by 4% in population terms during 2006/07. Approximately 80 percent of New Zealanders have bacteriologically-compliant drinking-water and protozoal-compliance was achieved in supplies serving 75 percent.
- All the causes of non-compliance fell during 2006/07 except for a small increase in the usage of non-recognised laboratories.
- Some of the issues in non-compliant hospital supplies identified in the previous review have been resolved. However, a small number of the hospital water supplies were non-compliant during 2006/07.
- There has been a significant improvement in the compliance of school supplies since 2005. However, there is a way to go yet as only 16% of school supplies were compliant during 2006/07.
- Some water suppliers are still confused about the appropriate protocol required to have P2 metals arising from plumbosolvency reassigned to P3 status, which would eliminate the need for monitoring of these determinands in future.
- Monitoring for *E. coli* ceased in 80 water supplies during the 2006/07 period (Appendix 2).
- During 2006/07, 26 LA-run zones failed to follow up bacteriological transgressions with adequate corrective action (Appendix 3).
- Bacteriological compliance was lost in 119 zones, including 62 LA-run zones, between 2005 and 2007 (Appendix 5)
- Discrepancies between the results of bacteriological monitoring by the water supplier and bacteriological surveillance by the DWA occurred in 25 zones during 2006/07 (Appendix 8).

## ESR Recommendations

While the turnaround time for this annual review has been substantially reduced this year, further reductions could be achieved. A timely report would allow the information within to be used more effectively for planning by the water suppliers. A few local authorities have not met the deadlines for completing the annual survey on several occasions in the past few years. Also, a number of LAs provided inaccurate data affecting the compliance status of their supplies. The following recommendations are made to help minimise the two main causes of delay: timeliness and accuracy.

- Probably the most effective means of achieving these aims would be to require all LAs to provide their monitoring data to the DHB in WINZ format each quarter.
- In future reviews, erroneous data or data that are received after the due date be incorporated within the national summary and as an addendum to the report but not within the appendices. This will encourage improved accuracy and timeliness in future surveys without jeopardising the accuracy of the national summary.

