

Chemical Injury Surveillance For New Zealand, 2003

National Implementation and Key Statistics

Prepared for the New Zealand Ministry of Health

June 2004

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Client Report
FW 0444

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ACKNOWLEDGMENTS

This report could not have been generated without the support of staff from the Coronial Services Office (CSO), Hawkes Bay Public Health Unit (HBPHU), West Coast Public Health Unit (WCPHU), Auckland Regional Public Health Service (ARPHS), National Poisons Centre (NPC) and NZHIS. The authors wish to especially thank Jeff Chuter (CSO), Morag Tilah (HBPHU), Vern Newcombe (WCPHU), Virginia Hope and Vivien McGaughey (ARPHS), John Fountain (NPC) and Chris Lewis (NZHIS).

The authors would also like to acknowledge the support and contribution by ESR staff, particularly Carol Kliem, Trev Margolin and Bevan Hambling.

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EXECUTIVE SUMMARY

This report describes the implementation of a comprehensive national surveillance system for acute chemically-mediated illness and death in New Zealand. The surveillance system draws upon existing national data sets and includes hospital emergency data from three sentinel sites covering metropolitan and rural areas. The national data sources used include: Coronial Services Office mortality data, New Zealand Health Information Service (NZHIS) hospital discharge data, and National Poisons Centre (NPC) data. Regional sentinel site data is derived from hospital emergency department notifications to local Public Health Services in Auckland, West Coast, and Hawkes Bay. This assemblage of national and local information and analysis provides a means to characterise the geographic regional variations in poisoning trends, differences among demographic groups nationally and across areas, and an ability to highlight important chemical substances contributing to injuries. In addition to the analysis of national and local statistics on poisonings more generally, this report contains three focussed analyses on areas of interest: 1) child poisonings, 2) paracetamol poisonings, and 3) ethanol poisoning. Key findings from the analyses of data include:

A total of 7218 poisoning hospitalisations occurred in 2003, a rate of 193.1 per 100 000 population. There were also 18784 calls to the NPC in 2003, a rate of 502.6 per 100 000 population. The West Coast DHB had the highest hospitalisation and NPC call rates in 2003 (333.7 and 760.0 per 100 000 population respectively). Nationally, the majority of the deaths and NZHIS hospitalisations were intentional, while the majority of the NPC calls were due to "Child Exploration". Two thirds of national deaths were male, while two thirds of the hospitalisations were female. Europeans had the highest rates of death and contacting the NPC, while the hospitalisation rate for Europeans and Maori was virtually the same. Household and therapeutic substances accounted for the greatest proportion of deaths and NPC calls, and were the dominant substances involved in child poisonings.

Of the substances identified amongst the three more detailed PHU hospitalisation notification datasets, paracetamol ranked first for West Coast and Hawkes Bay, and second for Auckland DHB. Between 4.5% and 12.1% of total hospital cases involved paracetamol, and there was one death with paracetamol as the primary cause.

Of the substances identified amongst the three hospital notification datasets, ethanol ranked first for Auckland DHB, second for Hawkes Bay and third for West Coast. Acute ethanol poisoning was the primary cause of death in eight instances. In addition there were four deaths reported from chronic ethanol poisoning. Two of the eight acute ethanol deaths were among teenagers and 8/22 (36.4%) of Hawkes Bay and 48/746 (6.4%) of Auckland hospital notification cases were aged less than 18 years. There was no apparent trend by sex for ethanol poisoning. Maori were disproportionately affected as three of the eight acute ethanol deaths were Maori as were 31.8% of the Hawkes Bay hospital notification cases.

We expect that with continued support, the current system will improve its ability to identify opportunities for public health interventions regarding hazardous substance injuries and susceptible demographic groups in particular regions. Options for further development of this system, and limitations of the data are discussed.

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^{1,2}), 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 resources for interventions and facilitating investigations.
- b) National surveillance of chemical injuries leading to the review of appropriate controls for certain products, and areas for intervention regarding particular target areas, 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 therapeutic and non-therapeutic substances
- 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. 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 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”.

1.4. Literature Review

The literature has been reviewed in a previous report to the Ministry of Health².

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 2003³.

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

1.6. Other Approaches Trialled 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 report⁴ and details on both are given in the 2003 MoH report³, only a brief overview is presented here.

1.6.1. Paper and Email Based System

- Trialled 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, principal was 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 implementation during the 2003/2004 financial year. Summary statistics from the various data sources for 2003 are then presented as are additional CSO analyses pertaining to 2001 and 2002.

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 report³.

- As different health outcomes 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 are currently incorporated into the comprehensive surveillance system: Coronial Services Office, NZHIS, Public Health Services, and the National Poisons Centre.

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 ICD 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 |
|---|---|
| <i>Broad description of code groupings</i> | |
| X60 – 69 | Intentional self-poisoning |
| X40 – 49 | Unintentional poisoning |
| Y10 – Y19 | Poisoning, undetermined intent |
| <i>X60-X69 Intentional poisoning by and exposure to:</i> | |
| 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 |
| <i>X40-X49 Unintentional poisoning by and exposure to:</i> | |
| 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 |
| <i>Y10-Y19 Poisoning by and exposure to (undetermined intent):</i> | |
| 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 with the current version the 10th since ICD coding was first used in 1901.

2.4. Public Health Services (PHS) Data

- While the paper and email based system was not universally successful in the 2001 pilot, some PHSs do currently operate their own local surveillance systems based on this approach.
- Any data collected can be incorporated into the comprehensive system. Likewise for any electronic data capture systems in place.
- The quality and quantity of data collected varies between PHSs.

2.5. National Poisons Centre (NPC) Data

- 24 hours a day, 365 day 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 per year.
- Details of calls recorded in database (currently being upgraded).
- NPC also operates an Internet database known as TOXINZ.

3. PROGRESS ON NATIONAL IMPLEMENTATION OF THE COMPREHENSIVE SURVEILLANCE SYSTEM.

National implementation of the comprehensive surveillance system progressed during the 2003/2004 financial year following on from the successful pilot for the Auckland region. ESR is currently receiving national data from the CSO and NZHIS on an ongoing quarterly basis. The CSO data covers all deaths from chemical causes since 1 January 2001 and is current as of 30 April 2004. The current NZHIS data set contains all 2003 poisoning related events as of 30 April 2004.

The NPC has provided ESR with a dataset pertaining to all calls received during 2003. This was received as a single annual dataset. The MoH is liaising with the NPC to put in place an agreement for the regular acquisition of NPC data.

Following on from the success of the 2003 pilot, Auckland Regional Public Health Service (ARPHS) provided ESR with notification data for 2003. However, this data is not representative of the entire Auckland region as notifications are only received by ARPHS on a regular basis from Auckland Hospital. ARPHS have a paper-based system in place.

Hawkes Bay Public Health Unit (HBPHU) have provided ESR with local notification data for 2003. A Memorandum of Understanding regarding the routine quarterly attainment of Hawkes Bay data is currently being developed. The majority of the information obtained by Hawkes Bay PHS is received directly from the local hospital (printouts for ED patients and electronic summaries for admitted patients), with data for a couple of fields obtained by electronically accessing the hospital records. As the hospital is upgrading its patient management system for ED patients, in the future virtually all of the data will be obtained electronically.

West Coast Public Health Unit (WCPHU) have also provided ESR with local notifications for 2003 and are providing ongoing data on a monthly basis for 2004 notifications. WCPHU obtain notifications data via a paper-based system.

Notification data has also been received from Wairarapa and Gisborne Public Health Units. The Wairarapa data currently held is for March and April 2004 while the Gisborne data is for the last four months of 2003. As neither dataset covers the full 2003 calendar year, it is not reported on further in this report. It is anticipated that the report on chemical injuries for 2004 will include the notification data from these two public health units.

In addition Southland Public Health Unit have indicated that they are willing to provide local data for incorporation into the comprehensive surveillance system. Data for 2003 is available although the substance details for the overdose cases are currently being retrospectively updated. Once this has been completed, the data will be provided to ESR along with ongoing data for 2004.

Thus the comprehensive chemical injury surveillance system currently incorporates national data from the CSO, NZHIS and NPC and local data from five public health units: Auckland, Hawkes Bay, West Coast, Wairarapa and Gisborne, with at least one more to be included in the near future.

4. RESULTS FROM THE COMPREHENSIVE SURVEILLANCE SYSTEM FOR 2003.

4.1. Introduction

Results from the CSO, NZHIS, NPC, ARPHS, HBPHU and WCPHU for 2003 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 specially for Auckland, Hawkes Bay and West Coast DHBs. Finally, a more detailed analysis of the combined data sets pertaining to poisoning in children aged less than five years and 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 ¹ | CSO | NZHIS | PHU | NPC |
|---|-----|----------------|--------|----------------|
| Date of death/incident/hospitalisation/notification | ✓ | ✓ | ✓ | ✓ |
| Town/City | ✓ | Can be derived | Varies | ✓ |
| DHB | ✓ | Can be derived | ✓ | Can be derived |
| Date of birth or age | ✓ | ✓ | ✓ | ✓ |
| Ethnicity | ✓ | ✓ | ✓ | ✓ |
| Sex | ✓ | ✓ | ✓ | ✓ |
| Intention | ✓ | ✓ | Varies | ✓ |
| Occupation | ✓ | X | X | X |
| Admission details | N/A | ✓ | Varies | N/A |
| Outcome | ✓ | ✓ | X | X |
| Causes/circumstances | ✓ | X | 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 | N/A |
| Caller details | N/A | N/A | N/A | ✓ |

¹ Additional fields are available at the local level, for example ARPHS also collects name, address and NHI number.

4.2. Summary of Key Statistics

4.2.1. 2003 National Analysis

- 7218 poisoning hospitalisations (NZHIS), a rate of 193.1 per 100 000 population.
- 18784 calls to the NPC, a rate of 502.6 per 100 000 population.
- 147 deaths reported to date.
- West Coast DHB had the highest NZHIS and NPC rates (333.7 and 760.0 per 100 000 population respectively).
- Majority of the deaths and NZHIS hospitalisations were intentional, while the majority of the NPC calls were due to “Child Exploration”.
- Highest age specific rates differed across the three datasets: 25-44 years for the CSO, 15-24 years for NZHIS and 0-4 years for NPC.
- Two thirds of the deaths were male, while two thirds of the NZHIS hospitalisations were female. There was no distinction by sex amongst the NPC calls.
- Europeans had the highest rates for the CSO and NPC data, while the NZHIS rate for Europeans and Maori was virtually the same.
- Household and therapeutic substances accounted for the greatest proportion of CSO deaths and NPC calls.

4.2.2. 2003 Auckland DHB Analysis

- NZHIS rate (217.0 per 100 000 population, 798 cases) was the third highest nationally.
- 1344 notifications received, rate of 365.5 per 100 000 population.
- 10 deaths reported to date (below the national rate).
- Across all three datasets, the majority of cases were intentional.
- Highest age specific rate for CSO and NZHIS data followed national trends (25-44 years and 15-24 years respectively). ARPHS data followed NZHIS data with the highest rate also amongst 15-24 year olds.

- While the NZHIS data followed the national trend by sex (over 60% were female), the Auckland DHB deaths showed an even split by sex. ARPHS data was also evenly split by sex.
- NZHIS and ARPHS data had a similar distribution by ethnicity with the highest rate for Maori. However there were no deaths reported of Maori ethnicity.
- Chemical/drugs of abuse were prominent in the CSO and ARPHS data with one third of the ARPHS cases involving ethanol.

4.2.3. 2003 Hawkes Bay DHB Analysis

- NZHIS rate the third lowest nationally (126.8 per 100 000 population, 182 cases).
- HBPHU received 313 notifications, a rate of 218.0 per 100 000 population.
- NPC rate of 621.3 per 100 000 population (892 calls) was the third highest nationally.
- No deaths reported to date.
- The NZHIS data had a greater proportion of unintentional cases than that recorded nationally.
- The highest age specific rate for all three datasets was for 0-4 year olds, although that for NZHIS was very similar to that for 15-24 year olds.
- NZHIS and NPC data followed the respective national trends by sex and the PHU data was similar to the NZHIS.
- Europeans had the highest ethnicity specific rate across all three datasets.
- Therapeutic and household substances dominated.

4.2.4. 2003 West Coast DHB Analysis

- NZHIS and NPC rates were the highest nationally (333.7 and 760.0 per 100 000 respectively).
- There were 47 notifications received by WCPHU – less than half the number of NZHIS hospitalisations.
- One death has been reported to date.

- NZHIS and NPC data followed the respective national trends for intent and sex. WCPHU notifications had a similar distribution by sex to the NZHIS data.
- Like the Hawkes Bay data, the highest age specific West Coast rates for NZHIS, PHU and NPC data was amongst 0-4 year olds.
- NZHIS and NPC rates by ethnicity differed to that observed nationally: the NZHIS European rate was noticeably higher than the Maori yet the Maori NPC rate was closer to the European rate.
- Therapeutic substances dominated.

4.2.5. 2003 Specific Analyses

4.2.5.1. Poisonings in Children aged less than 5 years

- Percentage of total cases in this age group ranged from 53.9 % of the NPC calls to 9.5% of the NZHIS hospitalisations.
- There was no apparent trend by sex.
- Between 64 and 88% of cases were European with between 0% and 25.8% Maori.
- Therapeutic and household substances were involved in the majority of cases.

4.2.5.2. Paracetamol Poisonings

- Between 4.5% and 12.1% of total cases involved paracetamol.
- Of the substances identified amongst the three PHU datasets, paracetamol ranked first for West Coast and Hawkes Bay, and second for Auckland DHB.
- There was one death with paracetamol as the primary cause.
- Majority of cases were female, across all datasets.
- Differences in age distribution were observed across the datasets.
- Between 61.5% and 87.5% of cases were European. Just over 20% of the ARPHS cases were Asian.

4.2.5.3. Ethanol Poisonings

- Between <1% and 34.3% of total cases involved ethanol.
- Of the substances identified amongst the three PHU datasets, ethanol ranked first for Auckland DHB, second for Hawkes Bay and third for West Coast.
- Acute ethanol poisoning was the primary cause of death in eight instances. In addition there were four deaths reported from chronic ethanol poisoning.
- Two of the eight acute ethanol deaths were amongst teenagers with 8/22 (36.4%) HBPHU and 48/746 (6.4%) ARPHS cases aged less than 18 years.
- There was no apparent trend by sex.
- Three of the eight acute ethanol deaths were Maori as were 31.8% of the HBPHU cases.

4.2.6. Mortality Data for 2001 and 2002

- Trends were very similar for both years, with the exception of ethnicity.
- There were 235 chemical injury deaths in 2001, 234 in 2002.
- Rate per 100 000 population for both years was 6.3.
- The majority of deaths for both years were intentional (68.9% in 2001 and 65.0% in 2002).
- West Coast DHB had the highest rate for both years.
- For both years, the highest age specific rate was for 25-44 year olds (11.1 per 100 000 population in 2001, 10.7 per 100 000 population in 2002).
- The majority of deaths were male (70.6% in 2001, 67.1% in 2002).
- The rates for Europeans remained consistent between the two years (just over 6 per 100 000 population).
- The rate for Maori increased from 4.8 per 100 000 population in 2001 to 6.1 per 100 000 in 2003.
- The rate for Pacific Peoples decreased from 4.0 per 100 000 population in 2001 to 2.5 per 100 000 population in 2002.
- Over half of the Maori and Pacific Peoples deaths were unintentional, while the majority of the European and Asian deaths were intentional.
- Combined results for both years showed that rates increased with increasing deprivation.

- Carbon monoxide was the leading cause of the intentional deaths (64.3%).
- The leading causes of unintentional deaths were methadone, morphine or heroin, and ethanol.

4.3. Detailed National Analysis (2003)

The following section compares national results for 2003 from the CSO, NZHIS and NPC. While the NZHIS and NPC datasets are complete for 2003, the CSO data is estimated to be between 50% and 60% complete. However, previous years results have shown that demographic and substance trends may already be established.

There were 7218 NZHIS poisoning hospitalisations in 2003, a national rate of 193.1 per 100 000 population. The NPC received 18784 calls in 2003, a rate of 502.6 per 100 000 population. To date, there have been 147 deaths filed at the CSO (3.9 per 100 000 population).

When comparing across the datasets by DHB, West Coast had the highest rate for both the NZHIS (333.7 per 100 000 population) and NPC (760.0 per 100 000 population) data (Figures 1 and 2, Appendix Table 3). In regard to the CSO data, the rate for West Coast is just below the national rate. However, CSO results by DHB need to be interpreted with caution, as the time taken by coroners to investigate deaths may be district specific. CSO data for 2001 and 2002, which is estimated to be nearly 100% complete, show that West Coast DHB had the highest rate for both years (see Section 5, Figures 9 and 10, and Appendix Table 31).

