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## This Issue in the Journal

### **Alcohol-related harm to others in New Zealand: evidence of the burden and gaps in knowledge**

Jennie Connor, Sally Casswell

Most research on the impacts of alcohol focuses on the drinkers, but harm to people other than the drinker is a concern of policy makers and communities. A careful search for existing sources of data about harm to others in NZ revealed that where there was information the burden is very large, for example in crime and traffic crashes. Police data and information from surveys of the general public suggests that about 50% of assault and other crime involves alcohol, and that alcohol is associated with more serious and severe events. In alcohol-related crashes, 40% of those injured were not the drinker responsible. For most other areas of harm we were unable to identify systematic collection of information about alcohol-related harm that could be used for measuring the size and nature of the problem, developing interventions, or monitoring efforts at prevention. The lack of reliable, timely information about harm to children warrants attention. As well as the effect of heavy drinkers on large numbers of individuals and families, the resources required for services to respond to the health, educational, justice and social welfare burden of heavy drinking constrains other public spending.

### **One in three New Zealand drinkers reports being harmed by their own drinking in the past year**

Jessica Meiklejohn, Jennie Connor, Kypros Kypri

This study examined the extent to which New Zealand drinkers are adversely affected by their own drinking. One in three people in the study reported experiencing at least one of 15 harmful consequences as a result of their own drinking in the previous 12 months. There was a clear association between the amount of alcohol consumed and the likelihood of experiencing adverse consequences. There were also evidence to suggest being male, young, Maori or living in a very deprived area increases the risk of suffering alcohol-related harm.

### **The Christchurch Breast Cancer Patient Register: the first year**

Valerie Davey, Bridget Robinson, Birgit Dijkstra, Gavin Harris

Established in 2009, Christchurch Breast Cancer Patient Register is the only breast cancer register in the South Island that was approved by the regional ethics committees to collect data from patients who had given prior consent. In its first year, the Register had a high recruitment rate of 337 patients which was 94% of eligible patients. Overall, 86% of patients had invasive breast carcinoma, and 14% pre-cancer, or “in situ” cancer. For those with invasive cancers, mastectomy (removal of the breast) was carried out in 47% and removal of the lump with radiation in 45%.

Sentinel node biopsy, whereby the first lymph node draining from the breast is removed for evaluation, without full axillary surgery was undertaken in 73% of patients, which is hoped to reduce later side effects.

### **Foot problems in Māori with diabetes**

Belinda Ihaka, Angela Bayley, Keith Rome

The aim of this study is to identify podiatric characteristics of Māori with diabetes. Participants with type 2 diabetes were selected from two Māori Health Organisations and underwent a podiatry assessment to determine their overall susceptibility to risk of diabetes-related complications (neuropathy, peripheral arterial disease, foot deformity). The majority of this group displayed clinical risk factors for diabetes-related complications (mean disease duration 12 years, and high blood glucose levels); however, there was a low prevalence for adverse neurovascular characteristics, a high prevalence for pre-ulcerative lesions and the participants had a good understanding of diabetes and related complications. This study demonstrates the need for ongoing podiatry screening and management for people with diabetes.

### **Providing care for women with gynaecological malignancy: the need for a coordinated national approach**

Peter Sykes, Michelle Vaughan, Kathryn Chrystal, Nieves Ehrenberg, Martin Hefford, Sarah Hutchings, Ai Ling Tan, Bryony Simcock, Digby Ngan Kee

About a thousand New Zealand women develop gynaecological cancers every year. There is evidence that women (particularly with ovarian cancer) benefit from undergoing treatment in specialist centres. Currently there is inequity of access for women to these centres and there are critical workforce shortages. This paper presents some information collated in a recent report commissioned by the Ministry of Health and lays out the argument for a coordinated national approach for the management of women with gynaecological malignancy.

### **What's in a cost? Comparing economic and public health measures of alcohol's social costs ((viewpoint article))**

Eric Crampton, Matt Burgess, Brad Taylor

We often hear that alcohol costs the country about \$5 billion dollars. But did you know that over \$700 million of that figure is drinkers' spending on alcohol? The vast majority of costs tallied in measures of the social costs of drinking are costs that drinkers bear from their own drinking, with no consideration of that many drinkers enjoy consuming alcohol. Social cost figures built on drinkers' spending on their own alcohol may be useful in policy advocacy, but are not useful for sensible policy addressing the very real, but smaller, costs that harmful drinkers impose on others.

## Alcohol harms

Doug Sellman, Simon Adamson

If we had been able to be more rational about the impacts of recreational drug use on society, it may have made more sense for the Government to have brought in strong regulations to curb the overuse of alcohol before it took steps to bring in strong regulations to curb the use of cigarettes. Why? Because the direct harm to others from the overuse of alcohol is greater than it is from the use of cigarettes.

However, the history of New Zealand is likely to record in time how it was strong regulations around the supply and sale of cigarettes that preceded the same type of measures to curb heavy drinking, rather than the other way around.

This edition of the *NZMJ* is being published on the eve of the final reading of a Government-led *Alcohol Reform Bill*; a Bill that many believe does not go nearly far enough to have any significant impact on the current harmful drinking culture.

It is timely that this edition contains two leading articles on alcohol harm, one addressing the harms to others from alcohol<sup>1</sup> and another reporting on self-reported harms to the individual drinker.<sup>2</sup> These two papers point to an enormous issue of alcohol-related harm across New Zealand and the need for urgent and effective alcohol reform at a population level.

