ENVIRONMENTAL RISK MANAGEMENT AUTHORITY

ERMA New Zealand

NGĀ KAIWHAKATŪPATO WHAKARARU TAIAO

Environmental Risk Management Authority

MONITORING REPORT

2011

Report to the Minister for the Environment:

Monitoring the effectiveness of the Hazardous Substances and New Organisms Act 1996

ERMA New Zealand

20 Customhouse Quay, Cnr Waring Taylor Street and Customhouse Quay, PO Box 131, Wellington 6140, New Zealand

Telephone 64-4-916 2426 Facsimile 64-4-914 0433 info@ermanz.govt.nz

Contents

Executive Summary 5

Introduction 7

Part 1 Overview of the HSNO Act 2009/2010 9

HSNO Act incidents 2009/2010 9
Hazardous substance incidents classification and analysis 10
New organism incidents analysis 14
HSNO Act decisions and decision-making processes 15
Hazardous substances decisions and decision-making 16
New organisms decisions and decision-making 17
HSNO Act compliance activities 2009/10 18
Hazardous substances compliance activities 18
New organisms compliance activities 20
HSNO Act enforcement action 2009/10 20
Hazardous substances enforcement action 20
New organisms enforcement action 21
Legislative reform 2009/10 21
Hazardous Substances and New Organisms Amendment Act 2010 21
HSNO Act engagement with Māori 22

Part 2 Assessment of HSNO specific interventions – Child Poisonings from Domestic Chemicals 24

Introduction 24
Poisoning trends 24
Sales data 24
Hospital data 25
New Zealand National Poisons Centre data 28
Automatic Dishwasher Powders 30
Background 30
Action 31
Impact of Change 32
Graphic Materials 32
Background 32
Action 33
Maximum Allowable Metal Limits 33
Impact 34
Child Resistant Packaging 34
Background 34
Justification 35
Effectiveness of Change 36
Conclusions 36

Part 3 Indicator Data 38

Executive Summary

This report consists of three parts: a commentary on the overall performance of the Hazardous Substances and New Organisms (HSNO) Act 1996; an evaluation of the effectiveness of HSNO Act controls on domestic chemicals, focusing on those chemicals that have led to incidents of poisoning in children younger than five years old; and a set of indicator data. The report is based on data and information from the 2009/2010 financial year with additional information included in parts to provide a more complete analysis.

Using the assessment of these data this report finds that while there continue to be incidents associated with hazardous substances and new organisms and occurrences of non-compliance, the HSNO Act is generally being effective at preventing and managing adverse effects on the environment, people and communities from hazardous substances and new organisms.

Part One of this report highlights the following messages:

- There were 1,296 reported hazardous substance incidents in 2009/2010. Seventy two of those impacted human health and 437 impacted the environment, though these reports only capture a fraction of likely harm.
- Many hazardous substances incidents were caused by human handling error and intentional misuse. This highlights the importance of delivering coherent safety and compliance messages to the public and workers about how controls should be complied with to reduce the occurrence of adverse effects.
- Chronic effects caused by hazardous substances remain difficult to identify.
- There have been no reported incidents of new organisms having adverse effects on the environment in the last seven years, indicating that the HSNO Act continues to protect the environment from the adverse effects of new organisms.
- The Authority completed a reassessment of 1080 for use in pest control in 2007. Incident numbers show that between 2008 and 2009 there was a decrease in reported operator non-compliance, and an increase in non-compliance by members of the public.
- Two applications for biological control agents (BCAs) were approved in 2009/10 bringing the total to 18 releases of BCAs facilitated by the HSNO Act. There has been no evidence of adverse effects on the environment or human health to date.

- Over the 2009/10 year, the Department of Labour issued 285 HSNO Act compliance orders and the Ministry of Agriculture and Forestry undertook four investigations into potential breaches of the HSNO Act.
- Low levels of funding and workplace visits, uncertainty over levels of compliance in the workplace, and uncertainty over the roles and responsibilities of some enforcement agencies are areas of concern for the compliance and enforcement regime.
- The HSNO Amendment Act 2010 brought in amendments to improve the operation of the HSNO Act.
- Over the period from January 1999 to June 2010, Māori participated in 37 percent of reviewed hazardous substance and new organism applications in the form of submissions or written responses.

Part Two summarises ERMA New Zealand's investigation into the effectiveness of HSNO Act controls on domestic chemicals with a focus on child poisonings. Overall, there has been a slight decrease over the last four years in the percentage of calls to the National Poisons Centre (NPC) which are for child poisonings from domestic chemicals, but a slight increase in the number of children being admitted to hospital for poisonings from domestic chemicals over the same period. There has been a significant decline in the number of medical referrals made by the NPC for automatic dishwasher powders since ERMA New Zealand initiated changes to the regulations for their pH levels.

Part Three presents data that has been collected for a set of key indicators since 2001. While these indicators are useful for identifying general trends, there are fundamental problems with the accuracy and reliability of the data preventing further analysis. This part is provided for information purposes only.

Introduction

This report meets the requirement under Output 5 of the Environmental Risk Management Authority's (ERMA New Zealand) Statement of Intent for the year 2010/11. This Output signals ERMA New Zealand's intention to monitor and review the effectiveness of the HSNO Act regime. This Output comes from sections 4 and 11(1)(b)(i) of the HSNO Act which state:

- Section 4: *"The purpose of this Act is to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms."*
- Section 11(1)(b)(i): *"The Authority may ... monitor and review ... the extent to which the Act reduces adverse effects on the environment or people from hazardous substances or new organisms."*

ERMA New Zealand has prepared a monitoring report annually since 2001 to summarise overall progress in achieving the outcomes laid out in the purpose and principles of the HSNO Act. The scope of the Act captures a very broad range of hazardous substances and new organisms with varying degrees of risk, so poses a challenge when attempting to monitor its performance. We can measure progress towards these outcomes by drawing on comprehensive and up-to-date data on use and effects, and the trends in occurrence of adverse effects. The limitations lie in directly attributing any progress in the reduction of adverse effects to HSNO Act contributions, and in the availability and quality of existing data sources - capturing chronic exposures to hazardous substances in particular.

This Monitoring Report follows the same format as recent years, combining available information on incidents, decision making, compliance and enforcement activities, engagement with Maori and an assessment of HSNO Act interventions in a specific topic area.

- Part 1 consists of commentary on the overall performance of the HSNO Act in the 2009/10 financial year.
- Part 2 evaluates the effectiveness of HSNO Act controls on domestic chemicals, focusing on those chemicals that have led to incidents of poisoning in children younger than five years old.
- Part 3 presents numerical indicators, drawn from data from the financial years 2001/02 to 2009/10.

Part 1
Overview of the HSNO Act 2009/2010

This section reviews the extent to which the HSNO Act reduces adverse effects on the environment or people from hazardous substances or new organisms as required by section 11(1)(b)(i) of the HSNO Act.

HSNO Act incidents 2009/2010

The number, severity and location of incidents are key measures of the extent to which the HSNO Act reduces adverse effects on the environment and people.

An incident is defined as an event involving a hazardous substance or new organism that may involve non-compliance with regulatory requirements and/or cause adverse effects to human health and safety or to the environment. ERMA New Zealand categorises incidents based on the severity of the effect that occurs, from Level 1 (minimal) to Level 5 (massive). Each level has criteria based around effects on People, Environment, Economic, Community, and adequacy of Controls. For example, a hazardous substance incident that involves mild, reversible, short term adverse health effects is assigned as level 2 (minor), serious harm to individuals or a death is assigned as level 3 (moderate), and more than one death is assigned as level 4 (major)[1].

Hazardous substance incidents that get reported to ERMA New Zealand tend to be caused by acute exposures (eg from fires, spills and accidents). There are significant limitations in capturing chronic exposures to hazardous substances.

A summary of incidents is published in ERMA New Zealand's Annual Report (*http://www.ermanz.govt.nz/about-us/corporate/Pages/Annual-reports.aspx*) and is re-summarised here, along with commentary on some of the stand-out incidents in the 2009/10 year.

[1] The criteria against which hazardous substances incidents are assessed "incident levels" were reviewed in 2009 because 95 percent of incidents fell into the Level 1 category with a few in Level 2 and none in Level 3 or 4. The new incident levels allow more definition around Level 1 and Level 2 incidents.

Hazardous substance incidents classification and analysis

There were 1,296 incidents involving hazardous substances reported to ERMA New Zealand during the year July 2009 to June 2010. This is a significant increase in the numbers reported over previous years due to the inclusion of New Zealand Fire Service (NZFS) data in the ERMA New Zealand incident database since 1 July 2009. Previously, NZFS data were reported separately, but alongside, data held by ERMA New Zealand. So while the number of incidents recorded in the ERMA New Zealand database has increased, it is only a result of bringing data sources together[2]. There has not been a significant change in the number of reported harms.

Excluding the NZFS data from the data set for incidents involving hazardous substances, the number of incidents is similar to that recorded for previous years. In 2009/10, 105 incidents that caused adverse effects on the environment were recorded, an increase of 45 on the 60 recorded in 2008/09 (an unusually low year) but less than the 129 recorded in 2007/08.

The number of recorded incidents involving hazardous substances attended by the NZFS decreased significantly because of industrial action taken by paid fire fighters in the period 16/07/09 to 23/12/09. During this time, incident records in the data collection system were not completed.

Petroleum products continue to be the most common hazardous substances associated with reported incidents (Figure 1).

The consolidated incidents have been analysed by location, severity, and impact on people and the environment. Due to current limitations in the way that incident causes are reported, it is often not possible to determine whether incidents are the result of non-compliance or not. Reported incidents do not include long latency illnesses caused by exposure to hazardous substances.

[2] Refer to the Indicator Data in Part Three for more information.