Figure 1: 2003 NZHIS poisoning hospitalisations by District Health Board

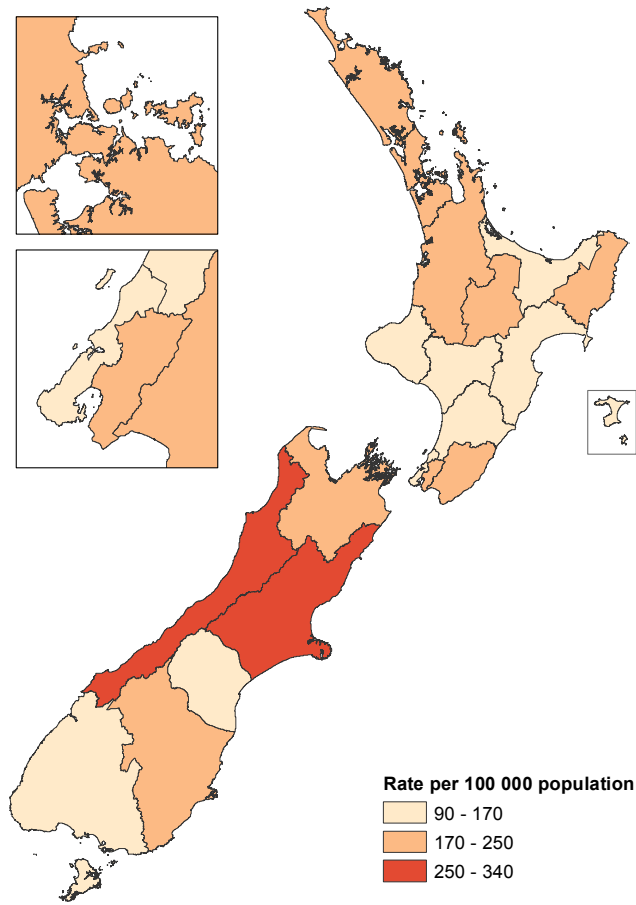


Figure 2: 2003 NPC calls by District Health Board

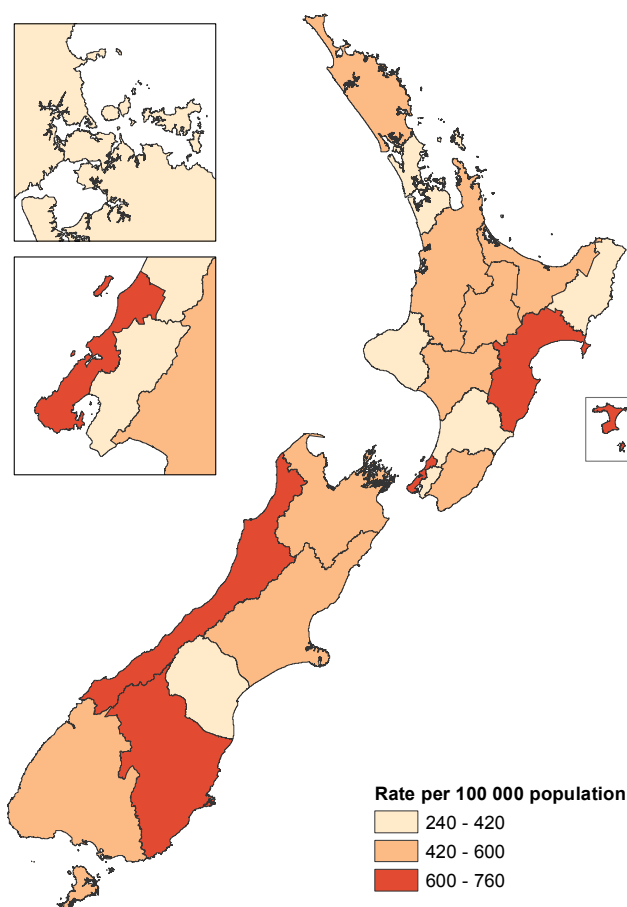
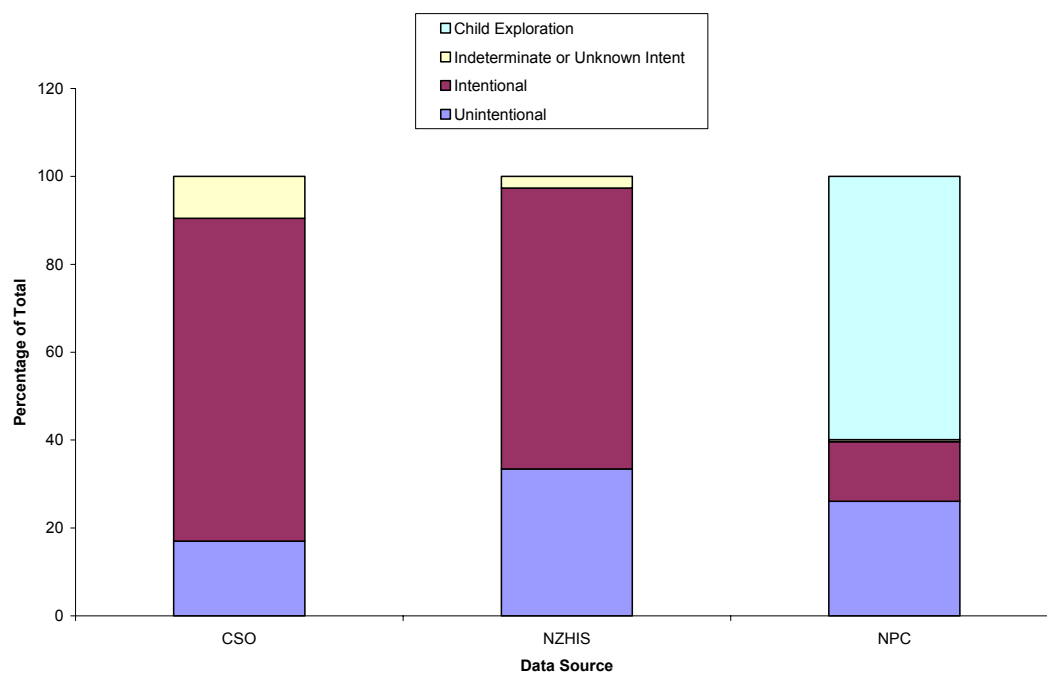


Figure 3 and Appendix Table 4 present national 2003 data from the three data sources by intent. The NPC use a category termed “Child Exploration” which is not used for the CSO and NZHIS data. These results show that the majority of the CSO deaths and NZHIS poisoning hospitalisations were intentional (73.5% and 63.9% respectively). The majority of the NPC calls were due to “Child Exploration” (59.9%).

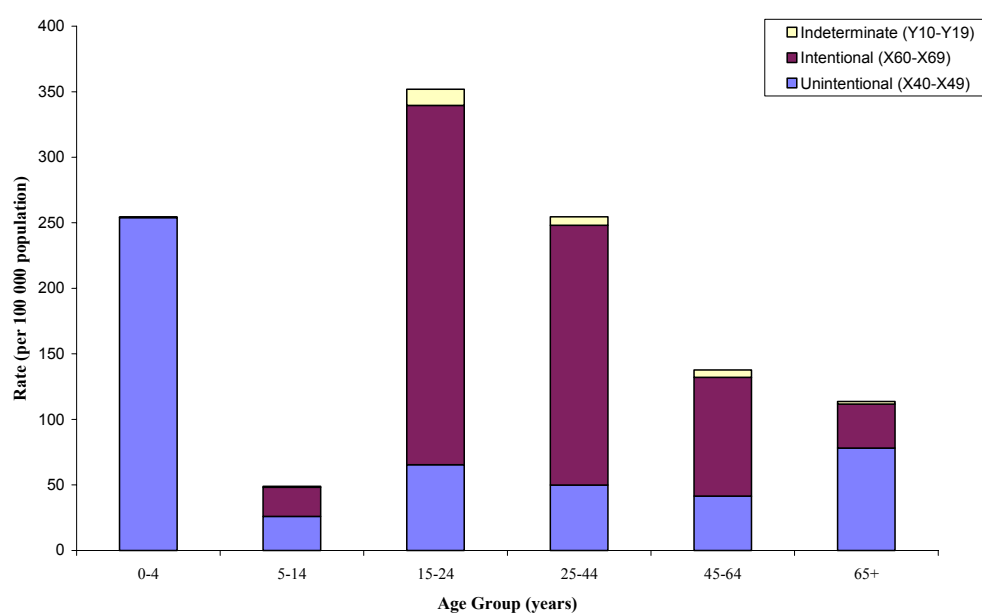
Figure 3: Percentage of poisonings by intent for each data source, 2003



The greatest percentage of CSO deaths and NZHIS poisoning hospitalisations were aged 25-44 years (45.6% and 39.1% respectively) (Appendix Table 5). The highest CSO age specific rate was also for this age group (6.0 per 100 000 population) while the highest age specific rate for the NZHIS data was for the 15-24 years age group (351.8 per 100 000 population). The NZHIS age specific rate for the 25-44 year age group was very similar to that for the 0-4 years age group (254.5 and 254.4 per 100 000 respectively). None of the NZHIS hospitalisations aged 0-4 years were deemed intentional (Figure 4). There were no CSO deaths aged less than 14 years.

In comparison, 53.9% (10125/18784) of the NPC calls related to persons aged 0-4 years, a rate of 3738.9 per 100 000 population. The next highest age specific rate occurred in the 15-24 years age group (308.8 per 100 000 population). Note that 12% of the NPC deaths were recorded as either adult with unspecified age, child with unspecified age or unknown.

Figure 4: NZHIS poisoning rates by age and intent, 2003



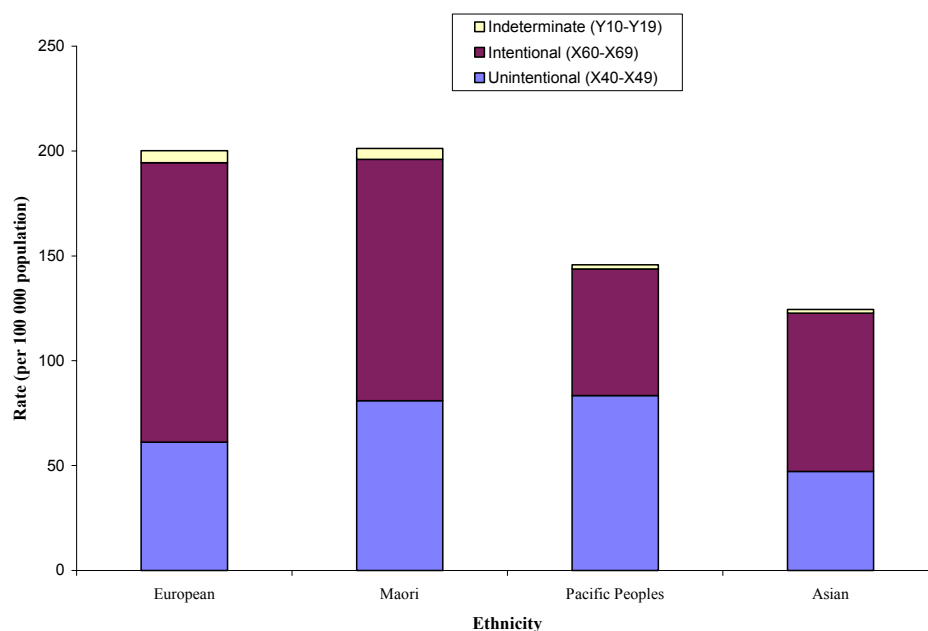
Differences by sex were apparent across the three datasets (Appendix Table 6). Two thirds of the CSO deaths were male, this result apparent across both intentional and unintentional deaths.

In comparison, males only accounted for just over one third of the NZHIS poisoning hospitalisations. The high number of female intentional poisonings largely drove this result; there was a similar number of male and female unintentional poisonings.

The split by sex was fairly even for the NPC calls, influenced by the high number of calls relating to “Child Exploration” which were not greatly differentiated by sex. However, two thirds of the intentional NPC calls were female.

For all three datasets, Europeans contributed to the greatest proportion of the total, followed by Maori and Pacific Peoples (Appendix Table 7). The actual rate for Europeans was highest for the CSO and NPC datasets. However, with the NZHIS data, the Maori rate was virtually the same as the European (200.2 and 201.2 per 100 000 respectively) (Figure 5). A greater proportion of the Maori hospitalisations were deemed unintentional (40.2% compared to 30.6% of the European hospitalisations). Pacific Peoples had an even higher proportion of unintentional hospitalisations (57.2%).

Figure 5: NZHIS poisoning rates by ethnicity and intent, 2003



Household and therapeutic substances accounted for the greatest proportion of the CSO deaths and NPC calls (Appendix Table 8). By far the leading substance involved in the CSO deaths was carbon monoxide; this substance was the primary agent in 74 deaths. No other single agent was responsible for greater than 10 deaths.

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 (34.6%). Note each hospitalisation can have up to ten ICD 10 codes assigned.

4.4. Detailed Auckland DHB Analysis (2003)

The following section compares 2003 Auckland DHB data from the CSO, NZHIS, and Auckland Regional Public Health Services (ARPHS). NPC data is excluded because Auckland DHB data cannot be differentiated from the Waitemata and Counties Manukau DHB data. While ARPHS should receive notifications from all Auckland hospitals it only receives routine notifications from Auckland Hospital, hence results for Auckland DHB only are presented. However, ARPHS notification data for Auckland DHB is incomplete for children as the majority of these cases are seen at Starship and notification data from this hospital is not routinely received by ARPHS.

In 2003, there were 798 NZHIS poisoning hospitalisations for Auckland DHB, a rate of 217.0 per 100 000 population. This is slightly above the national NZHIS poisoning hospitalisation rate of 193.1 per 100 000 population, and the third highest by DHB nationally. ARPHS received 1344 poisoning notifications from Auckland Hospital

(365.5 per 100 000 population). This number is greater than that for NZHIS as it includes emergency department patients. There have been 10 deaths filed at the CSO to date for Auckland DHB. The associated rate of 2.7 per 100 000 population is below the national CSO rate of 3.9 per 100 000 population.

For all three datasets, the majority of cases were intentional (Appendix Table 9). Note that intent for ARPHS data is determined by the PHS staff and is based on exposure as opposed to outcome. Cases involving alcohol are classed as intentional or indeterminate.

As with the national data, the highest Auckland DHB age specific rate for CSO deaths was for 25-44 year olds. There were six deaths in this age group, accounting for 60.0% of the total deaths (Appendix Table 10). The NZHIS data for Auckland DHB also followed the national NZHIS trend with the greatest number of cases aged 25-44 years (320, 40.1%) but the highest rate for those aged 15-24 years (398.5 per 100 000 population). The highest age specific rate for the ARPHS data was also for those aged 15-24 years (875.4 per 100 000 population) and again like the NZHIS data, the greatest number of cases was aged 25-44 years (561). However, it must be reiterated that the ARPHS data is not representative of child hospitalisations.

Like the national NZHIS data, females accounted for over 60% of the Auckland NZHIS poisoning hospitalisations (Appendix Table 11). However, the Auckland DHB CSO data differed from the national CSO trend (where a third of the deaths were male), with an even split between the sexes. ARPHS notification data was also fairly evenly split by sex.

Distribution of cases by ethnicity is similar between the Auckland DHB NZHIS and PHS datasets. For both datasets, the Auckland DHB ethnicity specific rates were highest for Maori (336.3 and 473.6 per 100 000 population respectively). This Auckland DHB rate for the NZHIS data is higher than that recorded nationally for Maori (201.2 per 100 000 population). There have been no deaths for Maori filed at the CSO to date for Auckland DHB (Appendix Table 12).

Chemicals/drugs of abuse accounted for 50% of the Auckland DHB deaths, compared to only 17.7% of the national deaths. In Auckland DHB these deaths were from ethanol (two chronic, one acute) and morphine or heroin (2). Only two of the ten Auckland DHB deaths were due to carbon monoxide (Appendix Table 13).

Chemicals/drugs of abuse also accounted for nearly half of the PHU notifications, with a third of the total notifications involving ethanol. The second and third most common substances were paracetamol and gamma-hydroxybutyrate (GHB) respectively (Appendix Table 14).

Similarly to the national findings, nearly a third of the ICD 10 codes assigned to NZHIS hospitalisations for Auckland DHB related to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified.

