HEALTH COUNTS
ENVIRONMENT MATTERS

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Director

ENVIRONMENTAL HEALTH INTELLIGENCE NZ (EHINZ)

- Established at College of Health, Massey University in 2010

- Primarily funded by the Ministry of Health as part of their statutory responsibility to monitor the health of New Zealanders

- Team of 12: skills in epidemiology, biostatistics, public health medicine, data and spatial analysis

GOALS

- To monitor how the environment affects the health of New Zealanders

- To provide intelligence for the development of public health policy and decision making on environmental health
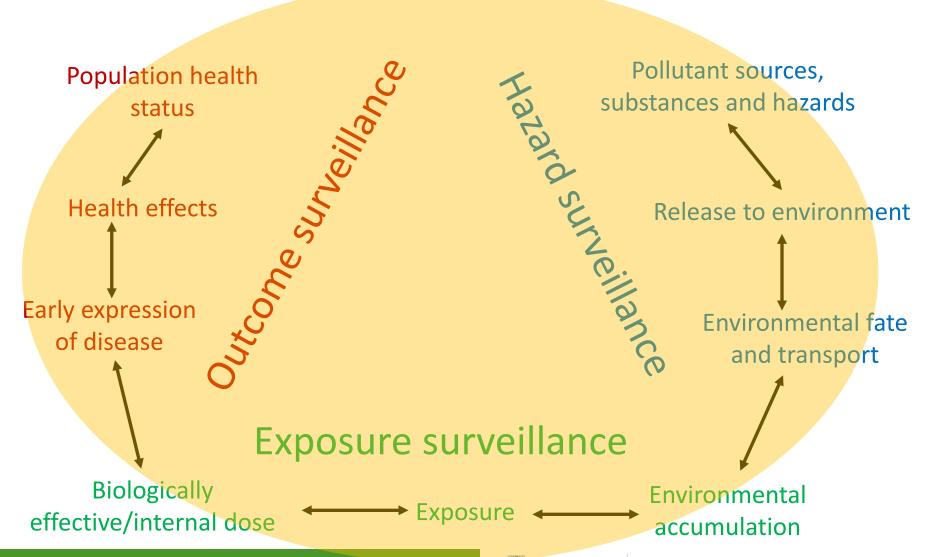
AIMS

- To monitor trends in the state of the environment
- To monitor trends in health outcomes linked to environmental hazards and exposures
- To compare the environmental health status of geographic areas
- To monitor the effectiveness of policies and other interventions on environmental health
- To raise awareness about environmental health issues
- To initiate further investigations into links between the environment and health

EHINZ – BRINGING IT TOGETHER

INFORMATION FOR ACTION

- Concept driven, not data driven

- Stakeholder driven, client focused

- Analysis of data and interpretation

- Timely dissemination of information and intelligence

- Adding value to data collected and published by other agencies

- Not a data collection agency (apart from Hazardous Substances Disease & Injury Tool)

CONCEPT-DRIVEN SYSTEMS MONITORING NZ's ENVIRONMENTAL HEALTH

- Environmental Health Indicators (EHIs)

- Hazardous Substances Surveillance (HSSS)

- Environmental Burden of Disease (EBoD)

- Population vulnerability to natural hazards

- New Zealand Congenital Anomalies Registry (NZCAR)

- PAWS (people•animals•wellbeing•surveillance) – a collaboration with Massey University's EpiCentre

AN ENVIRONMENTAL HEALTH INDICATOR

"...is an expression of the link between environment and health, targeted at an issue of specific policy or management concern and presented in a form that facilitates interpretation for effective decision-making"

Corvalan, Briggs and Kjellstrom 2000

ENVIRONMENTAL HEALTH INDICATOR

- A measurable variable used as a representation of an associated (but non-measured or non-measurable) factor or quantity

- Can describe the link between the environment and health

- Based on known or plausible cause-and-effect relationships between the environment and health

- Provide key evidence to help decision-makers, and raise awareness of environmental health risks, to improve human health