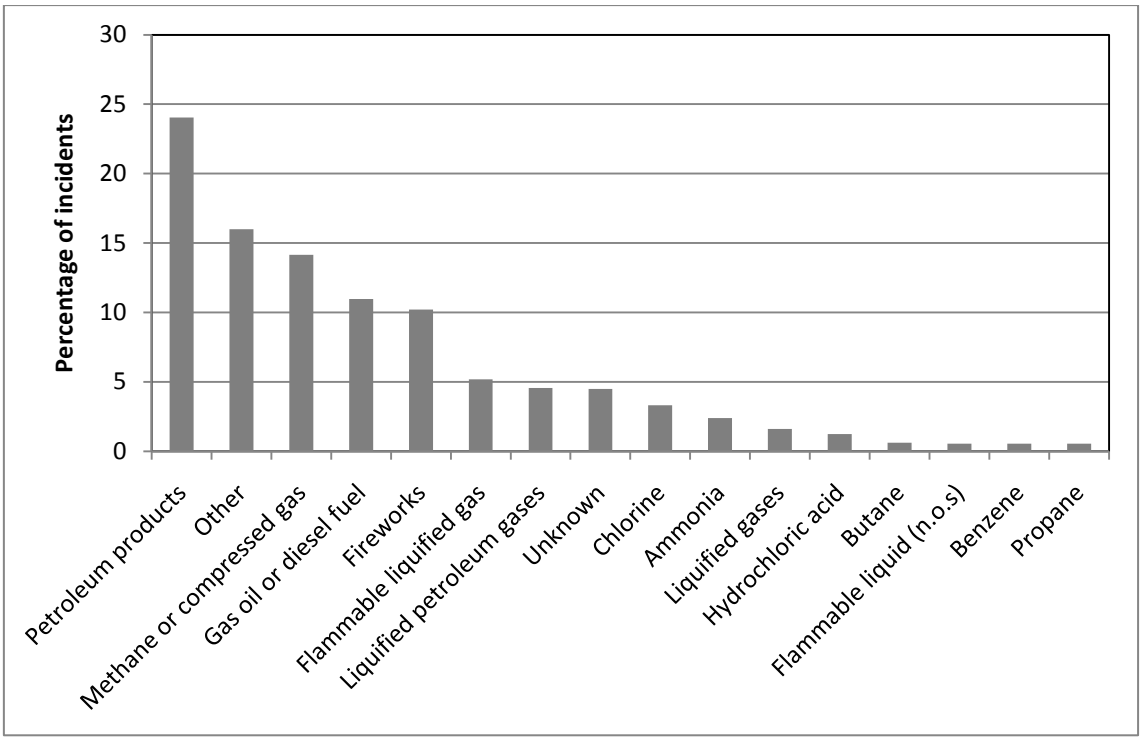

Figure 1: Hazardous substances involved in 1% or more of incidents reported to ERMA New Zealand. All others are captured in the "Other" category (16%).

Location

Of the 1,296 incidents reported to ERMA New Zealand in 2009/10, most occurred in public places (41 percent) and workplaces (26 percent). Incidents may be classified as occurring in more than one location. The remaining 33 percent occurred in motor vehicles, private dwellings, trains or ships. This distribution has remained fairly consistent over the last nine years.

Severity

In 2008/09 and 2009/10 there were no incidents classified as Level 4 or 5. In 2008/09 there were 26 incidents classified above Level 1 (all Level 2) and in 2009/2010 there were 28 incidents classified above Level 1. Eleven incidents were classified as Level 3 (moderate) and 17 as Level 2 (minor). They are summarised as follows:

- Level 3:
    - All were the result of either fire or explosion. Notably, three were caused by welding/cutting torches, and two were caused by inappropriate and careless use of petrol by youths.
    - All took place in a private dwelling (7) or workplace (4).

    - Four incidents resulted in death (three occurring in the workplace and one at a private dwelling), and the remaining seven all resulted in severe burns (six occurred in a private dwelling and one in a workplace).
- Level 2:
    - Six incidents resulted in adverse environmental effects.
    - Ten incidents were the result of fire or explosion, three of which involved fireworks, six being the result of a spill or leak, and one incident was the result of stock ingesting insecticide.
    - Eight incidents were caused through human error while hazardous substances were being handled.

Save banning a substance all together, there is little that can be done using legislation or regulation to prevent or manage incidents occurring through misadventure or intentional misuse involving that substance. Delivering coherent safety and compliance messages to the public and workers about how controls should be complied with is a vital means of managing and preventing adverse effects from hazardous substances.

Impact on the environment

Due to present data collection methods, it is often not possible to measure the extent of environmental harm, particularly the long term impacts of exposure below acute levels. For example, when a gas leak incident is recorded in the NZFS database, the system automatically assigns the incident as having an environmental impact. Gas leaks generally disperse into the air in localised areas with no long term effects on air quality or the wider environments. However, if a fuel leak occurs in a waterway, the environmental impacts are likely to be more significant, particularly on the aquatic ecosystem. Without being able to adequately measure the extent of environmental harm in most cases, we can report that 437 incidents in 2009/10 were recorded as having an adverse effect on the environment. A large proportion (77 percent) of these with known environmental effects were caused by spills (10 percent by fire) – mostly of petroleum products, or hydrocarbon gases.

Environmental effects were unknown in 19 percent of reported incidents.

Chronic environmental effects, like chronic human health effects, are difficult to identify and attribute to exposure to hazardous substances.

Impact on people

Only a fraction of human health effects relating to hazardous substances are captured in the incident database. While this section relates to incidents reported to ERMA New Zealand, Chemical Injury Surveillance System (CISS) reports between 2002 and 2007 indicate that there are a significant number of injuries and deaths occurring which are related to hazardous substances. For example, those data[3] show that in the year 2007, there were 110 deaths and 8,606 hospitalisations related to hazardous substance injuries.

Seventy-two reported incidents in 2009/10 were recorded as having an adverse effect on human health. This represents only 5.5 percent of the total number of incidents. It is possible that the real number is higher, as human health effects are reported as 'unknown' in 88 percent of reported incidents.

There were 17 non-vehicle incidents involving hazardous substances attended by the NZFS where civilian injuries were recorded. This is the same as 2008/09 and the lowest in a decade. These data were not affected by the NZFS industrial action.

There were 55 incidents involving hazardous substances reported to ERMA New Zealand where adverse effects on human health were recorded (excluding NZFS), compared with 58 in 2008/09. There was one non-vehicle incident involving hazardous substances attended by the NZFS where a civilian fatality was recorded. There were also three other deaths from incidents involving hazardous substances not involving the fire service.

The most common substances involved in incidents reported as causing adverse effects on human health were chlorine (9), unspecified hydrocarbons (7), other hydrogen gases (6), ammonia (5), and petrol (5).

The reported incidents generally relate to acute effects which are often able to be linked to specific substances and exposures. Chronic effects however are particularly hard to identify. While it is understood that chronic effects make up a large proportion of the burden of occupational mortality and morbidity, it remains difficult to attribute chronic harms to specific substances and exposures.

[3] Refer to indicator data in Part Three (indicator numbers 11-13). Note that the CISS include therapeutic drugs and alcohol in their definition of a hazardous substance.

New organism incidents analysis

There were 21 new organism incidents recorded in 2009/10 compared with 28 in 2008/09 and 11 in 2007/08. Most incidents involved containment breaches and did not result in adverse effects to public health or the environment. The incidents have been analysed by location, severity, and impact on people and the environment.

Location

Of the 21 incidents, two were unapproved new organism importations into the wider New Zealand environment and the remaining 19 incidents occurred in containment facilities.

Severity

In 2009/10 there were no incidents classified Level 4 or 5. Two incidents were classified Level 3 (moderate), 18 as Level 2 (minor). One incident was not categorised. This related to the discovery of two *Arabidopsis thaliana* plants found outside a genetically modified (GM) plant house. A MAF investigation could not conclusively determine whether the plants were GM or not. The Level 2 and 3 incidents are summarised as follows:

- Level 3:
    - One incident was reported as a result of a teenager getting bitten by a lion during an unapproved animal encounter at a private zoo.
    - The other incident involved the unapproved importation and release of an insect biological control agent into the wider New Zealand environment.
- Level 2:
    - There were fourteen incidents reported as a result of breaches of containment facilities:
        - Seven incidents involved the escape of zoo animals, all of which were recaptured.
        - Two incidents resulted from containment facilities undertaking non MAF-approved activities. One related to the unapproved construction of an alligator enclosure, and the other related to GM plant research being conducted in an area of a university not approved as a containment facility.
        - Two incidents resulted from GM microorganisms being accidentally removed from containment. In both cases the organisms were subsequently destroyed.

        - Three incidents were reported because of structural damage to containment facilities (cracks in the external structure of an animal containment facility; panes of glass being broken in a plant house; and a containment facility being broken into during a robbery).
    - Three people suffered minor injuries from zoo animals in containment facilities.
    - One incident involved the unapproved importation of two snakes into New Zealand.

Impact on the environment

None of the incidents caused any known adverse effects on the environment.

Impact on people

Four incidents involving zoo animals resulted in adverse effects on people. The teenager bitten by the lion received serious leg wounds. People involved in the other three incidents received scratches from interactions with zoo animals.

Reassessment of zoo animal containment

ERMA New Zealand is considering a Chief Executive-initiated reassessment of animals approved (or deemed approved) to be held in containment in zoo facilities. This has been prompted by the number of incidents (including the fatality of a zoo keeper in 2009), the blanket approach used in deeming existing zoo animals to be approved new organisms in containment, and a need to examine whether the purpose (use) of zoo animal approvals is going beyond what is solely covered by "public display"[4].

HSNO Act decisions and decision-making processes

The ability to decline or approve, with or without controls, hazardous substance or new organism applications is a key mechanism of the HSNO Act. The decision-making process, which includes engaging with stakeholders, is integral to this and is intended

[4] A zoo's purpose could also include education, the conservation of genetic material (through captive breeding), and research.

to ensure that robust decisions are made and appropriate controls are imposed. A summary of significant decisions and measures of efficiency in the decision-making process are published in ERMA New Zealand's Annual Reports. Commentary on some of the more significant of these in the 2009/10 year are discussed below.