Given the intense public interest in the upcoming *Alcohol Reform Bill*, a third paper is also welcomed, because it provides a counterview on alcohol harms and costs. Crampton and colleagues<sup>3</sup> discuss alcohol-related harm within a “standard economic approach” and conclude that cost estimates reflecting alcohol-related harm are often largely flawed and therefore of very limited use in informing alcohol policy.

In the first paper, Connor and Casswell—two of New Zealand’s foremost experts in alcohol policy and public health—have completed a tour de force in assembling the existing evidence of the harm of alcohol to others in New Zealand. They find this widely scattered body of information to be substantial in size and extent but not easily accessible or described in a usable fashion. The key findings are:

- There are no usable data on the harm to children of other people’s drinking in New Zealand, including the presence of fetal alcohol spectrum disorder;
- Harm from others’ drinking is higher than harm from one’s own drinking, especially for women and young people;
- Up to a half of criminal offences involve someone who had been drinking;
- Self-reported violence involved a drinking perpetrator in about half of cases;
- About 40% of those injured and 25% of those killed in alcohol-related traffic crashes are not the drinker responsible; and
- About 1 in 8 unintentional residential fire deaths were victims of alcohol-related fires.

Alcohol harm to children appears to be particularly poorly collected in New Zealand. For example, there are more than 12,000 care and protection notifications per year where children have been found to have been sexually, physically or emotionally abused or neglected but no reliable measure of the involvement of alcohol appears to be in place for routine use.

Connor and Casswell argue that because of the severe limitations in the description of alcohol-related harm to others, policy responses are likely being compromised, in contrast to cigarette smoking where the effects of passive smoking have been instrumental in bringing about new strong reform.

In the second paper Meiklejohn and colleagues report research on alcohol harm from a national postal survey. One in three New Zealand adult drinkers said they had been harmed by their own drinking in the past 12 months. Men, Māori, those living in a more deprived communities and the young are at increased risk of harm. The authors argue that the high prevalence of harm points to the need for effective population-based, rather than individually-based interventions as the necessary strategy to adopt and that interventions to reduce the availability and promotion of cheap alcohol have been shown to be the most effective.

In the third paper, Crampton and colleagues primarily criticise the method used by another set of economists (from Business and Economic Research Limited [BERL]) who provided an economic analysis of social costs of alcohol for the New Zealand Law Commission's review of the liquor laws.<sup>4</sup>

Crampton's group argues that about 80% of the stated costs should be discarded from the analysis because they do not conform to the "standard" (neoclassical) economic approach. The consequence of their recalculation is a substantial reduction in what they consider to be the true social cost of alcohol misuse in New Zealand: approximately \$1 billion instead of \$5 billion.

One of the main assumptions is that harm to the individual from alcohol can be eliminated from their "standard" economic analysis because this is offset by the benefit of alcohol that was factored in by the individual to the decision they made at the time of buying and consuming the alcohol.

Discussion of this "rational economic man" assumption is outside the scope of this editorial but it is of interest to note that public statements by representatives of BERL about the Crampton group's criticism of their method at the time included comments about the validity of this model of human cognition and behaviour. It is certainly worth pondering whether the consumption of a psychoactive substance which impairs judgement and diminishes impulse control is necessarily the best choice of behaviour to apply an assumption of rationality in human behaviour.

The narrowness of the Crampton group's approach is exemplified in the statement that "the only policy-relevant costs [of a fatal drink driver accident] are those imposed on emergency services in responding to the accident". Equally the lost productivity through mortality reveals the dismal view from the world of this particular economic approach: early death is not seen as a cost because the economic unit (the deceased person) can simply be replaced.

It is noteworthy that while Connor and Casswell describe a likely underestimate of the harm to others from alcohol, Crampton and colleagues would consider these further externalities to be legitimately included in their economic analysis.

However, given the lack of attention to quantifying the extent of these alcohol-related harms to others, as identified by Connor and Casswell, it seems disingenuous for Crampton et al to then attempt to systematically minimise the total extent of harm by dismissing harm to oneself as economically irrelevant. This does not mean that we should avoid rigorous debate on the extent and nature of alcohol-related harm or the most appropriate measures use, but an ideological stance certainly appears unhelpful.

The Crampton group position their critique of the BERL report as an economic versus a public health approach. Yet BERL is also a group of economists, not public health scientists.

From a non-economist standpoint Crampton et al would appear to be the fundamentalists in this debate and their conclusions need to also be considered in the context of their receiving funds from an alcohol industry, which benefits from their conclusions. Further, it is important to note that “standard (neoclassical) economic approaches” are coming under increasing scrutiny and criticism, particularly following the recent global financial crisis, which was not predicted by “standard” economic models. New economic models based on better science and more rigorous mathematics are now progressing.<sup>5</sup>

These developments are urgently needed in order to advance knowledge and improve quality of life. The complexity of the human drama needs the full spectrum of academic endeavour from the arts to the sciences, from rich novels to dry epidemiological papers in order to be adequately captured and understood.<sup>6</sup> Somewhere between these two traditional domains sits economics, bravely attempting to understand and explain human complexity from the standpoint of the supply and consumption of goods and services; a critical perspective when considering alcohol harms.

New economic models based on science, which more accurately reflect human nature and which can capture the full drama of human life, positive and negative, are required, to advance enlightened social policy in this emotionally charged and complex area of recreational drug use and costs to society.