4.5. Detailed Hawkes Bay DHB Analysis (2003)

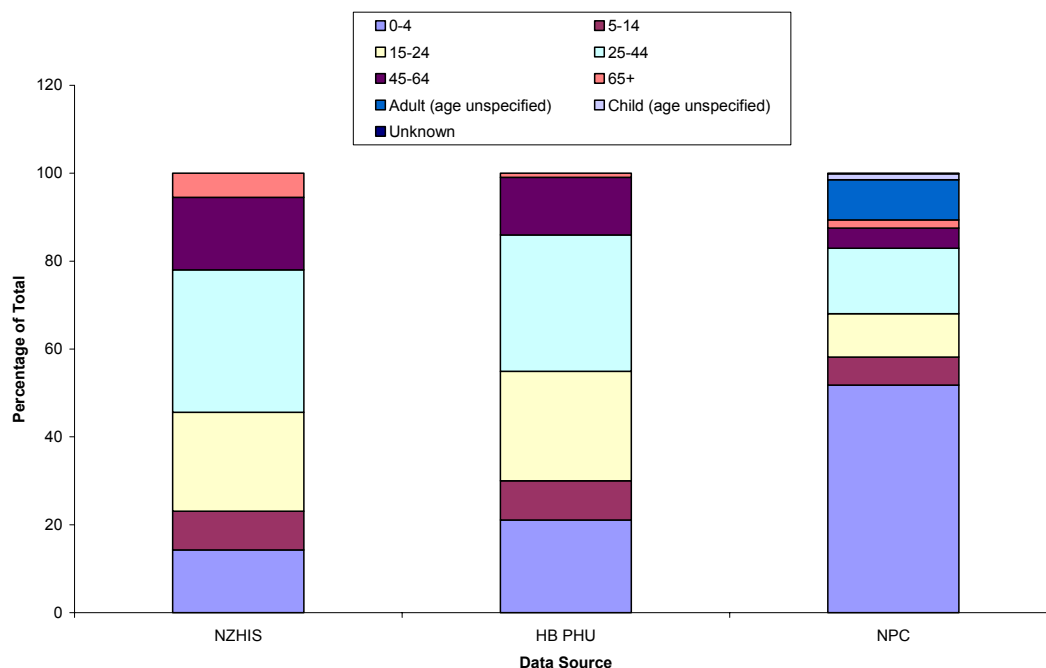
The following section compares 2003 Hawkes Bay DHB data from the CSO, NZHIS, Hawkes Bay PHU, and NPC. There were 182 NZHIS poisoning hospitalisations from Hawkes Bay DHB in 2003, a rate of 126.8 per 100 000 population. This rate is the third lowest nationally. Three hundred and thirteen notifications (from both the emergency department and inpatients) were received by HBPHU, a rate of 218.0 per 100 000 population. To date, there have been no deaths filed at the CSO for Hawkes Bay DHB.

The NPC received 892 calls from Hawkes Bay DHB in 2003, a rate of 621.3 per 100 000 population. Unlike the NZHIS and CSO data for Hawkes Bay DHB which ranked low on a national scale, this rate for NPC calls is the third highest nationally.

While the majority of the Hawkes Bay DHB NZHIS hospitalisations were intentional, there were a greater percentage of unintentional hospitalisations than the national average (41.2% for Hawkes Bay compared to 33.4% nationally) (Appendix Table 15). As with the national NPC data, just fewer than 60% of the Hawkes Bay NPC calls were due to “Child Exploration”. Intent was not available with the HBPHU data.

For the Hawkes Bay NZHIS, PHU and NPC data, the highest age specific rate was observed in those aged 0-4 years (Appendix Table 16). For the NPC, this rate (4262.4 per 100 000 population) was nearly eight times higher than the next rate. The difference was less pronounced with the HBPHU data (1.4 times higher) and even less so with the NZHIS data as the next highest rate was only 3 per 100 000 less. For all three datasets, the second highest rate was amongst those aged 15-24 years. The greatest numbers of cases for the NZHIS and PHU data were aged 25-44 years. The percentage distribution of NZHIS and PHU cases by age group was similar between the two datasets, although the PHU data had a slightly higher percentage of cases aged 0-4 years and slightly lower proportion of cases aged 65+ years (Figure 6). Even though the Hawkes Bay NZHIS age specific rate was highest amongst those aged 0-4 years (239.8 per 100 000 population), this rate was less than the national rate for this age group (254.4 per 100 000 population).

Figure 6: Percentage of Hawkes Bay poisonings by age group for each data source, 2003



Hawkes Bay data by sex is presented in Appendix Table 17. The distribution of cases by sex was similar between the NZHIS and PHU data, and between the local and national NZHIS data, with roughly two thirds of the hospitalisations amongst females. The Hawkes Bay NPC also followed the national NPC trend with a fairly even split by sex.

Across the Hawkes Bay NZHIS, PHU and NPC datasets, the highest ethnicity specific rate was amongst Europeans (141.1, 239.8, and 502.8 per 100 000 population respectively) (Appendix Table 18). While the NZHIS national rate for Maori was very similar to the European rate, for this local data, the European rate was 1.2 times the rate for Maori. The distribution of Hawkes Bay cases by ethnicity was very similar between the NZHIS and PHU datasets.

As with the national NPC data, calls relating to therapeutic and household substances accounted for the greater part of the Hawkes Bay NPC calls (Appendix Table 19). These two substance classes also accounted for the majority of the PHU notifications. Paracetamol and ethanol featured in the most commonly involved substances (Appendix Table 20).

Also following the national trend, a third of the ICD 10 codes assigned to the Hawkes Bay NZHIS data related to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified.

4.6. Detailed West Coast DHB Analysis (2003)

The following section compares 2003 West Coast DHB data from the CSO, NZHIS, West Coast PHU, and NPC. There were 101 NZHIS poisoning hospitalisations from West Coast DHB in 2003, the corresponding rate of 333.7 per 100 000 population the highest nationally (Figure 1). The West Coast NPC rate (760.0 per 100 000 population, 230 calls) was also the highest nationally (Figure 2).

Only one death in 2003 for West Coast DHB has been reported to date. However for both 2001 and 2002, West Coast had the highest rate of deaths per 100 000 population nationally (Figures 9 and 10). No further details on the one West Coast death are presented in this report to protect confidentiality.

The WCPHU only received 47 notifications, under half the number of hospitalisations reported in the NZHIS dataset for West Coast, indicating that not all hospitalisations are being notified to the PHU.

West Coast NZHIS and NPC data by intent both followed the national trends, with two thirds of the NZHIS poisonings being intentional and over half the NPC calls relating to “Child Exploration” (Appendix Table 21).

The highest age specific rate across the West Coast NZHIS, PHU and NPC datasets was for children aged 0-4 years (619.2, 412.8 and 5314.8 per 100 000 respectively), followed by that for 15-24 year olds (Appendix Table 22). While the NPC rate for 0-4 year olds was nearly ten times greater than that for 15-24 year olds, the NZHIS and PHU rates for 0-4 year olds were only 1.2 and 1.3 times greater respectively. As observed nationally, highest counts for hospitalisations from both sources, was for those aged 25-44 years.

Distribution of West Coast data by sex for each data source followed the national trend: approximately two thirds of the hospitalisations were female (NZHIS and PHU data) and NPC calls were not differentiated by sex (Appendix Table 23).

NZHIS data for West Coast does not follow the national trend when examined by ethnicity (Appendix Table 24), in that the rate for Europeans (348.1 per 100 000 population) is noticeably greater than that for Maori (197.0 per 100 000 population). There were no cases notified to the PHU with the ethnicity recorded as Maori. However, the West Coast NPC rate for Maori is twice that observed nationally, and much closer to the European rate.

Nearly 80% of the PHU notifications were associated with substances classed as therapeutic (Appendix Table 25). Paracetamol was the leading therapeutic substance identified (Appendix Table 26). Therapeutic substances accounted for just under half of the West Coast NPC calls, and while antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified were coded to nearly 30% of the NZHIS hospitalisations, a quarter were coded to nonopioid analgesics, antipyretics and antirheumatics.

4.7. Specific Analyses

Inclusion of several data sets in a comprehensive surveillance system enables comparison of data relating to specific public health issues possible 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.

4.7.1. Poisonings in Children Aged Less Than 5 Years

Details on cases aged less than five years are presented in Appendix Tables 27 and 28. CSO and ARPHS data is excluded from this analysis; CSO because there have been no cases for this age group reported to date and ARPHS because notifications from Starship are not received.

While just under 10% of the NZHIS hospitalisations were aged less than five years, over 50% of the NPC calls related to children in this age group. The respective proportions for HBPHU and WCPHU were 21.1% and 17.0%.

There was no distinction made by sex (numbers for WCPHU favour females but the numbers are small).

Across the four datasets, between 64% and 88% of the cases were Europeans. The percentage of Maori cases was similar between the NZHIS and HBPHU data: 22.4% and 25.8% respectively, with a lower percentage for NPC calls (7.6%) and no cases of Maori ethnicity in the WCPHU data.

Therapeutic and household substances together accounted for over two thirds of the NPC and HBPHU cases aged under five years. Seven (10.6%) of the HBPHU notifications involved paracetamol and a further four (6.1%) involved dishwashing liquid or powder. Household substances were not so prominent in the WCPHU data, as just over 60% of notifications were attributed to therapeutic substances.

4.7.2. Paracetamol Poisonings

2003 summary demographic data on paracetamol poisonings from the NPC, ARPHS, HBPHU and WCPHU are presented in Appendix Table 29. Between 4.5% and 12.1% of the total cases for each dataset were attributed to paracetamol. In addition there has been one death from paracetamol reported to date for 2003. Of the substances identified amongst the three PHU datasets, paracetamol ranked first for West Coast and Hawkes Bay, and second for Auckland DHB.

The most discernable pattern is by sex: across all four data sets, the majority of cases were female, ranging from 54.8% of the NPC cases to 82.1% of the HBPHU cases.

Trends by age are less apparent. As the bulk of the total NPC calls are for children aged 0-4 years, it is not surprising that nearly 60% of the NPC paracetamol related

calls are for this age group also. As the ARPHS data does not include StarShip notifications, comparisons cannot be made with this dataset. Forty five percent of the ARPHS paracetamol cases were aged 15-24 years with a further 39.3% aged 25-44 years. A similar percentage of HBPHU paracetamol cases were also aged 25-44 years, with a quarter aged 0-4 years. Low numbers make the WCPHU data less reliable; half were aged 45-64 years.

Between 61.5% and 87.5% of the paracetamol poisonings were of European ethnicity. This lower percentage is from ARPHS – in this dataset, 20% of the paracetamol cases were of Asian ethnicity.

4.7.3. Ethanol Poisonings

Proportion of cases involving ethanol ranged from less than 1% of the NPC cases to over a third of the ARPHS cases. Figures for the CSO, HBPHU and WCPHU were more comparable with each other, varying around 6% (Appendix Table 30). Of the substances identified amongst the three PHU datasets, ethanol ranked first for Auckland DHB, second for Hawkes Bay and third for West Coast. The eight deaths to date for 2003, which have been included in the analysis, were all from acute ethanol poisoning. In addition there have been four deaths recorded from chronic ethanol exposure.

Amongst the CSO, ARPHS, HBPHS and WCPHS data, no cases were aged less than 14 years. However, 14.5% of the NPC calls related to cases aged 0-4 years. All were categorised as “Child Exploration”. Two of the eight acute ethanol deaths were amongst teenagers; one was aged only 15 years, the other 19 years. Eight of the 22 Hawkes Bay cases (36.4%) involving ethanol were under the legal drinking age (18 years); four were aged 14 years, one 15 years, a further one 16 years and two were 17 years. One of the four West Coast ethanol hospitalisations was under age at 17 years. Forty-eight (6.4%) of the ARPHS ethanol cases were under 18 years of age.

There was no apparent trend by sex across the datasets, with the CSO and NPC cases being fairly evenly split by sex, the majority of the HBPHU and WCPHU cases being female and the majority of the ARPHS cases were male.

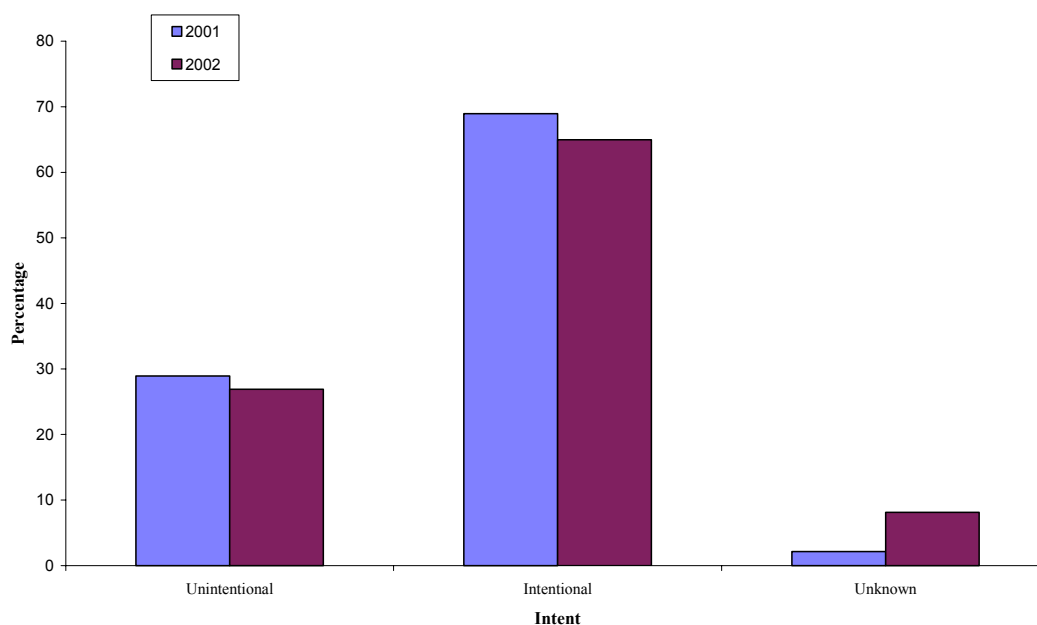
Three of the eight acute ethanol deaths were of Maori ethnicity, as were just over 30% of the HBPHU cases.

5. CORONIAL SERVICE OFFICE DATA FOR 2001 AND 2002

The number of deaths attributable to chemical injuries in New Zealand for 2001 and 2002 as of 30 April 2004 was 235 and 234 respectively. For both years this equates to an annual rate of 6.3 deaths per 100 000 population.

The breakdown of the deaths by intent is similar for both years, with the majority of deaths being intentional (68.9% in 2001, and 65.0% in 2002) (Figure 7).

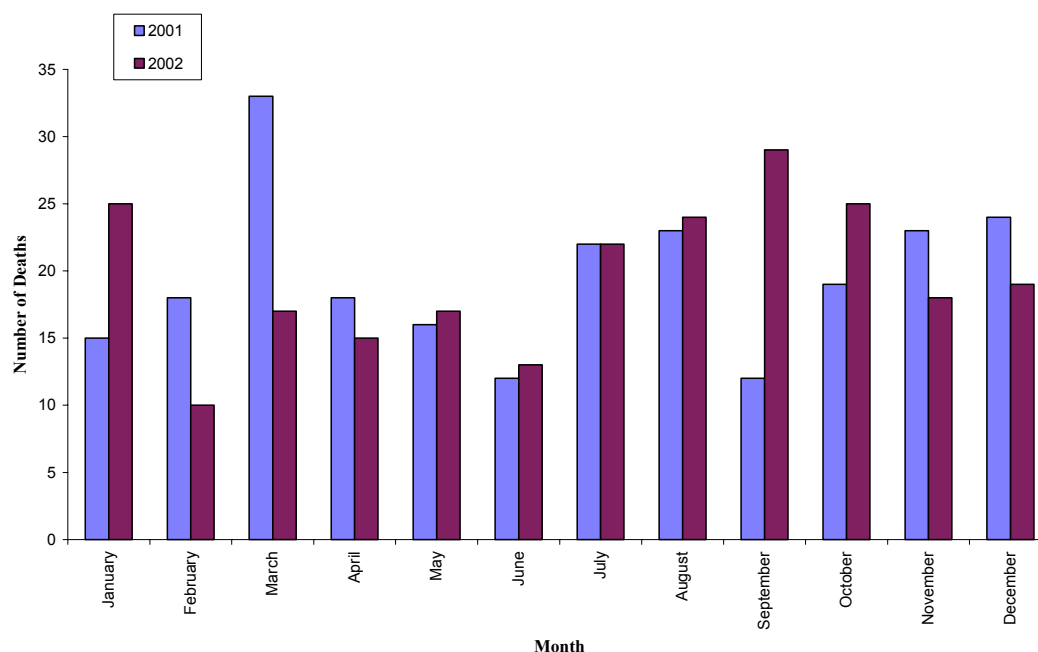
Figure 7: Chemical injury deaths by intent, 2001 and 2002



A difference in seasonal variation by month of death was apparent between the two years (Figure 8). In 2002, lower numbers were seen in February to June inclusive (late summer to early winter) with higher monthly counts observed between July and December. Thus when examined by the four seasons, spring (September to November) accounted for the greatest number of deaths (72/234, 30.8%).

In 2001, there was a less distinct pattern. Thirty-three deaths occurred in March, contributing to making autumn (March to May) the season with the highest number of deaths (67/235, 28.5%). In contrast to 2002, spring had the least number of deaths (54, 23.0%).