Hazardous substances decisions and decision-making

Approval for the soil fumigant 'Ripper'

In June 2010, the soil fumigant Ripper was approved by ERMA New Zealand. Ripper contains methyl iodide and chloropicrin, and approval was sought for its use within the strawberry industry as an alternative to methyl bromide, an Ozone Depleting Substance (ODS). Although Ripper is not an ODS, it is highly toxic and was approved with stringent controls to protect workers and the public from exposure.

The need to apply for a highly toxic substance approval was directly associated with the requirement under the Ozone Layer Protection (OLP) Act to phase out methyl bromide. This decision demonstrates how the requirements of one regulatory regime (OLP Act) can have potentially perverse outcomes in another regime (HSNO Act). The search for alternatives to ODS' requires that consideration be given to substances significantly more harmful to human health and the environment, other than the ozone layer.

1080 Reassessment

The Environmental Risk Management Authority completed a reassessment of 1080 for use in pest control in August 2007. After careful consideration, the Authority concluded that with additional controls, the benefits of using 1080 outweighed the adverse effects, and it released its decision to allow its continued use.

Three of the recommendations made by the Authority were that best practice guidance for communication be developed, that industry develop operational best practice, and that more research be undertaken on alternatives and improvements. There has been positive improvement in these areas.

Authority permissions under section 95A of the HSNO Act are delegated to Public Health Units and the Department of Conservation. Permissions at an aggregate level are then reported back to the Ministry of Health and on to ERMA New Zealand. The reports look at the number of operations assessed against the 1080 consultation guidelines and also at the levels of compliance.

A sample of permissions is now audited and onsite checks undertaken where they have not previously been required, a significant proportion of which relate to the use of 1080. This procedure has provided a more rigorous and accountable process for determining the level of compliance with the 1080 approval. The process has changed so that contractors applying 1080 are required to demonstrate that consultation has occurred in accordance with ERMA New Zealand's *Communications Guidelines for Aerial 1080 Operations* before a permission is given.

Research into alternatives and better use of 1080 also continues with more than 60 projects currently underway, up from 19 in 2007 and 44 in 2008.

While there are only two years of data on incident numbers, between 2008 and 2009 there has been a decrease in reported operator non-compliance (and most that did occur were considered minor). There has been an increase in non-compliance by members of the public.

During the reassessment process, some submitters claimed that 1080 was the cause of adverse human health effects. There have been no reported incidents to ERMA New Zealand of adverse health effects on people from the use of 1080 since the reassessment. While there continue to be environmental effects, in making its decision, the Authority considered that the benefits of 1080 use outweighed the adverse effects:

> *"It was the Environmental Risk Management Authority's intention that all aspects of the management regime be subject to public scrutiny. We believe this scrutiny shows the regime is generally working as intended to realise the benefits of using 1080 for pest control, while minimising the risks."*

For more information, refer to the Annual Reports on the Aerial Use of 1080 (http://www.ermanz.govt.nz/hs/1080resources/annual2009.html).

New organisms decisions and decision-making

Approvals for two Biological Control Agents

Two applications to release biological control agents (BCAs) were approved by the Authority in 2009/10. The BCAs were the lace bug *Gargaphia decoris* to control the weed woolly nightshade, and the parasitic wasp *Cotesia urabae* to control the gum leaf skeletoniser.

Woolly nightshade is widely established and is considered to be a major environmental weed in the northern half of the North Island. It can form dense thickets that prevent

the recruitment and growth of other vegetation, and has allelopathic properties whereby it produces chemicals that are inhibitory to the growth of other plant species.

The gum leaf skeletoniser is an Australian moth that became established in New Zealand around 2001. Its larvae feed on the surfaces of eucalypt leaves, producing the typical leaf "skeleton". Gum leaf skeletoniser has the potential to cause damage to eucalypt plantation forests, of which there are around 25,000 hectares in New Zealand.

This now brings the total number of BCAs released, or conditionally released, under the HSNO Act to 18, with no evidence of any of them causing adverse effects on the environment or human health to date. These two approvals provide further evidence that the HSNO Act is facilitating the release of BCAs into the New Zealand environment as identified in Part 2 of the 2010 Monitoring Report.

HSNO Act compliance activities 2009/10

The HSNO compliance system is essentially a set of safety requirements (controls) put in place to minimise the risks from activities relating to hazardous substances and new organisms. Compliance with (and, where necessary, enforcement of) HSNO Act controls is important to protect people and the environment from the identified risks posed by these substances and organisms.

Hazardous substances compliance activities

Hazardous substances are used in an estimated 150,000 workplaces, as well as in homes and public places. Enforcement responsibility is spread over 86 central and local government agencies with each agency having responsibility in specific situations (e.g. the Department of Labour (DoL) is responsible for hazardous substances enforcement in workplaces).

ERMA New Zealand places substantial emphasis on improving and supporting hazardous substance compliance. There are three key areas of focus – enforcement agencies, test certifiers and industry. Much of the work involves improving awareness of the HSNO Act compliance regime through guidance material, publications and training workshops.

A number of areas of concern with the hazardous substance compliance and enforcement regime include:

- Low funding level for the Department of Labour
- Low level of workplace visits
- Uncertainty over the levels of compliance in the workplace
- Uncertainty over the roles and responsibilities of some enforcement agencies

Given the large number of agencies responsible for HSNO Act enforcement, examples of compliance and enforcement activity in this part of the report have been confined to those undertaken by the DoL and the Ministry of Health (MoH) in the key areas of workplace safety and public health.

The Department of Labour - compliance activities

With such a large number of workplaces using or storing hazardous substances, the DoL must prioritise its enforcement activities. These priorities are high hazard sites, high risk sites, sites that require test certification and/or sites that use tracked substances. During 2009/10 the DoL focussed on the agrichemical industry, cool stores, major hazard facilities, LPG facilities, fumigants, new installations, oxidisers, compressed gas cylinders, transit depots and solvents.

The level of compliance activities carried out by the DoL during 2009/10 was consistent with that carried out in previous years (about 5,000 HSNO workplace assessments and 2,000 HSNO information visits). Although there is no definitive benchmark, international best practice indicates the optimal number of site visits is about 15 percent of workplaces. With over 150,000 workplaces, to achieve this level of inspection DoL would need to increase their site visits from approximately 5,000 per annum to over 22,000 site visits per annum. However DoL's current focus on test certificate compliance and monitoring of high risk sectors and sites should translate into more targeted enforcement of non-compliant operators.

The Ministry of Health - compliance activities

The MoH is responsible for enforcement where it is necessary to protect public health. The main focus areas for the MoH are vertebrate toxic agents (issuing permissions for pest control operations and investigating non-compliant operations) and the clearance of graphic materials (ensuring children's watercolour paints, crayons and finger paints do not contain heavy metals). However, MoH are becoming increasingly involved in the area of safety of consumer products and the safe storage of Polychlorinated Biphenyls (PCBs – prohibited substances under the HSNO Act). During 2009/10, MoH

undertook a series of investigations of non-compliant consumer products, carried out two compliance audits on cosmetics products and graphics materials, inspected five sites storing PCBs and declined one and approved two management plans for PCBs. This work is expected to continue into 2010/11.

New organisms compliance activities

New organism enforcement responsibility sits with one agency, the Ministry of Agriculture and Forestry (MAF). MAF's core enforcement activity includes border inspections, the inspection and auditing of containment facilities and approvals for release with controls, and incursion response and enforcement investigations for approved and unapproved new organisms. MAF manages new organisms at the border as part of its routine inspection work.

At the end of the 2009/10 year there were 166 containment facilities. These facilities are approved to one or more ERMA New Zealand/MAF operational standards (specific to microorganisms, vertebrates, invertebrates, planthouses and zoos) and were regularly audited by MAF every six months or annually. Over half the facilities inspected this year were fully compliant. Those facilities issued with a (usually minor) non-compliance completed the required corrective actions to MAF's satisfaction. All GM field test facilities were fully compliant with HSNO Act control requirements.

HSNO Act enforcement action 2009/10

Enforcement action is one of the means of achieving compliance with the HSNO Act. The formal enforcement tools currently available to HSNO Act enforcement agencies include compliance orders and prosecutions. If the Act is complied with, then the adverse effects on the environment and people are managed. A summary of HSNO Act enforcement action taken in 2009/10 is included below.

Hazardous substances enforcement action

The DoL issued 285 HSNO Act compliance orders (compared with 89 in 2008/09) and served 1,401 negotiated agreements for HSNO Act related issues (compared with 1,235 in 2008/09). The increase in compliance orders was most likely due to a combination of increased training, more experienced and confident enforcement officers, and the better targeting on non-compliant high risk sites.

During 2009/10 the MoH investigated 20 complaints of vertebrate toxic agent operations, 9 of which were found to be non-compliant, and 17 investigations relating to spray drift complaints. All issues were resolved informally through education and warnings with no formal enforcement action taken.

New organisms enforcement action

For serious breaches of the HSNO Act, across all areas of its responsibility, MAF will undertake criminal liability investigations.

Over the 2009/10 year, MAF undertook four investigations into potential breaches of the HSNO Act.

- Two companies were fined a total of $40,000 for the deliberate importation and release of the mirid bug (*Macrolophus pygmaeus*).
- An importer was sentenced to three months imprisonment for knowingly importing a new organism and possession of unauthorised goods, two corn snakes (*Elaphe guttata*).
- An incursion response was instigated by MAF after two *Arabidopsis thaliana* plants found outside a PC2 plant house had tested positive for the presence of foreign DNA sequences. The area around the facility was treated to kill any plants. MAF could not conclusively determine that the plants were GM or not, and as such no grounds for prosecution were found.
- An investigation was carried out into the escape of three male cheetahs from their enclosure at the Orana Wildlife Park. There were no prosecutions because the animals did not breach the containment facility and were not subject to the zoo containment standard at that time.