Parliament is about to debate a new Alcohol Reform Bill, which is the current government’s response to the most comprehensive review of alcohol undertaken in New Zealand to date. Most of the strong reforms recommended by the Law Commission have not been included in the new Bill by the current government, particularly those addressing “unbridled commercialisation”<sup>7</sup> by raising the price and dismantling the marketing of alcohol, as has worked for tobacco reform.

As the evidence of alcohol harms accumulates, especially harm to others, we must continue to urge our elected representatives in government to enact effective legislation in order to help reduce these harms, rather than use outdated neoliberal economic models, which result in doing little more than watch from the sidelines.

**Competing interests:** Both authors have received funding in the past from the Alcohol Advisory Council of New Zealand (ALAC), a service dedicated to reducing the harm from excessive alcohol use.

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## A shining light in the New Zealand cancer gloom

Ian D Campbell

It is great to see this first year result from the Canterbury Breast Cancer Registry.<sup>1</sup> Following on from publication of the New Zealand Guidelines Group (NZGG) *Management of Early Breast Cancer Guidelines* in 2009,<sup>2</sup> an Implementation Advisory Group was set up by NZGG and the Ministry of Health. The top priority recommendation from this Group<sup>3</sup> was to improve the collection of national breast cancer data to assess both inequalities in breast cancer incidence, presentation and outcomes and to allow overall monitoring of breast cancer management.

Currently such detailed breast cancer datasets are only available in Auckland, the Waikato, Canterbury and Wellington, thanks to the generous funding of the New Zealand Breast Cancer Foundation (BCF).

The BCF are unable to continue this funding, and there is an urgent need to consolidate these databases, on a new platform to ensure their survival. The Minister of Health, The Honorable Mr Tony Ryall, has been persuaded to commit some funding to this process, however the Registers remain under threat if there is inadequate funding, and a confirmed plan for this process is not in place by December of this year.

We know that cancer survival in New Zealand has been 20% worse than in Australia.<sup>4</sup> It is essential to have detailed data such as that presented in this paper to examine why that might be.

For example, in this issue of the *NZMJ*, Davey et al find that some 20% of women with hormone receptor positive breast cancer were not recommended hormonal therapy. This is a similar rate to that seen in the analysis of New Zealand data from the Breast SurgANZ National Breast Cancer Audit.<sup>5</sup>

Such therapies for women with hormone receptor positive breast cancers more than halve both recurrence rates and the incidence of new contralateral breast cancers and reduce mortality by a third. This is just one avenue for the Christchurch team to explore further to determine if outcomes can be improved.

Eight of 360 eligible women died prior to consent for data entry. Given these women have all had rapid bad breast cancer outcomes, they are an especially important group to study in detail. Having to obtain consent to enable study of this group, is a difficult, time-consuming process for the Registry teams, and a potentially distressing activity for the patients' next of kin.

Given that these datasets are only analysed and presented in group form, not with any individual identification, this raises the question of the need for informed consent for this type of audit. Such consent has already been done away with by law, for investigation of cervical cancers in relation to the National Cervical Screening Programme.

The data presented in Davey et al's paper otherwise indicate good compliance with reference datasets—for example the Breast Screen Aotearoa National Standards. The majority of women with small breast cancers underwent breast conserving surgery (although the mastectomy rate in this group was still 37%).

Most women did not receive axillary dissection for DCIS. Ninety percent of DCIS was grade 2 or 3, which is somewhat reassuring given that a frequent criticism of mammography screening programmes is the detection of low grade DCIS which might never progress to cause women a clinical problem without treatment (overdiagnosis).

The majority of women undergoing breast conserving surgery for invasive breast cancers, underwent breast radiotherapy, and the detailed data are available to the team to ensure that appropriate women were offered chemotherapy as part of their treatment pathway.

These are just a handful of the many presentation and treatment quality standards able to be addressed because of the tumour specific detail contained in this dataset. Such Registers should be rolled out nationally and for all our common cancers.

The New Zealand Cancer Steering Group and Cancer Treatment Advisory Group have cancer data in their sights, but just at a very generic level for the moment. It is vital that the detailed data present in the current Regional Breast Cancer Registries survives and prospers, to illuminate us all.

**Competing interests:** None declared.

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## Alcohol-related harm to others in New Zealand: evidence of the burden and gaps in knowledge

Jennie Connor, Sally Casswell

### Abstract

**Aim** To identify and summarise existing New Zealand data quantifying any aspects of harm experienced from the drinking of others.

**Methods** Surveys, research data, and administrative databases were identified through literature searching, examination of websites of relevant agencies, and direct enquiry among those working in research, government agencies and relevant NGOs. Accessible data were analysed, and published or collated data were summarised.

**Results** The prevalence of self-reported harm from others' drinking was higher than harm from own drinking (18% vs 12% in the past year) and was higher in women and young people. Most available data described aggression and crime, and unintentional injury due to traffic crashes and fires. No useable data were obtained on harm to children. Police records suggested that a third to a half of offences involved someone who had been drinking, and alcohol involvement increased with seriousness.

Self-reported violence involved a drinking perpetrator in about half of cases; more likely in stranger violence than family violence, but common in both. About 40% of those injured in alcohol-related traffic crashes were not the drinker responsible, and this represented about one in eight of all traffic injuries. Approximately one in eight unintentional residential fire deaths were innocent victims of alcohol-related fires.

**Conclusion** The range and magnitude of harms from others' drinking are substantial, but not well described. Shortcomings in the data systems of agencies dealing with people harmed by the drinking of others hamper surveillance, monitoring of effectiveness of interventions and advocacy for policy to reduce alcohol-related harm.

