

# **Chemical Injury Surveillance For New Zealand, 2004**

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**Chemical Injury Surveillance  
For New Zealand, 2004**

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## EXECUTIVE SUMMARY

### Current situation

- The Chemical Injury Surveillance System (CISS) presently incorporates national mortality data [sourced from the Coronial Services Office (CSO)], national inpatient hospitalisation data [sourced from the New Zealand Health Information Service (NZHIS)], and national spraydrift data (sourced from the DriftNet surveillance system).
- Local hospitalisation data including both emergency department and inpatient data are received from Public Health Units (PHUs) representing the following District Health Boards (DHBs); Auckland, Capital and Coast, Hutt, Wairarapa, West Coast and Southland.
- The National Poisons Centre (NPC) ceased providing ESR with data during 2004.

### Results

- 2004 results for the national data sets and local data for Auckland and West Coast DHBs are presented in this report and compared with results for 2003. Local data from the remaining PHUs were not received in time for inclusion in this report.

#### *National results:*

- 124 deaths reported to date for 2004 compared to 147 at the comparative time in 2003 (there is a time lag associated with this data).
- 6896 poisoning hospitalisations (NZHIS), a national rate of 184.5 per 100 000 population, slightly less than the 7218 cases reported in 2003.
- 10 spraydrift complaints compared to four in 2003.

#### *Auckland DHB results:*

- 705 NZHIS hospitalisations in 2004, a rate of 191.7 per 100 000 population compared to 798 cases in 2003.
- 1324 hospital notifications (emergency department patients and inpatients) received by Auckland Regional Public Health Service (ARPHS) in 2004, a rate of 365.5 per 100 000 population, compared to 1344 cases in 2003.
- 10 deaths reported to date, the same as at the equivalent time in 2003.

#### *West Coast DHB results:*

- 64 NZHIS hospitalisations in 2004, a rate of 211.5 per 100 000 population, compared to 101 cases in 2003. The 2004 rate ranked third nationally, a decrease from first in 2003.
- 35 notifications (emergency department patients and inpatients) received by West Coast Public Health Unit (WCPHU) in 2004 compared to 47 cases in 2003.
- 4 deaths have been reported to date for 2004, giving West Coast the highest national rate, as also observed in 2001 and 2002.



- Mortality data for the years 2002 and 2003 are also presented.
  - 243 chemical injury deaths in 2002, 218 in 2003, an average annual rate of 6.3 per 100 000 population.
  - Both demographic and substance trends were similar for both years.

### **Future developments/recommendations**

- During the next financial year, ESR will work with the NPC to develop a strategy for data sharing.
- Extension of the system to include local data from all PHUs would involve a significant increase in resources.
- The local data presently incorporated provides a good representation of the country on both a geographic and population basis (sentinel surveillance).
- It is therefore recommended that the project focus its resources on utilisation of the local data currently received rather than actively pursuing the recruitment of additional PHUs.

## 1. INTRODUCTION

In 2001, ESR was commissioned by the New Zealand Ministry of Health (MoH) to develop a national Chemical Injury Surveillance System (CISS). The primary legislative statute for the system being the requirement of Section 143 of the Hazardous Substances and New Organisms (HSNO) Act, 1996, which states that all hospitalisations from hazardous substance injury are to be notified to the Medical Officer of Health. The CISS is intended to encompass this requirement, and extend it to achieve the greatest public health utility. Reporting to the CISS is not a legislative requirement, but it is one mechanism through which hospitals can meet their statutory obligations under the HSNO Act. The following describes the objectives and scope of the CISS (adapted from previous ESR reports to the Ministry of Health<sup>1,2</sup>), provides some definitions, and discusses the current situation and other previously trialled approaches.

### 1.1. Objectives of the CISS

- a) Improved local surveillance of chemical injuries, by collecting specific data on substance/product, circumstances, and specific susceptible groups, thus allowing for prioritising of resources for facilitating investigations and interventions.
- b) National surveillance of chemical injuries leading to the review of appropriate controls for certain products, and areas for targeted intervention, including restriction of access to methods of (para) suicide, reducing the number of childhood poisonings through reviewing child resistant packaging needs for certain products, and improving workplace practices leading to a reduced number of serious acute injuries from occupational settings.

### 1.2. Scope of the CISS

#### 1.2.1. Inclusions

The system **is** intended to cover:

- Injuries (poisonings and chemical burns) caused by inappropriate use of hazardous substances
- Injuries caused by inappropriate use of therapeutic substances and alcohol (when classified as food)
- Hospital admissions (including short stay unit admissions and presentations to Emergency Departments)
- Fatalities where the primary toxicity of the substance was the cause of death
- Both intentional and unintentional exposures

#### 1.2.2. Exclusions

The system is **not** intended to cover:

- Adverse reactions to therapeutic agents when used as intended
- Injuries or deaths where poisoning is a secondary cause (e.g. car crashes)
- Biological food poisoning (e.g. salmonellosis)

### 1.3. Definitions

**“Hospitalisation”**: The Ministry of Health has interpreted “hospitalisations” to include all hospital attendances, irrespective of whether the patient is classed as an inpatient or outpatient. The Ministry considers the distinction between overnight stays and brief stays to be irrelevant, but considers that the important element is whether the person was treated as a patient.

**“Hazardous substance”**: The HSNO Act defines a hazardous substance as a substance which possesses an intrinsic toxicity, ecotoxicity, flammability, explosive, or corrosive property that meet pre-defined thresholds set by the Environmental Risk Management Authority (ERMA). For administrative reasons, certain substances are excluded from ERMA’s jurisdiction, even though they are clearly hazardous under the definition of the Act, because they are regulated under different legislation. Examples of these are human therapeutic drugs in finished form, which are regulated by the Ministry of Health under the Medicines Act and alcohol when classified as a food, which is regulated under the Food Act. These substances are often referred to as “non-hazardous, for the purposes of the HSNO Act”. Since the CISS is an instrument of the Ministry of Health, and is driven by a public health need, the substances included in it extend beyond that defined by ERMA’s regulatory limits. This is why therapeutic drugs and ethanol are included in the system, even though they are not regulated by ERMA per se.

**“Injury”**: Has been defined by the Ministry in 2001 as “..any physical harm or damage serious enough to warrant medical treatment”.

**Substances Classes, e.g. Chemicals/drugs of abuse**: refer to Appendix 2

### 1.4. Literature Review

The literature has been reviewed in a previous report to the Ministry of Health<sup>2</sup>.

### 1.5. Current Situation

Since 2001, three approaches for obtaining hospital notification data have been trialled and/or assessed. The latest, successfully trialled for Auckland in 2003 was a ‘comprehensive’ surveillance system incorporating poisoning data from the New Zealand Health Information Service (NZHIS), National Poisons Centre (NPC), Coronial Services Office (CSO) and Public Health Service (PHS). Results of this trial were presented in a report to the Ministry of Health in December 2003<sup>3</sup>.

Despite encountering some issues, the trial was able to provide better functional analyses for local investigation and intervention as well as national policy and practice than other systems trialled to date. Specifically, the combination of data sets allowed for better understanding of the underlying causes and consequences of exposures to hazardous substances as the data sets covered the spectrum of disease from hazard to exposure to outcome. That is, the NPC data largely addressed hazards

and exposure, the NZHIS data captured details of inpatient morbidity, and the CSO mortality data. The PHS data, while being less sensitive, contributed towards the gap in hospitalisation data, e.g. by including emergency patients.

It was therefore proposed that the 'comprehensive' system be implemented as the national chemical injuries surveillance system and extension of the system take place during the 2003/04 financial year. A report prepared for the Ministry of Health addressing this implementation and 2003 statistics was released in June last year<sup>4</sup>.

A brief overview on the comprehensive surveillance system and the specific datasets are given in Section 2 of this report.

## **1.6. Other Approaches Trialed To Date**

Prior to the comprehensive chemical injury surveillance system, two other approaches were investigated; a) a paper and email based system and b) an electronic system. As further details on the first are given in a 2002 MoH report<sup>5</sup> and details on both are given in the 2003 MoH report<sup>3</sup>, only a brief overview is presented here.

### **1.6.1. Paper and Email Based System**

- Trialed July-December 2001 in six PHS.
- Modelled on the national notifiable disease system (EpiSurv).
- Level of notification varied greatly from region to region with only one (smaller) region providing sufficient data for subsequent analysis.
- Number of issues, principally time to complete paper forms.

### **1.6.2. Electronic System**

- Electronic transfer of details from the hospital system.
- Cases to be identified based on ICD 10 codes.
- Discussion held regarding trialling at Middlemore Hospital but fields which could be obtained without significant additional funding would not differ to that sent to NZHIS as part of the National Minimum Data Set.
- Nation-wide hospital survey indicated that system could work but would require IT changes to existing patient management systems that would involve set up costs and/or ongoing funds.
- Thus with appropriate funding, an electronic system may be able to be implemented as hospitals update and renew their patient management systems.

## **1.7. Incorporation of the email and electronic based approaches into the comprehensive surveillance system**

While not relying solely on PHS notification data to obtain a picture of the burden of disease from chemical injuries, the comprehensive surveillance system does incorporate data from this source.

Experiences with the paper based and electronic systems showed that no one approach will work in all settings and that local circumstances would dictate local data quality and capture practicalities. Thus the paper based or electronic systems may work for some PHS and data captured by either of these or even alternative means can be incorporated into the comprehensive system.

### **1.8. This Report**

This reports provides a brief overview of the comprehensive surveillance system before detailing its continuation during the 2004/2005 financial year. Summary statistics from the various data sources for 2004 are then presented as are additional CSO analyses pertaining to 2002 and 2003.

## **2. BACKGROUND ON THE COMPREHENSIVE CHEMICAL INJURY SURVEILLANCE SYSTEM**

### **2.1. Introduction**

A brief overview of the comprehensive system is given below. More detail can be sourced from the 2003 MoH report<sup>3</sup>.

- As different health exposures and injuries result in different contacts with the health system, e.g. some injuries may be attended to in the home, others would involve a visit to a GP and/or be hospitalised whilst others may die, data from several sources is required to be incorporated into a comprehensive surveillance system.
- By implementing a surveillance system which looks at several health outcomes (as opposed to just hospital morbidity) plus exposure and hazard data, a better picture of the health effects attributable to hazardous substances/chemicals can be gained.
- The following data sources have been or are incorporated into the comprehensive surveillance system: Coronial Services Office, NZHIS, Public Health Services, the National Poisons Centre and DriftNet.

### **2.2. Coronial Services Office (CSO) Data**

- All deaths by acute chemical poisoning are deemed to be suspicious and thus should undergo a coroners inquest.
- Files are stored at the national Coronial Services Office (CSO) in Wellington.
- Case demographics, circumstances surrounding death including intent, and toxicology results are available.
- Although initially obtained manually, ESR now receives much of this data electronically. ESR has been obtaining CSO data since 2001.
- The main drawback associated with the coronial data is timeliness. It is estimated that by the end of a given year, approximately only 50% of cases for that year are available. By the end of the following year, it is anticipated that 90-95% of cases for the preceding year will be filed.

### **2.3. NZHIS Data**

- Public hospitals are required to provide NZHIS with data known as the National Minimum Data Set (NMDS) for all **inpatients**.
- Data includes basic demographics, domicile code, event start and end details, and International Classification of Disease (ICD) version 10 codes.
- Inpatients with ICD 10 codes of interest (Table 1) can be identified and the fields of relevance obtained from NZHIS.

**Table 1: ICD 10 codes of interest for comprehensive chemical injury surveillance**

ICD 10 Code	Description
<b><i>Broad description of code groupings</i></b>	
X60 – 69	Intentional self-poisoning
X40 – 49	Unintentional poisoning
Y10 – Y19	Poisoning, undetermined intent
<b><i>X60-X69 Intentional poisoning by and exposure to:</i></b>	
X60	Nonopioid analgesics, antipyretics and antirheumatics
X61	Antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified
X62	Narcotics and psychodysleptics [hallucinogens], not elsewhere classified
X63	Other drugs acting on the autonomic nervous system
X64	Other and unspecified drugs, medicaments and biological substances
X65	Alcohol
X66	Organic solvents and halogenated hydrocarbons and their vapours
X67	Other gases and vapours
X68	Pesticides
X69	Other and unspecified chemicals and noxious substances
<b><i>X40-X49 Unintentional poisoning by and exposure to:</i></b>	
X40	Nonopioid analgesics, antipyretics and antirheumatics
X41	Antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified
X42	Narcotics and psychodysleptics [hallucinogens], not elsewhere classified
X43	Other drugs acting on the autonomic nervous system
X44	Other and unspecified drugs, medicaments and biological substances
X45	Alcohol
X46	Organic solvents and halogenated hydrocarbons and their vapours
X47	Other gases and vapours
X48	Pesticides
X49	Other and unspecified chemicals and noxious substances
<b><i>Y10-Y19 Poisoning by and exposure to (undetermined intent):</i></b>	
Y10	Nonopioid analgesics, antipyretics and antirheumatics
Y11	Antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified
Y12	Narcotics and psychodysleptics [hallucinogens], not elsewhere classified
Y13	Other drugs acting on the autonomic nervous system
Y14	Other and unspecified drugs, medicaments and biological substances
Y15	Alcohol
Y16	Organic solvents and halogenated hydrocarbons and their vapours
Y17	Other gases and vapours
Y18	Pesticides
Y19	Other and unspecified chemicals and noxious substances

- Limitations associated with the NZHIS data:
  - Only inpatients are captured.
  - Only generic information is available on any substances involved.
  - There is a time delay between presentation at hospital and availability of the data from NZHIS.
  - The ICD-10-AM coding system is complex and inflexible, the current version is the 10<sup>th</sup> since ICD coding was first used in 1901.

#### 2.4. Public Health Services (PHS) Data

- While a paper and email-based system piloted in 2001 was not universally successful, some PHSs currently operate their own local surveillance systems based on this approach.
- Any data, whether collected via a paper or electronic system can be incorporated into the comprehensive system.
- The quality, quantity and consistency of data collected varies between PHSs.

#### 2.5. National Poisons Centre (NPC) Data

- 24 hours a day, 365 days per year telephone service that fields enquiries regarding **actual** or **potential** toxic exposures.
- While there is no requirement to phone the NPC in the event of a poisoning, about 21,000 phone calls are received each year.
- Details of calls are recorded in an electronic database.
- NPC also operates an Internet database known as TOXINZ.

#### 2.6. DriftNet (Spraydrift) Data

- A surveillance system designed to monitor the incidence of spray drift events with potential, reported or alleged health effects.
- Reported via the software *DriftNet*, which collects information on spray drift complaints and incidents reported to Public Health Service staff.
- Annual reporting indicates that the system is under utilised.