Legislative reform 2009/10

Hazardous Substances and New Organisms Amendment Act 2010

The Hazardous Substances and New Organisms Amendment Act 2010, previously part of the Regulatory Improvement Bill, received royal assent on 19 April 2010. The Bill provided an opportunity to improve the quality of regulation and reduce compliance burden on business by recommending small, but important amendments to nine Acts. The largest part of the Bill, Part 6, related to HSNO Act amendments and comprised 33 (out of a total of 64) clauses.

The resultant Amendment Act brings in a number of amendments to improve the operation of the HSNO Act, including delegations for decisions, new types of approvals for non-genetically modified new organisms, public notification of applications, and improvements in the management of the test certifier regime for hazardous substances compliance.

HSNO Act engagement with Māori

Sections 8 and 6(d) of the HSNO Act require all persons exercising functions, powers, and duties under the Act to take into account the principles of the Treaty of Waitangi, and '*The relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, valued flora and fauna, and other taonga'.*

ERMA New Zealand's Māori Unit, Kaupapa Kura Taiao, provides advice and guidance to ensure that Māori perspectives are effectively incorporated in decision-making. This information sharing and involvement in the decision-making process supports the broader purpose of reducing adverse effects. In June 2010, Kaupapa Kura Taiao commissioned a report[5] to provide an analysis of Māori participation in the application process over the period from January 1999 to June 2010. The report findings provide a measure of the level of Māori participation to date.

Overall, the participation rates within the application process for the period covered were relatively responsive, with Māori participating in 37 percent of the 104 reviewed applications in the form of submissions or written responses. Initial contact between the majority of applicants and Iwi required the assistance of Kaupapa Kura Taiao.

Engagement in the process, particularly at the pre-application stage, was promoted by providing regular correspondence and communication with Māori organisations throughout the country aiming specifically to work closely with Tangata Whenua who had research facilities in their area. There was a corresponding increase in substantial (or collective) submissions by Iwi.

For the reporting period, 68 percent of all Māori submissions were in response to applications regarding the introduction of new organisms and 32 percent in response to hazardous substances applications. Evidence showed that presenting issues recognising impact for Māori (in terms of both physical and metaphysical effects) were most common with applications regarding new organisms. Māori appeared more

[5] Māori Consultation and Submission Review: Brief Analysis of Māori Participation in the application process. June 18, 2010

likely to respond to an application with an area of the unknown (for example, GMO research) with a response relating to the unknown (for example, Mauri) than to an application with an amount of tested certainty (chemical approvals).

The report finds that although Māori do not contribute every time there is an application pending, they are able to participate when applications are important enough collectively to contribute. Higher rates of participation in significant applications could be due to the active engagement of ERMA New Zealand in promoting issues of significance and inviting Māori to respond.

Different factors shown to impact on the participation rates of Māori included:

- Adequacy of notification time (to consult);
- Capacity and capability of Māori to understand the application content;
- Ability of Māori to respond accordingly to the application;
- Availability of resources for applicants, Māori and ERMA New Zealand to engage; and/or
- Māori willingness to engage.

Educating applicants about how to develop relationships with Tangata Whenua at times proved challenging for ERMA New Zealand, however, all effort was made to engage Māori in the application process.

Combined information helped ERMA New Zealand provide a thorough understanding of the issue or issues of importance and ensure all areas of significance to Māori were investigated and reported correctly to the decision makers.

In August 2009 a report relating to the evaluation of the Decision Making Process regarding the endosulfan application was undertaken by Ngā Kaihautū and reported to the Authority. There were a number of minor suggestions made to improve the way that the Authority takes account of Māori perspectives. Another reassessment (methyl bromide) was underway and Ngā Kaihautū noted that the process being used was far superior to the one used for endosulfan.

To date there have been no successful appeals of HSNO approvals on Māori cultural grounds.

Part 2
Assessment of HSNO specific interventions – Child Poisonings from Domestic Chemicals

Introduction

Children are at a high risk of poisoning from hazardous chemicals that are used in the home. Many common household products, such as cleaners and insect repellents, may be toxic if ingested or inhaled. Children's inquisitive and exploratory activities can lead them to be exposed to these chemicals.

Household/domestic products were identified as a target area of concern for review by ERMA New Zealand. Several areas were identified where action could be taken to lessen the risks posed by domestic chemicals to children. This Part examines some of these initiatives and evaluates their effectiveness in reducing the harm to children from domestic chemical poisoning.

In 2006/07, ERMA New Zealand participated in the Safekids public awareness campaign which was aimed at reducing the incidence of poisonings among children. The campaign was initiated by Starship Children's Health.

Poisoning trends

Sales data

AC Nielsen collects sales data from supermarkets and other retailers. These data on the sales of household insecticides, rat baits and poisons, household cleaners, mould treatments, and plant protection products have been used to identify products adults and children are potentially exposed to.

Total supermarket sales of insecticides in the year to 25 April 2010 were 4,378,249 packets/containers. This is a 6.9 percent decrease from the previous year. The total

mass of insecticides sold in the quarter to 25 April 2010 in NZ supermarkets was 442,227kg.[6] The most common type of insecticide purchased was flyspray.

161,287 units of rodent bait and poisons were sold in supermarkets in the year to April. This is an 8.2 percent increase on the previous year. Coumatetralyl represented 90 percent of the active ingredients sold of rodent bait and poison products in the quarter to 25 April 2010. Bromadiolone made up 7 percent and brodifacoum was the remaining 3 percent.

The total supermarket sales of plant protection products (garden pesticides), in the year to April 2010 were 299,397 units. This is down 10.2 percent on the previous year. Glyphosate (a broad spectrum herbicide) made up 65 percent of the total amount of active ingredient sold in supermarkets for plant protection products in the quarter to 25 April 2010. It was by far the most common active ingredient with approximately 12 times more sold than the second highest selling active ingredient.

9.4 percent from a sample size of 2,500 households bought plant protection products in the year to April 2010, with people with young families making up 6.4 percent of plant protection buyers. Young families are defined as adults/shoppers any age, with all children less than 11 years old. They represent the demographic where young children are most likely to be exposed to domestic pesticides. The Average Weight of Purchase for plant protection was 1.5kg.

Sodium Hypochlorite made up 70 percent of the total amount of active ingredient sold (L or kg) of mould treatment products in the quarter to 25 April 2010.

Hospital data

The Ministry of Health manages the national dataset of hospital discharges (National Minimum Data Set - NMDS).[7] Many poisonings are minor and are not serious enough to warrant hospital admission; therefore the MoH data is only useful for showing the more serious poisonings. Compared to the National Poison Centre (NPC) figures (see next section), the data set is far smaller as very few of NPC calls would result in hospitalisation. Also, it is likely people would call 111 for an ambulance rather than the NPC in emergency situations.

[6] The amounts of product were given in kg or litres. An assumption was made that all products have to give an approximation of the total amount sold. This same assumption was used when calculating the amount of AI in products as these were given in percentages, g/kg, g/L or ml/L.

[7] This data covers publicly funded hospital discharges from all New Zealand hospitals from 1998 until now. Specific ages, external cause codes and diagnoses codes are assessed.

This report used hospital discharge data for the age group 0-4 because children in this age group account for 80 percent of poisoning-related admissions (Figure 2). This aligns with the Hazardous Substance (Packaging) Regulations 2001 which aims child resistant packaging at children younger than 51 months. Children in this age group are unaware of the dangers agents such as domestic chemicals can pose. As children develop, their natural instinct is to learn by exploration. At this age they are dependent on adults to keep them safe. Across all datasets we have found that age one has the highest incidence of poisonings.

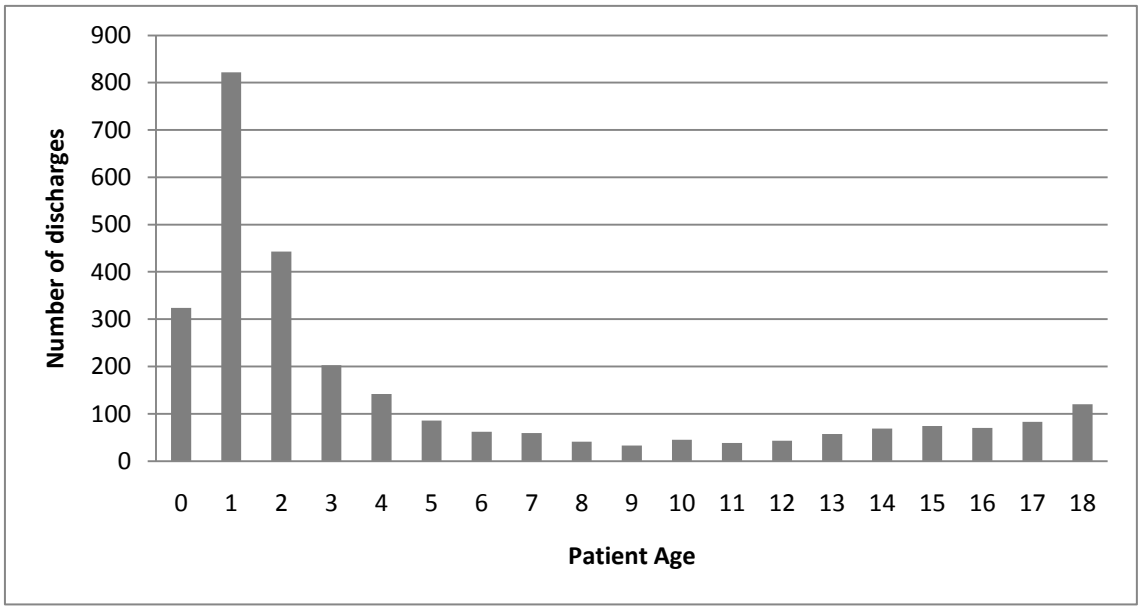

Figure 2: The number of publicly funded hospital discharges from accidental poisonings (ICD10 v1 external cause codes X46-X49), by age, 2000-2009. (MOH)

The dataset contained hospital discharges with the following ICD10 v1[8] codes for external causes of morbidity and mortality:

- X46 - Accidental poisoning by and exposure to organic solvents and halogenated hydrocarbons and their vapours;
- X47 - Accidental poisoning by and exposure to other gases and vapours;
- X48 - Accidental poisoning by and exposure to pesticides; and
- X49 - Accidental poisoning by and exposure to other and unspecified chemicals and noxious substances.