- Help identify potential risks to human health, including emerging risks

- Can help to guide policy actions, target action and allocate resources
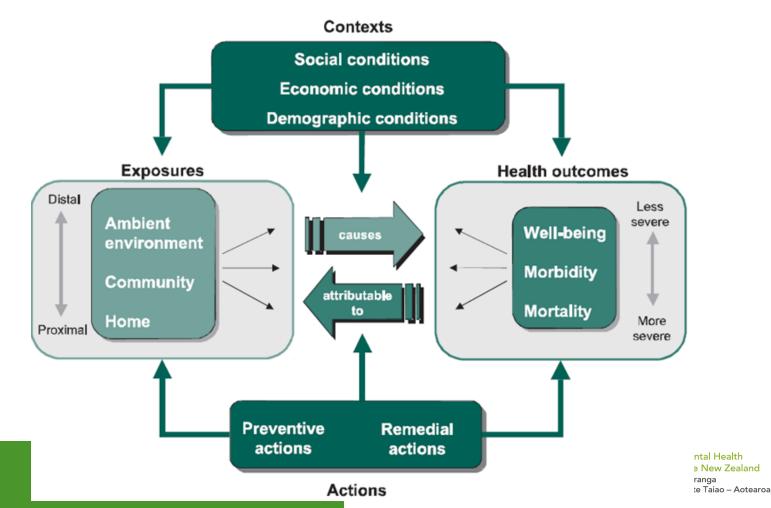
ENVIRONMENTAL HEALTH INDICATORS

- Good indicators are extremely difficult to define and compile, and cannot be chosen at random

- Sets of indicators are needed, because one indicator rarely tells the whole story

- Heavily biased by the perceptions and priorities of those who select them

- A science-based rationale is needed for choosing a useful and balanced set of indicators for the issues we are interested in

- If used effectively, they have to be part of a real, evidence-based and participatory culture of decision-making

FRAMEWORK FOR DEVELOPING THE SUITE OF NZ ENVIRONMENTAL HEALTH INDICATORS

- Based on the Multiple Exposures Multiple Effects (MEME) framework (Briggs 2003)

THE MEME FRAMEWORK

- Acknowledges the multiple links between environmental exposures and health effects, including the wider social, economic, and demographic conditions

- Each indicator generally describes one aspect of the environment–health relationship (such as exposures in the environment, or health outcomes)

- Flexible enough to be used to monitor a broad range of environmental health topics

- Underpinning the framework is a focus on social and demographic contexts, especially vulnerable populations

THE PROCESS FOR DEVELOPING THE NZ EHIs

SCOPING

Understand environmental health issue
- Understand the size of problem and who is affected
- Understand technical aspects of indicators for this issue

Understand users and their needs
- Identify key users
- Analyse user information needs
- Review existing data and indicators available
- Review policy context

Finalise the information needs that the indicator(s) will meet
- Identify rationale for indicator development
- Identify the specific purpose of the indicators

SELECTION

Identify causal relationships
- Identify known or plausible relationships between sources of pollution, state of the environment, exposure, and health outcomes

Create conceptual framework
- Based on Multiple Exposures Multiple Effects (MEME) framework
- Incorporating causal relationships

Identify potential indicators:
- Review existing indicators (national and international), expert advice, one-off analyses that can be converted to indicators, and available datasets
- Design a new indicator or undertake exploratory supporting analyses if needed
- Ensure indicators fit conceptual framework and reflect casual relationships

Evaluate potential indicators
- Evaluate against our selection criteria
- Obtain expert feedback
- Check alignment with other indicators and stakeholder needs

IMPLEMENTATION

Produce the indicators
- Analyse the data
- Produce factsheets and information for the website
- Publish factsheet and web content