### 3. **PROGRESS ON NATIONAL IMPLEMENTATION OF THE COMPREHENSIVE SURVEILLANCE SYSTEM, 2004/2005.**

National implementation of the comprehensive surveillance system was initiated in 2003/2004 following on from the successful pilot for the Auckland region. As summarised in last year's report<sup>4</sup>, ESR received national 2003 data from the CSO, NZHIS and NPC. In addition, local data were received for 2003 from Auckland Regional Public Health Service (ARPHS), Hawkes Bay Public Health Unit (HBPHU) and West Coast Public Health Unit (WCPHU).

During the previous year, ESR has continued to receive national data from the CSO and NZHIS on a quarterly basis. The CSO data presently covers all deaths from chemical causes since 1 January 2001 and is current as of 30 April 2005. The current NZHIS data set contains all poisoning related events from 1 January 2003 till 30 April 2005.

Local notification data were again received from ARPHS and WCPHU, and thus ESR now holds two complete years of data (2003, 2004) for both PHSs. However, the ARPHS dataset only contains data from Auckland Hospital thus the whole Auckland region is not represented. Both ARPHS and WCPHU received paper-based notifications that are then sent electronically to ESR.

DriftNet data for 2004 has been incorporated into the comprehensive chemical injury surveillance system.

Several PHUs made data available in June 2005, which will be included in the bi-annual CISS report due in December 2005. These included Southland PHU data retrospective to January 2002, and Hutt, Capital and Coast, and Wairarapa PHU data respective to January 2004.

Gisborne and Hawkes Bay PHUs supplied no data in 2004, despite communications that suggested data would be available. Staff turnover was responsible for the lack of data in at least one instance. ESR is in contact with these PHUs to try and resume data collection in 2005.

The NPC only supplied 2004 data for January to September. Thus one of the CISS project milestones for the 2005/2006 financial year is to work with the NPC to develop a medium term strategy for the future direction of CISS.

Thus the comprehensive chemical injury surveillance system continues to adjust to encompass the various data sets available. Unfortunately, two data sets (NPC and Hawkes Bay PHU) collected in 2003/2004 are no longer being supplied in 2005. However, two new datasets from Hutt and Southland PHUs have been supplied, and DriftNet data have been incorporated. The future of the system is addressed in Section 6 of this report titled **Future Developments**.

The next section presents results from the CSO, NZHIS, DriftNet, ARPHS and WCPHU datasets for 2004, followed by additional results from the CSO data pertaining to the years 2002/2003.

## 4. RESULTS FROM THE COMPREHENSIVE SURVEILLANCE SYSTEM FOR 2004.

### 4.1. Introduction

Results from the CSO, NZHIS, DriftNet, ARPMS and WCPHU for 2004 are presented in this section of the report.

Firstly the fields available at the national level are presented, followed by a summary of key statistics. National results by DHB, age, sex, ethnicity and substance from each data source are then presented, followed by results again from each data source pertaining to Auckland and West Coast DHBs. Finally, a more detailed analysis of the combined data sets pertaining to poisoning in children aged less than five years, poisonings involving paracetamol, and alcohol are presented.

The data fields, which are collected at the **national** level for each data source, are presented in Table 2.

**Table 2: Data Fields Currently Collected at the National Level for each Data Source**

Description of Field <sup>1</sup>	CSO	NZHIS	PHU
Date of death/incident/hospitalisation/notification	✓	✓	✓
Town/City	✓	Can be derived	Varies
DHB	✓	Can be derived	✓
Date of birth or age	✓	✓	✓
Ethnicity	✓	✓	✓
Sex	✓	✓	✓
Intention	✓	✓	Varies
Occupation	✓	X	X
Admission details	N/A	✓	Varies
Outcome	✓	✓	X
Causes/circumstances	✓	X	X
Substance name	✓	X	✓
Substance class	✓	✓	✓
Substance form e.g. tablet, liquid	X	X	X
Route	X	X	X
Acute/chronic	✓	X	X
Coroner	✓	N/A	N/A
Caller details	N/A	N/A	N/A

<sup>1</sup> Additional fields are available at the local level, for example ARPMS also collects name, address and NHI number.

## 4.2. Summary of Key Statistics

### 4.2.1. 2004 National Analysis

- 124 deaths reported to date for 2004 compared to 147 at the comparative time in 2003 (there is a time lag associated with this data).
- 6896 poisoning hospitalisations (NZHIS), a national rate of 184.5 per 100 000 population, slightly less than the 7218 cases reported in 2003.
- 10 spraydrift complaints compared to four in 2003.
- As in 2001 and 2002, West Coast DHB had the highest CSO rate.
- Canterbury, Otago and West Coast DHB's had the highest NZHIS hospitalisation rate, with the lowest from Capital and Coast DHB.
- The majority of the CSO deaths and NZHIS hospitalisations were deemed intentional.
- Highest age specific rates differed between the datasets: 45-64 years for the CSO and 15-24 years for NZHIS.
- 71% of the CSO deaths were male compared to 35.9% of the NZHIS hospitalisations.
- For both the CSO and NZHIS data, the highest ethnicity-specific rates were for Europeans followed closely by Maori.
- Nearly half (47.6%) of the primary substances involved in the CSO deaths were classified as household (majority being carbon monoxide), with almost another third (31.5%) as therapeutic.
- As in 2003, antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified accounted for the greatest proportion (33.6%) of the ICD 10 codes assigned to the NZHIS hospitalisations.

#### **4.2.2. 2004 Auckland DHB Analysis**

- 705 NZHIS hospitalisations in 2004, a rate of 191.7 per 100 000 population compared to 798 cases in 2003.
- 1324 hospital notifications (emergency department patients and inpatients) received by Auckland Regional Public Health Service (ARPHS) in 2004, a rate of 360.0 per 100 000 population, compared to 1344 cases in 2003.
- 10 deaths reported to date, the same as at the equivalent time in 2003.
- In agreement with the 2004 national trends and that observed for Auckland in 2003, the majority of cases across all three Auckland DHB datasets were intentional.
- Highest age-specific rates for NZHIS and ARPHS were amongst 15-24 year olds, following the national trend. In contrast the highest rate for CSO deaths was amongst cases aged over 65 years (cf 45-64 years for national data).
- NZHIS and CSO data followed the national trends by sex. ARPHS data were evenly split by sex.
- Europeans had the highest ethnicity specific rate for deaths and ARPHS notifications, while Maori had the highest rate amongst NZHIS hospitalisations.
- The primary agent in six of the ten deaths was classed as therapeutics, although no single substance dominated.
- 49.8% of the substances involved in the ARPHS notifications were classed as chemicals/drugs of abuse (dominated by ethanol), while 43.2% were therapeutics.

#### **4.2.3. 2004 West Coast DHB Analysis**

- 64 NZHIS hospitalisations in 2004, a rate of 211.5 per 100 000 population, compared to 101 cases in 2003. The 2004 rate ranked third nationally, a decrease from first in 2003.
- 35 notifications (emergency department patients and inpatients) received by West Coast Public Health Unit (WCPHU) in 2004 compared to 47 cases in 2003.

- 4 deaths have been reported to date for 2004, giving West Coast the highest national rate, as also observed in 2001 and 2002.
- NZHIS and CSO data followed national trends for intent and sex.
- 77.1% of the PHU notifications were classed as overdoses and 71.4% were female.
- As seen at the national level the highest CSO age specific rate was for the 45-64 year age group while for the NZHIS data the highest rate was amongst those aged 25-44 years. This age group ranked second nationally.
- In 2004 there were four NZHIS cases aged less than five years compared to 12 in 2003. 15-24 years olds had the highest age specific rate for the PHU data.
- Three of the four West Coast CSO deaths were of European ethnicity, the remaining of Maori ethnicity. The highest ethnicity-specific group for both the NZHIS and WCPHU data was for Europeans, complying with the national trends and those in 2003.
- As in 2003, therapeutic substances dominated the PHU notifications (69.6%).

#### **4.2.4. 2004 Specific Analyses**

##### **4.2.4.1. Poisonings in Children aged less than 5 years**

- 610 NZHIS hospitalisations (8.8%) versus 689 (9.5%) in 2003.
- 2 notifications from WCPHU (5.7%) compared to eight in 2003 (17.0%). Both 2004 notifications involved paracetamol.
- ARPHS data is not representative of children as these are largely seen at Starship Hospital.

##### **4.2.4.2. Paracetamol Poisonings**

- Numbers very similar to those reported in 2003:
  - 1 death nationally in 2004 to date, as in 2003 at the same time.
  - 8 WCPHU notifications for both years.
  - Only four more ARPHS notifications in 2004 compared to 2003 (139 versus 135).
- Paracetamol was the second most common substance for both PHUs.

- Strong trend by sex: three quarters of the paracetamol poisonings were female in both PHUs (77.7% for ARPHS and 75.0% for WCPHU).

#### **4.2.4.3. Ethanol Poisonings**

- 11 deaths compared to eight at the equivalent time in 2003.
- 791 ARPHS notifications versus 746 in 2003.
- 9 WCPHU notifications in 2004, four in 2003.
- Most common substance involved in the notifications from both PHUs.
- The youngest death was aged 17 years. 33.3% of the WCPHU alcohol notifications were aged under 18 years, and 8% (61 cases) of the ARPHS notifications involving alcohol.

#### **4.2.5. Mortality Data for 2002 and 2003**

- Demographic and substance results were similar for 2002 and 2003.
- There were 243 chemical injury deaths in 2002 and 218 in 2003, an average annual rate of 6.3 per 100 000 population.
- About two thirds of the deaths were intentional (64.6% in 2002 and 69.3% in 2003).
- While some DHBs were consistent between years e.g. Canterbury, Waitemata and Auckland DHBs had the highest number of deaths for both years, other DHBs showed notable changes e.g. West Coast decreased and Northland increased.
- For both years, the highest age specific rate was for 25-44 year olds (11.2 per 100 000 population in 2002, 8.6 per 100 000 population in 2003).
- About two thirds of the deaths for both years were male (67.5% in 2002 and 64.7%).
- Nearly three quarters (73.1%) of the deaths were Europeans. Maori and Pacific Peoples had a much higher proportion of unintentional deaths compared to Europeans.
- Combined results for both years showed that rates increased with increasing deprivation.

- Carbon monoxide was the most common substance, attributed to 62.7% of the intentional deaths.
- The leading substances involved in the unintentional deaths were methadone, morphine or heroin, and ethanol.

### 4.3. Detailed National Analysis (2004)

The following section compares national results for 2004 from the CSO, NZHIS and DriftNet data sources. While the NZHIS and DriftNet datasets are complete for 2004, the CSO data are estimated to be between 50% and 60% complete. However, previous years results have shown that CSO demographic and substance trends may already be present.

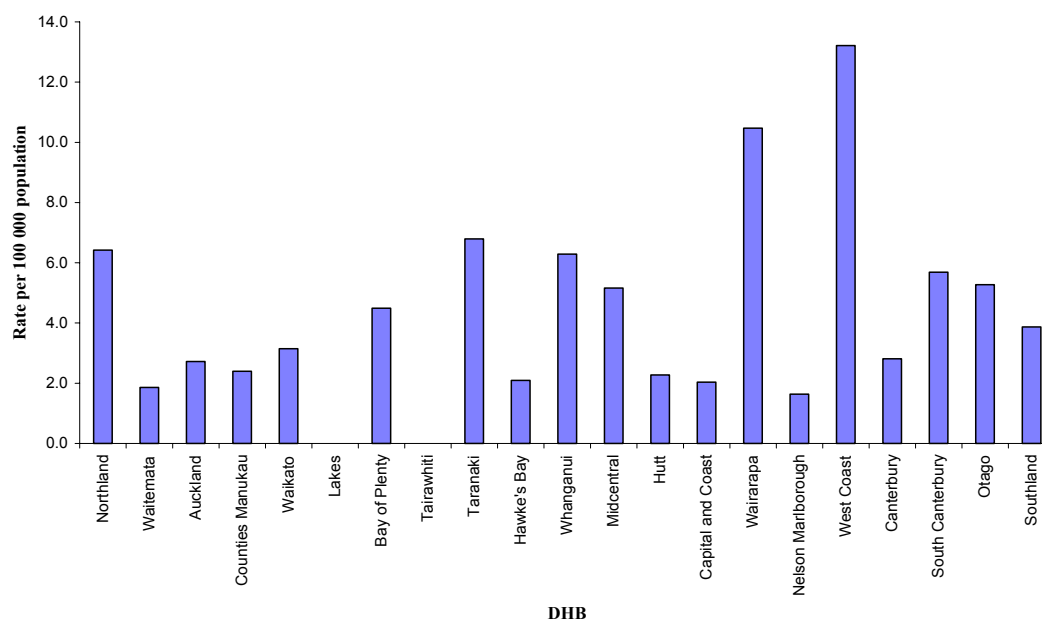
To date, there have been 124 deaths filed at the CSO for 2004, a rate of 3.3 per 100 000 population. This is 23 less deaths than that reported at the same time for 2003. Data for the years 2001 and 2002 indicate that about 240 poisoning related deaths occur each year, a rate of 6.4 per 100 000 population.

There were 6896 NZHIS poisoning hospitalisations in 2004, a national rate of 184.5 per 100 000 population. This is slightly less than the 7218 poisonings reported from NZHIS in 2003.

Ten spraydrift complaints were reported via DriftNet in 2004, an increase from the four complaints reported in 2003. They were received from; combined Auckland DHBs (3), Bay of Plenty (3), Otago (2), Canterbury (1) and Southland (1). The DriftNet data is discussed separately in Section 4.3.1.

When examining the CSO data to date by DHB, West Coast had the highest rate (13.2 per 100 000 population, four deaths) (Figure 1, Appendix Table 5). West Coast also had the highest rate in 2001 (13.2 per 100 000 population, four deaths) and in 2002 (19.8 per 100 000 population, six deaths). However, only one death occurred in West Coast DHB in 2003. In 2004, Wairarapa DHB also had a high rate for fatal poisonings; 10.5 per 100 000 population, four deaths. The greatest number of deaths to date for 2004 has occurred in Canterbury (12), Auckland (10) and Waikato (10). No deaths to date have occurred in Lakes or Tairāwhiti DHB. Note that filing of deaths at the CSO is coroner dependant which will influence counts by DHB.

**Figure 1: Chemical Injury Death Rates by DHB, 2004 to date.**



Analysis of NZHIS data by DHB shows that West Coast also has one of the highest rates of poisoning hospitalisations (211.5 per 100 000 population, 64 cases) (Figure 2, Appendix Table 5). The only DHBs with higher rates were Canterbury (273.7 per 100 000 population, 1169 cases) and Otago (250.1 per 100 000 population, 427 cases). These two DHBs also had rates above 200 per 100 000 population in 2003. In 2004 as in 2003, Capital and Coast DHB has the lowest rate (79.3 per 100 000 population, 195 cases).