Unfortunately many cases were not correctly classified or there was a lack of information. Seventy-two percent were classified in the X49 'other' category cause code even when diagnosis codes could be used to identify the cause. This problem

8 International Classification of Disease (ICD) version 10.

continued with place of occurrence, with 88 percent of cases occurring at an unspecified place.

Cases with the following diagnosis codes were also assessed:

- T510-T519 - alcohols;
- T520-T549 - solvents, hydrocarbons and corrosive substances;
- T55 - soaps and detergents;
- T560-T569 - metals;
- T570-T579 - inorganic substances;
- T58 - carbon monoxide;
- T590-T599 - gases, fumes and vapours;
- T600-T609 - pesticides; and
- T650-T659 - other toxic substances.

The number of discharges for child poisonings for the external cause codes and the diagnosis codes above (poisonings from domestic chemicals and excludes poisoning from other sources, for example allergies) are captured in Figure 3. The number of hospital discharges decreased from 126 in 2000 to 64 in 2005 but has since increased to 96 in 2009. The three most common diagnosis groups over the decade were T520-T549 (solvents, hydrocarbons and corrosive substances) with 446 discharges, T600-T609 (pesticides) with 167 discharges and T650-T659 (other toxic substances) with 142 discharges. The number of T520-T549 (solvents, hydrocarbons and corrosive substances) diagnoses decreased from 64 in 2000 to 30 in 2005 and has remained between 30 and 41 since.

A recent Safekids report[9] has shown that fewer children are being admitted to hospital for treatment of poisonings:

> *"Changes in the treatment of poisonings in the last decade mean fewer children are now hospitalised after a poisoning incident. Children are often treated at Emergency Departments or by local A & E clinics or General Practitioners. Between April 2004 and March 2005 Christchurch Hospital Emergency Department (ED) staff saw 87 children aged 0–4 years following a poisoning. Of the children seen 60 percent were treated and discharged, 39 percent were admitted to a hospital ward, and one child left before treatment was provided."*

[9] http://www.safekids.org.nz/Downloads/Safekids%20Factsheets/Safekids%20Poisoning%20Injury%20Factsheet%202006.pdf

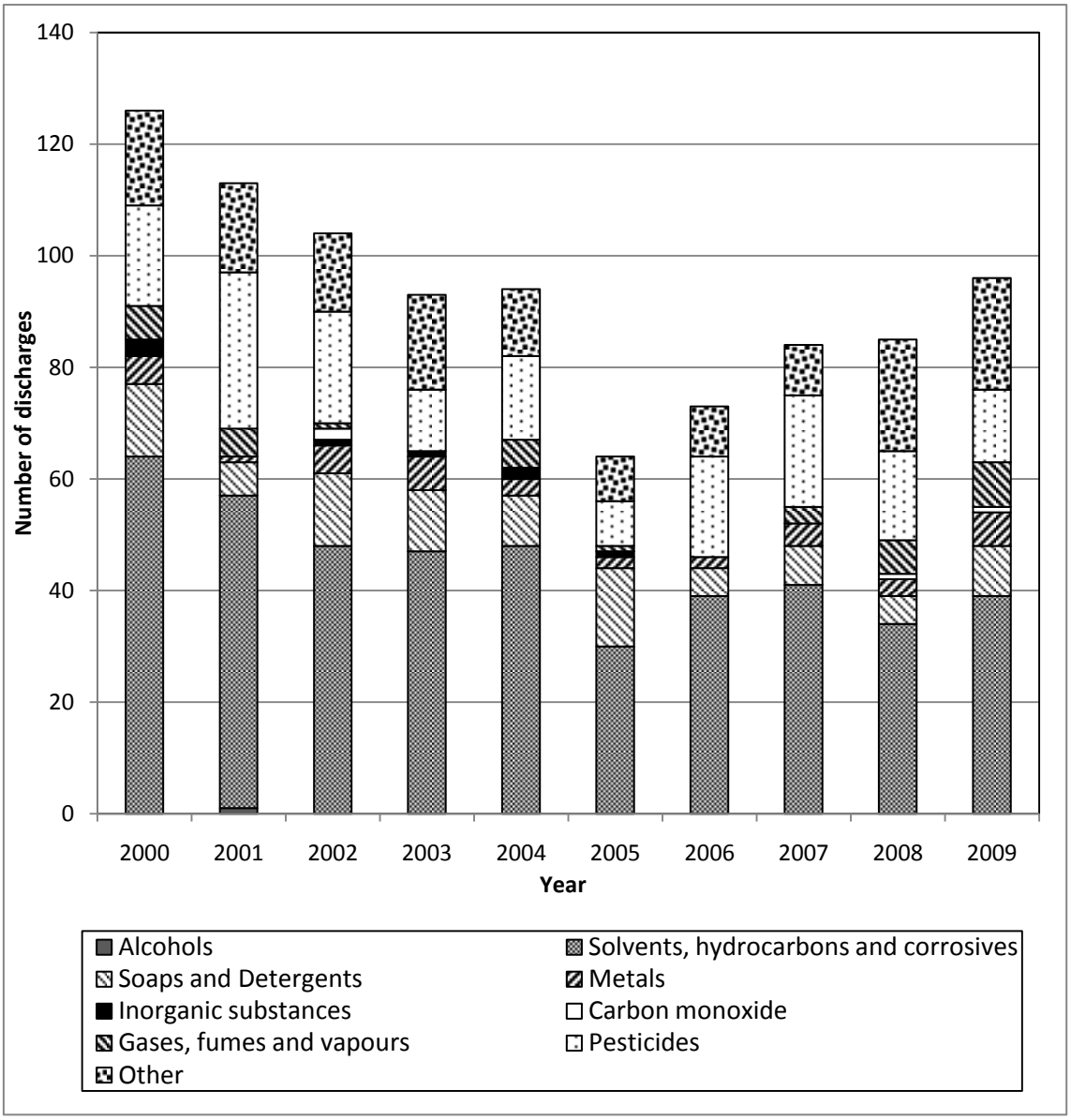

Figure 3: The number of publicly funded hospital discharges for children aged 0-4 with a relevant poisoning primary diagnosis (ICD-10 v1 diagnosis codes T510-T609 - T650-T659), by year. (MOH)

New Zealand National Poisons Centre data

The National Poisons Centre (NPC) runs a 24/7 emergency telephone service for poisons and hazardous chemicals enquiries. They provide advice to the public and health care professionals about what to do in acute poisoning situations. Information about all the calls they receive is collated in a database.

The number of calls to the NPC for child poisonings from domestic chemicals has been increasing since 2006. The data we are interested in are exploratory poisonings of children aged 0-4 that occurred in the home from household products.

The number of calls about child poisonings has increased quite dramatically, up to almost 6000 in 2009. However, the total number of calls to the NPC has also increased at an average of 5.4 percent per annum over the period 2003-2009 (Figure 4Figure 4). The increase in call volumes is likely due to a greater awareness of the service and better accessibility to the free phone number. Most household products have the 0800 number printed on the label and since the launch of the 0800 number there have been over 50,000 fridge magnets distributed to homes. The most common reason for calling the NPC is ingestion of paracetamol, a medicine and therefore not regulated under HSNO.

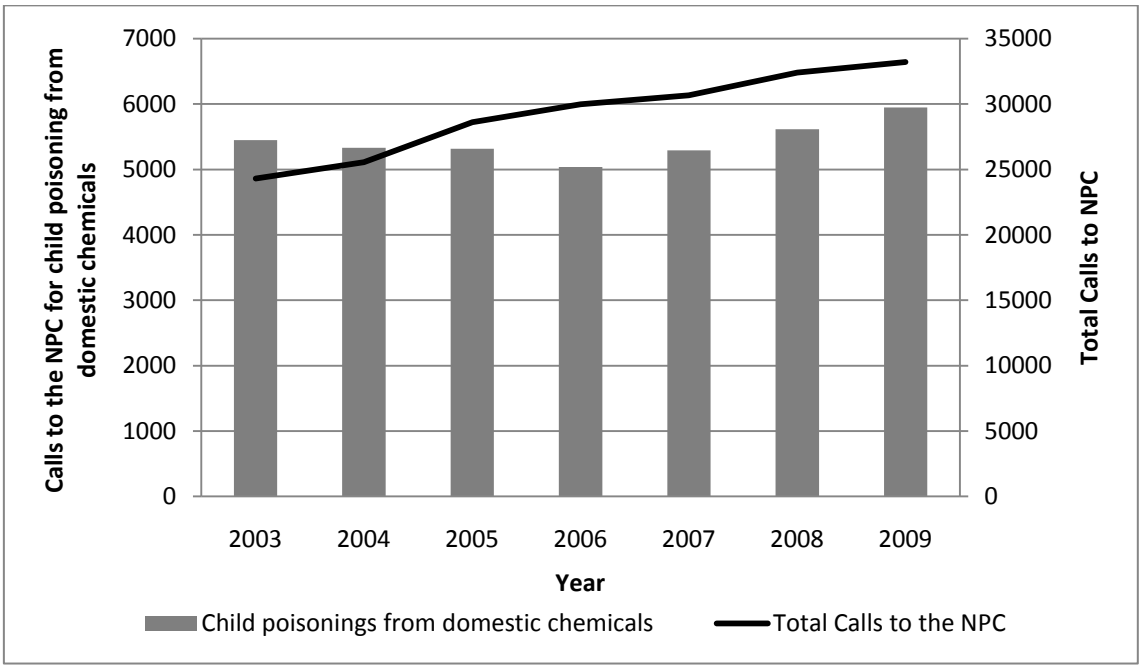

Figure 4: Calls to the National Poisons Centre for child poisonings (ages 0-4) from domestic chemicals compared with total calls to the NPC, by year. Note the different scales on the y axis. (NPC)

By looking at the number of child poisonings as a percentage of the total calls there is a more encouraging trend (Figure 5). The percentage has decreased from 22.4 percent in 2003 to 16.7 percent in 2006 and remained fairly constant since.