SELECTION CRITERIA FOR EHIs

CRITERIA	RATIONALE
Available data	Must have data that is easily and reliably extracted
Scientifically valid	Must have an established, scientifically sound link to the environmental health issue
Sensitive	Should respond relatively quickly and noticeably to changes, but not show false movements
Consistent	Should be consistent with those used in other indicator programmes, including internationally, to allow comparisons
Comparable	Should be consistent to allow comparisons over time
Methodologically sound measurement	Measurement needs to be methodologically sound
Intelligible and easily interpreted	Should be simple enough to be easily interpreted, and intuitive, in the sense that it is obvious what the indicators are measuring
Able to be disaggregated	Need to be able to be broken down into population subgroups or areas of particular interest, such as ethnic groups or regional areas
Timely	Data needs to be collected and reported regularly and frequently, so that the indicator reflects current trends
Public health impact	Need to be about an environmental health issue that has a significant public health impact. The impact may be through affecting a large part of the population, a vulnerable population, being relevant for Māori health, or having substantial policy relevance

DISSEMENTATION – CRITICAL ELEMENT PROVIDING INFORMATION FOR ACTION

- EHI website (www.ehinz.ac.nz) - reports on the selected indicators within the domains
- Intuitive dashboards for exploring indicators within the domains
- Factsheets - with updated indicator information distributed electronically to clients
- Healthspace Puna Ora (https://healthspace.ac.nz/) - an on-line visualisation of the health related-data at the various geographic levels (eg, DHB, territorial authority etc)

WWW.EHINZ.AC.NZ

INDICATOR LIST: CAN BE SORTED BY DOMAIN, TOPIC, INDICATOR OR SEARCHED BY KEY WORDS

ENVIRONMENTAL HEALTH INDICATORS

About the indicators

What are Environmental Health Indicators?

What is environmental health?

Indicator list

Links to other environment and health monitoring

Air quality

Recreational water

Drinking-water quality

Indoor environment

Transport

Hazardous substances

Climate change

Population vulnerability

Border Health

UV exposure

Indicator list

🔍 Search in table

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Domain ▲	Topic	Indicator
Air quality	Wood and coal fires	Number of households using wood fires for home heating
Air quality	Wood and coal fires	Number of households using coal fires for home heating
Air quality	Particulate matter	Annual average PM10 levels at monitoring sites
Air quality	Particulate matter	Exceedances of the national standard for PM10, including maximum PM10 levels
Air quality	Other air pollutants	Monitoring sites exceeding the WHO annual average guideline for nitrogen dioxide
Air quality	Other air pollutants	Monitoring sites exceeding the national environmental standard (one-hour average) for nitrogen dioxide
Air quality	Other air pollutants	Monitoring sites exceeding the WHO daily guideline for sulphur dioxide
Air quality	Other air pollutants	Monitoring sites exceeding the national environmental standard (one-hour average) for sulphur dioxide
Air quality	Other air pollutants	Carbon monoxide 8-hour maximum levels at monitored sites
Air quality	Health effects of air pollutants	Estimated number of restricted activity days associated with air pollution
Air quality	Health effects of air pollutants	Estimated number of of cardiac and respiratory hospital admissions associated with air pollution
Air quality	Health effects of air pollutants	Estimated number of premature deaths associated with air pollution
Air quality	Motor vehicles	Number of motor vehicles in the fleet, by vehicle type and fuel type
Air quality	Motor vehicles	Number of motor vehicle registrations, by vehicle type and fuel type
Air quality	Motor vehicles	Average age of vehicle fleet
Alcohol-related harm	Hazardous drinking	Hazardous drinking