**Figure 2: NZHIS Poisoning Rates by DHB, 2003 and 2004.**

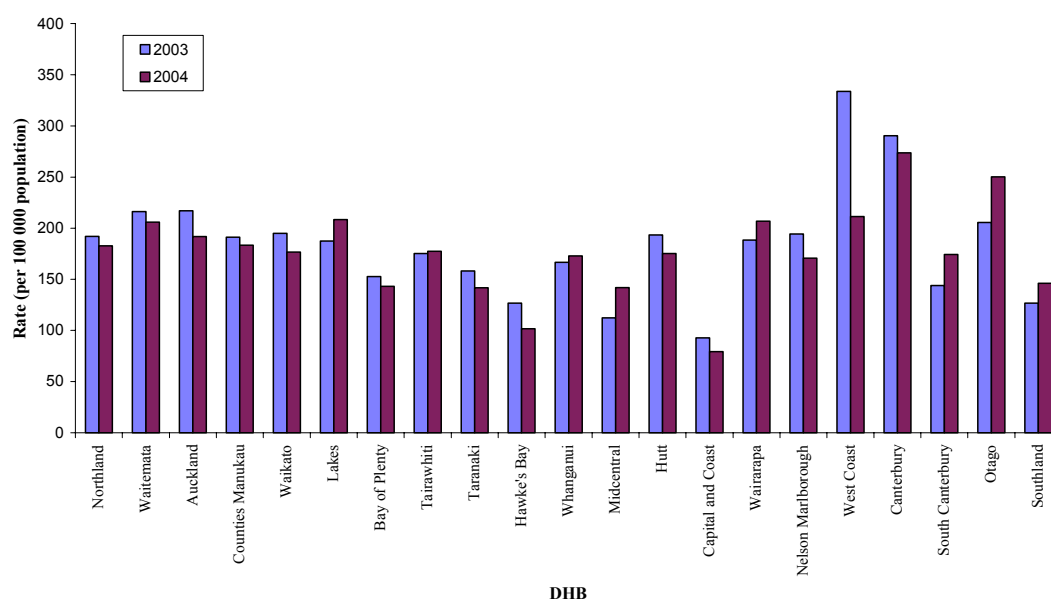
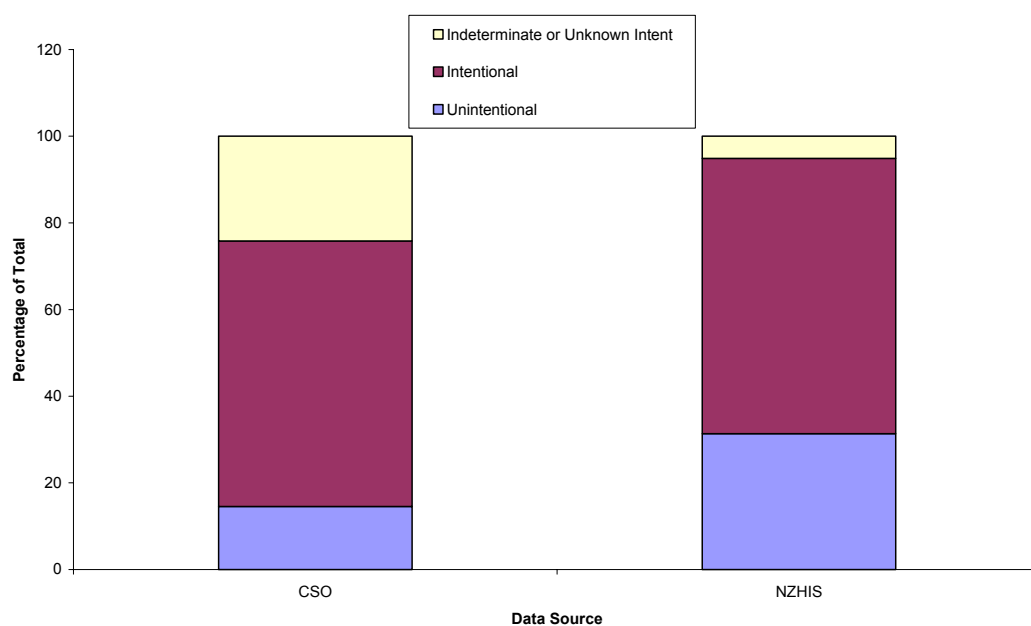




Figure 3 and Appendix Table 6 present national 2004 data from the CSO and NZHIS by intent. These results show that the majority of the CSO deaths and NZHIS poisoning hospitalisations were intentional (61.3% and 63.5% respectively). While the percentage of NZHIS hospitalisations deemed intentional in 2004 is virtually the same as that in 2003, the percentage of intentional CSO deaths is noticeably lower than the 73.5% observed at the same time in 2003.

**Figure 3: Percentage of poisonings by intent for CSO and NZHIS data, 2004.**



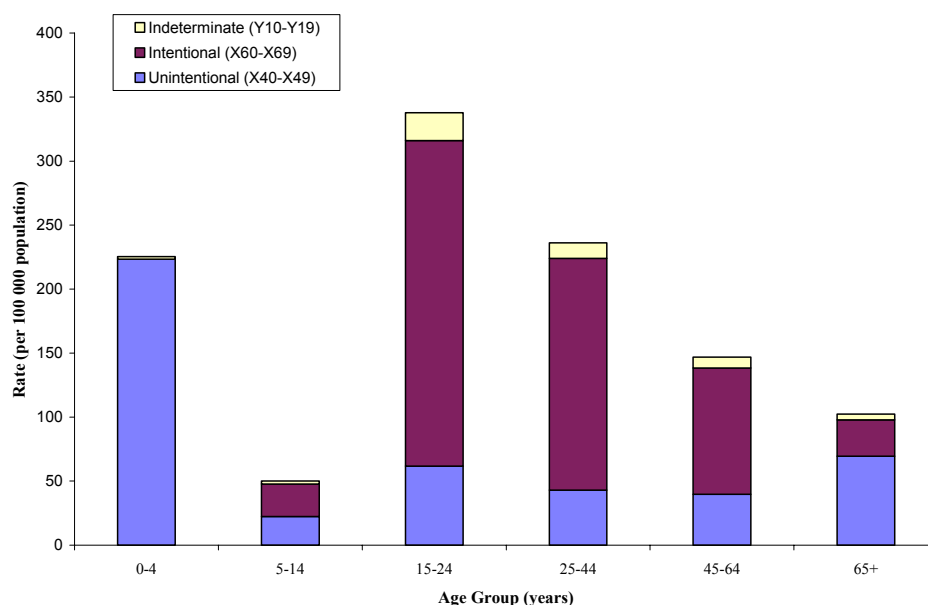
The highest age specific rate for NZHIS hospitalisations occurred in the 15-24 year age group (337.8 per 100 000 population, 1706 cases) (Figure 4, Appendix Table 7). Three quarters (75.3%) of these hospitalisations were deemed intentional. This age group had the third highest rate for the CSO data (3.6 per 100 000 population), behind that for those aged 45-64 years (4.7 per 100 000 population) and 25-44 years (4.5 per 100 000 population).

There were no deaths aged less than five years. However, the rate of NZHIS hospitalisations for this age group was quite high: 225.3 per 100 000 population, 610 cases. None of these hospitalisations were deemed intentional. Also quite high was the age specific rate for NZHIS hospitalisations aged 25-44; 236.1 per 100 000 population, 2619 cases. This was the highest number of cases amongst the assigned age groups.

Between two thirds and three quarters of the NZHIS hospitalisations aged 15-24, 25-44 and 45-64 years were deemed intentional (73.5%, 76.7% and 67.3% respectively). By comparison, less than one third (27.8%) of those NZHIS hospitalisations aged 65+ were deemed intentional (Figure 4).

In 2003, the highest age specific rate for the NZHIS data was also for the 15-24 years age group (351.8 per 100 000 population), but the highest CSO age specific rate was for cases aged 25-44 years (6.0 per 100 000 population).

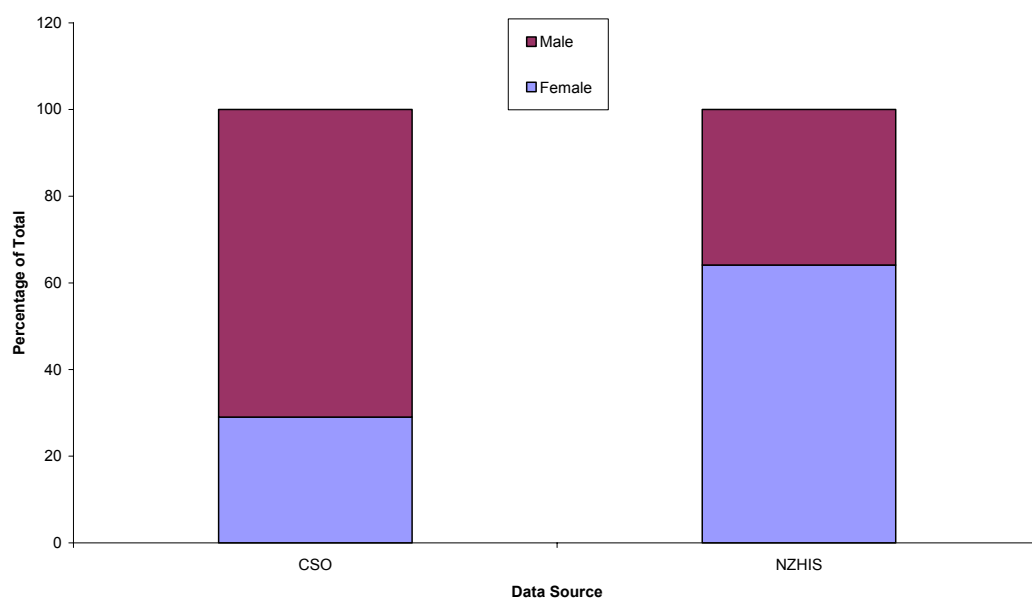
**Figure 4: NZHIS poisoning rates by age and intent, 2004.**



Differences by sex were apparent between fatal cases and hospitalisations (Figure 5, Appendix Table 8). Seventy-one percent of the CSO deaths were male compared to just over one third (35.9%) of the NZHIS hospitalisations. This trend was also observed in 2003.

The split between intentional and unintentional hospitalisations was fairly even for males, but 71.5% of the female hospitalisation were deemed intentional. Females had a higher proportion of unintentional deaths than males (22.2% compared to 11.4%).

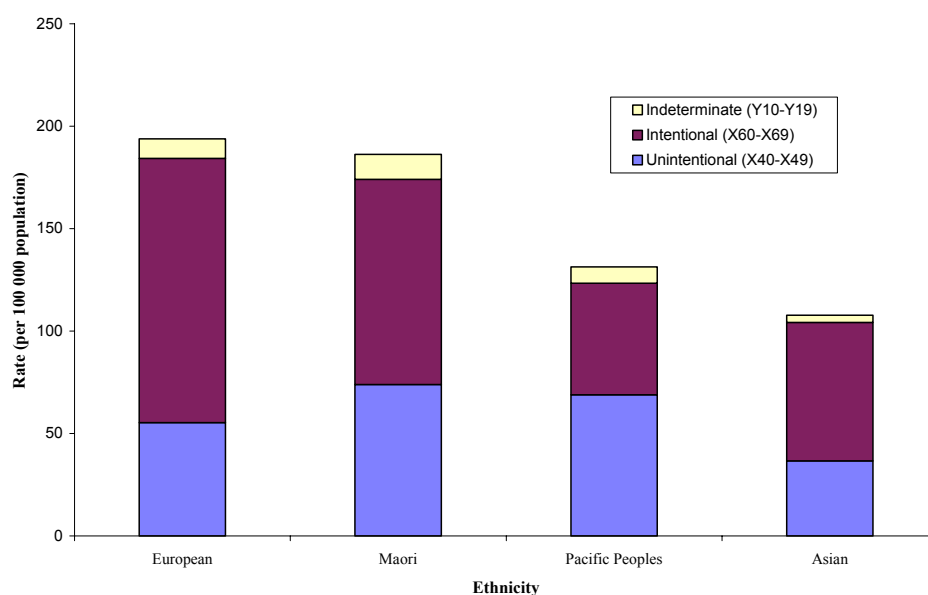
**Figure 5: Percentage of poisonings by sex for national CSO and NZHIS data, 2004.**



For both the CSO and NZHIS data, the highest ethnicity specific rates were for Europeans followed closely by that for Maori (Figure 6, Appendix Table 9). There were no deaths among Pacific Peoples and only one Asian death to date, but the hospitalisation rate for these two ethnicities was only slightly less than that for Europeans and Maori.

About two thirds of the European deaths and hospitalisations (66.3% and 66.5% respectively) were deemed intentional compared to only 18.8% of the Maori deaths and 53.8% of the Maori hospitalisations.

**Figure 6: NZHIS poisoning rates by ethnicity and intent, 2004.**



Nearly half (47.6%) of the primary substances involved in the CSO deaths were classified as household, with almost another third (31.5%) as therapeutic (Appendix Table 10). By far the leading substance involved in the CSO deaths was carbon monoxide; this substance was the primary agent in 56 deaths (45.2%). This trend is the same as that for 2003, although in that dataset, 74 deaths (50.3%) were attributed primarily to carbon monoxide. In 2004, the only other substances associated with greater than five deaths were ethanol (11 deaths) and methadone (10).

As in 2003, antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified accounted for the greatest proportion of the ICD 10 codes assigned to the NZHIS hospitalisations (33.6%). Note each hospitalisation can have up to ten ICD 10 codes assigned.

#### 4.3.1. Spraydrift analysis

Ten spraydrift incidents were reported via DriftNet in 2004 compared to four in 2003 (Table 3).

**Table 3: Number of Spraydrift Complaints Reported in DriftNet by Year**

Number of Complaints	1998*	1999	2000	2001	2002	2003	2004
	14	16	13	28	9	4	10

\* System implemented in September 1998

The ten incidents were reported from five PHUs (Table 4).

**Table 4: Public Health Units Reporting Spray Drift Incidents in 2004**

PHU	Number of Incidents	Number of People Reporting Symptoms	Number of People with Clinically Confirmed Symptoms
Auckland	3	100+	3
Tauranga	3	3	1
Canterbury	1	1	0
Otago	2	0	0
Southland	1	11	2

A wide range in reporting of associated health effects occurred, with one event resulting in no reported known health effects (Otago) and another reporting over 100 affected people (Auckland). However, only three of the 100+ individuals had clinically confirmed symptoms.

This latter spraydrift incident occurred at a school in Waiuku in November 2004. The agricultural chemical involved was the insecticide Tamaron (methamidophos), applied to neighbouring onions to control for thrips using a high-pressure hose. This was not the first instance of the school being affected. On the day the incident was reported to the Health Protection Officer two children were taken to A&E. Children and teachers at the school experienced sore throats, allergic reactions, headaches, numbness of lips, and nausea. An Environment Officer spoke with the sprayers about the problems caused at the school. The sprayers apologised and agreed to spray *after* school hours in the future.