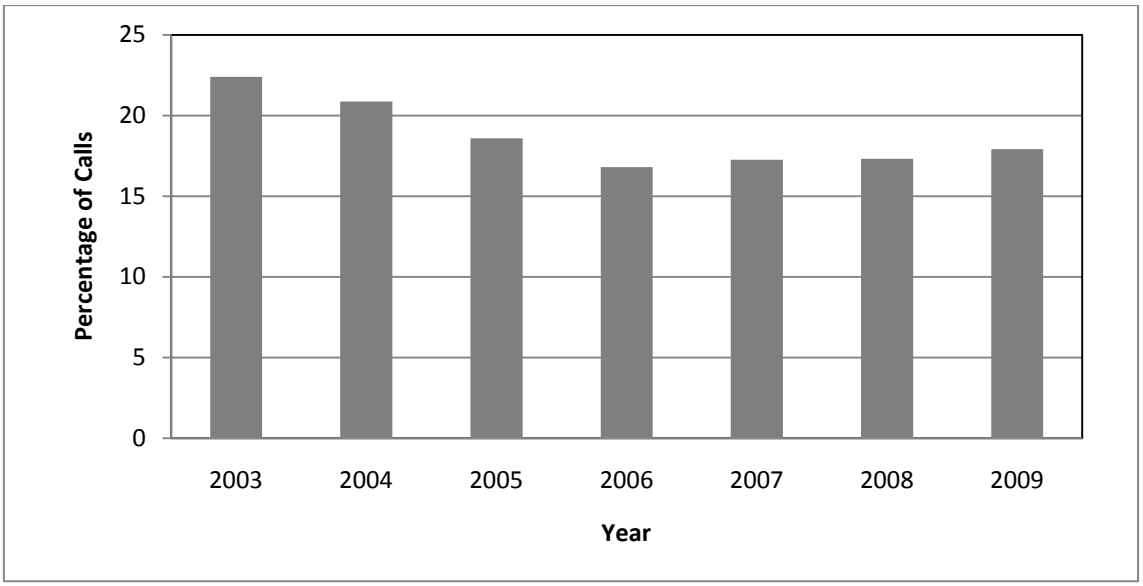

Figure 5: Percentage of calls to the NPC which are for child poisoning from domestic chemicals (NPC)

Automatic Dishwasher Powders

Background

Dishwasher powders were identified as an area of concern by ERMA New Zealand as part of the Hazardous Substance Risk Reduction Strategy in 2005. The NPC reported that from June 2002 to January 2005 there were 615 reported incidents of children ingesting dishwashing powders, an average of nineteen per month. Between January 2001 and January 2005, eleven children were admitted to Starship Children's hospital after ingesting dishwashing powder. Three required admission to the paediatric intensive care unit. Two required multiple operations, including a tracheotomy for one child.

Between 2003 and 2009, there were 1566 calls to the NPC regarding incidents of children under 5 being poisoned by dishwashing powders (Figure 6). Of these, the majority (908) were aged between 12-23 months. This demonstrates that most of these poisonings occur when children have developed the ability to crawl or walk but do not recognise that ingesting a substance may be hazardous. A 1996 Australian study found 94 percent of poisonings from dishwashing powders were by children aged between 6 and 29 months.[10]

[10] Cornish L and Dobbin M, Automatic dishwasher detergent poisoning: opportunities for prevention. Australia and New Zealand Journal of Public Health, 1996. 20(3): p. 278 -282.

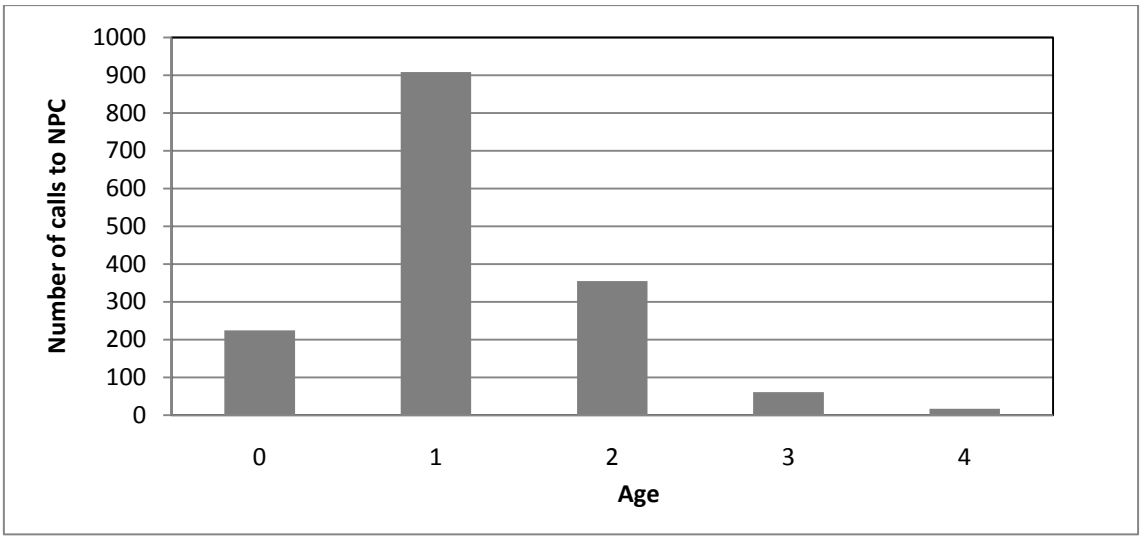

Figure 6: Number of calls to NPC for dishwasher powder exposures by age of children, 2003-2009. (NPC)

Almost all calls for dishwasher powder exposure (98 percent) were for ingestion of dishwashing powder. The rest were for exposure to eyes, skin or nasal inhalation.

Children usually gain access to dishwashing powder in one of two ways:

- Directly from the container. Dishwashing powders are sold in child resistant packaging. However, these can be easily reopened after incomplete closure while frequent opening and closing can distort the lid reducing its effectiveness.
- The other method is from the dishwasher itself. A 1996 Australian study using data from the Victorian Poisons Information Centre which investigated child poisonings from dishwasher powders found that 87 percent gained access to the powder from the dishwasher rather than directly from the package. Of these, three quarters ingested detergent remaining in the dispenser after operation of the machine while the rest took it before operation. More stringent packaging requirements would have no effect on these cases.

Action

In parallel with the Safekids publicity campaign, ERMA New Zealand initiated changes to the regulations for dishwashing powder, reducing their pH levels. As of the first of July 2007, no publically available automatic dishwasher products could have a pH of greater than 12.5. The lower pH levels reduce damage when children swallow dishwashing powder, so reduces the risk of children dying or suffering serious harm.

Impact of Change

This regulations change has contributed to a significant reduction in child poisonings from dishwashing powders, as indicated by the steady decrease in the percentage of calls to the NPC (Figure 6). Most importantly, however, is that the number of medical referrals by the NPC has dropped suddenly. This means that while the number of incidents has slightly decreased, the number of serious incidents that required medical attention has significantly decreased, dropping from 36 medical referrals in 2006 to six in 2007 and remaining low since (Figure 7).

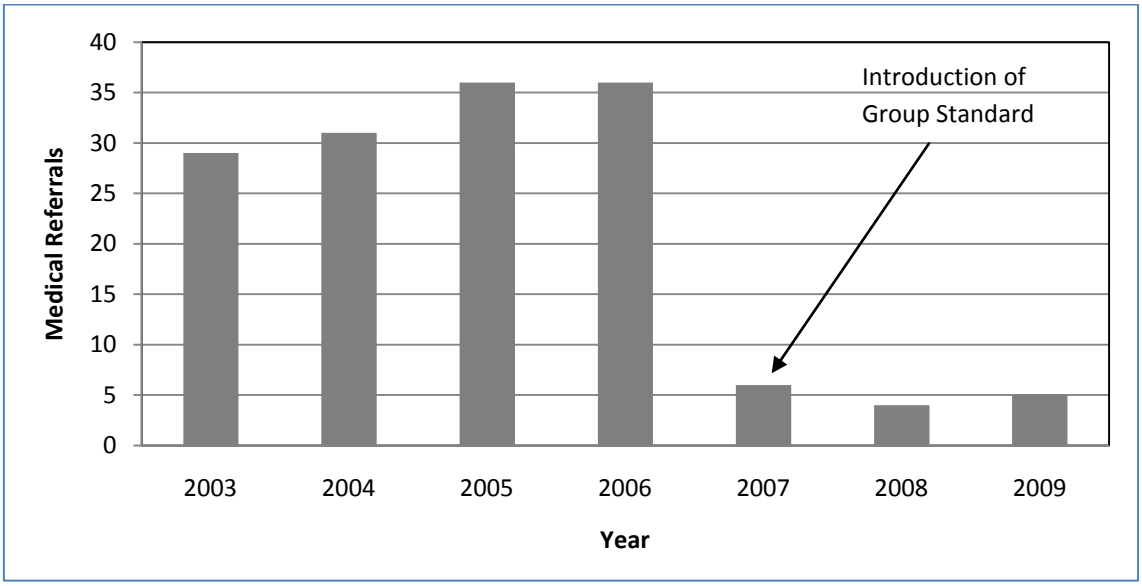

Figure 7: Number of medical referrals by the NPC from exposure to dishwasher powder, by year, for children aged 0-4. (NPC)

Graphic Materials

Background

Ingestion of toxic metals by children can cause long-term health problems. For example, exposure to lead can affect the developing brain and impair a child's cognitive development and should be minimised as far as practicable. Lead poisoning is notifiable under the Health Act 1956. Testing of children's graphic materials has, in rare instances, shown metal content well in excess of the allowed limits.