LANDING PAGE FOR EACH DOMAIN: BACKGROUND, KEY FACTS, DIFFERENT TOPICS

Drinking-water quality

This section provides data about drinking-water quality and health in New Zealand. Find out about population access to drinking-water and human health effects.
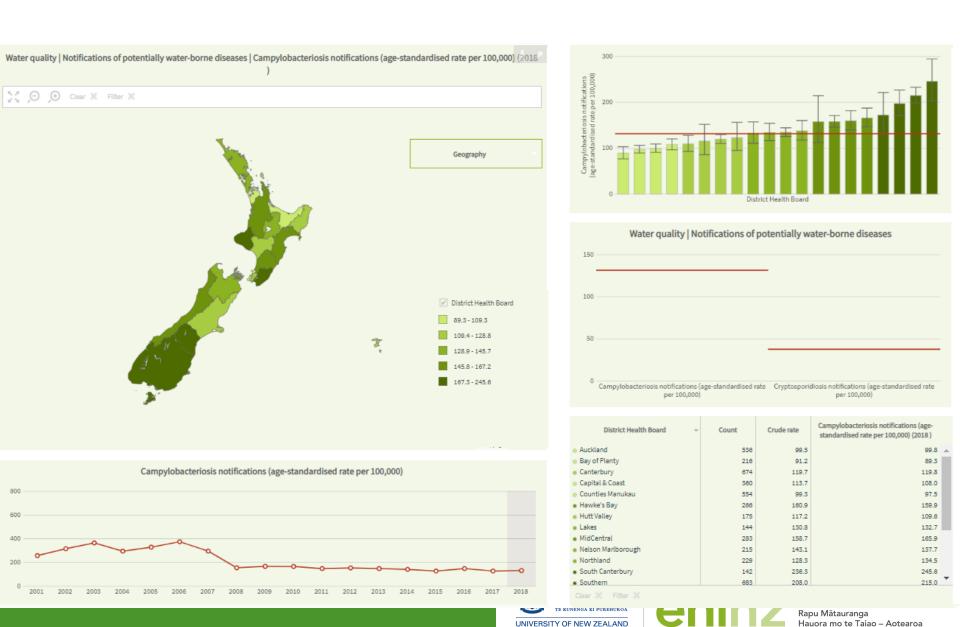
About drinking-water quality and health

Indicators at a glance: Drinking-water quality

View an interactive regional map and dashboard

Access to safe drinking-water
Statistics on the population with access to safe drinking-water in New Zealand.

Water-borne diseases related to drinking-water
Statistics on three potentially water-borne diseases in New Zealand: campylobacteriosis, cryptosporidiosis and giardiasis.

Access to fluoridated drinking-water
Statistics about the population with access to fluoridated water in New Zealand.

Oral health of children
Statistics on the oral health of children living in fluoridated and non-fluoridated areas in New Zealand.

Climate change

This section describes changes in temperature, rainfall and drought, and health impacts.

About climate change and health

Indicators at a glance - Climate change

View an interactive regional map and dashboard

Temperature
Describes changes in New Zealand's temperatures over time, and possible impacts on health.

Drought
Statistics on rainfall and drought in New Zealand over time, and possible impacts on health.

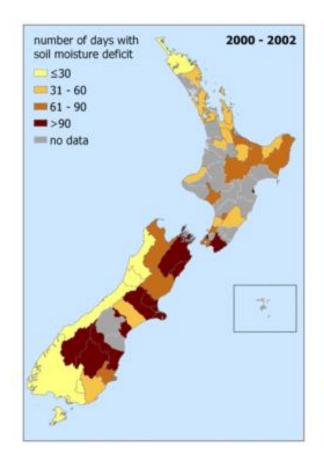### Monitoring the health effects of climate change
How climate change may affect the health of New Zealanders, and who might be most at risk.

Vulnerability to climate change
Identifies population groups who are more at risk from health impacts of climate change

Energy use
Describes changes in New Zealand's energy use over time.

Air quality

This section provides data and statistics about air quality and health in New Zealand. Find out about sources of air pollution, levels of air pollution, and human health effects.

About air quality and health

Indicators at a glance - Air quality

Wood and coal fires
Statistics on the numbers of households using wood and coal fires for home heating in New Zealand.

Motor vehicles
Statistics on motor vehicle numbers and average ages of vehicles in New Zealand.

Particulate matter
Monitoring data on particulate matter (PM10 and PM2.5) levels in New Zealand.

Other air pollutants
Monitoring data for nitrogen dioxide, sulphur dioxide and carbon monoxide, at selected New Zealand sites.