Alcohol consumption can have a range of adverse impacts on the consumer, and these have been the subject of considerable study. Recently, researchers have started to focus on alcohol-related harms to people other than the drinker; described as the "collateral damage", "second-hand effects", or "negative externalities" of drinking.<sup>1-5</sup>

Taking a systematic approach to describing and quantifying harm to others from drinking is important for two reasons. The first is to identify problems for specific attention that might otherwise be invisible or neglected. The second is to provide a more complete picture of the burden of drinking in communities to inform decision-making about policy on alcohol control. Advocacy based on harm to "innocent victims" has been a powerful influence in tobacco control.<sup>6</sup>

Despite the obvious relevance to policy, attempts to quantify and cost the many impacts of alcohol on people other than the drinker, or to separate that burden from the overall toll of alcohol in the population have previously been uncommon.<sup>7-9</sup> A number of countries, including New Zealand,<sup>10</sup> have adapted the methodology of the

Global Burden of Disease Comparative Risk Assessment (CRA)<sup>11</sup> to demonstrate the scale of alcohol-related health harm, by synthesising data on alcohol's effects into summary measures of burden.

The global CRA has shown harm worldwide to be almost equal to that of tobacco using these methods.<sup>12</sup> However, because the CRA focuses on health conditions alone, and there is a lack of good data on many alcohol-related outcomes, substantial harm is unaccounted for in these analyses, particularly harm to others.

People may be affected by the drinking of their partners, their families, their friends, their work mates, other people they know, or strangers. The collective drinking habits of communities also have an effect on people's lives. The impacts vary widely in nature and severity, from noisy neighbours to child neglect to fatal injuries.

Some of those harmed by the drinking of others come to the attention of health and social agencies or the police, and such contacts are recorded in administrative databases. Many other affected individuals leave no discoverable trace of their experience, and the size of the burden will only be uncovered by a systematic approach such as a population-based survey. Thus, service use data and self-report provide complementary views of harms from the drinking of others.

As a first step to address the lack of documentation of the range and magnitude of adverse effects of other peoples' drinking this study aimed to:

- Identify, analyse, and collate data on alcohol-related harm to others from existing administrative and survey databases in New Zealand; and
- Identify gaps in the data systems needed to estimate the magnitude of harm to others and monitor changes over time.

## Methods

Surveys, research data, and administrative databases were identified through literature searching, examination of websites of relevant agencies, and direct enquiry among those working in research, government agencies and relevant NGOs. Accessible data were analysed, and published or collated data were summarised. No relevant useable data from the time period 2003-8 were excluded.

### Individual level data

**Health Behaviour Surveys 2003 and 2004 (HBS03/4)**—Data were combined from the 2004 Health Behaviours Survey (HBS) – Alcohol Use and the 2003 Health Behaviours Survey–Drug Use, conducted for the Ministry of Health. The combined sample was made up of 16,480 New Zealand adults, aged 18–65, living in private residential dwellings. Data were collected between September 2003 and August 2004 for the alcohol survey (n=8397) and from April 2003 to November 2003 for the drug survey (n=7083). A full description of the methods used for these surveys is available.<sup>13 14</sup>

The questionnaires were based on previous National New Zealand Alcohol Surveys 1995 & 2000,<sup>15</sup> and the same questions were used in the Alcohol Use and Drug Use surveys for all of the items about alcohol consumption and experience of assault reported here. The surveys were weighted to adjust for sampling design, and a scaling factor was used to form new sample weights when combining data from the two surveys. Response rates were 59% for the alcohol survey and 68% for the drug survey.

**GENACIS–New Zealand survey (Gen07)**—This 2007 national survey of 18–70 year olds (n=1924) sampled from the electoral roll and used postal questionnaires. It was carried out by researchers at the University of Otago and the response rate was 49%.

The investigators used the core questionnaire from the GENACIS study, an international collaborative study of gender, alcohol and culture<sup>16</sup> Further details of methods have been published<sup>17</sup> Respondents reported their own and their partner's alcohol consumption, and details of the most severe incident of

partner aggression by the respondent and towards the respondent in the past 2 years. Mean scores for severity, anger and fear associated with these incidents of victimization and perpetration were analysed by gender and involvement of alcohol. Multinomial models estimated associations of drinking patterns with aggression to and from the respondent.

**Crash Analysis System (CAS)**—Descriptive information about traffic crashes and injuries in New Zealand is available from the Crash Analysis System (CAS) of Land Transport New Zealand.<sup>18</sup> CAS data are derived from traffic crash reports completed by police attending crashes and although reporting of crashes involving injury within a 24 hour period is mandatory, reporting is known to be incomplete.<sup>19</sup> The reports classify injuries as fatal, serious or minor and typically all fatal crashes are reported.

CAS data for 2003–2007 were extracted and analysed.<sup>20</sup> Numbers of non-fatal crash injuries were adjusted for under-reporting, using conversion factors provided by the Ministry of Transport.<sup>21</sup> Crashes where a driver or other protagonist had a blood alcohol of more than 0.03g/100ml were considered to be alcohol-involved. Innocent victims in alcohol-related crashes were those who were injured when they were not either a drinking driver or a drunk pedestrian, cyclist or passenger who caused the crash. Motorcyclists were classified as drivers or passengers and combined with car occupants. Average costs of minor, serious and fatal injuries were obtained from the New Zealand Ministry of Transport.<sup>21</sup>

**New Zealand Fire Service Commission (NZFSC)**—The involvement of alcohol in fatal unintentional residential fires for the period mid-1997 to mid-June 2003 was reported in a study by Dr Ian Miller in 2005.<sup>22</sup> Subsequently we analysed Dr Miller’s database for the period mid-1995 to the end of 2006.