Figure 8: Chemical injury deaths by month, 2001 and 2002



Appendix Table 31 and Figures 9 and 10 present chemical injury death data by DHB. DHBs with the greatest number of deaths for 2001 were Canterbury (31) and Waitemata (24) but the highest rate was from the West Coast (13.2 per 100 000 population, 4 deaths). 2002 trends were similar; again West Coast had the highest rate (19.8 per 100 000, 6 deaths) and Canterbury the highest number of deaths (28), followed by Waitemata (24). Auckland DHB also had 24 deaths in 2002.

Only two DHBs showed a significant change between the two years; Taranaki DHB showed a significant decrease from 11 deaths in 2001 to 2 in 2002 while Otago DHB showed a significant increase from 4 deaths in 2001 to 16 in 2002.

DHBs with greater than 10 deaths in a single year which had a higher than average percentage of deaths which were deemed unintentional included Auckland (47.4%, 9/19 in 2001 and 41.7%, 10/24 in 2002) and Hawkes Bay (45.5%, 5/11 in 2001). However in 2002, none of the eight Hawkes Bay deaths were deemed unintentional.

Figure 9: Chemical injury death rates by DHB, 2001 and 2002

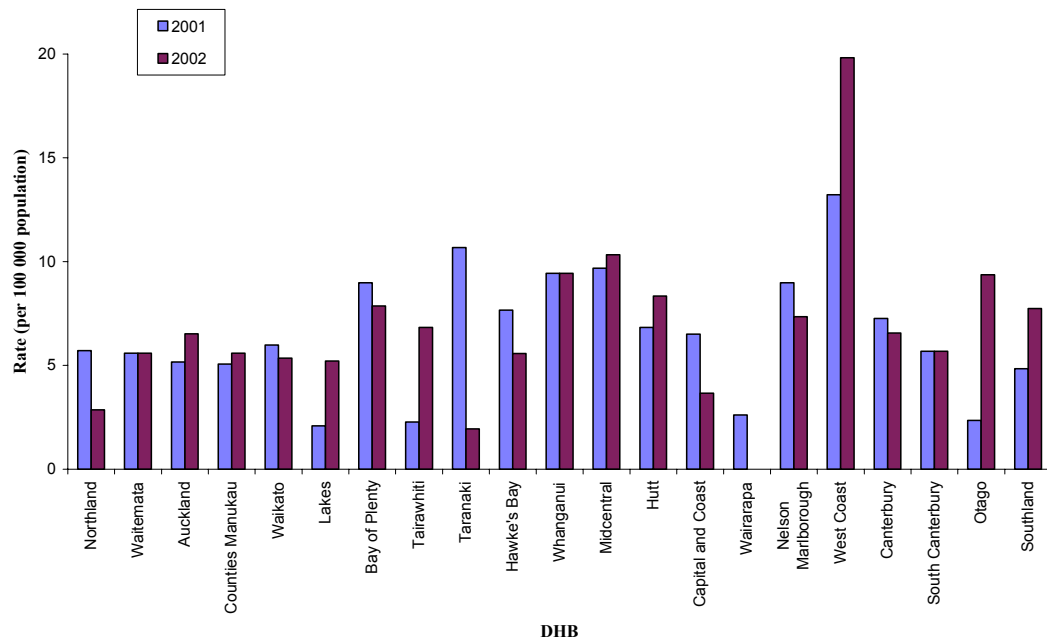
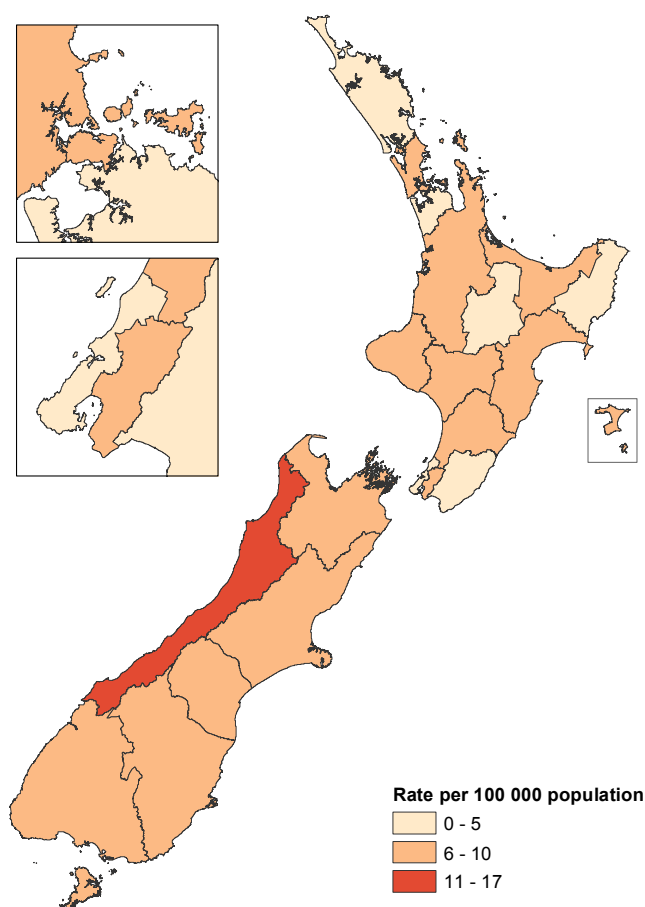


Figure 10: 2001 and 2002 combined CSO deaths by District Health Board



For both 2001 and 2002, by far the greatest number of cases and highest age specific rates occurred in the 25-44 year age group (123 deaths, 11.1 per 100 000 in 2001 and 119 deaths, 10.7 per 100 000 in 2002) (Appendix Table 32, Figures 11 and 12). On average, nearly two thirds (63.6%) of the deaths aged 25-44 years were deemed intentional.

There were two deaths amongst children aged less than five years, one in 2001 and one in 2002. Both were unintentional deaths due to cooking oil fires. There were also two deaths aged 5-14 years. One resulted from intentional petrol ingestion, the other from cerebral anoxia secondary to inhalation of solvents, namely butane and propane and, to a lesser extent isobutane. Intent was unknown for the later case.

Figure 11: Chemical injury death rates by age group, 2001 and 2002

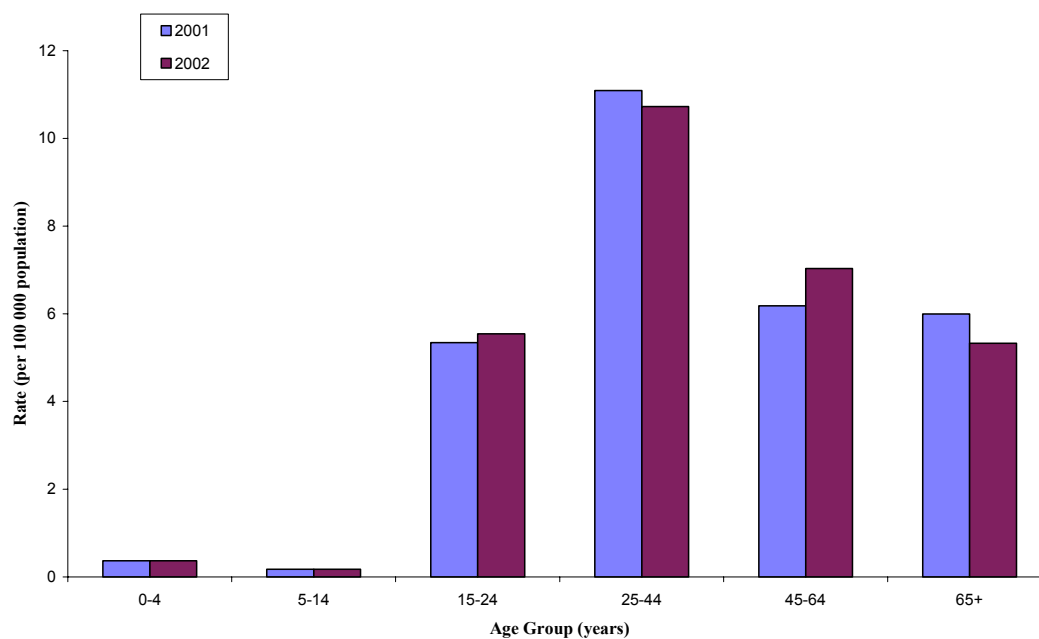
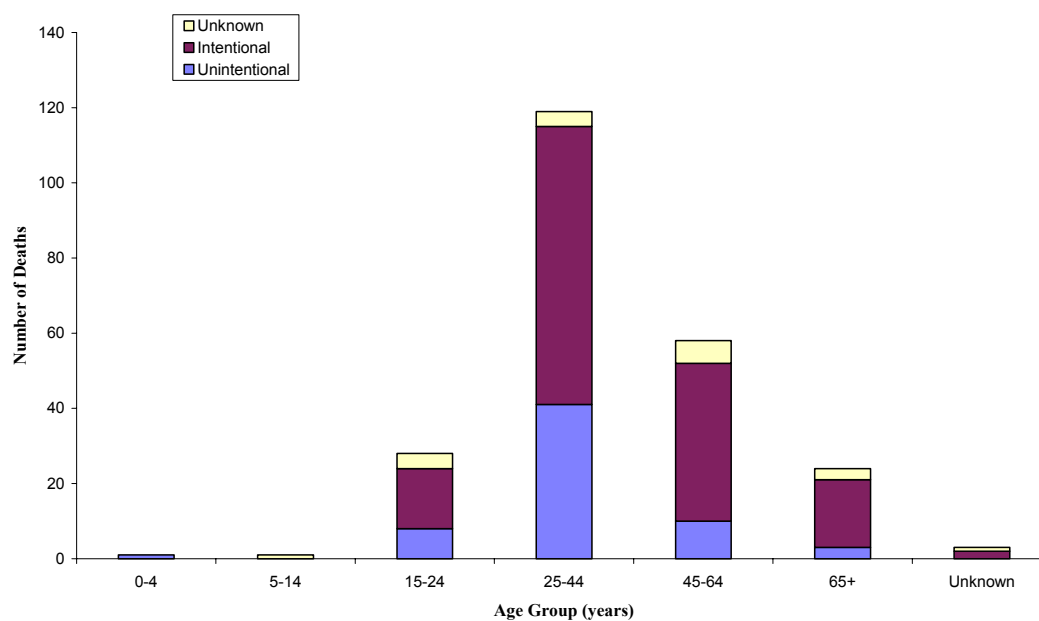


Figure 12: Chemical injury deaths by age group and intent, 2002



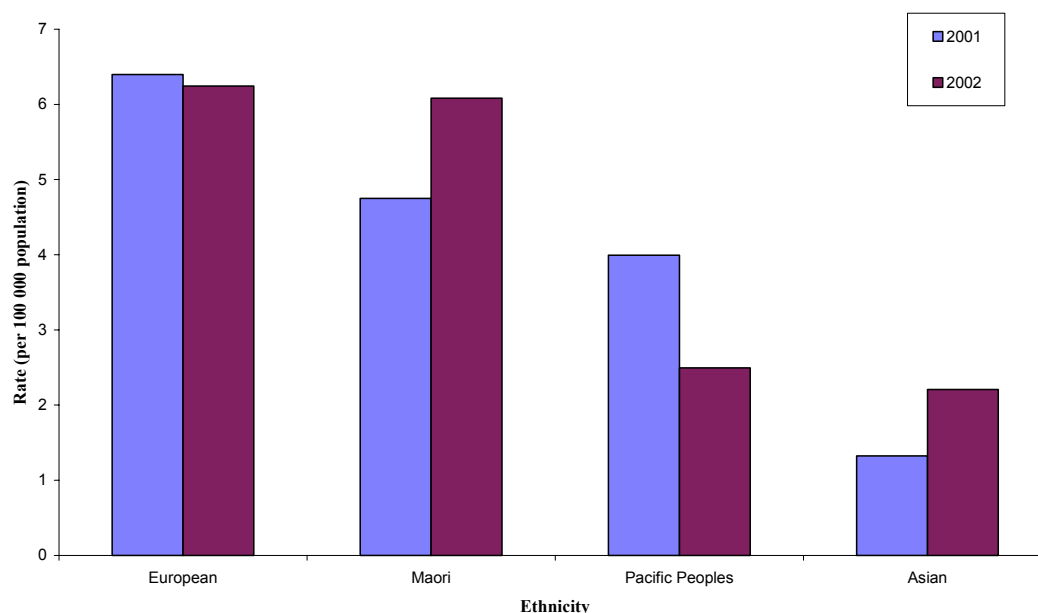
Sex was known for all deaths. For both years, by far the majority were male (70.6% in 2001 and 67.1% in 2002) (Appendix Table 33). In 2001, males had a slightly higher proportion of unintentional deaths than females, but this trend was reversed in 2002.

In 2001, where ethnicity was known (203/235 deaths), 82.3% of deaths (167/203) were classed as Europeans, the resulting rate being 6.4 per 100 000 population. The ethnicity specific rate for Maori was 4.8 per 100 000 population and for Pacific Peoples, 4.0 per 100 000 population (Appendix Table 34).

In 2002, the percentage and ethnicity specific rate for Europeans was similar to that observed in 2001 (79.1%, 6.2 per 100 000 population). However, there was a noticeable increase in the rate for Maori to 6.1 per 100 000 population accompanied by a decrease in the rate for Pacific Peoples to 2.5 per 100 000 population (Figure 13).

The majority of the European and Asian deaths for both years were deemed intentional (70.3% and 87.5% respectively). In comparison, just over half of the Maori and Pacific Peoples deaths were deemed unintentional.

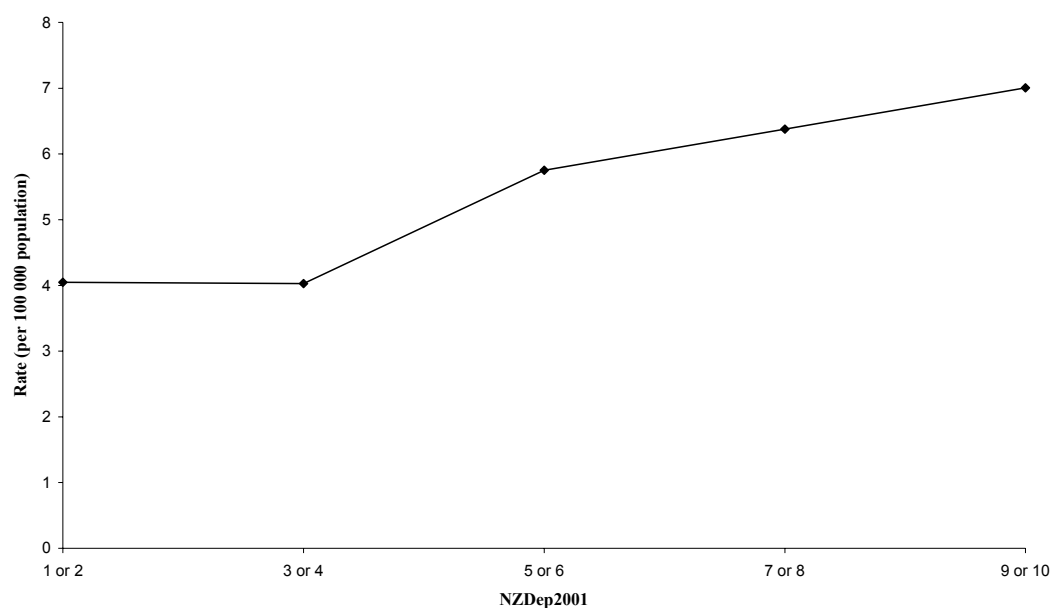
Figure 13: Chemical injury death rates by ethnicity, 2001 and 2002



The following graph (Figure 14) 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. 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 2001 and 2002 show that rates were found to increase with increasing deprivation.

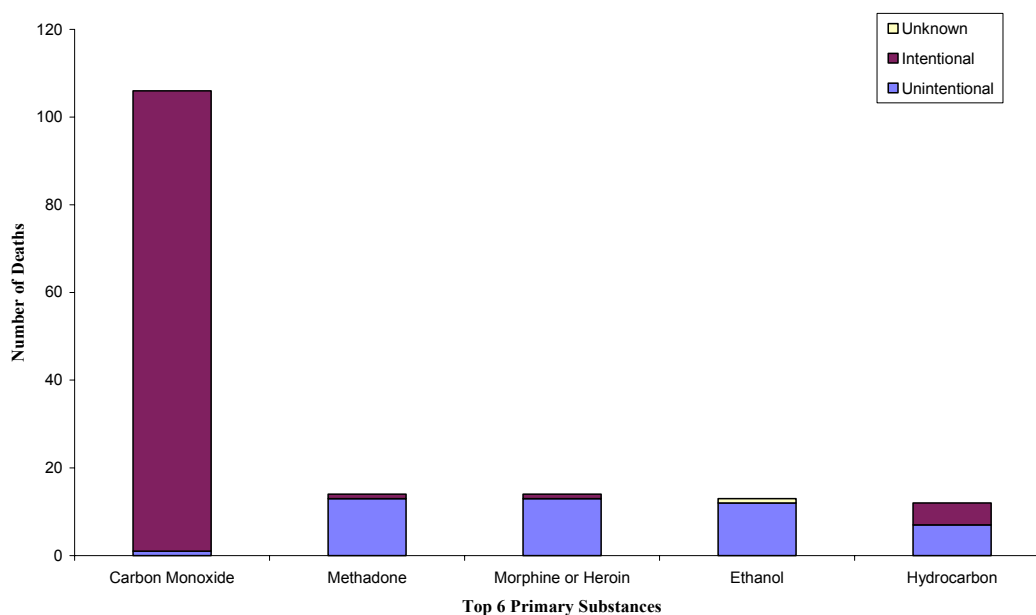
Figure 14: Chemical injury death rates by NZDep2001, 2001 and 2002 deaths combined



Substance data was similar between both years. Forty-two different primary cause chemical substances were associated with the 2001 deaths, likewise for the 2002 deaths. Combined results for both years show that just under half (46.7%) of the primary substances were classed as “Household/Domestic Chemicals”. The next most prominent substance class was “Therapeutics” (31.1%) followed by “Chemicals/Drugs of Abuse” (19.4%) (Appendix Table 35).