Health effects of air pollution
Summary of the health effects of air pollution in New Zealand, including burden of disease estimates.

INTERACTIVE DASHBOARDS

Drinking-water quality

This section provides data about drinking-water quality and health in New Zealand. Find out about population access to drinking-water and human health effects.

Domain and topic

Water quality

Notifications of potentially water-borne diseases

Indicator

Campylobacteriosis notifications (age-standardised rate per 100,000)

Year(s)

2018

2001-18

Key Information

Indicator Factsheet and metadata.

Source: Institute of Environmental Science and Research Ltd. (ESR). National Database of notifiable diseases (EpiSurv).

- The age-standardised campylobacteriosis notification rate was 132 per 100,000 people in 2018 (6,463 notifications). This was approximately the equal lowest rate since reports began in 2001.
- The age-standardised notification rate for giardiasis was 31 per 100,000 people in 2018 (1,392 notifications). This has remained unchanged since 2015.
- The age-standardised notification rate for cryptosporidiosis was 38 per 100,000 people in 2018 (1,551 notifications). This was approximately the equal highest with 2001.
- Notification rates for potentially waterborne diseases continued to be higher for children aged 0–4, people of European/Other ethnicity, and people living in less deprived or rural areas.

Guide   Share

Water quality | Notifications of potentially water-borne diseases | Campylobacteriosis notifications (age-standardised rate per 100,000) (2018)

Geography

- DHBs
- Regional Councils
- TAs

145.8 - 167.2
167.3 - 245.6

Campylobacteriosis notifications (age-standardised rate per 100,000)

Time trend

800
600
400
200
0
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

Campylobacteriosis notifications (age-standardised rate per 100,000)

District Health Board

Water quality | Notifications of potentially water-borne diseases

Comparison with other areas

150
100
50
0
Campylobacteriosis notifications (age-standardised rate per 100,000)   Cryptosporidiosis notifications (age-standardised rate per 100,000)

District Health Board	Count	Crude rate	Campylobacteriosis notifications (age-standardised rate per 100,000) (2018)
Auckland	536	99.5	99.8
Bay of Plenty	216	91.2	89.3
Canterbury	674	119.7	119.8
Capital & Coast	360	113.7	108.0
Counties Manukau	554	99.3	97.5
Hawke's Bay	266	160.9	159.9

Clear   Filter

2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

Oral health of children

Statistics on the oral health of children living in fluoridated and non-fluoridated areas in New Zealand.

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

CAMPYLOBACTEROSIS NOTIFICATIONS, 2001-18

ENVIRONMENTAL HEALTH INDICATORS

About the indicators

Air quality

Recreational water

Drinking-water quality

Indoor environment

Transport

Hazardous substances

Climate change

> About climate change and health
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> Indicators at a glance - Climate change
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> Temperature
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> Drought
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> Monitoring the health effects of climate change
>
> Energy use

Population vulnerability

Border Health

UV exposure

Children

Animals & human health

Alcohol-related harm

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Monitoring the health effects of climate change

How climate change may affect the health of New Zealanders, and who might be most at risk.

Energy use

Describes changes in New Zealand's energy use over time.