Only deaths in residential settings and fires of unintentional causation were included (i.e. fires attributed to arson, suicide or homicide were excluded). Data were originally obtained from two sources:

- The NZFS Fire Incident Risk Management System (FIRMS), which records information collected at or near the time of the incident; and
- Inquest records, obtained through Coronial Services of the Ministry of Justice.  
(Inquest records provided a wealth of contextual information, such as behaviour of those involved before and during the fire, intention, and cause of death, that is obtained during the judicial process.)

**Community Sentiment Surveys**—In July 2007, Brett MacLennan (University of Otago PhD candidate) surveyed residents of 7 local government areas of New Zealand to assess community sentiment toward alcohol problems and their regulation. An electoral roll sample (18+ years of age) and postal questionnaires were used. The overall response rate was 58% (n=1306). Further details of methods are available.<sup>23</sup>

**Alcohol harm to others survey (SHORE 08/9)**—This nationally representative telephone survey was conducted in 2008/09 by SHORE and Whariki Research Centre, Massey University. The sample comprised 12–80 year olds, using a complex sampling frame similar to the HBS03/04 surveys. The response rate was 64% (n=3068).<sup>24</sup>

## Published data

**NZ Alcohol and Drug Use Survey 2007 (ADUS07)**—This nationally representative survey of New Zealanders aged 16–64 years was carried out by the Ministry of Health in August 2007–April 2008 (n=6784). It measured self-reported alcohol and drug use behaviours among the usually-resident New Zealand population living in private dwellings, using a multi-stage, stratified, probability proportional to size (PPS) sample design. Interviews were conducted in respondents’ homes, using a combination of face-to-face computer-assisted personal interview and audio computer-assisted self-interview. Response rate was 60%.<sup>25</sup>

**New Zealand Crime and Safety Survey (NZCASS)**—The 2006 NZCASS was conducted by the Ministry of Justice in a nationally representative random sample of 5416 people aged 15 and over living in private households. Face-to-face interviews were conducted in homes in February–June 2006. Participants were asked about being a victim of a type of crime covered by the survey since 1st January 2005. They reported the circumstances and impact of any offences they had experienced. The response rate was 59%.<sup>26</sup>

**New Zealand Police (Police)**—In 2009 the New Zealand Police published the National Alcohol Assessment report,<sup>27</sup> summarising data for the 2007/8 year on alcohol involvement in crime, based on 15 police databases. These include the National Intelligence Application (NIA), National Homicide Monitoring System (NHMS), New Zealand Alcohol and Drug Abuse Monitoring Programme (NZ-ADAM), Communications and Resource Deployment (CARD), Family Violence database, Alco-link, Tactical Options Reports, Auckland Central Adult Sexual Assault Team (ASAT)

## Results

In 2007, one in six adults aged 16–64 years (18.1%, 16.7–19.4) reported that they had experienced harmful effects on their friendships or social life, home life or financial position in the past year due to someone else's alcohol use (ADUS07). This was higher than the proportion experiencing any harmful effects from their own drinking (12.2%), and differentially affected women (22.8% vs 17% of men) and younger people, with 35% of women between 18 and 24 years of age reporting harm. There was no overall association with socioeconomic deprivation, but those living in the lowest socioeconomic quintile reported significantly more harm to home life and financial position than the highest socioeconomic quintile as measured by NZDep06.

### Violence and crime: police data

New Zealand Police reported that in the 2007/2008 year at least 31% of all recorded offenders were affected by alcohol (118,829 of 377,911 offences). This finding was consistent between three different data sources. (NIA, Alco-Link, NZ-ADAM). However, alcohol status was unknown in more than a quarter of cases. The proportion of offences perpetrated under the influence of alcohol amongst those with known status was estimated to be 46%, and this was considered a more realistic estimate overall.<sup>27</sup>

In the case of *violent* offending, the offender had consumed alcohol before committing the offence in at least 33% of cases (n=20,447).

Police reported that in 49.5% of 489 homicides occurring between Jan 1999 and June 2008 either a suspect or a victim consumed alcohol prior to the incident (NHMS). The proportion of offenders affected by alcohol was greater (44%) than the proportion of victims who were affected by alcohol (35%). Almost one half (49.3%; n=241) of all homicides were *family violence related homicides* and 37% of these (n=89) involved either a suspect or a victim drinking alcohol prior to the offence (NHMS).

Of alcohol-involved homicides, 56% occurred in residential areas, 31% in public places, 7% in licensed premises and 6% unknown location. All but one of the homicides on licensed premises were alcohol-related (NHMS).

There were 19,388 recorded family violence assault victims in the 2007/2008 year, of whom 82% were women. The proportion of offenders affected by alcohol was recorded as 34%, and the proportion of victims who were affected by alcohol was estimated to be between 14% and 16% (Family Violence Database).

Data from the Auckland Central police district revealed that 28% of *victims* of sexual offences were judged to have consumed alcohol prior to the incident (ASAT). At the same time, the national data on all recorded sexual offences (n=3652) showed that the proportion of sexual *offenders* affected by alcohol at the time of offending was 15%.