High levels of toxic metals were found in several children's painting products. The Graphic Materials Group Standard[11] was developed to better regulate these products and to ensure that graphic materials used by children do not contain harmful levels of metals, such as lead, mercury and chromium. Children are more likely to put themselves at great risk of ingesting harmful material through chewing on crayons and putting their fingers, which have handled such items, in their mouths.

Under previous regulation (the Toxic Substances Regulations 1983) no person could import, manufacture or sell a graphic material (including crayons, finger paints and children's water colour paints) where the quantity of heavy metals (e.g. lead, mercury, chromium) exceeded specified limits. These Regulations required any person importing crayons or children's water colour paints to demonstrate, by providing evidence to the Medical Officer of Health, that these products did not exceed the prescribed metal limits. These requirements were established to address concerns over the risks to children who ate or chewed the materials, after it was discovered that some imported materials contained high concentrations of these contaminants.

Action

These Regulations were revoked, from 2 July 2006, by section 152(4) of the HSNO Act 1996. The Graphic Materials Group Standard 2009 was introduced to reflect the Toxic Substances Regulations that were in place prior to the HSNO Act.

Maximum Allowable Metal Limits

The Group Standard set limits on the maximum amount of leachable metal in milligrams per kilogram (mg/kg) of graphic material. The limits for finger paint are generally lower to recognise the greater potential for exposure via oral ingestion of such liquid/jelly-like substances applied directly by the fingers (i.e. chewing or sucking of a graphic instrument is not required in order to ingest the substances) and that they may be used by very young children (Table 1). For graphic materials other than finger paint, the maximum allowable metal limits are the same as under the Toxic Substances Regulations 1983.

[11] A group standard is an approval under HSNO for a group of hazardous substances of a similar nature, or type or having similar circumstances of use. For example, there are group standards for aerosols, cosmetics and fertilisers.

Table 1: Maximum leachable quantity limits for metals in graphic materials

	Finger paint	*Other graphic materials*
Antimony	60	60
Arsenic	25	25
Barium	250	1000
Cadmium	50	75
Chromium	25	60
Lead	90	90
Mercury	25	60
Selenium	500	500

The Graphic Materials Group Standard was specifically aimed at materials primarily intended for use by children such as crayons, water colour paints, finger paints, pastels, chalk, coloured pencils and felt pens. There is an obligation to prove compliance for graphic materials that will be used by children.

Impact

We do not have data to show the impact of the Graphic Materials Group Standard. This is due to the narrow scope of the Standard, the unspecific nature of the information available, the relatively short period it has been in effect (since June 2009) and the likelihood that exposure is more likely to lead to chronic effects. Furthermore, we would expect no change as the Group Standard reflects the pre-HSNO Toxic Substances regulation. However, its effectiveness is shown through the Ministry of Consumer Affairs action in recalling products that are non-compliant, in order to protect children from harm.

The NPC receives, on average, 5.3 calls per year relating to children ingesting crayons. It is important that crayons have maximum allowable limits of toxic substances so that children are protected from harm.

Child Resistant Packaging

Background

Child resistant packaging (CRP) is designed to lengthen the time it takes for a child to open a container. This increases the probability of adult intervention before the child

accesses the contents, and the possibility of the child losing interest. Child resistant packaging is effective in preventing poisonings, but such packaging is not 'child proof'.

There were no mandatory CRP requirements before the introduction of the HSNO Act, only a voluntary Ministry of Health Code of Practice.

Child resistant packaging has been made mandatory by Hazardous Substances packaging regulations for corrosive substances, as well as acutely toxic substances which may be accessible to children.

Group Standards took the packaging regulations and added an equivalence provision allowing packaging to be used that was compliant with the requirements of countries approved by the Authority that are aligned with the Globally Harmonised Classification System for Chemicals (GHS)

The basis for this equivalence compliance provision was that these countries have a similar standard of public health protection to New Zealand. Allowing packaging compliant with the requirements of comparable jurisdictions was determined to be an efficient and effective way of managing the risks of the substances in question without imposing additional compliance costs on industry.

The equivalence compliance provision was set to expire on 31 December 2010 since it was expected that these jurisdictions would have implemented the GHS and the provision would be obsolete. An amendment was made to the Group Standards to retain the equivalence compliance provisions because this has not occurred.

Justification

ERMA considered that the benefits of moving from paper to child resistant plastic packaging did not outweigh the costs because:

- this may require a New Zealand-specific production line, resulting in inefficient production, increased production costs and overall price of these products and present an unnecessary barrier to trade without offering health benefits;
- moving to plastic packaging will result in an increased environmental burden from plastics in New Zealand; and
- applying CRP on low risk substances may result in CRP being regarded as a nuisance rather than a measure to protect children and may lead to situations such as adults decanting contents into non-CRP containers or replacing the lid with a non-CRP one. For example, the Group Standards do not require irritants

to be in CRP while corrosives must be. The distinction between irritants and corrosives is irritants are below 11.5pH and corrosives are above it.

Solid 6.1D (acutely toxic) cleaning products pose relatively lower risks to children compared with those in liquid form. Children are unlikely to ingest sufficient quantities of the solids to result in toxicity. However, this reasoning does not apply to liquid cleaning products triggering 6.1D classification. Liquids are easier to swallow, so it is possible for a child to ingest toxicologically significant quantities despite the fact that the products might be unpalatable.

Effectiveness of Change

The effectiveness of the change can be demonstrated by the fact that a number of products have been withdrawn because of non-compliance. It has driven manufacturers to create safer alternatives that don't reach the threshold for CRP so they can save costs by not needing CRP for their products.

An example of CRP non-compliance where action was taken was where enforcement agencies involved in an investigation of washing machine powders found that some had higher pH levels than 11.5 and were not contained in CRP. This was not compliant with the HSNO requirements. One washing powder was found to have a pH of 12.6 and another had a pH of 11.8. Substances above a pH of 11.5 must display hazard warnings and be contained in child-resistant packaging. Since the investigation, both companies have brought their products in line with the regulations.

Conclusions

Part 2 of the monitoring report has examined HSNO interventions to child poisonings from domestic chemicals. We know that large amounts of domestic chemicals which can cause harm are sold in supermarkets. Sales of some types of chemicals have increased while others have decreased. We want to minimise the risk to children while still allowing effective products to be available on the market.

Part of the way in which we minimise the risk is through child resistant packaging. CRP is designed to lengthen the time it takes for a child to open a container. ERMA has made CRP a requirement for particular types of substances and enforcement action has been taken in cases of non-compliance.

The most dramatic intervention can be seen in the marked decline in the number of medical referrals by the NPC for automatic dishwasher powder exposures. This clearly demonstrates the effectiveness of the maximum pH limit imposed on automatic dishwasher powders.

The Graphic Materials Group Standard has placed maximum allowable metal limits on products aimed at children and a number of products have been recalled for noncompliance.

Looking at overall poisoning trends we observe a slight decrease in the percentage of calls to the NPC regarding childhood poisoning. However, since 2006, there was also an increase in the number of children being admitted to hospital for poisoning from domestic chemicals (but the number in 2009 is still lower than that at the start of the decade).

Part 3
Indicator Data

This section provides data for a set of numerical indicators that have been collected since 2001. There are some gaps where information may have been unavailable at the time of publication. Some data have been updated since the year they were first collected so may differ from figures shown in previous monitoring reports.

Whilst these indicators provide a useful baseline for trend analysis, some fundamental problems have been identified with the data. Some indicators do not provide enough detail to adequately inform regulatory decision-making. Some datasets have changed since they were first used and are no longer useful for long term trend analysis. Other data may not be available in any given year due to resourcing or other constraints at the source agency or other unforeseen problems. Any trends identified in the numbers shown should therefore be treated with caution and are presented here for information purposes only. See the relevant comments for each indicator for more specific detail.

Acronyms used for data sources:

CISS = The Chemical Injury Surveillance System, produced by the Institute of Environmental Science and Research

DoL = Department of Labour

ERMA NZ = Environmental Risk Management Authority

MAF = Ministry of Agriculture and Forestry

NZFS = New Zealand Fire Service

NZHIS = New Zealand Health Information Service within the Ministry of Health

Stats NZ = Statistics New Zealand

Indicator short description	Data source	Indicator #	Level	Year									Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	
Hazardous substances imports and exports													
Gross weight of hazardous substances imported into New Zealand	Stats NZ	27	P	1,321,355 tonnes	2,275,708 tonnes	8,784,382 tonnes	9,550,062 tonnes	9,302,164 tonnes	9,314,878 tonnes	9,474,277 tonnes	8,621,130 tonnes	8,940,246 tonnes	Fluctuations in these figures are largely driven by changes in the petroleum market.
Gross weight of hazardous substances exported from New Zealand	Stats NZ	28	P	89,105 tonnes	Information unavailable	Information unavailable	Information unavailable	905,383 tonnes	810,105 tonnes	2,886,400 tonnes	2,596,218 tonnes	2,871,139 tonnes	
Hazardous substance incidents													
Total number of incidents (vehicle and non-vehicle) involving hazardous substances attended by the NZ Fire Service	NZFS	21	P and S	1826	2078	1831	1,926	1,696	1819	1852	1748	1089	Reduction in these figures is due to industrial action by the Fire Service, in the period 16/07/09 to 23/12/09 which led to reduced data entry.
Total number of non-vehicle incidents involving hazardous substances attended by the NZ Fire Service	NZFS	22	P and S	1079	1167	1175	1,178	1065	1326	1283	1253	844	Reduction in these figures is due to industrial action by the Fire Service, in the period 16/07/09 to 23/12/09 which led to reduced data entry.
Total number of incidents involving hazardous substances reported to ERMA New Zealand	ERMA NZ	23	P and S	227	230	216	223	194	237	278	188	1293	Data may be unreliable for long-term trend analysis because there have been several changes to data sources and databases in the past two years. NZFS data are now included in the ERMA incident database.