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New Zealand
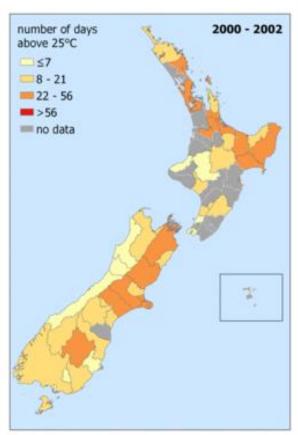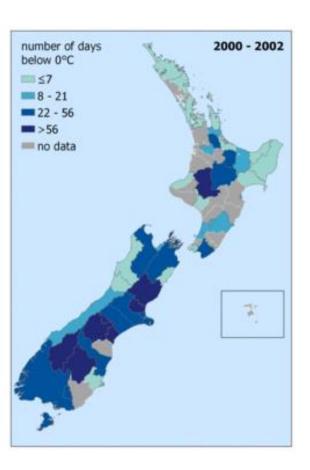
CLIMATE CHANGE
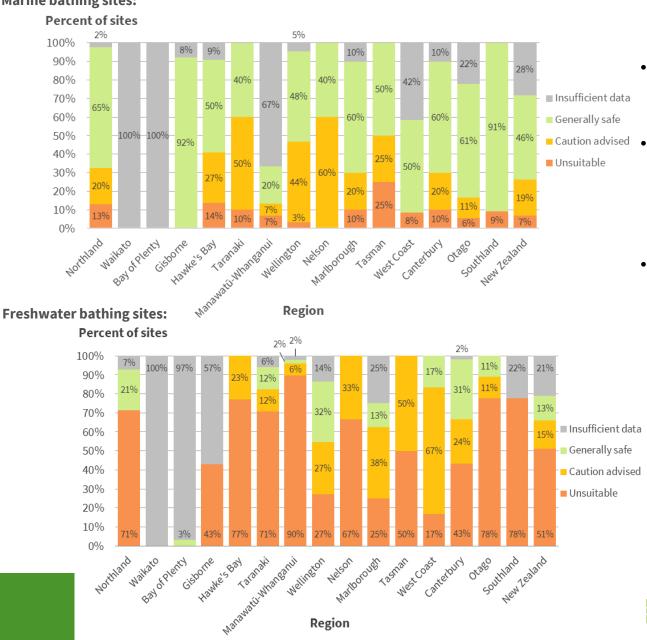
RECREATIONAL WATER

Marine bathing sites:

Freshwater bathing sites:

- Only one in six rivers can be considered safe to swim in.

- Bathing sites in the ocean are much more likely to be safe to swim at than those in freshwater rivers or lakes.

- Swimming sites in urban areas may be less likely to be safe to swim than rural areas – but not by much.

ehinz

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Hauora mo te Taiao – Aotearoa

HEATMAP OF EHIs, DHBs

FACTSHEETS

- An online data visualisation tool for exploring health data at various geographic levels
- Covers topics such as environmental health, alcohol-related harm and other important NZ health issues

New Zealand Health Topics

Explore our indicators and data within these topics

Environmental health
Ngā Tūtohu Taiao

Alcohol-related harm
Pānga waipiro

Health status
Mana hauora

Population information
Tatauranga taupori

Māori health
Hauora

Pacific people's health
Te Hauora ō ngā iwi ō te Moana-nui-ā-Kiwa

Mental health
Hauora hinengaro

Child and youth health
Ngā tamariki

vironmental Health
elligence New Zealand
ou Mātauranga
uora mo te Taiao – Aotearoa

• Indicators are presented in a range of geographies including district health boards, territorial authorities, regional councils and area units

Explore our interactive data

These dashboards let you explore regional data about environmental health.

District Health Board

District health boards (DHBs) are responsible for the health of the people living in their district. There are 20 DHBs in New Zealand.

View DHB map

Territorial Authority

Territorial authorities (TAs) include city councils and district councils. TAs provide services and infrastructure for their local community. There are 67 TAs in New Zealand.

View TA map
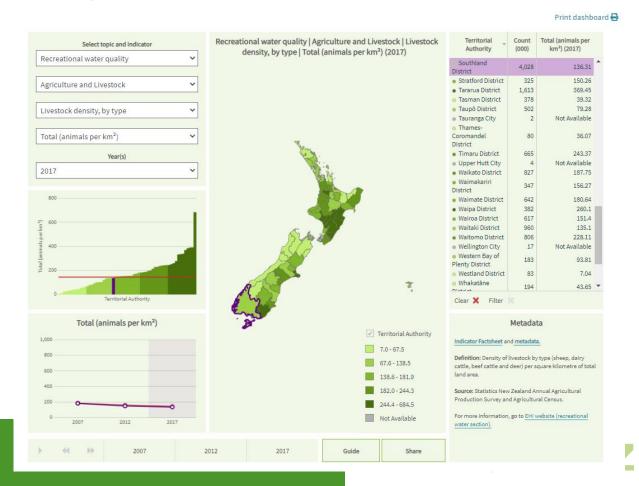
Regional Council

Regional councils (RCs) are responsible for many environmental and public transport matters in their region. There are 16 regional councils (including unitary authorities) in New Zealand.