Auckland reported two additional events in narrative form (they were unsure of whether or not to classify them as DriftNet incidents): the first was a rural resident who experienced adverse health effects from "Pastureclear" herbicide spray coming from a neighbouring farm. He consulted his GP, but the Medical Officer of Health was not notified of an environmental poisoning. The matter was handled instead by Auckland Regional Council Biosecurity and literature and advice were sent to the offending farmer. The second incident was in a residential neighbourhood in December: a resident felt unwell and when seen at North Shore Hospital showed no evidence of chemical poisoning. Although the person also claimed pet rabbits, dogs and wild birds had suffered adverse health effects there were no health complaints from other members of the public.

The second largest reported event occurred in February 2004 in a Southland residential neighbourhood. All those affected were European adults aged 27 to 63, only one of whom was male, and most were at home gardening when the event occurred. Symptoms reported included nausea, vomiting, allergy symptoms, stomach cramps and fever. Two of the affected people sought the advice of their GP. The herbicide used was Diquat, otherwise known as Reglone, and symptoms were consistent with those expected from acute inhalation of Diquat

(<http://extoxnet.orst.edu/pips/diquatdi.htm>).

All three of the events reported in Tauranga in 2004 occurred in late August/early September, and were attributed to Hi-Cane (hydrogen cyanamide), used on kiwi fruit to improve bud-breaking and crop yield (<http://www.treecrops.org.nz/knowl/addgen/hydcyanam.html>). Typical acute symptoms according to a toxicological review include severe irritation to the eyes, skin and respiratory tract. Of the three people who submitted complaints

from Hi-Cane, one was seen by a GP and had symptoms consistent with poisoning. Symptom reports from the other two complainants could not be attributed to Hi-Cane and were not investigated further.

The two Otago spraydrift reports were completely unrelated: The first incident occurred in October in an Oamaru residential area and was the result of a neighbour spraying a hedge with Roundup Creosote Dip. Upon investigation it was later discovered that the complainant had been advised in advance that the spraying would take place, but he had forgotten. No symptoms were reported. The second event occurred in November in Purakanui when a woman and her young child observed a helicopter spraying Roundup overhead. The complainants concern was for the water supply she collected from her roof. No symptoms were reported and the complainant was advised to clean out the tank.

Numerous applications of unknown chemicals were perceived to have happened and affected a local resident in Springston (Canterbury). The implicated neighbouring bulb and flower grower was more than 300 metres away, and reported that they apply Roundup (glyphosate) twice each year using a hand-held applicator. There was no medical evidence of health effects and no specific date of exposure.

2004 reporting via DriftNet has further highlighted several issues with the surveillance system and this is discussed further in Section 6 of this report titled Future Developments.

#### **4.4. Detailed Auckland DHB Analysis (2004)**

The following section compares 2004 Auckland DHB data from the CSO, NZHIS, and Auckland Regional Public Health Services (ARPHS).

ARPHS receives poisoning notifications from Auckland Hospital only, thus representing Auckland DHB. However, these data are incomplete for children as the majority of these cases are seen at Starship Hospital and notification data from this hospital are not routinely received by ARPHS.

In 2004, 1324 notifications were received by ARPHS, a similar number to that notified in 2003 (1344). The 2004 rate for Auckland DHB was 360.0 per 100 000 population.

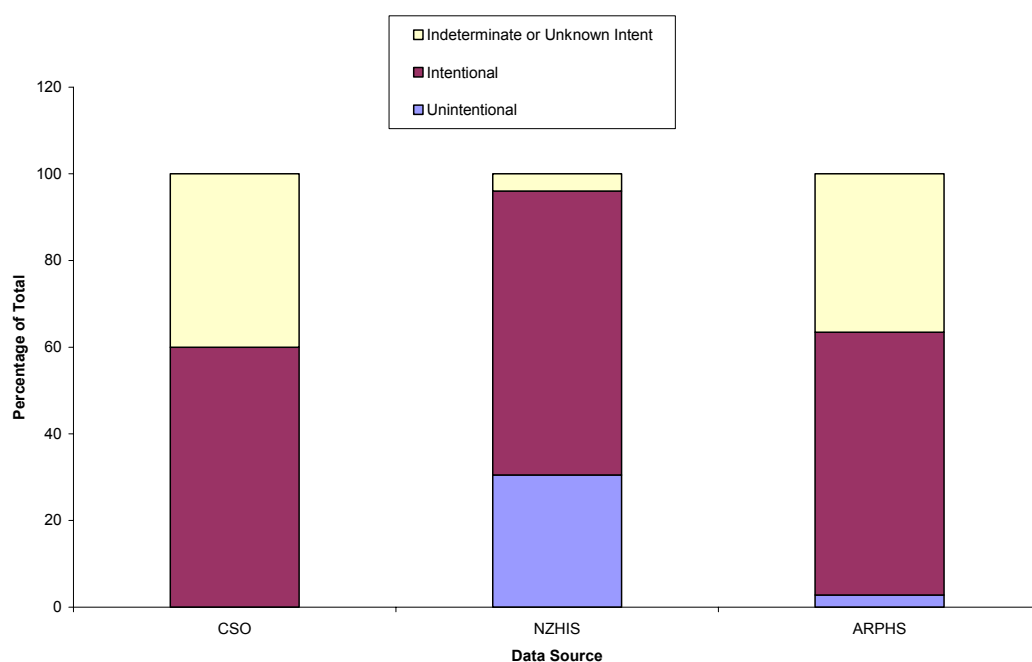
Unlike the NZHIS data, which only contains inpatient data, the ARPHS data also includes cases seen at Auckland Hospital emergency department. Hence a greater number of notifications were received by ARPHS than by NZHIS. The 2004 NZHIS dataset for Auckland DHB contains 705 cases, a rate of 191.7 per 100 000 population. This is slightly above the national NZHIS poisoning hospitalisation rate of 184.5 per 100 000 population, and the seventh highest by DHB nationally. In 2003, Auckland DHB was ranked third, with a rate of 217.0 per 100 000 population (798 cases).

There have been 10 deaths filed at the CSO to date for Auckland DHB in 2004, the associated rate of 2.7 per 100 000 population below the national CSO rate of 3.3 per 100 000 population. There were also 10 deaths filed at the CSO at the equivalent time

last year. To date for 2003, there are now 20 deaths filed at the CSO for Auckland DHB.

In agreement with the 2004 national trends and that observed in 2003, the majority of cases across all three Auckland DHB datasets were intentional (Figure 7, Appendix Table 11). However 30.5% of the NZHIS cases were deemed unintentional compared to only 2.8% of the ARPHS cases. Note that intent for ARPHS data are determined by the PHS staff and is based on exposure as opposed to outcome. Cases involving alcohol are classed as intentional or indeterminate.

**Figure 7: Percentage of Auckland DHB poisonings by intent for each data source, 2004.**



As with the national data, the highest Auckland DHB age specific rate for NZHIS hospitalisations was amongst 15-24 year olds (309.6 per 100 000 population, 174 cases) (Appendix Table 12). This age group also had the highest age specific rate for the ARPHS data. At 841.6 per 100 000 population it was almost twice the next highest rate of 429.6 per 100 000 population amongst those aged 25-44 years. However, for both datasets, the actual case numbers were highest overall in this later age bracket (300 for NZHIS and 544 for ARPHS). These trends are similar to those observed in 2003 for NZHIS and ARPHS.

While the ARPHS data does not include child notifications, the 2004 Auckland DHB NZHIS rate for those aged less than five years (170.6 per 100 000 population, 43 cases) was less than the national rate (225.3 per 100 000 population), and that observed in Auckland DHB in 2003 (230.0 per 100 000 population, 58 cases).

In contrast to the national 2004 data, the highest Auckland DHB age specific rate for CSO deaths was for the 65+ years age group (5.3 per 100 000 population, 2 cases). In

2003, the highest rate was amongst those aged 25-44. For both years, this later age group had the highest number of actual cases (four in 2004 and six in 2003).

When analysed by sex, the Auckland NZHIS and CSO data followed the national trends with the majority of the hospitalisations being female but the majority of the deaths being male (Appendix Table 13). In contrast, as in 2003, the ARPHS notification data were fairly evenly split by sex.

While ethnicity trends for the Auckland DHB CSO data follow those observed nationally, with the highest rate being for Europeans followed by Maori, the NZHIS data for Auckland DHB differs from the national observation in that Maori have a higher rate than Europeans (278.0 versus 222.3 per 100 000 population) (Appendix Table 14). Amongst the ARPHS data the rate for Europeans is higher than that for Maori. In 2003, Maori had the highest rate with both the NZHIS and ARPHS data.

The primary agent in six of the ten deaths for Auckland DHB in 2004 were classed as therapeutics, although no single substance dominated (Appendix Tables 15 & 16).

Fifty percent of the substances involved in the ARPHS notifications were classed as chemicals/drugs of abuse, while 43.2% were therapeutics (Appendix Table 15). This observation was also seen in 2003. By far the single most common substance involved with the notifications was ethanol; 791 instances (Appendix Table 16). It was both the most common substance involved in the intentional and indeterminate intent notifications. However, of the 55 substances involved in the unintentional deaths, xylol (a solvent) was the most common (6 notifications). Paracetamol was the second most common substance, both overall and amongst the intentional notifications. While the notifications involving ethanol were fairly evenly split by sex, 77.7% of the paracetamol notifications were female.

Similarly to the national findings and that observed in 2003, 33.7% of the ICD 10 codes assigned to NZHIS hospitalisations in 2004 for Auckland DHB related to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified (Appendix Table 15).

#### **4.5. Detailed West Coast DHB Analysis (2004)**

The following section presents 2004 data for West Coast DHB from the CSO, NZHIS, and West Coast PHU. There were 64 NZHIS poisoning hospitalisations from West Coast DHB in 2004, the corresponding rate of 211.5 per 100 000 population the third highest nationally (Appendix Table 5). This is a decrease from the rate observed in 2003 (333.7 per 100 000 population, 101 cases), which was the highest nationally.

The WCPHU only received 35 notifications from Grey Hospital relating to chemical injury in 2004, just over half (54.7%) the number of hospitalisations reported in the NZHIS dataset for West Coast, indicating that not all hospitalisations are being notified to the PHU. The same finding was observed in 2003. The corresponding 2004 rate for the PHU notifications was 115.6 per 100 000 population. As observed with the NZHIS rate for West Coast, this is less than the 2003 rate; 155.3 per 100 000 population (47 notifications).



To date for 2004, there have been four deaths for West Coast filed at the CSO, giving it the highest rate by DHB. This finding follows that observed in 2001 and 2002, although the rate for West Coast in 2003 was one of the lowest nationally as only one death has so far been reported.

Over three quarters (77.1%, 27 cases) of the 2004 WCPHU notifications were classed as overdoses, the remaining were ingestion (5) and one each of burn, injection and "other". Sixty three percent of the NZHIS hospitalisations were deemed intentional (Appendix Table 17). These findings are similar to that observed in 2003, for both data sets. All of the deaths for 2004 were classed as intentional.

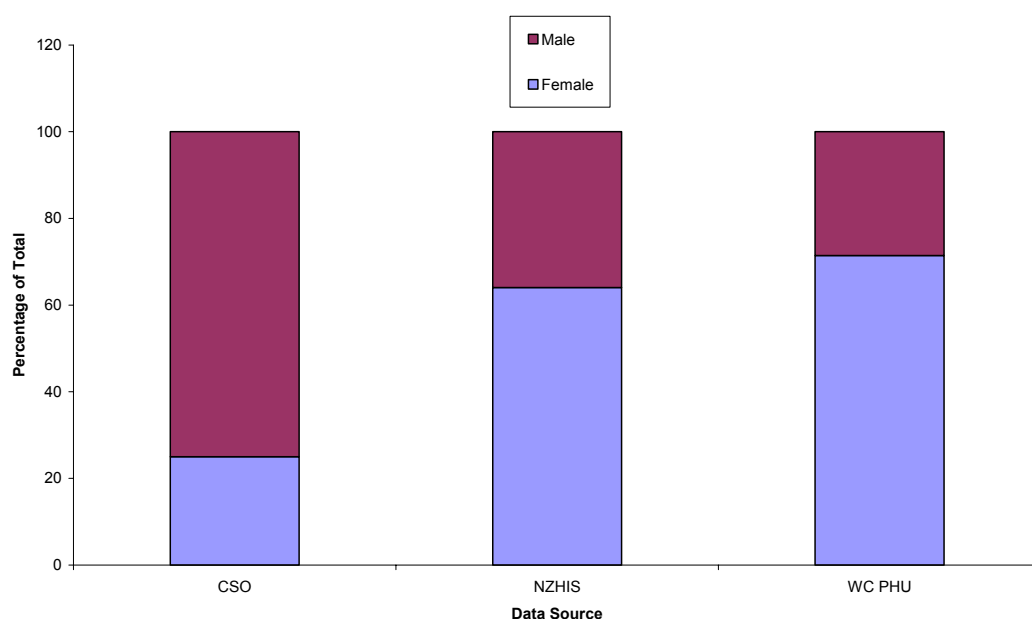
As seen with the national data, the highest age specific rate for the West Coast CSO data was amongst those aged 45-64 years, although those aged over 65 years followed closely (note only small numbers are involved).

The highest age specific rate for the West Coast NZHIS data was for those aged 25-44 years (356.0 per 100 000 population, 31 cases), followed by those aged 15-24 years (290.4 per 100 000 population, 9 cases), a reverse of the order seen at the national level. There were four NZHIS cases aged less than five years, a notable decrease from the 12 in this age group in 2003.

There were two PHU notifications involving children aged 0-4 years. Again this is a decrease from 2003 where there were eight notifications in the WCPHU dataset for this age group. In 2004, the greatest number of cases were aged 25-44 years (16 cases), the corresponding rate of 183.7 per 100 000 population the second highest age specific rate behind that for those aged 15-24 years (193.6 per 100 000 population, 6 notifications). In 2003, the highest age specific rate was for cases aged 0-4 years followed by those aged 15-24 years.

CSO and NZHIS data for West Coast by sex followed the national trends and those observed in 2003 with males dominating the deaths and females dominating the hospitalisations (Appendix Table 19, Figure 8). As in 2003, the PHU data was distributed similarly by sex to the NZHIS data. In 2004, this was particularly evident amongst PHU cases aged 25-44 where 14 of the 16 cases were female. However, males outnumbered females 5:1 in the 15-24 age group.

**Figure 8: Percentage of West Coast DHB poisonings by sex for each data source, 2004.**



Three of the four West Coast CSO deaths were of European ethnicity, the remaining of Maori ethnicity (Appendix Table 20). The highest ethnicity specific group for both the NZHIS and WCPHU data was for Europeans, complying with the national trends and those in 2003.

Two of the four CSO deaths were primarily a result of carbon monoxide poisoning, the other two deaths were attributed to therapeutic agents (Appendix Tables 21 & 22). Over two thirds (69.6%) of the PHU notifications were ascribed to therapeutic substances although the single most common substance was ethanol (involved in nine cases). This was followed by paracetamol derivatives (panadol and pamol) (8 cases). Two of these cases were the two children aged less than five years. Five notifications involved zopiclone.