The low proportion of offenders recorded to have been affected by alcohol was considered an artefact of the delay in apprehending the offenders (ASAT).

**Table 1. Police data: proportion (%) of offences where the offender, the victim, or either the offender or the victim were affected by alcohol**

Type of offence	Either (%)	Offender (%)	Victim (%)
Violent offending		33	
Family violence		34	14–16
Homicide	49.5	44	35
Family violence related homicide	37		
Sexual offence		15*	28

\*known to be very incomplete

In incidents where police officers used *tactical options* (“use of force”) it was estimated that 59% of offenders were affected by alcohol (Tactical Options Report), and the proportion was 35% in cases when police officers employed Tasers (electro-shock weapon).

Across all categories of offences, where alcohol was involved 42% of alleged offenders reported having had their last drink at a private residence, 18% at licensed premises, 18% in a public place, and for 20% location was unknown (Alco-link).

### **Violence and crime: self-reported assault**

**Health Behaviour Surveys**—Using self-reported data from HBS 03/4 we estimated the 12-month prevalence of physical assault to be 6.8% (6.2–7.4) for men and 3.0% (2.6–3.3) for women, between the ages of 18 and 65 years. More than half (54%) of assaults involved a perpetrator who had been drinking. The 12-month prevalence of sexual assault was 0.4% (0.2–0.5) for men and 1.0% (0.8–1.2) for women, with 57% perpetrator drinking. For both types of assault, alcohol use was more strongly associated with a perpetrator from outside the family.

These findings suggest that more than 62,000 physical assaults and 10,000 sexual assaults occur in New Zealand every year where the offender has been drinking.

About half of all physical assaults reported in the surveys, whether or not they involved alcohol, were by a stranger. The distributions of “person responsible” differed by involvement of alcohol. In particular, where alcohol is not involved assaults were more likely to involve a member of the respondent’s family; 35% compared with 23% in the alcohol-involved group. Alcohol-involved assaults were more likely to occur in a pub, bar or club, or on the street than assaults not involving alcohol, which more commonly occurred at the respondent’s home.

Medical attention was sought for 15% of physical assaults involving drinking by the assailant and 10% of those not involving drinking ( $p=0.17$ ). Police involvement was reported for similar proportions of assaults with and without drinking by the perpetrator (26% vs 28%;  $p=0.70$ ). Overall, in one year, about 17,000 assaults by someone who has been drinking involved police, and 10,500 required medical attention.<sup>28</sup>

**NZCASS**—In the NZ Crime and Safety Survey conducted by the Ministry of Justice<sup>29</sup> 41% of victims of interpersonal violence reported that the *offender* was under the influence of alcohol. This was most common for offences by strangers (49%) followed by sexual offences against women (44%), partner offences (37%), and offences by people well known (31%). On average 20% of *victims* of interpersonal crimes reported themselves to have been drinking alcohol prior to the violence.

The offender only was reported to have been drinking in 31% of offences by strangers, 27% of sexual offences against women, 19% of offences by people well known and 17% of partner offences. The proportion of offences when only the victim was drinking was very small and similar across offence categories.

**Table 2. The involvement of alcohol in interpersonal violence (NZCASS)**

Variables	Offences by strangers (n=426)	Offences by partners (n=276)	Offences by people well known (n=296)	Sexual offences against women (n=137)	All offences (n=1135)
Person drinking	%	%	%	%	%
Offender only	31	17	19	27	23
Victim only	<1	2	2	5	2
Both offender and victim	18	19	13	17	17
Neither offender nor victim	44	58	53	41	50
Don't know	7	5	14	9	9

Adapted from Table 13 in *Family Violence Statistics Report 2009*<sup>29</sup>

For offences involving force or threat of force, alcohol was reported to be more involved in crime in public places (47 %) than in private places (31%). Offences occurring in *places of entertainment* were most likely to involve an offender who had been drinking (79%), and a victim who reported drinking themselves (45%).

**Table 3. Proportion of victims of aggression reporting the involvement of alcohol at the time of offence (NZCASS)]**

Person drinking	Public places %	Private places %	Places of entertainment %
Offender	47	31	79
Victim	26	9	45

### **Violence and crime: partner aggression**

Data from a 2007 general population survey (Gen07) showed approximately 15% of men and 12% of women reported an aggressive act by a partner, and 11% of men and 16% of women reported being aggressive towards a partner in the past 2 years. A minority of these respondents (about 4% of the whole population) reported both. Reported aggression showed a negative gradient with age, with younger people more likely to report both victimisation and perpetration.

Among respondents who reported aggressive acts, women reported alcohol involvement more often than men, and particularly male-only drinking when they were victimised (Table 4).

Men reported more often than women that both partners were drinking when a man was aggressive towards a partner, and a higher proportion of incidents when the woman was the only one drinking.

**Table 4. Involvement of alcohol in most aggressive act reported (Gen07)**

Variables	FEMALE respondents		MALE respondents	
	Aggression from partner %	Aggression to partner %	Aggression from partner %	Aggression to partner %
Both drinking	14.4	14.5	14.9	16.9
Respondent only	0.7	3.1	4.6	3.4
Partner only	22.2	12.0	5.8	4.5
Neither	62.8	70.4	74.7	75.3

When reporting victimization, women scored severity, anger and fear higher than men except when they were the only one drinking. Mean scores were significantly different depending on who was drinking when the incident occurred, with highest levels of anger and fear when the partner only was drinking, followed by situations where both partners were drinking.