The main contributor to the “Household/Domestic Chemicals” class was carbon monoxide. Carbon monoxide was the primary substance involved in 43.9% of the total deaths (206/469). In particular, it was attributed to nearly two thirds of the intentional deaths (64.3%) (Figure 15). The other leading primary substances (both years combined) were methadone (32), morphine or heroin (31), ethanol (23), hydrocarbon (petrol, butane, LPG etc) (22) and amitriptyline (19). Methadone, morphine or heroin and ethanol were the leading causes of the unintentional deaths (Appendix Table 36).

Figure 15: Top 5 Primary substances involved in chemical injury deaths by intent, 2001



Primary substances classed as “Agricultural” accounted for less than five percent of deaths, however, 7 of the 11 agricultural substances were cyanide. Of these cyanide deaths, 4 (57.1%) were from the West Coast DHB. Cyanide deaths therefore accounted for 40% (4/10) of the total West Coast deaths. Details on substances specifically regulated by the HSNO Act are presented in Appendix Table 37.

Just under half of the deaths involved more than one substance. The total number of substances involved in the 2001 deaths was 79, and 80 substances in total were involved in the 2002 deaths.

6. DISCUSSION

National and local comparisons across the datasets

This report presents national New Zealand poisoning data for 2003 from the following sources: CSO (mortality data), NZHIS (inpatient morbidity data) and the NPC (exposure data). For the first time, this has allowed for a comprehensive assemblage of poisoning data on a national scale, thus providing a reasonably comprehensive picture of the burden of disease attributable to chemical poisoning in New Zealand.

Several poisoning trends of public health importance were obtained from this analysis. While approximately two thirds of the hospitalisations were female, two thirds of the deaths were male. Age specific rates differed across the datasets, with the highest hospitalisation rate amongst 15-24 year olds (351.8 per 100 000 population), the highest death rate amongst 25-44 year olds (6.0 per 100 000 population) and the highest NPC call rate for 0-4 year olds (3738.9 per 100 000 population). While Europeans had the highest rates for the CSO and NPC data, the hospitalisation rate for Europeans and Maori was virtually the same. Household and therapeutic substances accounted for the greatest number of deaths and NPC calls.

In addition to the national data, local poisoning notification data is presented from ARPHS, HBPHU, and WCPHU. This PHU data includes emergency patient details that are absent from the national collection of data. As the national CSO, NZHIS and NPC datasets can be broken down by DHB (with the soon to be resolved exception of the three Auckland DHBs), this provides for in-depth analysis of the mortality, morbidity and exposure to chemical injuries at the local level. Thus comparisons can be made between the DHBs and against the national trends.

Auckland, Hawkes Bay and West Coast each had some trends that complied with the national trends and some which differed. Auckland, for example followed the national trends for the highest age specific rates across the datasets, but unlike the national trends, had a similar number of male and female deaths and the Maori rate for hospitalisations was noticeably higher than that for Europeans. Furthermore, chemicals/drugs of abuse were more prominent than household and therapeutic substances, with one third of the notifications involving ethanol.

While the trends by sex and substance for Hawkes Bay followed the national trends, a greater proportion of NZHIS hospitalisations were unintentional than observed nationally, and the highest age specific rate was amongst 0-4 year olds (although very similar to that for 15-24 year olds).

The most prominent finding for West Coast was that NZHIS and NPC rates for this DHB were the highest nationally, as was the rate of deaths in 2001 and 2002. Other local trends identified which differed from that observed nationally were that the highest NZHIS rate was amongst 0-4 year olds (like Hawkes Bay) and the NZHIS European rate was noticeably higher than Maori. In addition the Maori NPC rate was closer to the European than reported nationally.

Across all three PHU datasets, ethanol and paracetamol ranked amongst the top substances involved in the hospitalisations.

Mortality findings

In addition to comparing several poisoning datasets for 2003, this report also examines in detail poisoning related deaths for 2001 and 2002. During this time period there were 469 poisoning deaths, an annual rate of 6.3 per 100 000 population. This rate is only slightly less than that observed internationally. Poisoning death rates (based on external causes of poisoning) in 2001 for England and Wales, and Canada were 7 per 100 000 population, while for the US the rate was 8 per 100 000 population⁵. It should be noted that the data collection method for New Zealand (data obtained from the national Coronial Services Office) differs to that used to calculate the above international figures (ICD-9 and ICD-10 codes) although the extent to which this may influence the results is not known.

The vast majority (314, 67%) of the New Zealand poisoning deaths in 2001/2002 were intentional (suicide), the associated annual rate being 4.2 deaths per 100 000 population. The rate for males was much higher than that for females: 6.1 per 100 000 population for males, compared to 2.4 per 100 000 population for females, a ratio of 2.5:1. This trend is apparent for suicides in general, both for New Zealand and internationally. In New Zealand, in 2001, there were 3.3 male suicides to every female suicide⁶. Across 12 OECD countries, the average was 2.9 male suicides to every female suicide⁷. However, the hospitalisation data presented in this report adds to the suggestion that females make more non-fatal suicide attempts⁸.

There are also differences by sex in the type of poison (carbon monoxide poisoning versus poisoning by solid or liquid substances) used to commit suicide. Of the 221 male suicides by poisoning which occurred in New Zealand in 2001 and 2002, 73.3% were by carbon monoxide poisoning. In comparison, only 43.0% (40/93) of the female suicides by poisoning were due to carbon monoxide.

Suicide by poisoning is one of the most common methods of suicide in New Zealand. Data from NZHIS⁷ for 1988-1997 show that for males, poisoning by any method was a close second after hanging. During this time period, 37.7% of the suicides were from hanging compared to 35.1% from poisoning. Of the poisoning deaths, nearly 80% were from carbon monoxide (28.0% of the total male suicides).

Data for the same years for females show that poisoning (carbon monoxide, solids and liquids) was the number one method of suicide (51.2%). Hanging was second (30.4%). Nearly 60% of these poisoning deaths were from solids or liquids, accounting for 30.2% of the total female suicides, hence slightly less than that from hanging.

Overall, poisoning by any method was the most common method of suicide (38.4%) followed closely by hanging (36.2%). On its own, carbon monoxide poisoning accounted for 26.5% of total suicides.

The highest age specific rate for suicides from the 2001/2002 CSO data of 10.3 per 100 000 population was amongst males aged 25-44 years (57 cases in 2001, 52 in 2002). Seventy six percent (83/109) of these deaths were from carbon monoxide poisoning. This is a significant number of deaths by this means, and slightly higher

than the national average for males of all ages. However NZHIS data for 1988-1997 show that hanging was still a more common method of suicide than carbon monoxide poisoning for this demographic⁷.

The NZHIS data show that poisoning by either solid or liquid substances or carbon monoxide was the most common method for some age/sex groups. These included poisoning by solid or liquid substances amongst females aged 25-44 years, and 65 years and over, and poisoning by carbon monoxide for males aged 45-64 years and 65 years and over⁷.

Suicide by poisoning of any means is of public health importance in New Zealand. Although the CSO dataset does not include any suicide risk factor information it is hoped that this report can be of assistance to professionals working in the suicide prevention field.

Unintentional deaths by poisoning are also of public health importance. In 2001/2002 there were 131 such deaths recorded in the CSO dataset, an annual rate of 1.8 per 100 000 population. Methadone, morphine or heroin and acute ethanol poisoning were the leading cause of the unintentional deaths, together accounting for 55.7% of the unintentional cases. Clearly any public health actions to prevent unintentional deaths should be focused on these substances.

Also important when considering the targeting of public health action is the finding that just over 50% of the Maori and Pacific Peoples poisoning deaths were deemed unintentional compared to 23.9% of the European deaths and 12.5% of the Asian deaths.

Progressing the comprehensive chemical injury surveillance system

From the current situation the comprehensive chemical injury surveillance system could be progressed further in two ways. Firstly more national data from sources such as General Practitioners (GPs), Ambulances Services, and other exposure databases could be incorporated. GP data would further complete the picture of the burden of disease in New Zealand, as it would comprise primarily chronic poisonings. Ideally this data would be obtained electronically. More investigation is required in this area, particularly into the type of data collected by GP's and the systems utilised by GP practices. One way to approach this would be to contact IPAs or PHOs, for example Pegasus in Christchurch. Another option for sourcing chronic disease data is via the DriftNet surveillance system. During the 2004/05 financial year, this system is to undergo review, with one possible option being to extend it to include chronic chemical health complaints or exposure to substances reported to PHUs. ESR has begun scoping exposures, symptoms or syndromes, and circumstances under which such a reporting mechanism would yield meaningful information for policy makers and the local authorities alike⁹.

Data captured within the existing scope of DriftNet (agricultural spraydrift incidence which have a health effect) will be included in the chemical injuries reports from 2004 onwards. Ambulance data is not available in an easily accessible manner as the reports written by ambulance officers are paper based and confidentiality issues arise. As this data is expected to include mainly acute poisoning cases, which ideally should be

captured by PHU or NZHIS data, it is recommended that inclusion of ambulance data take a lower priority.

The other option for extending the comprehensive chemical injury surveillance system is to incorporate more local PHU data. The PHU data presented in this report consists of a major metropolitan city (Auckland), a provincial town (Napier/Hastings) and a rural town (West Coast), thus providing a representative sentinel surveillance system. ESR has also received some Gisborne and Wairarapa PHU data although it remains to be seen as to how complete these datasets will eventually be. Southland PHU has also indicated that they are receiving notification data that they would be willing to send to ESR. While ESR would like to encourage other PHUs to collect and send notification data for incorporation into the system, particularly another metropolitan city, we feel that the existing system is at least sufficient.

While the comprehensive system provides for comparisons across several datasets, some issues are encountered, several of which we identified in the 2003 pilot and are reiterated here. Firstly the timeliness of the data varies between the datasets, making time period comparisons less robust as has been illustrated with the 2003 CSO data in this report. While lack of timeliness is an inherent problem with the CSO data, previous years analyses have shown that the dataset available at the end of a given year (which is estimated to be approximately 50% complete) is sufficient to provide general demographic and substance trends which conform with those identified once the dataset is nearer 100% complete. However, geographic trends should be interpreted with caution in the less complete CSO dataset, as the time taken for reports to be filed at the CSO may be longer and thus geographically influenced.

For 2003, the NPC data for the Auckland region could not be differentiated across the three Auckland District Health Boards, thus the Auckland DHB data from the CSO, NZHIS, and ARPHS could not be compared with that from the NPC. This problem is to be rectified in the present upgrade of the NPC system and from July 2004 onwards, the NPC database will include a DHB field.

Other issues include the different criteria used across the datasets to determine intent and the inability to directly link the datasets to allow for overlaps to be detected. As discussed in report on the 2003 pilot, this issue regarding intent may be remedied if a standard definition was developed. The nature of the CSO and NZHIS data sources makes any changes with regard to these unfeasible, but it should be possible to implement a standard definition for use by the various PHUs. However, we must reiterate that the primary objective of the surveillance system is not ascertainment of intent but of exposure and injury from chemical substances.

Regarding the inability to link the datasets, collection of personal identifiers, e.g. name and NHI number, at the national level is not desirable for confidentiality reasons. However, when numbers are small it may be possible to match based on other fields such as date of birth, sex, DHB etc. Therefore this option may be particularly relevant for a) deaths and b) hospitalisations in less populated DHBs. It may also be possible to make use of data encryption mechanisms. It is proposed that the practicalities of these two options be explored.

The issue regarding the use of different systems for coding substances was raised in the report on the 2003 pilot. It was recommended that the internationally recognised substance classification codes being implemented with the NPC upgrade also be applied to the CSO and PHU data. While this has yet to be implemented, the current substances classes used by the NPC (Appendix 2) were applied to the PHU and CSO data, making comparisons more compatible.

While these issues present challenges, such that any system, in the current environment, will be less than optimal, they do not outweigh the overall benefits of the system for enabling public health action at both the local and national level.

APPENDIX 1

Table 3: National CSO, NZHIS, PHU and NPC data by DHB (2003)

| DHB | CSO (deaths to date) | | NZHIS (admitted patients) | | PHU Notifications | | NPC Calls | |
|--------------------|----------------------|-------------------|---------------------------|-------------------|-------------------|-------------------|--------------|-------------------|
| | No. | Rate ¹ | No. | Rate ¹ | No. | Rate ¹ | No. | Rate ¹ |
| Northland | 14 | 10.0 | 269 | 191.9 | | | 632 | 451.0 |
| Waitemata | 19 | 4.4 | 929 | 216.2 | | | 4576 | 390.1 |
| Auckland | 10 | 2.7 | 798 | 217.0 | 1344 | 365.5 | | |
| Counties Manukau | 16 | 4.3 | 718 | 191.2 | | | | |
| Waikato | 12 | 3.8 | 619 | 194.8 | | | 1596 | 502.3 |
| Lakes | 1 | 1.0 | 180 | 187.5 | | | 515 | 536.6 |
| Bay of Plenty | 10 | 5.6 | 272 | 152.7 | | | 897 | 503.5 |
| Tairāwhiti | 3 | 6.8 | 77 | 175.2 | | | 181 | 411.9 |
| Taranaki | 4 | 3.9 | 163 | 158.2 | | | 362 | 351.3 |
| Hawke's Bay | 0 | 0.0 | 182 | 126.8 | 313 | 218.0 | 892 | 621.3 |
| Whanganui | 6 | 9.4 | 106 | 166.6 | | | 367 | 576.9 |
| MidCentral | 8 | 5.2 | 174 | 112.3 | | | 642 | 414.2 |
| Hutt | 7 | 5.3 | 255 | 193.4 | | | 320 | 242.7 |
| Capital and Coast | 6 | 2.4 | 228 | 92.7 | | | 1495 | 608.0 |
| Wairarapa | 2 | 5.2 | 72 | 188.5 | | | 212 | 554.9 |
| Nelson Marlborough | 2 | 1.6 | 238 | 194.3 | | | 605 | 494.0 |
| West Coast | 1 | 3.3 | 101 | 333.7 | 47 | 155.3 | 230 | 760.0 |
| Canterbury | 10 | 2.3 | 1240 | 290.3 | | | 2291 | 536.4 |
| South Canterbury | 2 | 3.8 | 76 | 144.0 | | | 172 | 325.9 |
| Otago | 9 | 5.3 | 351 | 205.6 | | | 1113 | 651.9 |
| Southland | 5 | 4.8 | 131 | 126.8 | | | 532 | 514.8 |
| Area Outside DHB | | | 39 | | | | | |
| Unknown/Missing | | | | | | | 1154 | |
| TOTAL | 147 | 3.9 | 7218 | 193.1 | | | 18784 | 502.6 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population

Table 4: National CSO, NZHIS, and NPC data by Intent (2003)

| Intent | CSO (deaths to date) | | NZHIS (admitted patients) | | NPC Calls | |
|----------------------|----------------------|------------|---------------------------|------------|--------------|------------|
| | No. | % | No. | % | No. | % |
| Intentional | 108 | 73.5 | 4613 | 63.9 | 2540 | 13.5 |
| Unintentional | 25 | 17.0 | 2414 | 33.4 | 4905 | 26.1 |
| Indeterminate or Unk | 14 | 9.5 | 191 | 2.6 | 90 | 0.5 |
| “Child Exploration” | | | | | 11249 | 59.9 |
| TOTAL | 147 | 100 | 7218 | 100 | 18784 | 100 |

Table 5: National CSO, NZHIS, and NPC data by Age Group (2003)

| Age Group | CSO (deaths to date) | | | NZHIS (admitted patients) | | | NPC Calls ² | | |
|-------------------------|----------------------|-------------------|------------|---------------------------|-------------------|------------|------------------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| 0-4 | 0 | 0.0 | 0.0 | 689 | 254.4 | 9.5 | 10125 | 3738.9 | 53.9 |
| 5-14 | 0 | 0.0 | 0.0 | 282 | 48.9 | 3.9 | 1534 | 243.0 | 8.2 |
| 15-24 | 20 | 4.0 | 13.6 | 1777 | 351.8 | 24.6 | 1531 | 308.8 | 8.2 |
| 25-44 | 67 | 6.0 | 45.6 | 2823 | 254.5 | 39.1 | 2036 | 182.2 | 10.8 |
| 45-64 | 40 | 4.8 | 27.2 | 1135 | 137.6 | 15.7 | 946 | 118.6 | 5.0 |
| 65+ | 18 | 4.0 | 12.2 | 512 | 113.7 | 7.1 | 333 | 78.5 | 1.8 |
| Adult (age unspecified) | | | | | | | 1940 | | 10.3 |
| Child (age unspecified) | | | | | | | 272 | | 1.4 |
| Unknown | 2 | | 1.4 | | | | 67 | | 0.4 |
| TOTAL | 147 | 3.9 | 100 | 7218 | 193.1 | 100 | 18784 | 502.6 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

²NPC age categories are slightly different (0-4, 5-15, 16-25, 26-45, 46-65, 66+) due to the age categories recorded by the NPC.