All of the zopiclone notifications were female, as were six of the eight (75%) paracetamol derivatives and six of the nine (66.7%) ethanol notifications. Just under half of the ethanol notifications were aged between 14 and 19 years (44.4%).

As with the national and Auckland DHB NZHIS data, antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified were the most commonly assigned classification for the West Coast NZHIS hospitalisations (29.8%) (Appendix Table 21).

#### **4.6. Specific Analyses**

Inclusion of several data sets in a comprehensive surveillance system enables comparison of data relating to specific public health issues and the resulting picture is

more representative of the associated burden of disease than would have been obtained when examining one data set alone. This has been illustrated in the following examples: poisoning in children aged less than five years and poisonings involving paracetamol, and ethanol.

#### **4.6.1. Poisonings in Children Aged Less Than 5 Years**

Details on cases aged less than five years are presented in Appendix Table 23. CSO and ARPMS data are excluded from this analysis; CSO because there have been no cases for this age group reported to date and ARPMS because notifications from Starship are not received.

In 2004, there were 610 NZHIS hospitalisations involving children under five years of age (8.8%), a decrease from the 689 or 9.5% in 2003. Only two of the 35 WCPHU notifications in 2004 pertained to children of this age group (5.7%) and both involved paracetamol. This is a notable decrease from the eight (17.0%) child notifications from WCPHU in 2003.

As expected, none of the NZHIS hospitalisations were intentional. There were slightly more males than females. Just under two thirds (63.9%) were of European ethnicity and 22.6% were of Maori ethnicity.

DHBs where poisonings in children aged less than five years attributed to 15% or more of the total for the respective DHB included Bay of Plenty (16.9%), Wairarapa (16.5%), Tairāwhiti (15.4%) and South Canterbury (15.2%).

#### **4.6.2. Paracetamol Poisonings**

2004 summary demographic data on paracetamol poisonings are presented in Appendix Table 24. To date there has only been one death primarily attributed to paracetamol. However, ARPMS received 139 notifications involving the substance, and WCPHU received eight. Thus paracetamol was the second most common substance for both PHUs.

In 2003 there was also one CSO death from paracetamol at the time of reporting, and eight notifications from WCPHU. The number of ARPMS notifications was also virtually the same in 2003 and 2004 (135 versus 139).

As in 2003 the most notable observation is that about three quarters of the notifications were female (77.7% for ARPMS and 75.0% for WCPHU).

Across both PHUs, almost three quarters (71.4%) of the notifications were of European ethnicity. The highest proportion of the ARPMS notifications involving paracetamol were aged between 25-44 years (44.6%) followed by 15-24 years (36.0%).

#### **4.6.3. Ethanol Poisonings**

To date for 2004 there have been 11 deaths from acute ethanol poisoning (8.7% of total deaths) (Appendix Table 25). ARPMS received 791 ethanol notifications (37.3%

of total) and WCPHU received 9 (19.6% of total). Ethanol was the most common substance involved with both the ARPHS and WCPHU notifications. It was the second most prevalent primary substance associated with the deaths (behind carbon monoxide).

By comparison there were eight deaths at the equivalent time in 2003, 746 notifications from ARPHS and four from WCPHU.

The majority of the deaths in 2004 were of indeterminate intent and five of the 11 occurred in adults aged 45-64 years. The youngest death was aged 17 years. Only three of the deaths were female. Nearly half of the deaths were of Maori ethnicity (5/11), the remainder were European. DHBs where ethanol deaths accounted for a fifth or more of the total deaths for that DHB included Taranaki (2/7 deaths), Bay of Plenty (2/8) and Capital and Coast (1/5).

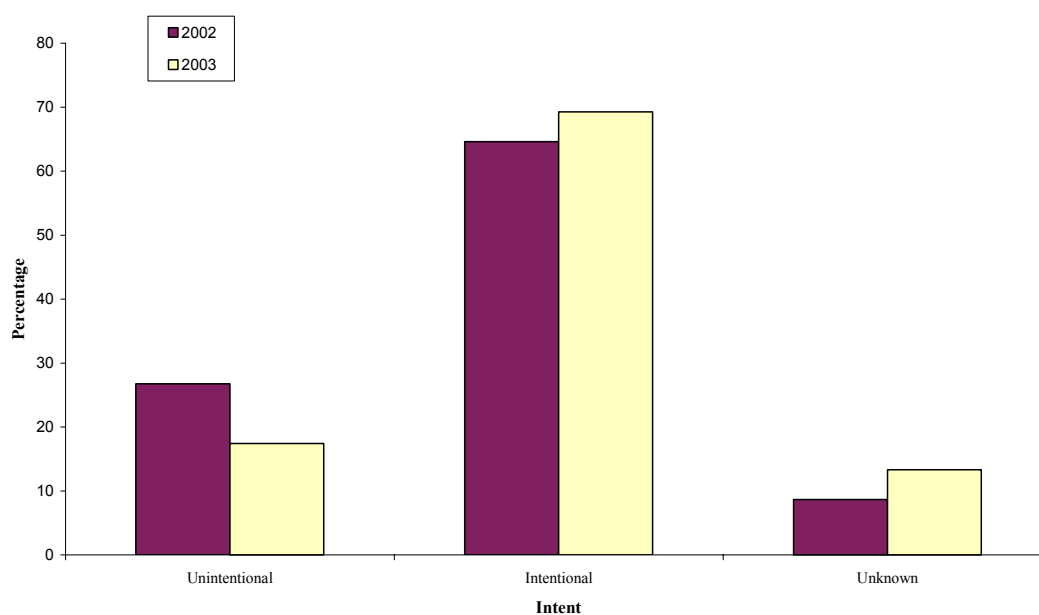
For both PHUs in 2004, the majority of notifications were aged 25-44 years, followed by those aged 15-24 years. However there were 61 notifications from ARPHS involving teenagers aged less than 18 years and three from WCPHU [aged 14 (n=1) and 15 (n=2) years]. ARPHS received slightly more notifications involving males than females but two thirds (66.7%) of the WCPHU notifications were female. Two thirds of the notifications from both PHUs were of European ethnicity (66.1% for ARPHS and 66.7% for WCPHU).

## 5. CORONIAL SERVICE OFFICE DATA FOR 2002 AND 2003

The number of deaths attributable to chemical injuries in New Zealand for 2002 and 2003 as of 30 April 2005 was 243 and 218 respectively. By comparison, there have been 239 deaths filed for the year 2001. The corresponding annual rate for 2002 was 6.5 per 100 000 population and for 2003, 5.8 per 100 000 populations.

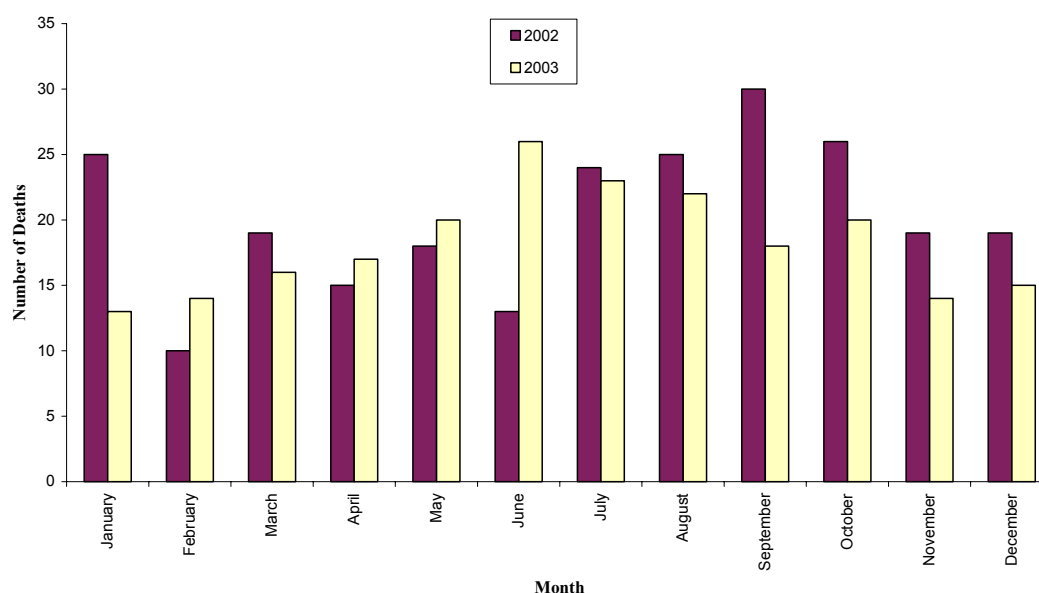
The breakdown of the deaths by intent is similar for both years, with the majority of deaths being intentional (64.6% in 2002, and 69.3% in 2003) (Figure 9).

**Figure 9: Chemical injury deaths by intent, 2002 and 2003.**



Fifty-six percent of the 2002 deaths and 59% of the 2003 deaths occurred over the winter and spring months (May to October) (Figure 10).

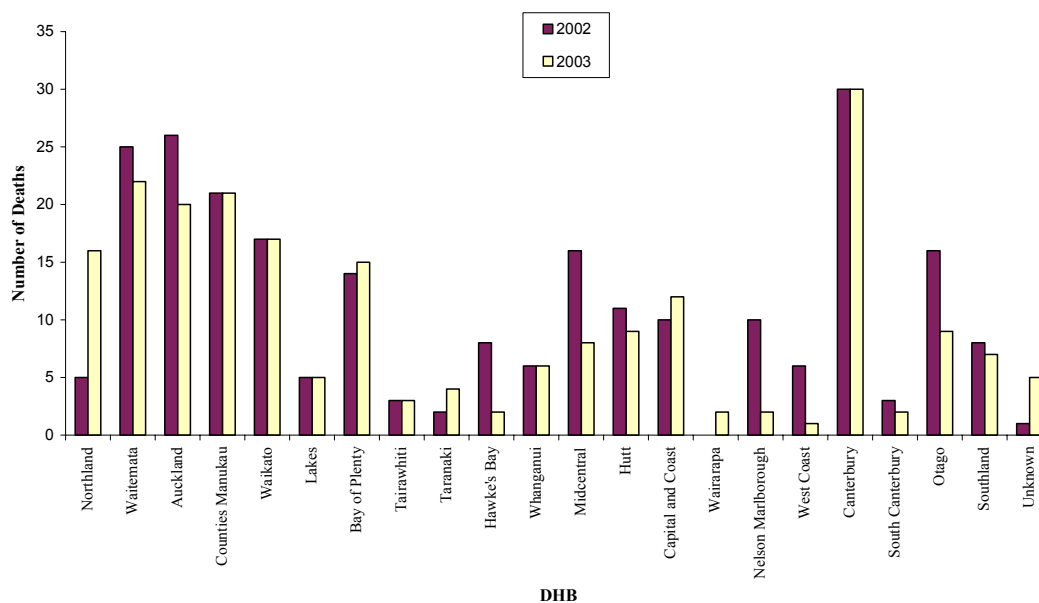
**Figure 10: Chemical injury deaths by month, 2002 and 2003.**



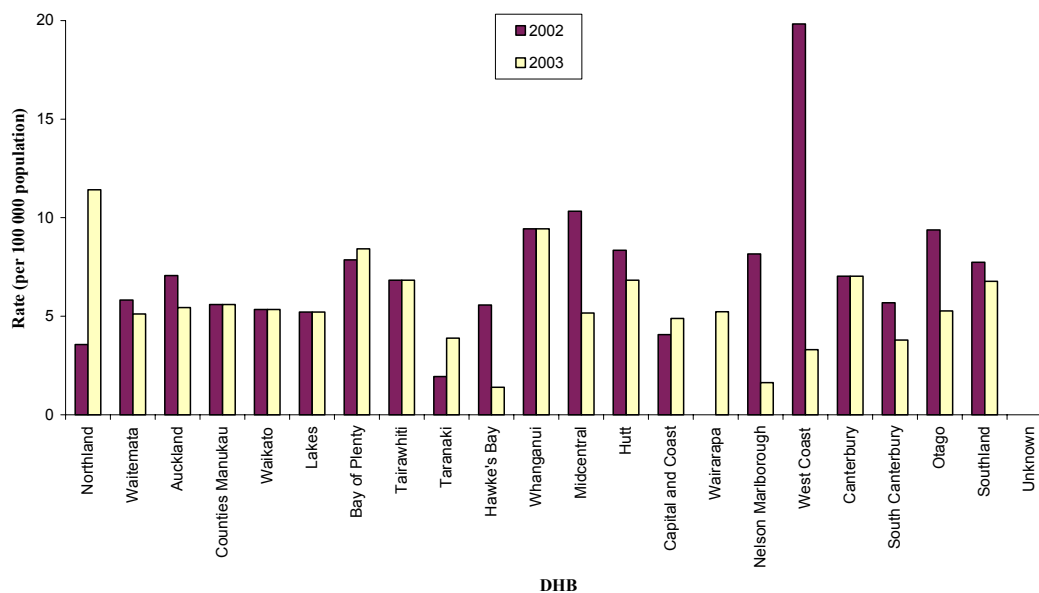
Figures 11 & 12 and Appendix Table 26 present chemical injury death data by DHB. For both years the greatest number of deaths occurred in Canterbury DHB (30 in each year), followed by Waitemata (25 in 2002 and 22 in 2003) and Auckland (26 in 2002 and 20 in 2003). The highest rate in 2002 was from West Coast DHB (19.8 per 100 000 population, 6 deaths), followed by MidCentral (10.3 per 100 000 population, 16 deaths). In 2003 the highest rate occurred in Northland DHB (11.4 per 100 000 population, 16 cases). The 2003 rate for West Coast was 3.3 per 100 000 population (1 death) while the 2002 rate for Northland was 3.6 per 100 000 population (5 deaths).

DHBs which had a decrease of five or more deaths between 2002 and 2003 included MidCentral (8 more in 2002), Nelson Marlborough (8), Otago (7), Auckland (6), Hawkes Bay (6) and West Coast (5). Only Northland had a notable increase in 2003 with 11 more deaths than it had in 2002.