Indicator short description	Data source	Indicator #	Level	Year									Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	
Number of non-vehicle incidents involving hazardous substances attended by the NZ Fire Service where civilian injuries were recorded	NZFS	7	S	57	31	22	22	29	19	27	17	17	Only includes injuries from fire-related incidents
Number of non-vehicle incidents involving hazardous substances attended by the NZ Fire Service where civilian fatalities were recorded	NZFS	8	S	1	1	1	0	2	2	0	1	1	There was one death in 07/08 of a fire-fighter which is not defined as a civilian fatality
Number of incidents involving hazardous substances reported to ERMA New Zealand where adverse effects on human health were recorded	ERMA NZ	9	S	59	48	30	22	42	57	71	58	72	Data may be unreliable for long-term trend analysis because there have been several changes to data sources and databases in the past two years. NZFS data are now included in the ERMA incident database.
Number of incidents involving hazardous substances reported to ERMA New Zealand where human deaths were recorded	ERMA NZ	10	S	2	1	1	0	0	6	2	3	4	
Number of non-vehicle incidents involving hazardous substances attended by the NZ Fire Service where environmental contamination was recorded	NZFS	15	S	1249	523	411	424	436	594	467	501	332	Reduction in these figures is due to industrial action by the Fire Service, in the period 16/07/09 to 23/12/09 which led to reduced data entry.

Indicator short description	Data source	Indicator #	Level	Year									Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	
Number of incidents involving hazardous substances reported to ERMA New Zealand where adverse effects to the environment were recorded	ERMA NZ	16	S	60	67	28	63	64	98	129	60	437	Data may be unreliable for long-term trend analysis because there have been several changes to data sources and databases in the past two years. NZFS data are now included in the ERMA incident database.
Hazards in the workplace													
Number of cases reported to DoL of diseases affecting the lungs resulting from hazardous substance use in the workplace	DoL	5	S	82	64	46	60	46	73	48	39	26	
Number of cases reported to DoL of poisoning or toxic effects relating to workplace exposure to hazardous substances	DoL	6	S	92	71	27	66	54	48	51	75	58	
Public health effects													
Number (and rate per 100,000 population) of hospitalisations for accidental poisoning by and exposure to noxious substances, excluding foodstuffs and plants, for children aged 0-4 years	NZHIS	1	S	2001: 161 (57.2)	2002: 149 (53.0)	2003: 132 (46.8)	2004: 145 (51.0)	2005: 238 (83.6)	2006: 230 (80.3)	2007: 227 (77.6)	2008: 191 (63.7)	2009: 118 (38.2)	

Indicator short description	Data source	Indicator #	Level	Year									Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	
Number (and rate per 100,000 population) of hospitalisations for accidental poisoning by and exposure to noxious substances, excluding foodstuffs and plants, for Māori children aged 0-4 years	NZHIS	2	S	2001: 39 (52.4)	2002: 49 (65.9)	2003: 28 (37.9)	2004: 34 (46.0)	2005: 54 (73.8)	2006: 47 (64.3)	2007: 53 (69.1)	2008: 48 (59.1)	2009: 33 (38.7)	
Number (and rate per 100,000 population) of deaths from accidental poisoning by and exposure to noxious substances, excluding foodstuffs and plants, for the total population	NZHIS	3	S	1999: Information unavailable	2000: 12 (0.31)	2001: 7 (0.18)	2002: 12 (0.30)	2003: 21 (0.52)	2004: 17 (0.42)	2005: 16 (0.39)	2006: 7 (0.17)	2007: 33 (0.78)	
Number (and rate per 100,000 population) of deaths from accidental poisoning by and exposure to noxious substances, excluding foodstuffs and plants, for the Māori population	NZHIS	4	S	1999: Information unavailable	2000: 3 (0.52)	2001: 0 (0)	2002: 5 (0.84)	2003: 10 (1.66)	2004: 6 (0.98)	2005: 7 (1.13)	2006: 4 (0.64)	2007: 6 (0.95)	
Number (and rate per 100,000 population) of hospitalisations for hazardous substance related injuries	CISS	11	S	Information unavailable	Information unavailable	2003: 7218 (193.1)	2004: 6896 (184.5)	2005: 7358 (196.9)	2006: 8061 (200.1)	2007: 8606 (213.6)	2008: 8571 (212.8)	Information unavailable	**The CISS is no longer operating so this information is no longer available**. This indicator and the following two from the CISS include therapeutic drugs and alcohol in their definition of a hazardous substance.

Indicator short description	Data source	Indicator #	Level	Year									Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	
Number (and rate per 100,000 population) of hospital emergency department attendances for hazardous substance related injuries	CISS	12	S	Information unavailable	Information unavailable	Information unavailable	Information unavailable	Information unavailable	Information unavailable	Information unavailable	2008: 171 (13.2)	Information unavailable	Not all District Health Boards report emergency department data, the figure for 2008 is from 6 DHBs.
Number (and rate per 100,000 population) of deaths related to hazardous substance injuries	CISS	13	S	Information unavailable	2002: 243 (6.5)	2003: 231 (6.2)	2004: 211 (5.2)	2005: 227 (5.6)	2006: 196 (4.9)	2007: 110 (2.7)	Information unavailable	Information unavailable	
New organism incidents													
Number of incidents involving approved new organisms (including GMOs) reported to ERMA New Zealand where adverse effects on human health were recorded	ERMA NZ	14	S	0	1	0	0	2	3	1	6	4	
Number of incidents involving approved new organisms (including GMOs) reported to ERMA New Zealand where adverse effects to the environment were recorded	ERMA NZ	20	S	0	0	0	0	0	0	0	0	0	No incidents involving approved GMOs are recorded as having had an adverse effect on the environment at any time since 2001
Hazardous substances applications and approvals													
Number of hazardous substances reassessed	ERMA NZ	24	R	3	0	0	0	0	4	4	5	4	
Number of hazardous substances reassessed and stricter controls imposed	ERMA NZ	25	R	0	0	0	0	0	2	3	1	3	

Indicator short description	Data source	Indicator #	Level	Year									Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	
Number of hazardous substances reassessed and declined	ERMA NZ	26	R	0	0	0	0	0	0	0	4	1	
New organisms and GMO approvals													
Number of approved new organisms (including GMOs) subsequently declared as unwanted organisms under the Biosecurity Act 1993	ERMA NZ	19	P	0	0	0	0	0	0	0	0	0	
Hazardous substances compliance and containment													
Number of breaches of containment involving approved hazardous substances	ERMA NZ	38	P and S	0	0	0	0	0	0	0	0	0	
Number of compliance orders issued by enforcement agencies	ERMA NZ	31	R	203	Information unavailable	Information unavailable	55	16	Information unavailable	82	94	290	Excludes infringement notices issued by the Police under the Land Transport Dangerous Goods Rules.
Number of prosecutions taken	ERMA NZ	32	R	0	Information unavailable	Information unavailable	3	0	0	0	1	0	
Number of inspections where no further actions were required as a proportion of total inspections made	ERMA NZ	33	R	98%	Information unavailable	Information unavailable	99.20%	99.70%	Information unavailable	98.4%	98.1%	95.4%	
Number inspections where a compliance order was issued as a proportion of total inspections made	ERMA NZ	34	R	0.01%	Information unavailable	Information unavailable	0.74%	0.30%	Information unavailable	1.6%	1.8%	4.6%	

Indicator short description	Data source	Indicator #	Level	Year									Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	
Number of inspections where a prosecution was taken as a proportion of total inspections made	ERMA NZ	35	R	0%	Information unavailable	Information unavailable	0.40%	0%	0%	0%	0.02%	0%	
New organisms (including GMO) compliance and containment													
Number of breaches of containment involving approved new organisms (including GMOs) that did not result in an escape or release	ERMA NZ	36	P and S	4	5	3	1	0	3	2	7	5	
Number of breaches of containment of an approved new organism (including GMOs) that resulted in the release or escape	ERMA NZ	37	P and S	0	2	1	4	8	5	1	9	8	
Number of unauthorised developments of GMOs	ERMA NZ	39	P and S	0	0	0	0	0	2	0	0	0	
Number of intentional releases of unapproved new organisms (including GMOs)	ERMA NZ	40	P and S	2	2	1	4	1	5	1	2	2	
Number of compliance orders issued by enforcement agency (MAF)	ERMA NZ	31	R	0	0	0	0	0	0	0	1	0	
Number of prosecutions taken	ERMA NZ	32	R	0	1	0	1	1	0	1	0	2	
Number of inspections where no further actions were required as a proportion of total inspections made	ERMA NZ	33	R	82%	83%	81%	81%	63%	65%	77%	69%	64%	

Indicator short description	Data source	Indicator #	Level	Year									Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	
Number inspections where a compliance order was issued as a proportion of total inspections made	ERMA NZ	34	R	0%	0%	0%	0%	0%	0%	0%	0.4%	0%	
Number of inspections where a prosecution was taken as a proportion of total inspections made	ERMA NZ	35	R	0%	0.7%	0%	<0.5%	<0.5%	0%	<0.5%	0%	0.8%	