Table 6: National CSO, NZHIS, and NPC data by Sex (2003)

| Sex | CSO (deaths to date) | | | NZHIS (admitted patients) | | | NPC Calls | | |
|--------------|----------------------|-------------------|------------|---------------------------|-------------------|------------|--------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| Female | 48 | 2.5 | 32.7 | 4572 | 238.8 | 63.3 | 9006 | 470.5 | 47.9 |
| Male | 98 | 5.4 | 66.7 | 2645 | 145.1 | 36.6 | 9425 | 517.0 | 50.2 |
| Unknown | 1 | | 0.7 | 1 | | | 353 | | 1.9 |
| TOTAL | 147 | 3.9 | 100 | 7218 | 193.1 | 100 | 18784 | 502.6 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

Table 7: National CSO, NZHIS, and NPC data by Ethnicity (2003)

| Ethnicity | CSO (deaths to date) | | | NZHIS (admitted patients) | | | NPC Calls | | |
|-----------------|----------------------|-------------------|------------|---------------------------|-------------------|------------|--------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| European | 111 | 4.3 | 75.5 | 5225 | 200.2 | 72.4 | 11714 | 448.8 | 62.4 |
| Maori | 19 | 3.6 | 12.9 | 1059 | 201.2 | 14.7 | 1140 | 216.6 | 6.1 |
| Pacific Peoples | 2 | 1.0 | 1.4 | 292 | 145.8 | 4.0 | 226 | 112.8 | 1.2 |
| Asian | 1 | 0.4 | 0.7 | 282 | 124.5 | 3.9 | 128 | 56.5 | 0.7 |
| Other | 0 | | 0 | 249 | | 3.4 | 437 | | 2.3 |
| Unknown | 14 | | 9.5 | 111 | | 1.5 | 5139 | | 27.4 |
| TOTAL | 147 | 3.9 | 100 | 7218 | 193.1 | 100 | 18784 | 502.6 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

Table 8: National CSO, NZHIS, and NPC data by Substance Class (2003)

| CSO (deaths to date) | | | NZHIS (admitted patients) | | | NPC Calls | | |
|----------------------------------|------------|------------|------------------------------|--------------|------------|-----------------|--------------|------------|
| Substance Class | No. | % | Substance Class ¹ | No. | % | Substance Class | No. | % |
| Household/Domestic Chemicals | 74 | 50.3 | X41 + X61 + Y11 | 3543 | 34.6 | Therapeutic | 7025 | 37.4 |
| Therapeutics | 42 | 28.6 | X40 + X60 + Y10 | 1972 | 19.3 | Household | 6141 | 32.7 |
| Chemical/Drugs of Abuse | 26 | 17.7 | X44 + X64 + Y14 | 1567 | 15.3 | Plant | 1244 | 6.6 |
| Agrichemicals | 3 | 2.0 | X45 + X65 + Y15 | 1174 | 11.5 | Agricultural | 1091 | 5.8 |
| Unknown/Missing | 2 | 1.4 | X42 + X62 + Y12 | 718 | 7.0 | Cosmetic | 1021 | 5.4 |
| Herbal Remedy/Dietary Supplement | 0 | 0.0 | X49 + X69 + Y19 | 596 | 5.8 | Industrial | 931 | 5.0 |
| TOTAL | 147 | 100 | X43 + X63 + Y13 | 290 | 2.8 | Miscellaneous | 797 | 4.2 |
| | | | X47 + X67 + Y17 | 214 | 2.1 | Animal | 376 | 2.0 |
| | | | X46 + X66 + Y16 | 97 | 0.9 | Fungus | 158 | 0.8 |
| | | | X48 + X68 + Y18 | 70 | 0.7 | TOTAL | 18784 | 100 |
| | | | TOTAL | 10241 | 100 | | | |

¹Refer to Table 1 for description of each code. Numbers total to greater than 7218 because multiple E codes can be assigned to each hospitalisation.

Table 9: Auckland DHB data from CSO, NZHIS, and ARPHS by Intent (2003)

| Intent | CSO (deaths to date) | | NZHIS (admitted patients) | | ARPHS Notifications | |
|----------------------|----------------------|------------|---------------------------|------------|---------------------|------------|
| | No. | % | No. | % | No. | % |
| Intentional | 5 | 50.0 | 491 | 61.5 | 868 | 64.6 |
| Unintentional | 3 | 30.0 | 301 | 37.7 | 40 | 3.0 |
| Indeterminate or Unk | 2 | 20.0 | 6 | 0.8 | 436 | 32.4 |
| TOTAL | 10 | 100 | 798 | 100 | 1344 | 100 |

Table 10: Auckland DHB data from CSO, NZHIS, and ARPHS by Age Group (2003)

| Age Group | CSO (deaths to date) | | | NZHIS (admitted patients) | | | ARPHS Notifications | | |
|--------------|----------------------|-------------------|------------|---------------------------|-------------------|------------|---------------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| 0-4 | 0 | 0.0 | 0.0 | 58 | 230.0 | 7.3 | 0 | | 0.0 |
| 5-14 | 0 | 0.0 | 0.0 | 18 | 38.1 | 2.3 | 2 | | 0.1 |
| 15-24 | 1 | 1.8 | 10.0 | 224 | 398.5 | 28.1 | 492 | 875.4 | 36.6 |
| 25-44 | 6 | 4.7 | 60.0 | 320 | 252.7 | 40.1 | 561 | 443.0 | 41.7 |
| 45-64 | 2 | 2.7 | 20.0 | 110 | 147.6 | 13.8 | 224 | 300.6 | 16.7 |
| 65+ | 1 | 2.6 | 10.0 | 68 | 179.2 | 8.5 | 62 | 163.4 | 4.6 |
| Unknown | | | | | | | 3 | | 0.2 |
| TOTAL | 10 | 2.7 | 100 | 798 | 217.0 | 100 | 1344 | 365.5 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

Table 11: Auckland DHB data from CSO, NZHIS, and ARPHS by Sex (2003)

| Sex | CSO (deaths to date) | | | NZHIS (admitted patients) | | | ARPHS Notifications | | |
|--------------|----------------------|-------------------|------------|---------------------------|-------------------|------------|---------------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| Female | 5 | 2.6 | 50.0 | 495 | 260.9 | 62.0 | 651 | 343.1 | 48.4 |
| Male | 5 | 2.8 | 50.0 | 303 | 170.2 | 38.0 | 691 | 388.2 | 51.4 |
| Unknown | 0 | | 0.0 | | | | 2 | | 0.1 |
| TOTAL | 10 | 2.7 | 100 | 798 | 217.0 | 100 | 1344 | 365.5 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

Table 12: Auckland DHB data from CSO, NZHIS, and ARPHS by Ethnicity (2003)

| Ethnicity | CSO (deaths to date) | | | NZHIS (admitted patients) | | | ARPHS Notifications | | |
|-----------------|----------------------|-------------------|------------|---------------------------|-------------------|------------|---------------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| European | 8 | 3.9 | 80.0 | 497 | 240.7 | 62.3 | 858 | 415.6 | 63.8 |
| Maori | 0 | 0.0 | 0.0 | 98 | 336.3 | 12.3 | 138 | 473.6 | 10.3 |
| Pacific Peoples | 1 | 2.3 | 10.0 | 70 | 160.4 | 8.8 | 83 | 190.2 | 6.2 |
| Asian | 0 | 0.0 | 0.0 | 93 | 147.1 | 11.7 | 142 | 224.5 | 10.6 |
| Other | 0 | | 0.0 | 34 | | 4.3 | 27 | | 2.0 |
| Unknown | 1 | | 10.0 | 6 | | 0.8 | 96 | | 7.1 |
| TOTAL | 10 | 2.7 | 100 | 798 | 217.0 | 100 | 1344 | 365.5 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

Table 13: Auckland DHB data from CSO, NZHIS, and ARPHS by Substance Class (2003)

| CSO (deaths to date) | | | NZHIS (admitted patients) | | | ARPHS Notifications | | |
|------------------------------|-----------|------------|------------------------------|-------------|------------|-------------------------------------|-------------|------------|
| Substance Class | No. | % | Substance Class ¹ | No. | % | Substance Class | No. | % |
| Chemical/Drugs of Abuse | 5 | 50.0 | X41 + X61 + Y11 | 371 | 32.3 | Chemicals/drugs of abuse | 1068 | 49.2 |
| Therapeutics | 3 | 30.0 | X40 + X60 + Y10 | 205 | 17.8 | Therapeutics | 867 | 39.9 |
| Household/Domestic Chemicals | 2 | 20.0 | X45 + X65 + Y15 | 193 | 16.8 | Other/Unknown | 151 | 7.0 |
| TOTAL | 10 | 100 | X44 + X64 + Y14 | 177 | 15.4 | Household | 36 | 1.7 |
| | | | X49 + X69 + Y19 | 93 | 8.1 | Therapeutic | 21 | 1.0 |
| | | | X42 + X62 + Y12 | 59 | 5.1 | Industrial | 19 | 0.9 |
| | | | X47 + X67 + Y17 | 21 | 1.8 | Herbal remedies/dietary supplements | 5 | 0.2 |
| | | | X43 + X63 + Y13 | 15 | 1.3 | Agricultural | 4 | 0.2 |
| | | | X46 + X66 + Y16 | 13 | 1.1 | Plant | 1 | 0.0 |
| | | | X48 + X68 + Y18 | 3 | 0.3 | TOTAL | 2172 | 100 |
| | | | TOTAL | 1150 | 100 | | | |

¹ Refer to Table 1 for description of each code. Numbers total to greater than 798 because multiple E codes can be assigned to each hospitalisation.

Table 14: Auckland DHB data from CSO and ARPHS by Substance (2003)

| CSO (deaths to date) | | | ARPHS Notifications | | |
|--------------------------------|-----|------|-----------------------------------|-----|------|
| Primary Substances | No. | % | Substances (Top 11) | No. | % |
| Carbon Monoxide | 2 | 20.0 | Ethanol | 746 | 34.3 |
| Ethanol (chronic) | 2 | 20.0 | Paracetamol | 135 | 6.2 |
| Morphine or Heroin | 2 | 20.0 | Gamma-hydroxybutyrate | 92 | 4.2 |
| Dextropropoxyphene/Paracetamol | 1 | 10.0 | Unknown | 87 | 4.0 |
| Ethanol | 1 | 10.0 | Zopiclone | 85 | 3.9 |
| Meprobamate | 1 | 10.0 | Methamphetamine | 60 | 2.8 |
| Zopiclone | 1 | 10.0 | Tetrahydrocannabinols | 60 | 2.8 |
| | | | 3,4 methylenedioxymethamphetamine | 59 | 2.7 |
| | | | Diazepam | 38 | 1.7 |
| | | | Clonazepam | 37 | 1.7 |
| | | | Paroxetine | 33 | 1.5 |

Table 15: Hawkes Bay data from NZHIS and NPC by Intent (2003)

| Intent | NZHIS (Admitted patients) | | NPC Calls | |
|----------------------|------------------------------|------------|------------|------------|
| | No. | % | No. | % |
| Intentional | 107 | 58.8 | 184 | 20.6 |
| Unintentional | 75 | 41.2 | 191 | 21.4 |
| Indeterminate or Unk | 0 | 0.0 | 9 | 1.0 |
| “Child Exploration” | | | 508 | 57.0 |
| TOTAL | 182 | 100 | 892 | 100 |

Table 16: Hawkes Bay data from NZHIS, PHU and NPC by Age Group (2003)

| Age Group | NZHIS (admitted patients) | | | PHU Notifications | | | NPC Calls ² | | |
|-------------------------|---------------------------|-------------------|------------|-------------------|-------------------|------------|------------------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| 0-4 | 26 | 239.8 | 14.3 | 66 | 608.7 | 21.1 | 462 | 4262.4 | 51.8 |
| 5-14 | 16 | 66.6 | 8.8 | 28 | 116.6 | 8.9 | 57 | 216.5 | 6.4 |
| 15-24 | 41 | 236.8 | 22.5 | 78 | 450.5 | 24.9 | 88 | 535.4 | 9.9 |
| 25-44 | 59 | 149.9 | 32.4 | 97 | 246.4 | 31.0 | 133 | 333.0 | 14.9 |
| 45-64 | 30 | 91.3 | 16.5 | 41 | 124.8 | 13.1 | 41 | 128.6 | 4.6 |
| 65+ | 10 | 52.1 | 5.5 | 3 | 15.6 | 1.0 | 16 | 88.4 | 1.8 |
| Adult (age unspecified) | | | | | | | 82 | | 9.2 |
| Child (age unspecified) | | | | | | | 12 | | 1.3 |
| Unknown | | | | | | | 1 | | 0.1 |
| TOTAL | 182 | 126.8 | 100 | 313 | 218.0 | 100 | 892 | 621.3 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

²NPC age categories are slightly different (0-4, 5-15, 16-25, 26-45, 46-65, 66+) due to the age categories recorded by the NPC.

Table 17: Hawkes Bay data from NZHIS, PHU and NPC by Sex (2003)

| Sex | NZHIS (admitted patients) | | | PHU Notifications | | | NPC Calls | | |
|--------------|---------------------------|-------------------|------------|-------------------|-------------------|------------|------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| Female | 121 | 164.5 | 66.5 | 206 | 280.0 | 65.8 | 447 | 607.6 | 50.1 |
| Male | 61 | 87.1 | 33.5 | 107 | 152.8 | 34.2 | 419 | 598.5 | 47.0 |
| Unknown | | | | | | | 26 | | 2.9 |
| TOTAL | 182 | 126.8 | 100 | 313 | 218.0 | 100 | 892 | 621.3 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

Table 18: Hawkes Bay data from NZHIS, PHU and NPC by Ethnicity (2003)

| Ethnicity | NZHIS (admitted patients) | | | PHU Notifications | | | NPC Calls | | |
|-----------------|---------------------------|-------------------|------------|-------------------|-------------------|------------|------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| European | 140 | 141.1 | 76.9 | 238 | 239.8 | 76.0 | 499 | 502.8 | 55.9 |
| Maori | 37 | 114.0 | 20.3 | 64 | 197.2 | 20.4 | 64 | 197.2 | 7.2 |
| Pacific Peoples | 1 | 27.7 | 0.5 | 4 | 110.7 | 1.3 | 8 | 221.5 | 0.9 |
| Asian | 0 | 0.0 | 0.0 | 2 | 76.6 | 0.6 | 2 | 76.6 | 0.2 |
| Other | 2 | | 1.1 | 2 | | 0.6 | 20 | | 2.2 |
| Unknown | 2 | | 1.1 | 3 | | 1.0 | 299 | | 33.5 |
| TOTAL | 182 | 126.8 | 100 | 313 | 218.0 | 100 | 892 | 621.3 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

Table 19: Hawkes Bay data from NZHIS, PHU and NPC by Substance Class (2003)

| NZHIS (admitted patients) | | | PHU Notifications | | | NPC Calls | | |
|------------------------------|------------|------------|---------------------------|------------|------------|-----------------|------------|------------|
| Substance Class ¹ | No. | % | Substance Class | No. | % | Substance Class | No. | % |
| X41 + X61 + Y11 | 79 | 33.9 | Therapeutic | 150 | 47.9 | Therapeutic | 383 | 42.9 |
| X40 + X60 + Y10 | 36 | 15.5 | Unknown | 69 | 22.0 | Household | 277 | 31.1 |
| X44 + X64 + Y14 | 31 | 13.3 | Household | 64 | 20.4 | Plant | 57 | 6.4 |
| X45 + X65 + Y15 | 31 | 13.3 | Chemical/Drugs of Abuse | 14 | 4.5 | Agricultural | 55 | 6.2 |
| X42 + X62 + Y12 | 19 | 8.2 | Industrial | 5 | 1.6 | Industrial | 42 | 4.7 |
| X49 + X69 + Y19 | 19 | 8.2 | Agrichemical | 5 | 1.6 | Cosmetic | 37 | 4.1 |
| X43 + X63 + Y13 | 8 | 3.4 | Plant | 4 | 1.3 | Miscellaneous | 25 | 2.8 |
| X48 + X68 + Y18 | 5 | 2.1 | Herbal/Dietary Supplement | 2 | 0.6 | Animal | 10 | 1.1 |
| X47 + X67 + Y17 | 3 | 1.3 | TOTAL | 313 | 100 | Fungus | 6 | 0.7 |
| X46 + X66 + Y16 | 2 | 0.9 | | | | TOTAL | 892 | 100 |
| TOTAL | 233 | 100 | | | | | | |

¹ Refer to Table 1 for description of each code. Numbers total to greater than 182 because multiple E codes can be assigned to each hospitalisation.