View RC map

- Interactive dashboards allow data to be displayed on maps, bar graphs, tables and time series

Reports for local areas (eg, alcohol-related harm topic)

Drinking pattern

Hospitalisations wholly attributable to alcohol (including ED visits > 3 hours), 15+ years, by drinking pattern, 2013–2018 (age-standardised rate per 100,000)

	Wellington City			New Zealand		
	Rate	Lower CI	Upper CI	Rate	Lower CI	Upper CI
Acute intoxication	140.2	132.7	147.9	79.3	78.1	80.6
Chronic drinking	76.0	70.7	81.5	63.3	62.3	64.4
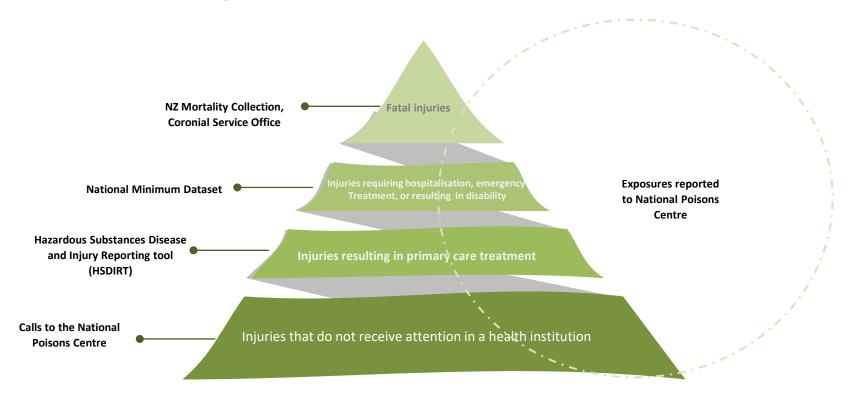
Notes: ED visits > 3 hours are emergency department only visits of > 3 hours of care, which have only been routinely recorded in the NMDS from 2012. N/A means the rate was suppressed because the number of hospitalisations was < 20.

Source: National Minimum Dataset (NMDS), Ministry of Health

The age-standardised rate ratio of hospitalisations for conditions related to a drinking pattern of acute intoxication, compared to conditions related to chronic drinking, in **Wellington City** was **1.8** (**1.7 – 2.0**), for the six year period of 2013–18.

HAZARDOUS SUBSTANCES SURVEILLANCE SYSTEM (HSSS)

- Monitors diseases, injuries and deaths from hazardous substances exposures

NZ Mortality Collection, Coronial Service Office — Fatal injuries

National Minimum Dataset — Injuries requiring hospitalisation, emergency Treatment, or resulting in disability

Hazardous Substances Disease and Injury Reporting tool (HSDIRT) — Injuries resulting in primary care treatment

Calls to the National Poisons Centre — Injuries that do not receive attention in a health institution

Exposures reported to National Poisons Centre

THE HAZARDOUS SUBSTANCES DISEASE AND INJURY REPORTING TOOL (HSDIRT)

- An electronic form that simplifies notification of hazardous substance injuries, from primary health care to Medical Officers of Health

- Developed in conjunction with bestpractice Decision Support

- HSDIRT has been designed to allow notification of:
  - lead absorption 0.48umol/l (soon to reduce to 0.24umol/l)
  - injuries and diseases due to hazardous substances
  - poisoning arising from chemical contamination of the environment (eg, agrichemical spraydrift)