A pattern of heavy episodic drinking by the respondent was associated with a three-fold increase in reported victimisation involving drinking (OR 2.9, 95% CI 1.4–6.2), and a doubling of reported perpetration involving drinking (OR 2.2, 95% CI 1.0–4.7). Partner drinking frequency and partner usual volume were also positively associated with both victimisation and perpetration that involved drinking, although less strongly.<sup>30</sup>

### Road traffic injuries

In national survey in 2007 (ADUS07) 1.2% (0.9–1.5) of 16–64 year olds reported being involved in a motor vehicle crash in the past 12 months due to someone else's drinking, and this was similar for men and women. On a population basis this represents 30,700 adults per year.

**CAS**—For the period 2003–2007 we calculated that 28% (n=64,328) of road traffic injuries across all road user groups involved alcohol. Of this total, 43% were injuries to someone other than the drinking person responsible. This equated to 12% of all traffic crash injuries being due to some one else's drinking across all age groups. However, amongst 15–19 year olds, almost one in five of all traffic injuries (19%) were due to some one else's drinking, making up half of all alcohol-related crash injuries at this age.

Amongst children under 15, virtually all injuries in alcohol-related crashes were attributable to some one else's drinking, and 90% were sustained as car passengers.

For 90% of the children who died and more than 70% of those injured by a drinking driver, the responsible driver was in their car.

Car crashes involving someone else's drinking were responsible for an annual average of 5,535 injuries to innocent victims, including 60 deaths. 381 of those injured were children under 15 years of age. The estimated cost of crash injuries due to someone else's drinking in the 5-year period was 2.5 billion NZ dollars, or 0.5 billion dollars per year.<sup>20</sup>

### **Residential fires**

A recent study of unintentional residential fires in New Zealand, in the period 1 July 1997–30 June 2003, revealed that there were 131 deaths in 108 fires with 14 multiple fatalities.<sup>22</sup> The proportion of primary fire victims with a BAC above 0.08 (the legal driving limit) was 34%. Secondary deaths in fires unintentionally ignited those affected by alcohol (n=14) comprised 11% of all unintentional residential fire deaths and 24% of all alcohol-related fire deaths. In one of the alcohol related incidents there were five secondary deaths.

**Table 5. Deaths in 44 unintentional residential fires where the blood alcohol level of the primary victim was greater than 0.08 g/100ml (1997–2003)**

Victim	Number of deaths	% of all unintentional residential fire deaths
Primary	44	34%
Secondary	14	11%
<b>Total</b>	<b>58</b>	<b>44%</b>

Adapted from Table 5.4a in Human Behaviour Contributing to Unintentional Residential Fire Deaths 1997–2003<sup>22</sup>

We obtained further data from the author of this study and extended the series to encompass 15 July 1995 to Dec 2006. The total number of fatalities in unintentional residential fires was 302, with 93 (31 %) fatalities due to 78 residential fires where the primary victim had a BAC over 0.08. There were 22 secondary victims representing almost one quarter (24%) of all residential fire fatalities due to alcohol. Of these, 10 (45 %) were children and 12 (54 %) were adults. Three-quarters of adult secondary victims were men.

**Table 6. Secondary victims of alcohol-related unintentional residential fires, by ethnicity (July 1996–Dec 2006)**

Variables	Adult		Child	
	NZ Maori	NZ European	NZ Maori	NZ European
Male	6	3	5	1
Female	2	1	4	0
<b>Total</b>	<b>8</b>	<b>4</b>	<b>9</b>	<b>1</b>

## **Effects on children**

As already discussed for traffic crashes and fires, unintentional injury due to alcohol-impaired caregivers is a risk to children. We did not identify any data sources for other external causes of unintentional injury, and very little other documentation of harms to children from drinking.

**Fetal alcohol spectrum disorder (FASD)**—There are no reliable data on the prevalence or severity of FASD in New Zealand, although the NZ Paediatric Surveillance Unit monitors new diagnoses.<sup>31</sup> There is no organised screening in infancy or childhood.

Studies that include self-reported prevalence of drinking during pregnancy indicate that some exposure of the fetus to alcohol occurs in at least a quarter of pregnancies. Most women of childbearing age are current drinkers, a substantial proportion expose the fetus before they are aware of pregnancy, and the vast majority reduce their drinking or stop during pregnancy. In ADUS07, 28.7% (24.7–32.7) of women who had been pregnant on the last 3 years reported consuming alcohol during pregnancy.<sup>25</sup>

In a 2005 study, 40% reported having consumed alcohol before they realised they were pregnant, 53% reported having consumed alcohol some time during pregnancy, and 20% had drunk 4 or more standard drinks on one occasion at least once during pregnancy. Most of the heavy drinking episodes occurred before the pregnancy was known.<sup>32</sup>

A survey in 2006 of mothers delivering babies at a single hospital found 28% drank during pregnancy, 10% continued drinking more than 70g per week, with 4% drinking more heavily. Nine percent reported one or more heavy drinking episodes during pregnancy.<sup>33</sup>

In the USA the prevalence of FAS is estimated to be 0.5 to 2 per 1000 live births, the prevalence of FAS and ARND combined (FASD) at least 10 per 1000.<sup>34</sup> If this estimate is applied to New Zealand, where there are about 60,000 births per annum, there would be at least 600 children born with FASD each year. However, we would expect this to be conservative given that drinking during pregnancy in New Zealand is higher than in the US where an estimated 12.5% of women drink alcohol during pregnancy, and 3.4% of women binge drink.<sup>35</sup> A more recent US estimate<sup>36</sup> has put the prevalence of FASD in populations of younger school children as high as 2–5%.