Table 20: Hawkes Bay data from PHU by Substance (Top 11) (2003)

| PHU Notifications | | |
|--|-----|------|
| Substance (Top 11) | No. | % |
| Not stated | 68 | 21.3 |
| Multiple drugs (unspecified) | 28 | 8.8 |
| Paracetamol (includes Panadol & Pamol) | 28 | 8.8 |
| Ethanol | 22 | 6.9 |
| Antidepressants (unspecified) | 21 | 6.6 |
| Smoke | 16 | 5.0 |
| Benzodiazapines (unspecified) | 15 | 4.7 |
| Antiepileptics (unspecified) | 9 | 2.8 |
| Ibuprofen | 5 | 1.6 |
| Opioids (unspecified) | 5 | 1.6 |
| Tetrahydrocannabinols | 5 | 1.6 |

Table 21: West Coast data from NZHIS and NPC by Intent (2003)

| Intent | NZHIS (Admitted patients) | | NPC Calls | |
|----------------------|------------------------------|------------|------------|------------|
| | No. | % | No. | % |
| Intentional | 68 | 67.3 | 58 | 25.2 |
| Unintentional | 32 | 31.7 | 53 | 23.0 |
| Indeterminate or Unk | 1 | 1.0 | 2 | 0.9 |
| “Child Exploration” | | | 117 | 50.9 |
| TOTAL | 101 | 100 | 230 | 100 |

Table 22: West Coast data from NZHIS, PHU and NPC by Age Group (2003)

| Age Group | NZHIS (admitted patients) | | | PHU Notifications | | | NPC Calls ² | | |
|-------------------------|---------------------------|-------------------|------------|-------------------|-------------------|------------|------------------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| 0-4 | 12 | 619.2 | 11.9 | 8 | 412.8 | 17.0 | 103 | 5314.8 | 44.8 |
| 5-14 | 1 | 20.5 | 1.0 | 1 | 20.5 | 2.1 | 18 | 340.1 | 7.8 |
| 15-24 | 16 | 516.3 | 15.8 | 10 | 322.7 | 21.3 | 16 | 542.6 | 7.0 |
| 25-44 | 42 | 482.3 | 41.6 | 14 | 160.8 | 29.8 | 34 | 381.1 | 14.8 |
| 45-64 | 22 | 290.7 | 21.8 | 12 | 158.5 | 25.5 | 20 | 270.7 | 8.7 |
| 65+ | 8 | 196.1 | 7.9 | 2 | 49.0 | 4.3 | 5 | 131.6 | 2.2 |
| Adult (age unspecified) | | | | | | | 30 | | 13.0 |
| Child (age unspecified) | | | | | | | 3 | | 1.3 |
| Unknown | | | | | | | 1 | | 0.4 |
| TOTAL | 101 | 333.7 | 100 | 47 | 155.3 | 100 | 230 | 760.0 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

²NPC age categories are slightly different (0-4, 5-15, 16-25, 26-45, 46-65, 66+) due to the age categories recorded by the NPC.

Table 23: West Coast data from NZHIS, PHU and NPC by Sex (2003)

| Sex | NZHIS (admitted patients) | | | PHU Notifications | | | NPC Calls | | |
|--------------|---------------------------|-------------------|------------|-------------------|-------------------|------------|------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| Female | 64 | 426.1 | 63.4 | 34 | 226.3 | 72.3 | 117 | 778.9 | 50.9 |
| Male | 37 | 242.7 | 36.6 | 13 | 85.3 | 27.7 | 108 | 708.5 | 47.0 |
| Unknown | | | | | | | 5 | | 2.2 |
| TOTAL | 101 | 333.7 | 100 | 47 | 155.3 | 100 | 230 | 760.0 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

Table 24: West Coast data from NZHIS, PHU and NPC by Ethnicity (2003)

| Ethnicity | NZHIS (admitted patients) | | | PHU Notifications | | | NPC Calls | | |
|-----------------|---------------------------|-------------------|------------|-------------------|-------------------|------------|------------|-------------------|------------|
| | No. | Rate ¹ | % | No. | Rate ¹ | % | No. | Rate ¹ | % |
| European | 91 | 348.1 | 90.1 | 38 | 145.4 | 80.9 | 134 | 512.6 | 58.3 |
| Maori | 5 | 197.0 | 5.0 | 0 | 0.0 | 0.0 | 11 | 433.4 | 4.8 |
| Pacific Peoples | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 666.7 | 0.4 |
| Asian | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 497.5 | 0.4 |
| Other | 3 | | 3.0 | 1 | | 2.1 | 10 | | 4.3 |
| Unknown | 2 | | 2.0 | 8 | | 17.0 | 73 | | 31.7 |
| TOTAL | 101 | 333.7 | 100 | 47 | 155.3 | 100 | 230 | 760.0 | 100 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

Table 25: West Coast data from NZHIS, PHU and NPC by Substance Class (2003)

| NZHIS (admitted patients) | | | PHU Notifications | | | NPC Calls | | |
|------------------------------|------------|------------|--------------------------------|-----------|------------|-----------------|------------|------------|
| Substance Class ¹ | No. | % | Substance Class | No. | % | Substance Class | No. | % |
| X41 + X61 + Y11 | 48 | 29.3 | Therapeutic | 37 | 78.7 | Therapeutic | 112 | 48.7 |
| X40 + X60 + Y10 | 41 | 25.0 | Household/Domestic Chemical | 4 | 8.5 | Household | 61 | 26.5 |
| X44 + X64 + Y14 | 32 | 19.5 | Chemical/Drugs of Abuse | 4 | 8.5 | Cosmetic | 13 | 5.7 |
| X43 + X63 + Y13 | 14 | 8.5 | Unknown | 1 | 2.1 | Agricultural | 12 | 5.2 |
| X45 + X65 + Y15 | 11 | 6.7 | Agricultural | 1 | 2.1 | Plant | 11 | 4.8 |
| X42 + X62 + Y12 | 6 | 3.7 | TOTAL | 47 | 100 | Industrial | 9 | 3.9 |
| X49 + X69 + Y19 | 6 | 3.7 | | | | Miscellaneous | 8 | 3.5 |
| X47 + X67 + Y17 | 5 | 3.0 | | | | Animal | 4 | 1.7 |
| X46 + X66 + Y16 | 1 | 0.6 | | | | Fungus | 0 | 0.0 |
| X48 + X68 + Y18 | 0 | 0.0 | | | | TOTAL | 230 | 100 |
| TOTAL | 164 | 100 | | | | | | |

¹Refer to Table 1 for description of each code. Numbers total to greater than 101 because multiple E codes can be assigned to each hospitalisation.

Table 26: West Coast data from PHU by Substance (Top 11) (2003)

| PHU Notifications | | |
|--------------------------------|-----|------|
| Substance (Top 11) | No. | % |
| Paracetamol (Includes Panadol) | 8 | 12.1 |
| Medication Unknown | 5 | 7.6 |
| Carbamazepine (Tegretol) | 4 | 6.1 |
| Ethanol | 4 | 6.1 |
| Bezafibrate (Bezalip) | 3 | 4.5 |
| Paroxetine | 3 | 4.5 |
| Ibuprofen (Brufen & Neurophen) | 2 | 3.0 |
| Promethazine (Phenergan) | 2 | 3.0 |
| Quinapril HCL (Accupril) | 2 | 3.0 |
| Sleeping Pills | 2 | 3.0 |
| Zopiclone | 2 | 3.0 |

Table 27: Summary Demographic Data from NZHIS, NPC, HBPHU and WCPHU for Poisonings in Children Aged Less Than 5 Years

| DEMOGRAPHICS | NZHIS National | | NPC ¹ National | | HBPHU | | WCPHU | |
|---|----------------|------------|---------------------------|-------------|--------------------|------|--------------------|------|
| | No. | % | No. | % | No. | % | No. | % |
| Number of cases & % of total cases | 689 | 9.5 | 10125 | 53.9 | 66 | 21.1 | 8 | 17.0 |
| Intent | | | | | | | | |
| Intentional | 0 | 0.0 | 7 | 0.1 | Data not available | | Data not available | |
| Unintentional | 688 | 99.9 | 220 | 2.2 | | | | |
| Indeterminate or Unknown "Child Exploration" | 1 n/a | 0.1 n/a | 2 9896 | 0.0 97.7 | | | | |
| Sex | | | | | | | | |
| Male | 368 | 53.4 | 5513 | 54.4 | 33 | 50.0 | 3 | 37.5 |
| Female | 321 | 46.6 | 4444 | 43.9 | 33 | 50.0 | 5 | 62.5 |
| Unknown | 0 | 0.0 | 168 | 1.7 | 0 | 0.0 | 0 | 0.0 |
| Ethnicity | | | | | | | | |
| European | 440 | 63.9 | 7135 | 70.5 | 48 | 72.7 | 7 | 87.5 |
| Maori | 154 | 22.4 | 765 | 7.6 | 17 | 25.8 | 0 | 0.0 |
| Pacific People | 54 | 7.8 | 159 | 1.6 | 1 | 1.5 | 0 | 0.0 |
| Asian | 19 | 2.8 | 75 | 0.7 | 0 | 0.0 | 0 | 0.0 |
| Other | 17 | 2.5 | 224 | 2.2 | 0 | 0.0 | 0 | 0.0 |
| Unknown | 5 | 0.7 | 1767 | 17.5 | 0 | 0.0 | 1 | 12.5 |

¹ Possibly also some children aged <5 years in the Child (unspecified age) category.

Table 28: Summary Substance Data from NPC, HBPHU and WCPHU for Poisonings in Children Aged Less Than 5 Years

| NPC National | | | HBPHU | | | WCPHU | | |
|-----------------|------|------|---------------------------|-----|------|-----------------|-----|------|
| Substance Class | No. | % | Substance Class | No. | % | Substance Class | No. | % |
| Household | 3855 | 38.1 | Therapeutic | 24 | 36.4 | Therapeutic | 5 | 62.5 |
| Therapeutic | 3706 | 36.6 | Household | 20 | 30.3 | Unknown | 1 | 12.5 |
| Plant | 822 | 8.1 | Unknown | 8 | 12.1 | Household | 1 | 12.5 |
| Cosmetic | 779 | 7.7 | Industrial | 5 | 7.6 | Agricultural | 1 | 12.5 |
| Agricultural | 336 | 3.3 | Agricultural | 4 | 6.1 | | | |
| Miscellaneous | 326 | 3.2 | Plant | 3 | 4.5 | | | |
| Industrial | 134 | 1.3 | Chemical/Drug of Abuse | 2 | 3.0 | | | |
| Fungus | 113 | 1.1 | | | | | | |
| Animal | 54 | 0.5 | | | | | | |

Table 29: Summary Demographic Data from CSO, NPC, ARPHS, HBPHU and WCPHU for Paracetamol Poisonings

| DEMOGRAPHICS ¹ | CSO National ² | | NPC National ³ | | ARPHS | | HBPHU | | WCPHU | |
|------------------------------------|---------------------------|-----|---------------------------|------|-------|------|-------|------|-------|------|
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Number of cases & % of total cases | 1 | 0.7 | 843 | 4.5 | 135 | 6.2 | 28 | 8.8 | 8 | 12.1 |
| Intent | | | | | | | | | | |
| Intentional | | | 211 | 25.0 | 133 | 98.5 | | | | |
| Unintentional | | | 102 | 12.1 | 1 | 0.7 | | | | |
| Indeterminate or Unknown | | | 7 | 0.8 | 1 | 0.7 | | | | |
| “Child Exploration” | | | 523 | 62.0 | 0 | 0.0 | | | | |
| Age Group (years) | | | | | | | | | | |
| 0-4 | | | 504 | 59.8 | 0 | 0.0 | 7 | 25.0 | 1 | 12.5 |
| 5-14 | | | 93 | 11.0 | 0 | 0.0 | 1 | 3.6 | 0 | 0.0 |
| 15-24 | | | 107 | 12.7 | 61 | 45.2 | 6 | 21.4 | 2 | 25.0 |
| 25-44 | | | 48 | 5.7 | 53 | 39.3 | 11 | 39.3 | 1 | 12.5 |
| 45-64 | | | 28 | 3.3 | 18 | 13.3 | 3 | 10.7 | 4 | 50.0 |
| 65+ | | | 7 | 0.8 | 3 | 2.2 | 0 | 0.0 | 0 | 0.0 |
| Unknown | | | 4 | 0.5 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| “Child (unspecified age)” | | | 2 | 0.2 | n/a | n/a | n/a | n/a | n/a | n/a |
| “Adult (unspecified age)” | | | 50 | 5.9 | n/a | n/a | n/a | n/a | n/a | n/a |
| Sex | | | | | | | | | | |
| Male | | | 637 | 43.5 | 40 | 29.6 | 5 | 17.9 | 2 | 25.0 |
| Female | | | 462 | 54.8 | 94 | 69.6 | 23 | 82.1 | 6 | 75.0 |
| Unknown | | | 14 | 1.7 | 1 | 0.7 | 0 | 0.0 | 0 | 0.0 |
| Ethnicity | | | | | | | | | | |
| European | | | 523 | 62.0 | 83 | 61.5 | 23 | 82.1 | 7 | 87.5 |
| Maori | | | 50 | 5.9 | 9 | 6.7 | 5 | 17.9 | 0 | 0.0 |
| Pacific People | | | 8 | 0.9 | 3 | 2.2 | 0 | 0.0 | 0 | 0.0 |
| Asian | | | 8 | 0.9 | 28 | 20.7 | 0 | 0.0 | 0 | 0.0 |
| Other | | | 10 | 1.2 | 6 | 4.4 | 0 | 0.0 | 0 | 0.0 |
| Unknown | | | 244 | 28.9 | 6 | 4.4 | 0 | 0.0 | 1 | 12.5 |

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

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

³ Paracetamol total based on a search of the NPC database for paracetamol, pamol, panadol and paracare.

Table 30: Summary Demographic Data from CSO, NPC, ARPHS, HBPHU and WCPHU for Acute Ethanol Poisonings

| DEMOGRAPHICS | CSO National ¹ | | NPC National ² | | ARPHS | | HBPHU | | WCPHU | |
|------------------------------------|---------------------------|------|---------------------------|------|-------|------|--------------------|------|--------------------|------|
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Number of cases & % of total cases | 8 | 5.4 | 159 | 0.8 | 746 | 34.3 | 22 | 6.9 | 4 | 6.1 |
| Intent | | | | | | | | | | |
| Intentional | 1 | 12.5 | 95 | 59.7 | 350 | 46.9 | | | | |
| Unintentional | 4 | 50.0 | 27 | 17.0 | 1 | 0.1 | Data not available | | Data not available | |
| Indeterminate or Unknown | 3 | 37.5 | 6 | 3.8 | 395 | 52.9 | | | | |
| “Child Exploration” | 0 | 0.0 | 31 | 19.5 | 0 | 0.0 | | | | |
| Age Group (years) | | | | | | | | | | |
| 0-4 | 0 | 0.0 | 23 | 14.5 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 5-14 | 0 | 0.0 | 10 | 6.3 | 1 | 0.1 | 4 | 18.2 | 0 | 0.0 |
| 15-24 | 2 | 25.0 | 39 | 24.5 | 253 | 33.9 | 9 | 40.9 | 1 | 25.0 |
| 25-44 | 4 | 50.0 | 44 | 27.7 | 298 | 39.9 | 7 | 31.8 | 3 | 75.0 |
| 45-64 | 2 | 25.0 | 10 | 6.3 | 157 | 21.0 | 2 | 9.1 | 0 | 0.0 |
| 65+ | 0 | 0.0 | 0 | 0.0 | 35 | 4.7 | 0 | 0.0 | 0 | 0.0 |
| Unknown | 0 | 0.0 | 2 | 1.3 | 2 | 0.3 | 0 | 0.0 | 0 | 0.0 |
| “Child (unspecified age)” | 0 | 0.0 | 0 | 0.0 | n/a | n/a | n/a | n/a | n/a | n/a |
| “Adult (unspecified age)” | 0 | 0.0 | 31 | 19.5 | n/a | n/a | n/a | n/a | n/a | n/a |
| Sex | | | | | | | | | | |
| Male | 4 | 50.0 | 76 | 47.8 | 450 | 60.2 | 5 | 22.7 | 1 | 25.0 |
| Female | 4 | 50.0 | 82 | 51.6 | 296 | 39.6 | 17 | 77.3 | 3 | 75.0 |
| Unknown | 0 | 0.0 | 1 | 0.6 | 1 | 0.1 | 0 | 0.0 | 0 | 0.0 |
| Ethnicity | | | | | | | | | | |
| European | 2 | 25.0 | 70 | 44.0 | 487 | 65.3 | 14 | 63.6 | 3 | 75.0 |
| Maori | 3 | 37.5 | 8 | 5.0 | 77 | 10.3 | 7 | 31.8 | 0 | 0.0 |
| Pacific People | 1 | 12.5 | 1 | 0.6 | 45 | 6.0 | 0 | 0.0 | 0 | 0.0 |
| Asian | 0 | 0.0 | 0 | 0.0 | 52 | 7.0 | 0 | 0.0 | 0 | 0.0 |
| Other | 0 | 0.0 | 5 | 3.1 | 24 | 3.2 | 0 | 0.0 | 0 | 0.0 |
| Unknown | 2 | 25.0 | 75 | 47.2 | 61 | 8.2 | 1 | 4.5 | 1 | 25.0 |

¹ Acute cases only. In addition there were four deaths from chronic ethanol exposure.