**Figure 11: Number of chemical injury deaths by DHB, 2002 and 2003.**



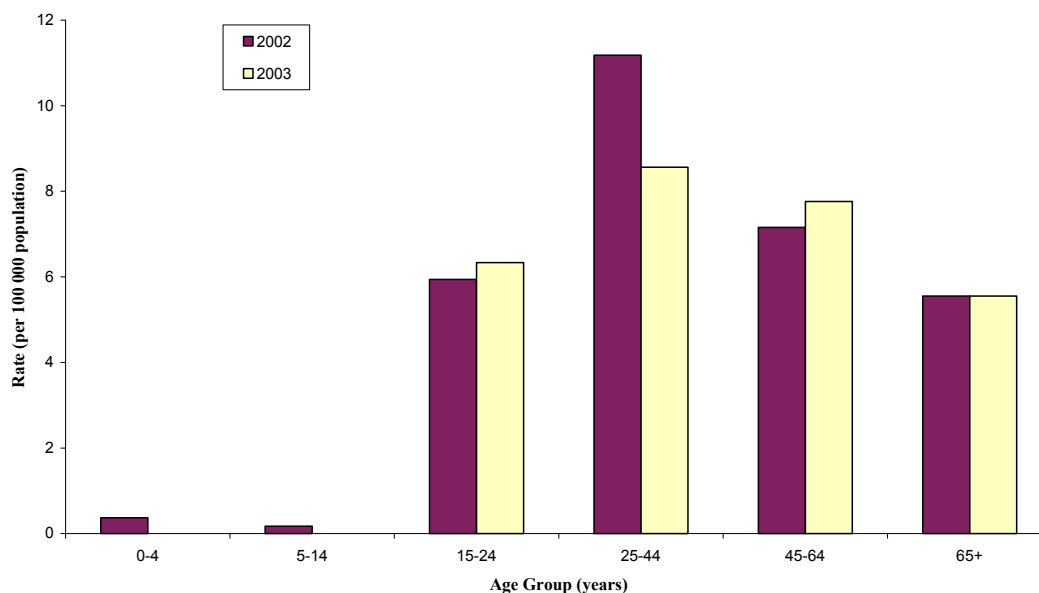
**Figure 12: Chemical injury death rates by DHB, 2002 and 2003.**



Although for both years the highest age specific rate occurred in the 25-44 year age group, the 2002 rate for this age group was notably higher; 11.2 per 100 000 population (124 deaths) compared to 8.6 per 100 000 population (95 deaths) in 2003. This difference can be attributed to an increased in the number of unintentional deaths in this age group in 2002. Age specific rates across the other age groups were comparable. (Figures 13 & 14 and Appendix Table 27).

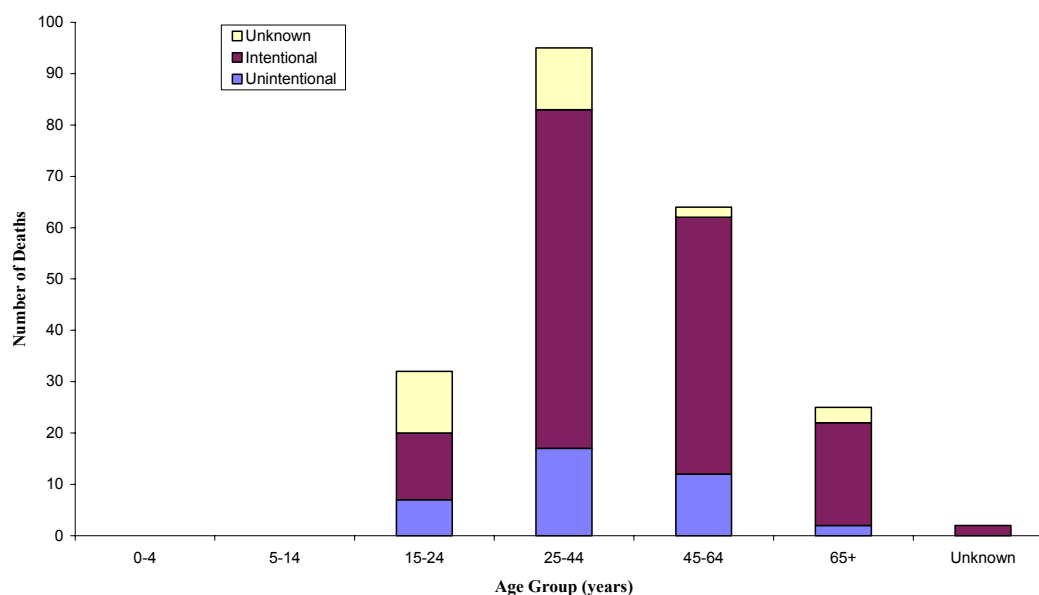
There were no deaths aged less than five years or 5-14 years in 2003 but one in each age group in 2002. The less than five-year-old case was an unintentional death due to a cooking oil fire, and the 5-14 year old case was from cerebral anoxia secondary to inhalation of solvents, namely butane and propane and, to a lesser extent isobutene, with unknown intent.

**Figure 13: Chemical injury death rates by age group, 2002 and 2003.**





**Figure 14: Chemical injury deaths by age group and intent, 2003.**

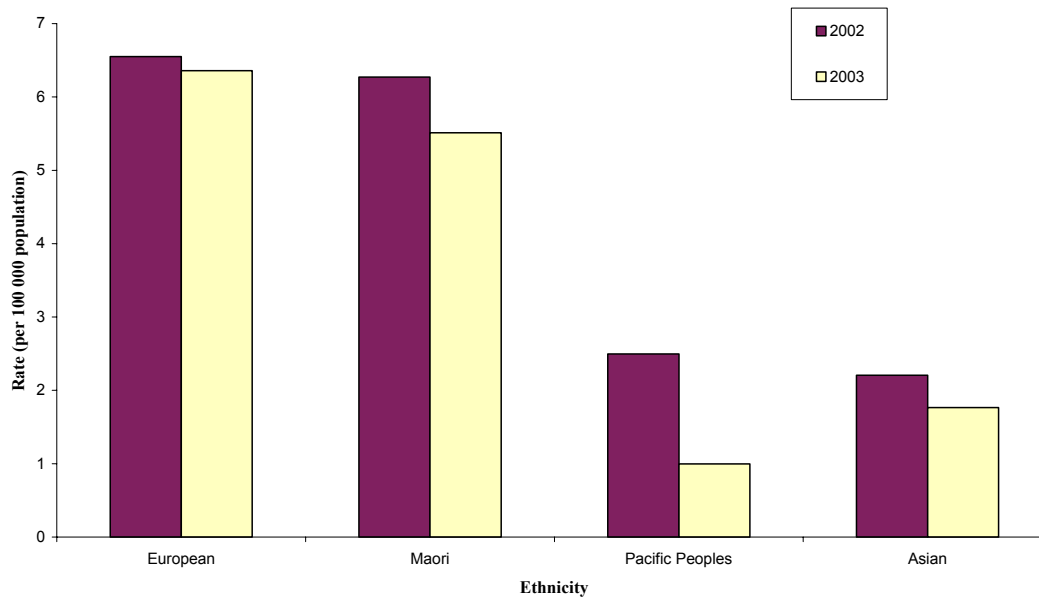


About two thirds (66.2%) of the deaths for both years were male (Appendix Table 28).

For both years, cases were distributed similarly by ethnicity with an average of 73.1% of cases of European ethnicity, and 13.4% of Maori ethnicity (Appendix Table 29, Figure 15). There were only seven deaths of Pacific Peoples ethnicity and nine of Asian ethnicity for both years combined.

Nearly half (48.4%) of the Maori deaths and 57.1% of the Pacific Peoples deaths were deemed unintentional compared to only 16.9% of the European deaths.

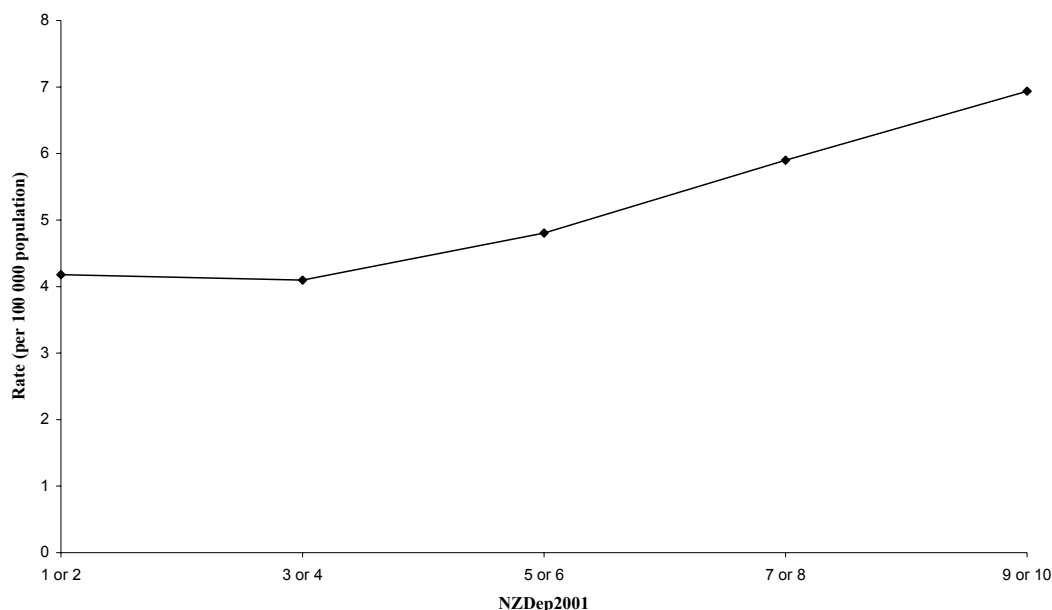
**Figure 15: Chemical injury death rates by ethnicity, 2002 and 2003.**



The following graph (Figure 16) illustrates the association between rates of chemical injury deaths and deprivation in New Zealand. The measure of deprivation is based on the NZDep2001 decile scale, with 1 representing the least deprived and 10 representing the most deprived score<sup>6</sup>. Analysis is based on the address where the chemical exposure occurred as opposed to the home address of the case, although for the majority of cases they are the same. Cases are included only where the address was geocoded to at least an accuracy of “Street”.

Combined results for 2002 and 2003 show that rates were found to increase with increasing deprivation.

**Figure 16: Chemical injury death rates by NZDep2001, 2002 and 2003 deaths combined.**

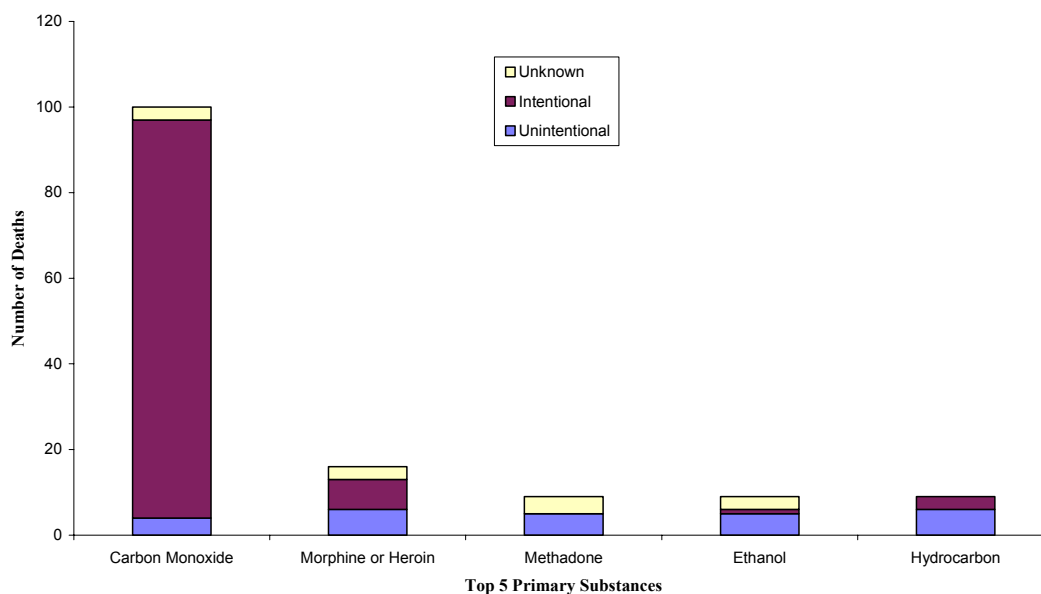


Substance data were similar for both years. Forty-four different primary cause chemical substances were associated with the 2002 deaths, 37 with the 2003 deaths. Just over half (53.6%) of the deaths involved more than one substance.

Combined results for both years show that just under half (46.4%) of the primary substances were classed as “Household/Domestic Chemicals”. The next most prominent substance class was “Therapeutics” (30.2%) followed by “Chemicals/Drugs of Abuse” (19.3%) (Appendix Table 30).

The main contributor to the “Household/Domestic Chemicals” class was carbon monoxide. Carbon monoxide was the primary substance involved in 44.0% of the total deaths (203/461). In particular, it was attributed to 62.7% of the intentional deaths (Figure 17). The other leading primary substances (both years combined) were morphine or heroin (35), methadone (26), ethanol (20), hydrocarbon (petrol, butane, LPG etc) (19) and amitriptyline (17) (Appendix Table 31). Methadone (20 deaths), morphine or heroin (20) and ethanol (17) were the leading causes of the unintentional deaths (Appendix Table 31). Of note in 2003 is that there were six unintentional deaths attributed to hydrocarbons and only one in 2002.

**Figure 17: Top 5 Primary substances involved in chemical injury deaths by intent, 2003.**



Primary substances classed as “Agricultural” accounted for just 2.2% of deaths. However, 6 of the 10 agricultural substances were cyanide. These were from the following DHB’s; Capital and Coast (2), West Coast (2), Lakes and Bay of Plenty.

Other primary substances associated with the deaths for these two years which are specifically regulated by the HSNO Act included hydrocarbons (21), methylated spirits (3) and one each of boric acid, bendicarb, glyphosate, kerosene, mevinphos and paraquat (Appendix Table 32).

## 6. FUTURE DEVELOPMENTS/RECOMMENDATIONS

This section focuses on the future direction of CISS. As many of the result trends in 2004 are similar to those observed in 2003, please refer to the 2003 report<sup>4</sup> for discussion of national trends across datasets and comparison of New Zealand's mortality figures with international results.

This report has presented comprehensive chemical injury surveillance data for the year 2004. This data comprises of national mortality data (sourced from the CSO), national inpatient hospitalisation data (sourced from NZHIS), national spraydrift data (sourced from the DriftNet surveillance system) and local emergency department and inpatient hospitalisation data for Auckland and West Coast DHBs. Such a comprehensive assemblage of poisoning data was first presented for 2003. Thus in this report comparisons across years have for the first time been undertaken.

Although National Poison Centre (NPC) data and local Hawkes Bay data which were available for 2003 were not supplied for 2004, the system has recently extended to include local data representing four other DHBs (Capital and Coast, Hutt, Wairarapa and Southland). However, these data were not received in time for inclusion in this report. During the next financial year ESR hopes to work with the NPC to develop a medium term strategy for CISS and data sharing.

However, extending the system to incorporate emergency department data from all of the DHBs will not be obtained without a significant increase in resources. The contributing DHB are well representative of the country, both on a geographic and population basis. Four of the six are based in the North Island, two of which represent large metropolitan centres. On a population basis Auckland DHB is ranked fourth and Capital and Coast is ranked sixth. The other DHBs represent smaller provincial and rural areas. West Coast and Wairarapa have the smallest populations of all the DHBs and Southland is ranked 14/21. This cross-section of DHBs provides a useful sentinel surveillance system, which incorporated with the national datasets, provides useful analysis which will aid health professional involved in implementing policies and interventions.