Hazardous Substances Disease & Injury Reporting Tool

bestpractice
DECISION SUPPORT FOR HEALTH PROFESSIONALS

| **Exposure Event** | Assessment | Notifier / Patient Details | PHU Review | ▶ |

Send notification to Medical Officer of Health at: [Please Select ▼]

Exposure Event

Exposure route ☐ Ingestion ☐ Inhalation ☐ Skin contact ☐ Eye contact ☐ Unknown

Date exposure began [_____] 📅 **OR** Month/Year [_____] **OR** Unknown ☐

Exposure length ○ < 1 day ○ between 1 day & 1 month ○ ≥1 month ○ Unknown

Place of exposure ☐ Home ☐ Workplace ☐ School/ECC
☐ Public place ☐ Unknown ☐ Other

Intent ○ Unintentional ○ Intentional ○ Unknown

Is this case known to be linked to other cases of the same exposure event? ○ Yes ○ No

Substance

Substance categories ☐ Household chemical ☐ Agrichemical ☐ Industrial chemical
☐ Fireworks/explosive ☐ Lead ☐ Unknown
☐ Other

Examples: Household: cosmetic, dishwashing powder   Industrial: solvent, chlorine, fumigant
            Agrichemical: pesticide, animal remedies, spraydrift   Other: mercury, arsenic

Substance name (complete at least 1 field)

| **Chemical name** | **Product name** | **Common name** | **Unknown** |
| *sodium hypochlorite* | *Janola* | *bleach* | |

e.g.

☒
⊞ [_____] [_____] [_____] ☐

| **Exposure Event** | Assessment | Notifier / Patient Details | PHU Review | ▶ |

[Refresh]   [Park]   [Cancel]   [Submit]

LEAD ABSORPTION NOTIFICATIONS

• Pacific people were most affected by lead exposure from their occupation in 2014–19

Lead absorption notifications

This factsheet presents a national indicator, which allows us to monitor lead absorption.

Key facts

Pb There were 204 lead absorption notifications in 2019, an increase since 2017. The increase was driven by growth in notifications among adults.

Painters remain the most notified occupational group with lead absorption.

In 2019, gunshot wound ranked as one of the most common sources of non-occupational/unknown lead exposure.

Pacific people were most affected by lead exposure from their occupation in 2014–19

Due to certain manual labour work dominated by males, there have been more notifications for males than for females every year since 2014, and males tend to have higher blood lead levels than females.

HAZARDOUS SUBSTANCES NOTIFICATIONS FACTSHEET

- In 2019, most notifications involved household chemicals, which was the most common cause of injury for children under five years old. This was the same in 2018.

Key facts

In 2019, there were a total of 98 hazardous substance notifications. This is a 30% decrease from 2018 (140 notifications).

Children under the age of five years had the highest notification rate in 2018 and 2019.

In 2019, most notifications involved household chemicals, which was the most common cause of injury for children under five years old. This was the same in 2018.

More than half (59%) of the notifications were males in 2014–19.

From 2014–19, ingestion was the most common route of exposure for children under five years. For adults, their most common route of exposure was inhalation.

The highest hazardous substances injury notification rates occurred in the most deprived areas (NZDep 2018 quintile 5) in 2014–19.

From 2014 –19, most notifications were injuries that occurred in the home.

HAZARDOUS SUBSTANCES-RELATED HOSPITALISATIONS

- Every year children under five years have the highest hazardous substances-related hospitalisation rates, although the rate has decreased from 2006 to 2019.

Key facts

In 2019, there were 463 unintentional hazardous substances-related hospitalisations, and the number of hospitalisations has decreased since 2006 (563 hospitalisations).

Children under five years continue to have the highest hazardous substances-related hospitalisation rates compared to other age groups.

The most common cause of injury in children under five years was from 'solvents, hydrocarbons and corrosive' substances.

Males have had consistently higher rates of hazardous substances-related hospitalisations than females since 2006.

Māori had a higher rate of hazardous substances-related hospitalisations than non-Māori since 2006.