² Ethanol total based on a search of the NPC database for alcohol, ethanol, beer, wine, whiskey, rum, vodka, and gin.

Table 31: CSO data by District Health Board, 2001 and 2002

| DHB | 2001 | | | | | 2002 | | | | |
|-------------------|-----------|------------|----------|------------|-------------------|-----------|------------|-----------|------------|-------------------|
| | "A" | "I" | "U" | Total | Rate ¹ | "A" | "I" | "U" | Total | Rate ¹ |
| Northland | 2 | 6 | 0 | 8 | 5.7 | 2 | 0 | 2 | 4 | 2.9 |
| Waitemata | 4 | 20 | 0 | 24 | 5.6 | 4 | 19 | 1 | 24 | 5.6 |
| Auckland | 9 | 9 | 1 | 19 | 5.2 | 10 | 12 | 2 | 24 | 6.5 |
| Counties | | | | | | | | | | |
| Manukau | 6 | 13 | 0 | 19 | 5.1 | 5 | 15 | 1 | 21 | 5.6 |
| Waikato | 7 | 12 | 0 | 19 | 6.0 | 4 | 11 | 2 | 17 | 5.4 |
| Lakes | 0 | 2 | 0 | 2 | 2.1 | 2 | 3 | 0 | 5 | 5.2 |
| Bay of Plenty | 4 | 12 | 0 | 16 | 9.0 | 5 | 9 | 0 | 14 | 7.9 |
| Tairāwhiti | 1 | 0 | 0 | 1 | 2.3 | 1 | 2 | 0 | 3 | 6.8 |
| Taranaki | 3 | 8 | 0 | 11 | 10.7 | 2 | 0 | 0 | 2 | 1.9 |
| Hawke's Bay | 5 | 6 | 0 | 11 | 7.7 | 0 | 7 | 1 | 8 | 5.6 |
| Whanganui | 1 | 5 | 0 | 6 | 9.4 | 1 | 4 | 1 | 6 | 9.4 |
| MidCentral | 5 | 10 | 0 | 15 | 9.7 | 4 | 12 | 0 | 16 | 10.3 |
| Hutt | 2 | 4 | 3 | 9 | 6.8 | 2 | 7 | 2 | 11 | 8.3 |
| Capital and Coast | 4 | 12 | 0 | 16 | 6.5 | 1 | 6 | 2 | 9 | 3.7 |
| Wairarapa | 1 | 0 | 0 | 1 | 2.6 | 0 | 0 | 0 | 0 | 0.0 |
| Nelson | | | | | | | | | | |
| Marlborough | 3 | 8 | 0 | 11 | 9.0 | 2 | 7 | 0 | 9 | 7.3 |
| West Coast | 1 | 3 | 0 | 4 | 13.2 | 1 | 3 | 2 | 6 | 19.8 |
| Canterbury | 9 | 21 | 1 | 31 | 7.3 | 8 | 17 | 3 | 28 | 6.6 |
| South | | | | | | | | | | |
| Canterbury | 0 | 3 | 0 | 3 | 5.7 | 1 | 2 | 0 | 3 | 5.7 |
| Otago | 0 | 4 | 0 | 4 | 2.3 | 4 | 12 | 0 | 16 | 9.4 |
| Southland | 1 | 4 | 0 | 5 | 4.8 | 4 | 4 | 0 | 8 | 7.7 |
| TOTAL | 68 | 162 | 5 | 235 | 6.3 | 63 | 152 | 19 | 234 | 6.3 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

"A" = Accidental or Unintentional

"I" = Intentional

"U" = Unknown Intent

Table 32: CSO data by Age Group, 2001 and 2002

| Age Group | 2001 | | | | | 2002 | | | | |
|--------------|-----------|------------|----------|------------|-------------------|-----------|------------|-----------|------------|-------------------|
| | "A" | "I" | "U" | Total | Rate ¹ | "A" | "I" | "U" | Total | Rate ¹ |
| 0-4 | 1 | 0 | 0 | 1 | 0.4 | 1 | 0 | 0 | 1 | 0.4 |
| 5-14 | 0 | 1 | 0 | 1 | 0.2 | 0 | 0 | 1 | 1 | 0.2 |
| 15-24 | 7 | 20 | 0 | 27 | 5.3 | 8 | 16 | 4 | 28 | 5.5 |
| 25-44 | 40 | 80 | 3 | 123 | 11.1 | 41 | 74 | 4 | 119 | 10.7 |
| 45-64 | 18 | 31 | 2 | 51 | 6.2 | 10 | 42 | 6 | 58 | 7.0 |
| 65+ | 2 | 25 | 0 | 27 | 6.0 | 3 | 18 | 3 | 24 | 5.3 |
| Unknown | 0 | 5 | 0 | 5 | | 0 | 2 | 1 | 3 | |
| TOTAL | 68 | 162 | 5 | 235 | 6.3 | 63 | 152 | 19 | 234 | 6.3 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

"A" = Accidental or Unintentional

"I" = Intentional

"U" = Unknown Intent

Table 33: CSO data by Sex, 2001 and 2002

| Sex | 2001 | | | | | 2002 | | | | |
|--------------|-----------|------------|----------|------------|-------------------|-----------|------------|-----------|------------|-------------------|
| | "A" | "I" | "U" | Total | Rate ¹ | "A" | "I" | "U" | Total | Rate ¹ |
| Female | 18 | 48 | 3 | 69 | 3.6 | 26 | 45 | 6 | 77 | 4.0 |
| Male | 50 | 114 | 2 | 166 | 9.1 | 37 | 107 | 13 | 157 | 8.6 |
| Unknown | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | |
| TOTAL | 68 | 162 | 5 | 235 | 6.3 | 63 | 152 | 19 | 234 | 6.3 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

"A" = Accidental or Unintentional

"I" = Intentional

"U" = Unknown Intent

Table 34: CSO data by Ethnicity, 2001 and 2002

| Ethnicity | 2001 | | | | | 2002 | | | | |
|-----------------|-----------|------------|----------|------------|-------------------|-----------|------------|-----------|------------|-------------------|
| | "A" | "I" | "U" | Total | Rate ¹ | "A" | "I" | "U" | Total | Rate ¹ |
| European | 46 | 116 | 5 | 167 | 6.4 | 33 | 116 | 14 | 163 | 6.2 |
| Maori | 14 | 11 | 0 | 25 | 4.8 | 17 | 12 | 3 | 32 | 6.1 |
| Pacific Peoples | 4 | 4 | 0 | 8 | 4.0 | 3 | 1 | 1 | 5 | 2.5 |
| Asian | 0 | 3 | 0 | 3 | 1.3 | 1 | 4 | 0 | 5 | 2.2 |
| Other | 0 | 0 | 0 | 0 | | 0 | 1 | 0 | 1 | |
| Unknown | 4 | 28 | 0 | 32 | | 9 | 18 | 1 | 28 | |
| TOTAL | 68 | 162 | 5 | 235 | 6.3 | 63 | 152 | 19 | 234 | 6.3 |

¹Rate calculated using 2001 Census data and expressed per 100 000 population.

"A" = Accidental or Unintentional

"I" = Intentional

"U" = Unknown Intent

Table 35: CSO data by Substance Class, 2001 and 2002

| Substance Class | 2001 | | 2002 | |
|----------------------------------|------------|------------|------------|------------|
| | No. | % | No. | % |
| Household/Domestic Chemicals | 111 | 47.2 | 108 | 46.2 |
| Therapeutics | 75 | 31.9 | 71 | 30.3 |
| Chemical/Drugs of Abuse | 43 | 18.3 | 48 | 20.5 |
| Agrichemicals | 6 | 2.6 | 5 | 2.1 |
| Herbal Remedy/Dietary Supplement | 0 | 0.0 | 0 | 0.0 |
| Unknown/Missing | 0 | 0.0 | 2 | 0.9 |
| TOTAL | 235 | 100 | 234 | 100 |

Table 36: CSO data by Primary Substance, 2001 and 2002

| Year | Accidental | | Intentional | | Unknown Intent | | All Intents | |
|------|--------------------------------|-----|--------------------------------|-----|--------------------------------|-----------------|--------------------------------|-----|
| | Primary Substance | No. | Primary Substance | No. | Primary Substance | No. | Primary Substance | No. |
| 2001 | Methadone | 13 | Carbon Monoxide | 105 | Amitriptyline | 1 | Carbon Monoxide | 106 |
| | Morphine or Heroin | 13 | Dothiepin | 7 | Doxepin | 1 | Methadone | 15 |
| | Ethanol | 12 | Hydrocarbon | 5 | Dextropropoxyphene/Paracetamol | 1 | Morphine or Heroin | 14 |
| | Hydrocarbon | 7 | Amitriptyline | 4 | Ethanol | 1 | Ethanol | 12 |
| | Dextropropoxyphene/Paracetamol | 4 | Nortriptyline | 4 | Propanolol | 1 | Hydrocarbon | 12 |
| | Amitriptyline | 2 | Cyanide | 4 | | | Amitriptyline | 7 |
| | Paroxetine | 2 | Zopiclone | 4 | | | Dothiepin | 7 |
| | Methamphetamine | 2 | Ethylene Glycol | 3 | | | Dextropropoxyphene/Paracetamol | 6 |
| | | | Doxepin | 2 | | | Nortriptyline | 5 |
| | | | Propofol | 2 | | | Cyanide | 4 |
| | | | Quinalbarbitone | 2 | | | Zopiclone | 4 |
| | | | | | | | Doxepin | 3 |
| | | | | | | | Ethylene Glycol | 3 |
| | | | | | | Methamphetamine | 3 | |
| 2002 | Methadone | 15 | Carbon Monoxide | 97 | Ethanol (chronic) | 7 | Carbon Monoxide | 100 |
| | Ethanol | 10 | Amitriptyline | 8 | Hydrocarbon | 2 | Methadone | 17 |
| | Morphine or Heroin | 10 | Hydrocarbon | 7 | Methadone | 2 | Morphine or Heroin | 17 |
| | Cooking oil fire | 4 | Morphine or Heroin | 6 | Amitriptyline | 1 | Amitriptyline | 12 |
| | Carbon Monoxide | 3 | Doxepin | 3 | Morphine or Heroin | 1 | Ethanol | 11 |
| | Amitriptyline | 3 | Cyanide | 3 | Insulin | 1 | Hydrocarbon | 10 |
| | Clozapine | 2 | Insulin | 3 | Codeine | 1 | Ethanol (chronic) | 7 |
| | Chlorpromazine | 2 | Propanolol | 3 | Paracetamol | 1 | Cooking oil fire | 4 |
| | Ethanol/Methanol | 2 | Dothiepin | 2 | Ethanol | 1 | Insulin | 4 |
| | | | Codeine | 2 | Chlorpromazine | 1 | Dothiepin | 3 |
| | | | Dextropropoxyphene/Paracetamol | 2 | Nortriptyline | 1 | Cyanide | 3 |
| | | | Triazolam | 2 | | | Doxepin | 3 |
| | | | | | | | Chlorpromazine | 3 |
| | | | | | | Codeine | 3 | |
| | | | | | | Paracetamol | 3 | |
| | | | | | | Propanolol | 3 | |

Table 37: HSNO substances from CSO data by DHB, intent, age, sex and ethnicity, 2001 and 2002 combined

| Characteristics | HSNO Substances | | | | | | | |
|----------------------------|--------------------------|---------|--------------------|-----------------|---------|-----------------------|-------------------------|-------------------------|
| | Hydrocarbon ¹ | Cyanide | Methylated spirits | Ethylene glycol | Acetone | Paraquat ² | Boric Acid ² | Glyphosate ² |
| Number (all substances) | 22 | 7 | 4 | 3 | 2 | 1 | 1 | 1 |
| Number (primary substance) | 22 | 7 | 3 | 3 | 0 | 1 | 1 | 1 |
| DHB | | | | | | | | |
| Northland | 0 | 0 | 0 | 0 | 0 | | | |
| Waitemata | 0 | 0 | 1 | 0 | 0 | | | |
| Auckland | 1 | 0 | 0 | 0 | 0 | | | |
| Counties Manukau | 4 | 0 | 0 | 1 | 0 | | | |
| Waikato | 2 | 1 | 1 | 1 | 0 | | | |
| Lakes | 0 | 0 | 0 | 0 | 0 | | | |
| Bay of Plenty | 1 | 0 | 0 | 0 | 0 | | | |
| Tairāwhiti | 0 | 0 | 0 | 0 | 0 | | | |
| Taranaki | 0 | 0 | 0 | 0 | 0 | | | |
| Hawke's Bay | 1 | 0 | 0 | 0 | 0 | | | |
| Whanganui | 1 | 0 | 0 | 0 | 0 | | | |
| MidCentral | 2 | 0 | 0 | 0 | 0 | | | |
| Hutt | 0 | 0 | 0 | 0 | 0 | | | |
| Capital and Coast | 2 | 1 | 0 | 1 | 0 | | | |
| Wairarapa | 0 | 0 | 0 | 0 | 0 | | | |
| Nelson Marlborough | 1 | 0 | 0 | 0 | 0 | | | |
| West Coast | 1 | 4 | 1 | 0 | 0 | | | |
| Canterbury | 5 | 1 | 0 | 0 | 2 | | | |
| South Canterbury | 0 | 0 | 1 | 0 | 0 | | | |
| Otago | 0 | 0 | 0 | 0 | 0 | | | |
| Southland | 1 | 0 | 0 | 0 | 0 | | | |
| Intent | | | | | | | | |
| Intentional | 12 | 7 | 1 | 3 | 0 | | | |
| Unintentional | 8 | 0 | 3 | 0 | 2 | | | |
| Indeterminate/Unknown | 2 | 0 | 0 | 0 | 0 | | | |

| Characteristics | HSNO Substances | | | | | | | |
|-------------------|--------------------------|---------|--------------------|-----------------|---------|-----------------------|-------------------------|-------------------------|
| | Hydrocarbon ¹ | Cyanide | Methylated spirits | Ethylene glycol | Acetone | Paraquat ² | Boric Acid ² | Glyphosate ² |
| Age Group (years) | | | | | | | | |
| 0-4 | 0 | 0 | 0 | 0 | 0 | | | |
| 5-14 | 2 | 0 | 0 | 0 | 0 | | | |
| 15-24 | 5 | 0 | 0 | 1 | 0 | | | |
| 25-44 | 4 | 3 | 1 | 0 | 2 | | | |
| 45-64 | 6 | 2 | 2 | 0 | 0 | | | |
| 65+ | 4 | 0 | 1 | 2 | 0 | | | |
| Unknown | 1 | 2 | 0 | 0 | 0 | | | |
| Sex | | | | | | | | |
| Male | 15 | 7 | 2 | 3 | 0 | | | |
| Female | 7 | 0 | 2 | 0 | 2 | | | |
| Ethnicity | | | | | | | | |
| European | 13 | 5 | 3 | 2 | 1 | | | |
| Maori | 5 | 0 | 0 | 0 | 0 | | | |
| Pacific People | 2 | 0 | 0 | 1 | 0 | | | |
| Asian | 0 | 0 | 0 | 0 | 0 | | | |
| Other | 1 | 0 | 0 | 0 | 0 | | | |
| Unknown | 1 | 2 | 1 | 0 | 1 | | | |

1 Hydrocarbon includes petrol, turpentine, LPG, fly spray and lighter fluid.

2 DHB, intent, age, sex and ethnicity details not specified to protect privacy.

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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