DriftNet data was incorporated into CISS for the first time in 2004 although it has been reported on separately since 1998. Highlighted in 2004 is the variation between PHU as to the criteria an incident must meet to be reported via Driftnet. For example, some PHU report spraydrift events with no reports of adverse health effects whereas others are unsure if adverse health events need to have occurred for the incident to be reported on DriftNet. Clarification of the reporting criteria with PHUs needs to take place. In addition the feasibility of adapting DriftNet for chronic poisonings will need to be discussed further with the MoH.

It is therefore recommend that the 2005/2006 CISS project resources are focused on better utilization of the existing datasets rather than active expansion of the system while a medium term strategy is being developed with John Fountain of the NPC. Needless to say, if other agencies or PHUs are in a position to provide data, this would be readily and appreciatively encompassed into CISS.

## APPENDIX 1

**Table 5: National CSO, NZHIS, PHU and DriftNet data by DHB (2004)**

DHB	CSO (deaths to date)		NZHIS (admitted patients)		PHU Notifications		DriftNet Complaints
	No.	Rate <sup>1</sup>	No.	Rate <sup>1</sup>	No.	Rate <sup>1</sup>	No.
Northland	9	6.4	256	182.7			0
Waitemata	8	1.9	885	205.9			3
Auckland	10	2.7	705	191.7	1324	360.0	
Counties Manukau	9	2.4	689	183.5			
Waikato	10	3.1	561	176.6			0
Lakes	0	0.0	200	208.4			0
Bay of Plenty	8	4.5	255	143.1			3
Tairāwhiti	0	0.0	78	177.5			0
Taranaki	7	6.8	146	141.7			0
Hawke's Bay	3	2.1	146	101.7			0
Whanganui	4	6.3	110	172.9			0
MidCentral	8	5.2	220	142.0			0
Hutt	3	2.3	231	175.2			0
Capital and Coast	5	2.0	195	79.3			0
Wairarapa	4	10.5	79	206.8			0
Nelson							0
Marlborough	2	1.6	209	170.6			0
West Coast	4	13.2	64	211.5	35	115.6	0
Canterbury	12	2.8	1169	273.7			1
South Canterbury	3	5.7	92	174.3			0
Otago	9	5.3	427	250.1			2
Southland	4	3.9	151	146.1			1
Area Outside DHB			28				
Unknown/Missing	2		0				
<b>TOTAL</b>	<b>124</b>	<b>3.3</b>	<b>6896</b>	<b>184.5</b>			<b>10</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population

**Table 6: National CSO and NZHIS data by Intent (2004)**

Intent	CSO (deaths to date)		NZHIS (admitted patients)	
	No.	%	No.	%
Intentional	76	61.3	4381	63.5
Unintentional	18	14.5	2163	31.4
Indeterminate or Unk	30	24.2	352	5.1
<b>TOTAL</b>	<b>124</b>	<b>100</b>	<b>6896</b>	<b>100</b>

**Table 7: National CSO and NZHIS data by Age Group (2004)**

Age Group	CSO (deaths to date)			NZHIS (admitted patients)		
	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%
0-4	0	0.0	0.0	610	225.3	8.8
5-14	1	0.2	0.8	289	50.1	4.2
15-24	18	3.6	14.5	1706	337.8	24.7
25-44	50	4.5	40.3	2619	236.1	38.0
45-64	39	4.7	31.5	1211	146.8	17.6
65+	15	3.3	12.1	461	102.3	6.7
Unknown	1		0.8	0		0.0
<b>TOTAL</b>	<b>124</b>	<b>3.3</b>	<b>100</b>	<b>6896</b>	<b>184.5</b>	<b>100</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

**Table 8: National CSO and NZHIS data by Sex (2004)**

Sex	CSO (deaths to date)			NZHIS (admitted patients)		
	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%
Female	36	1.9	29.0	4421	230.9	64.1
Male	88	4.8	71.0	2475	135.8	35.9
Unknown	0		0.0	0		0.0
<b>TOTAL</b>	<b>124</b>	<b>3.3</b>	<b>100</b>	<b>6896</b>	<b>184.5</b>	<b>100</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

**Table 9: National CSO and NZHIS data by Ethnicity (2004)**

Ethnicity	CSO (deaths to date)			NZHIS (admitted patients)		
	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%
European	92	3.5	74.2	5061	193.9	73.4
Maori	16	3.0	12.9	980	186.2	14.2
Pacific Peoples	0	0.0	0.0	263	131.3	3.8
Asian	1	0.4	0.8	244	107.7	3.5
Other	1		0.81	240		3.5
Unknown	14		11.3	108		1.6
<b>TOTAL</b>	<b>124</b>	<b>3.3</b>	<b>100</b>	<b>6896</b>	<b>184.5</b>	<b>100</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

**Table 10: National CSO and NZHIS data by Substance Class (2004)**

CSO (deaths to date)			NZHIS (admitted patients)		
Substance Class	No.	%	Substance Class <sup>1</sup>	No.	%
Household/Domestic Chemicals	59	47.6	X41 + X61 + Y11	3300	33.6
Therapeutics	40	31.5	X40 + X60 + Y10	1922	19.5
Chemical/Drugs of Abuse	20	15.7	X44 + X64 + Y14	1477	15.0
Unknown/Missing	3	2.4	X45 + X65 + Y15	1211	12.3
Agrichemicals	2	1.6	X42 + X62 + Y12	750	7.6
Herbal Substance/Dietary Supplement	0	0.0	X49 + X69 + Y19	534	5.4
<b>TOTAL</b>	<b>124</b>	<b>100</b>	X43 + X63 + Y13	247	2.5
			X47 + X67 + Y17	215	2.2
			X46 + X66 + Y16	95	1.0
			X48 + X68 + Y18	82	0.8
			<b>TOTAL</b>	<b>9833</b>	<b>100</b>

<sup>1</sup>Refer to Table 1 for description of each code. Numbers total to greater than 6896 because multiple E codes can be assigned to each hospitalisation.

**Table 11: Auckland DHB data from CSO, NZHIS, and ARPHS by Intent (2004)**

Intent	CSO (deaths to date)		NZHIS (admitted patients)		ARPHS Notifications	
	No.	%	No.	%	No.	%
Intentional	6	60.0	462	65.5	803	60.6
Unintentional	0	0.0	215	30.5	37	2.8
Indeterminate or Unk	4	40.0	28	4.0	484	36.6
<b>TOTAL</b>	<b>10</b>	<b>100</b>	<b>705</b>	<b>100</b>	<b>1324</b>	<b>360.0</b>

**Table 12: Auckland DHB data from CSO, NZHIS, and ARPHS by Age Group (2004)**

Age Group	CSO (deaths to date)			NZHIS (admitted patients)			ARPHS Notifications		
	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%
0-4	0	0.0	0.0	43	170.6	6.1	0		0.0
5-14	0	0.0	0.0	19	40.2	2.7	1		0.1
15-24	1	1.8	10.0	174	309.6	24.7	473	841.6	35.7
25-44	4	3.2	40.0	300	236.9	42.6	544	429.6	41.1
45-64	3	4.0	30.0	120	161.0	17.0	230	308.6	17.4
65+	2	5.3	20.0	49	129.2	7.0	70	184.5	5.3
Unknown	0		0.0	0		0.0	6		0.5
<b>TOTAL</b>	<b>10</b>	<b>2.7</b>	<b>100</b>	<b>705</b>	<b>191.7</b>	<b>100</b>	<b>1324</b>	<b>360.0</b>	<b>100</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

**Table 13: Auckland DHB data from CSO, NZHIS, and ARPHS by Sex (2004)**

Sex	CSO (deaths to date)			NZHIS (admitted patients)			ARPHS Notifications		
	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%
Female	3	1.6	30.0	417	219.8	59.1	646	340.4	48.8
Male	7	3.9	70.0	288	161.8	40.9	675	379.2	51.0
Unknown	0		0.0	0		0.0	3		0.2
<b>TOTAL</b>	<b>10</b>	<b>2.7</b>	<b>100</b>	<b>705</b>	<b>191.7</b>	<b>100</b>	<b>1324</b>	<b>360.0</b>	<b>100</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

**Table 14: Auckland DHB data from CSO, NZHIS, and ARPHS by Ethnicity (2004)**

Ethnicity	CSO (deaths to date)			NZHIS (admitted patients)			ARPHS Notifications		
	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%
European	9	4.4	90.0	459	222.3	65.1	885	428.7	66.8
Maori	1	3.4	10.0	81	278.0	11.5	112	384.4	8.5
Pacific Peoples	0	0.0	0.0	64	146.7	9.1	79	181.0	6.0
Asian	0	0.0	0.0	65	102.8	9.2	16	25.3	1.2
Other	0		0.0	32		4.5	159		12.0
Unknown	0		0.0	4		0.6	73		5.5
<b>TOTAL</b>	<b>10</b>	<b>2.7</b>	<b>100</b>	<b>705</b>	<b>191.7</b>	<b>100</b>	<b>1324</b>	<b>360.0</b>	<b>100</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.



**Table 15: Auckland DHB data from CSO, NZHIS, and ARPHS by Substance Class (2004)**

CSO (deaths to date)			NZHIS (admitted patients)			ARPHS Notifications		
Substance Class	No.	%	Substance Class <sup>1</sup>	No.	%	Substance Class	No.	%
Therapeutics	6	60.0	X41 + X61 + Y11	347	33.7	Chemical/Drugs of abuse	1055	49.8
Chemical/Drugs of Abuse	2	20.0	X40 + X60 + Y10	207	20.1	Therapeutic	916	43.2
Household/Domestic Chemicals	2	20.0	X45 + X65 + Y15	167	16.2	Industrial	65	3.1
<b>TOTAL</b>	<b>10</b>	<b>100</b>	X44 + X64 + Y14	139	13.5	Household	34	1.6
			X42 + X62 + Y12	59	5.7	Unknown	21	1.0
			X49 + X69 + Y19	55	5.3	Herbal substance/dietary supplement	17	0.8
			X43 + X63 + Y13	20	1.9	Agricultural	8	0.4
			X47 + X67 + Y17	16	1.6	Garden plant	2	0.1
			X46 + X66 + Y16	11	1.1	<b>TOTAL</b>	<b>2118</b>	<b>100</b>
			X48 + X68 + Y18	10	1.0			
			<b>TOTAL</b>	<b>1031</b>	<b>100</b>			

<sup>1</sup> Refer to Table 1 for description of each code. Numbers total to greater than 705 because multiple E codes can be assigned to each hospitalisation.

**Table 16: Auckland DHB data from CSO and ARPHS by Substance (2004)**

CSO (deaths to date)			ARPHS Notifications		
Primary Substances	No.	%	Substances (Top 10*)	No.	%
Carbon Monoxide	2	20.0	Ethanol	791	37.3
Ethanol	1	10.0	Paracetamol	139	6.6
Morphine or Heroin	1	10.0	Zopiclone	94	4.4
Clozapine	1	10.0	Gamma-hydroxybutyrate	54	2.5
Citalopram	1	10.0	Clonazepam	50	2.4
Doxepin	1	10.0	Ibuprofen	42	2.0
Fluoxetine	1	10.0	Methamphetamine	42	2.0
Phenobarbitone	1	10.0	Paroxetine	42	2.0
Felodipine	1	10.0	3,4-Methylenedioxymethamphetamine	40	1.9
<b>TOTAL</b>	<b>10</b>	<b>100</b>	Cannabis	39	1.8

\* Excludes unknowns

**Table 17: West Coast DHB data from CSO and NZHIS by Intent (2004)**

Intent	CSO (deaths to date)		NZHIS (Admitted patients)	
	No.	%	No.	%
Intentional	4	100	40	62.5
Unintentional	0	0.0	20	31.3
Indeterminate or Unk	0	0.0	4	6.3
<b>TOTAL</b>	<b>4</b>	<b>100</b>	<b>64</b>	<b>100</b>

**Table 18: West Coast DHB data from CSO, NZHIS and WCPHU by Age Group (2004)**

Age Group	CSO (deaths to date)			NZHIS (admitted patients)			PHU Notifications		
	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%
0-4	0	0.0	0.0	4	206.4	6.3	2	103.2	5.7
5-14	0	0.0	0.0	1	20.5	1.6	2	41.1	5.7
15-24	0	0.0	0.0	9	290.4	14.1	6	193.6	17.1
25-44	1	11.5	25.0	31	356.0	48.4	16	183.7	45.7
45-64	2	26.4	50.0	13	171.8	20.3	8	105.7	22.9
65+	1	24.5	25.0	6	147.1	9.4	1	24.5	2.9
Unknown	0		0.0	0		0.0	0		0.0
<b>TOTAL</b>	<b>4</b>	<b>13.2</b>	<b>100</b>	<b>64</b>	<b>211.5</b>	<b>100</b>	<b>35</b>	<b>115.6</b>	<b>100</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

**Table 19: West Coast DHB data from CSO, NZHIS and WCPHU by Sex (2004)**

Sex	CSO (deaths to date)			NZHIS (admitted patients)			PHU Notifications		
	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%
Female	1	6.7	25.0	41	273.0	64.1	25	166.4	71.4
Male	3	19.7	75.0	23	150.9	35.9	10	65.6	28.6
Unknown	0		0.0	0		0.0	0		0.0
<b>TOTAL</b>	<b>4</b>	<b>4.0</b>	<b>100</b>	<b>64</b>	<b>211.5</b>	<b>100</b>	<b>35</b>	<b>115.6</b>	<b>100</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

**Table 20: West Coast DHB data from CSO, NZHIS and WCPHU by Ethnicity (2004)**

Ethnicity	CSO (deaths to date)			NZHIS (admitted patients)			PHU Notifications		
	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%	No.	Rate <sup>1</sup>	%
European	3	11.5	75.0	60	229.5	93.8	26	99.5	74.3
Maori	1	39.4	25.0	3	118.2	4.7	2	78.8	5.7
Pacific Peoples	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Asian	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Other	0		0.0	1		1.6	0		0.0
Unknown	0		0.0	0		0.0	7		20.0
<b>TOTAL</b>	<b>4</b>	<b>13.2</b>	<b>100</b>	<b>64</b>	<b>211.5</b>	<b>100</b>	<b>35</b>	<b>115.6</b>	<b>100</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

**Table 21: West Coast data from CSO, NZHIS and WCPHU by Substance Class (2004)**

CSO (deaths to date)			NZHIS (admitted patients)			PHU Notifications		
Substance Class	No.	%	Substance Class <sup>1</sup>	No.	%	Substance Class	No.	%
Household/Domestic Chemicals	2	50.0	X41 + X61 + Y11	28	29.8	Therapeutic	32	69.6
Therapeutics	2	50.0	X40 + X60 + Y10	20	21.3	Chemicals/Drugs of Abuse	9	19.6
<b>TOTAL</b>	<b>4</b>	<b>100</b>	X45 + X65 + Y15	14	14.9	Unknown	2	4.3
			X44 + X64 + Y14	13	13.8	Agricultural	1	2.2
			X42 + X62 + Y12	8	8.5	Household/Domestic Chemicals	1	2.2
			X49 + X69 + Y19	7	7.4	Industrial	1	2.2
			X47 + X67 + Y17	3	3.2	<b>TOTAL</b>	<b>46</b>	<b>100</b>
			X48 + X68 + Y18	1	1.1			
			X43 + X63 + Y13	0	0.0			
			X46 + X66 + Y16	0	0.0			
			<b>TOTAL</b>	<b>94</b>	<b>100</b>			

<sup>1</sup> Refer to Table 1 for description of each code. Numbers total to greater than 64 because multiple E codes can be assigned to each hospitalisation.

**Table 22: West Coast DHB data from CSO and WCPHU by Substance (2004)**

CSO (deaths to date)			PHU Notifications		
Primary Substances	No.	%	Substances (Top 5*)	No.	%
Carbon Monoxide	2	50.0	Ethanol	9	19.6
Dothiepin	1	25.0	Paracetamol or derivatives	8	17.4
Orphenadrine	1	25.0	Zopiclone	5	10.9
<b>TOTAL</b>	<b>4</b>	<b>100</b>	Promethazine	3	6.5
			Dothiepin	2	4.3

\* Excludes unknowns

**Table 23: Summary Demographic Data from NZHIS and WCPHU for Poisonings in Children Aged Less Than 5 Years**

DEMOGRAPHICS	NZHIS National		WCPHU	
	No.	%	No.	%
Number of cases & % of total cases	610	8.8	2	5.7
Intent			Data not available	
Intentional	0	0.0		
Unintentional	605	99.2		
Indeterminate or Unknown	5	0.8		
Sex				
Male	342	56.1	1	50.0
Female	268	43.9	1	50.0
Ethnicity				
European	390	63.9	2	100
Maori	138	22.6	0	0.0
Pacific People	40	6.6	0	0.0
Asian	19	3.1	0	0.0
Other	18	3.0	0	0.0
Unknown	5	0.8	0	0.0
DHB			N/A	
Northland	18	7.0		
Waitemata	89	10.1		
Auckland	43	6.1		
Counties Manukau	63	9.1		
Waikato	45	8.0		
Lakes	24	12.0		
Bay of Plenty	43	16.9		
Tairāwhiti	12	15.4		
Taranaki	9	6.2		
Hawke's Bay	19	13.0		
Whanganui	9	8.2		
MidCentral	23	10.5		
Hutt	31	13.4		
Capital and Coast	16	8.2		
Wairarapa	13	16.5		
Nelson Marlborough	23	11.0		
West Coast	4	6.3		
Canterbury	81	6.9		
South Canterbury	14	15.2		
Otago	16	3.7		
Southland	15	9.9		

**Table 24: Summary Demographic Data from CSO, ARPHS and WCPHU for Paracetamol Poisonings**

DEMOGRAPHICS <sup>1</sup>	CSO National <sup>2</sup>		ARPHS		WCPHU	
	No.	%	No.	%	No.	%
Number of cases & % of total cases	1	0.8	139	6.6	8	17.4
Intent						
Intentional			134	96.4		
Unintentional			2	1.4		
Indeterminate or Unknown			3	2.2		
Age Group (years)						
0-4			0	0.0	2	25.0
5-14			0	0.0	1	12.5
15-24			50	36.0	1	12.5
25-44			62	44.6	2	25.0
45-64			18	12.9	2	25.0
65+			9	6.5	0	0.0
Unknown			0	0.0	0	0.0
Sex						
Male			31	22.3	2	25.0
Female			108	77.7	6	75.0
Ethnicity						
European			99	71.2	6	75.0
Maori			8	5.8	1	12.5
Pacific People			8	5.8	0	0.0
Asian			2	1.4	0	0.0
Other			20	14.4	0	0.0
Unknown			2	1.4	1	12.5

<sup>1</sup> Paracetamol combinations such as dextropropoxyphene/paracetamol or paracetamol/codeine not included in paracetamol counts.

<sup>2</sup> Only deaths where paracetamol was the primary substance involved in the death are represented. Further details not specified to protect privacy.

**Table 25: Summary Demographic Data from CSO, ARPHS and WCPHU for Acute Ethanol Poisonings**

DEMOGRAPHICS	CSO National <sup>1</sup>		ARPHS		WCPHU	
	No.	%	No.	%	No.	%
Number of cases & % of total cases	11	8.7	791	37.3	9	19.6
Intent					Data not available	
Intentional	2	18.2	342	43.2		
Unintentional	1	9.1	2	0.3		
Indeterminate or Unknown	8	72.7	447	56.5		
Age Group (years)						
0-4	0	0.0	0	0.0	0	0.0
5-14	0	0.0	1	0.1	1	11.1
15-24	4	36.4	279	35.3	3	33.3
25-44	2	18.2	311	39.3	5	55.6
45-64	5	45.5	149	18.8	0	0.0
65+	0	0.0	47	5.9	0	0.0
Unknown	0	0.0	4	0.5	0	0.0
Sex						
Male	8	72.7	456	57.6	3	33.3
Female	3	27.3	332	42.0	6	66.7
Unknown	0	0.0	3	0.4	0	0.0
Ethnicity						
European	6	54.5	523	66.1	6	66.7
Maori	5	45.5	60	7.6	1	11.1
Pacific People	0	0.0	52	6.6	0	0.0
Asian	0	0.0	13	1.6	0	0.0
Other	0	0.0	88	11.1	0	0.0
Unknown	0	0.0	55	7.0	2	22.2
DHB						
Northland	1	11.1	N/A		N/A	
Waitemata	0	0.0				
Auckland	1	10.0				
Counties Manukau	1	11.1				
Waikato	1	10.0				
Lakes	0	n/a				
Bay of Plenty	2	25.0				
Tairāwhiti	0	n/a				
Taranaki	2	28.6				
Hawke's Bay	0	0.0				
Whanganui	0	0.0				
MidCentral	1	12.5				
Hutt	0	0.0				
Capital and Coast	1	20.0				
Wairarapa	0	0.0				
Nelson Marlborough	0	0.0				
West Coast	0	0.0				
Canterbury	1	8.3				
South Canterbury	0	0.0				
Otago	0	0.0				
Southland	0	0.0				

<sup>1</sup> Acute cases only. In addition there was one death from chronic ethanol exposure.

**Table 26: CSO data by District Health Board, 2002 and 2003**

DHB	2002					2003				
	"A"	"I"	"U"	Total	Rate <sup>1</sup>	"A"	"I"	"U"	Total	Rate <sup>1</sup>
Northland	2	1	2	5	3.6	1	12	3	16	11.4
Waitemata	4	20	1	25	5.8	2	16	4	22	5.1
Auckland	11	13	2	26	7.1	3	12	5	20	5.4
Counties										
Manukau	5	15	1	21	5.6	5	16	0	21	5.6
Waikato	4	11	2	17	5.4	4	13	0	17	5.4
Lakes	2	3	0	5	5.2	1	4	0	5	5.2
Bay of Plenty	5	9	0	14	7.9	3	10	2	15	8.4
Tairāwhiti	1	2	0	3	6.8	1	2	0	3	6.8
Taranaki	2	0	0	2	1.9	0	3	1	4	3.9
Hawke's Bay	0	7	1	8	5.6	0	2	0	2	1.4
Whanganui	1	4	1	6	9.4	1	5	0	6	9.4
MidCentral	4	12	0	16	10.3	2	6	0	8	5.2
Hutt	2	7	2	11	8.3	1	7	1	9	6.8
Capital and Coast	1	7	2	10	4.1	1	6	5	12	4.9
Wairarapa	0	0	0	0	0.0	0	2	0	2	5.2
Nelson										
Marlborough	2	7	1	10	8.2	0	2	0	2	1.6
West Coast	1	3	2	6	19.8	1	0	0	1	3.3
Canterbury	9	18	3	30	7.0	8	19	3	30	7.0
South										
Canterbury	1	2	0	3	5.7	0	2	0	2	3.8
Otago	4	12	0	16	9.4	2	7	0	9	5.3
Southland	4	4	0	8	7.7	2	5	0	7	6.8
Unknown	0	0	1	1		0	0	5	5	
<b>TOTAL</b>	<b>65</b>	<b>157</b>	<b>21</b>	<b>243</b>	<b>6.5</b>	<b>38</b>	<b>151</b>	<b>29</b>	<b>218</b>	<b>5.8</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

"A" = Accidental or Unintentional

"I" = Intentional

"U" = Unknown Intent

**Table 27: CSO data by Age Group, 2002 and 2003**

Age Group	2002					2003				
	"A"	"I"	"U"	Total	Rate <sup>1</sup>	"A"	"I"	"U"	Total	Rate <sup>1</sup>
0-4	1	0	0	1	0.4	0	0	0	0	0.0
5-14	0	0	1	1	0.2	0	0	0	0	0.0
15-24	8	18	4	30	5.9	7	13	12	32	6.3
25-44	42	76	6	124	11.2	17	66	12	95	8.6
45-64	11	42	6	59	7.2	12	50	2	64	7.8
65+	3	19	3	25	5.6	2	20	3	25	5.6
Unknown	0	2	1	3		0	2	0	2	
<b>TOTAL</b>	<b>65</b>	<b>157</b>	<b>21</b>	<b>243</b>	<b>6.5</b>	<b>38</b>	<b>151</b>	<b>29</b>	<b>218</b>	<b>5.8</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

"A" = Accidental or Unintentional

"I" = Intentional

"U" = Unknown Intent

**Table 28: CSO data by Sex, 2002 and 2003**

Sex	2002					2003				
	"A"	"I"	"U"	Total	Rate <sup>1</sup>	"A"	"I"	"U"	Total	Rate <sup>1</sup>
Female	26	45	8	79	4.1	15	52	9	76	4.0
Male	39	112	13	164	9.0	22	99	20	141	7.7
Unknown	0	0	0	0		1	0	0	1	
<b>TOTAL</b>	<b>65</b>	<b>157</b>	<b>21</b>	<b>243</b>	<b>6.5</b>	<b>38</b>	<b>151</b>	<b>29</b>	<b>218</b>	<b>5.8</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

"A" = Accidental or Unintentional

"I" = Intentional

"U" = Unknown Intent

**Table 29: CSO data by Ethnicity, 2002 and 2003**

Ethnicity	2002					2003				
	"A"	"I"	"U"	Total	Rate <sup>1</sup>	"A"	"I"	"U"	Total	Rate <sup>1</sup>
European	35	121	15	171	6.6	22	124	20	166	6.4
Maori	17	12	4	33	6.3	13	8	8	29	5.5
Pacific Peoples	3	1	1	5	2.5	1	0	1	2	1.0
Asian	1	4	0	5	2.2	0	4	0	4	1.8
Other	0	1	0	1		0	0	0	0	
Unknown	9	18	1	28		2	15	0	17	
<b>TOTAL</b>	<b>65</b>	<b>157</b>	<b>21</b>	<b>243</b>	<b>6.5</b>	<b>38</b>	<b>151</b>	<b>29</b>	<b>218</b>	<b>5.8</b>

<sup>1</sup>Rate calculated using 2001 Census data and expressed per 100 000 population.

"A" = Accidental or Unintentional

"I" = Intentional

"U" = Unknown Intent

**Table 30: CSO data by Substance Class, 2002 and 2003**

Substance Class	2002		2003	
	No.	%	No.	%
Agrichemicals	6	2.5	4	1.8
Chemical/Drugs of Abuse	50	20.6	39	17.9
Herbal Remedy/Dietary Supplement	0	0.0	0	0.0
Household/Domestic Chemicals	111	45.7	103	47.2
Therapeutics	73	30.0	66	30.3
Unknown/Missing	3	1.2	6	2.8
<b>TOTAL</b>	<b>243</b>	<b>100</b>	<b>218</b>	<b>100</b>





**Table 32: HSNO substances from CSO data by DHB, intent, age, sex and ethnicity, 2002 and 2003 combined**

Note: where count of substance is not greater than one, details are not included in the table to protect privacy. Relevant substances include: boric acid, bendicarb, glyphosate, kerosene, mevinphos and paraquat.

Characteristics	HSNO Substances		
	Hydrocarbon <sup>1</sup>	Cyanide	Methylated spirits
Number (primary substance)	21	6	3
DHB			
Northland	0	0	0
Waitemata	1	0	1
Auckland	0	0	0
Counties Manukau	3	0	1
Waikato	3	0	0
Lakes	0	1	0
Bay of Plenty	1	1	0
Tairāwhiti	0	0	0
Taranaki	0	0	0
Hawke's Bay	0	0	0
Whanganui	1	0	0
MidCentral	0	0	0
Hutt	0	0	0
Capital and Coast	3	2	0
Wairarapa	0	0	0
Nelson Marlborough	1	0	0
West Coast	1	2	1
Canterbury	4	0	0
South Canterbury	0	0	0
Otago	0	0	0
Southland	3	0	0
Intent			
Intentional	10	5	0
Unintentional	7	0	3
Indeterminate/Unknown	4	1	0
Age Group (years)			
0-4	0	0	0
5-14	1	0	0
15-24	5	0	0
25-44	4	5	2
45-64	8	1	1
65+	2	0	0
Unknown	1	0	0
Sex			
Female	6	0	1
Male	15	6	2
Ethnicity			
European	12	4	1
Māori	4	1	0
Pacific People	1	0	1
Asian	0	0	0
Other	1	0	0
Unknown	3	1	1

<sup>1</sup> Hydrocarbon includes petrol, turpentine, LPG, fly spray, lighter fluid etc.

## APPENDIX 2

Chemical category working definitions with examples:

- **Therapeutics:** prescription or non-prescription drugs are included in this category even if they are used inappropriately (i.e. deliberately with intent to injure, or with intent to abuse but not injure).
- **Agrichemicals:** Includes all pesticides and licensed animal remedies (from MAF registration list)
- **Industrial chemicals:** i.e. solvents and caustic chemicals used in an industrial or occupational setting. The same chemicals may also be found in the home (e.g. isopropyl alcohol), and be covered under household/domestic.
- **Cosmetics:** make-up, nail polish, hand lotions, etc...
- **Household/domestic chemicals:** cleansers, detergents, methylated spirits (accidents only), carbon monoxide, motor oil, etc...
- **Chemicals/drugs of abuse:** Includes chemicals of addiction. Methylated spirits, ethanol, methadone, heroin, cocaine, methamphetamine, fantasy, ecstasy, etc...
- **Herbal remedies/dietary supplements:** vitamins, natural product remedies, etc...
- **Plants:** garden plants
- **Bites/Stings:** spider bites, bee stings
- **Other/Unknown:**

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