**Prevalence of emotional, physical and sexual abuse**—In the SHORE survey conducted in 2008/9<sup>24</sup> 17% of respondents with children in the household reported that the children had been negatively affected by the drinking of someone else in the last 12 months; 11% reported children were yelled at, criticised or verbally abused, 7% reported children had witnessed serious violence in the home, 2% reported children were physically hurt and 2% reported that a protection agency or family service had been called because of someone else's drinking.

In New Zealand, the Child, Youth and Family Service (CYFS) in the Ministry of Social Development deals with child abuse and neglect notifications. Our requests to access to administrative data from CYFS were declined on the basis that the data were not sufficiently reliable for our purposes.

Published data indicate there were care and protection notifications for 50,301 children in 2006, with about one in four being found to have been sexually, physically or emotionally abused or neglected (n=12,453). This a rate of 12.1 per 1000 New Zealanders aged 0–16 years.<sup>37</sup>

Recent Australian research based on similar agency data from Victoria<sup>38</sup> suggests that 33% of these (n=4109) are likely to be associated with alcohol use by the perpetrator, and that alcohol use is associated with seriousness of the outcome. However, the annual rate of substantiated cases was lower in Australia than in New Zealand (6.7 per 1000 in 2005), and the comparability of the data may be limited.

Data from the NZ Police Family Violence database<sup>39</sup> shows 15% of victims documented in Police reports of family violence incidents in 2006 were children. Overall, alcohol was considered to be a contributing factor in 29% of family violence incidents, but this is not reported separately for child victims. Other drug use was not considered to be a definite factor in any family violence incident in 2006.

A recent report on family homicides between 2002–2006<sup>40</sup> found that of a total of 141 deaths in the 5-year period, 38 were child homicides. The investigators found that alcohol and/or drug abuse featured at the time of the incident or as a background factor, or both, in half of child homicides, and that lack of awareness of the risks of alcohol and drug use in the context of the care of children was evident in some cases.

No other data concerning the effects of others' drinking on children were identified that were available for review.

## Effects on coworkers

There is little documentation of impacts of other people's drinking through places of work in New Zealand. However, self-reports of effects on people's own work suggest this could be a substantial issue. In ADUS07 3.2% of adults reported harmful effects of drinking on their work, study or employment opportunities in the previous 12 months.

Nearly 10% (estimated population n=251,900) had worked while feeling under the influence of alcohol at least once. Men and younger people were over-represented in both cases. Based on the survey sample an estimated 68,900 people had operated machinery while feeling under the influence of alcohol.

Alcohol-related absenteeism was also common, with 5.6% of adults (estimated population n=147,500) reporting at least one day off work or school due to drinking in the past 12 months. Many reported multiple days off, resulting in approximately 392,800 workdays lost per year.<sup>25</sup> This gives no indication of the loss of productivity or the effect of this on coworkers or employers.

Data from the SHORE 08/09 survey give some indication of the impact on coworkers.<sup>24</sup> Two percent of adults reported a heavy drinking coworker and of these 44% reported that their own productivity was reduced as a result. In addition, 31% reported having to cover for the drinker, and 26% having to work extra hours.

The HBS data on assault<sup>28</sup> show 7.3% of physical assaults and 11.4% of sexual assaults occurred at work and that more than half of these involved a perpetrator who had been drinking. The NZCASS found that 31% of all personal property offences

and 18% of all assaults and threats occurred work and at least 17% of all offences in the workplace involved alcohol.

## Community amenity

In addition to the specific effects of individuals' drinking on others there are a range of collective effects of the drinking patterns and culture of a community on the nature of the living environment. Low-level offending and antisocial behaviour by a visible minority of drinkers, combined with knowledge of the real risks of alcohol-related harm, affect the perceptions of residents and their behaviour.

In the Community Sentiment Surveys in 2007, MacLennan found that exposure to alcohol's effect on community amenity was common but varied considerably between communities, as seen in Table 7 (Data collected as part of PhD research).

**Table 7. Percentage of residents in seven NZ communities who had experienced adverse effects of alcohol on community amenity at least once in the previous 12 months**

Adverse effects	N	% (95% CI)	Range across communities (%)
Seen someone drunk in public	1278	77 (75–79)	51–92
Seen a person disoriented or passed out on the street because they had too much to drink	1277	45 (42–48)	14–68
Seen vomit on footpaths or in shop doorways	1280	61 (58–64)	29–78
Seen alcohol bottles smashed or lying on streets	1296	92 (90–93)	82–96
Seen someone urinating in the street	1272	45 (42–47)	24–58
Seen a fight where one or more of the people involved were drunk	1284	37 (34–40)	16–48

The perception that alcohol played a major role in community problems was widespread, and problem drinking among young people was considered by a majority of those surveyed to be a major problem (Table 8).<sup>23</sup>

**Table 8. Opinions about role of alcohol in community problems, among residents of seven NZ communities**

Variables	% issue is a major problem in their community (n=1236)	% alcohol plays a major role (n=1239)
Violent Crime	25%	79%
Family Violence	31%	85%
Vandalism	39%	46%
Problem drinking among under 25 year olds	58%	100%
Problem drinking among 25+ year olds	22%	100%
Public drunkenness	23%	100%
Traffic accidents	26%	57%
Dangerous driving	39%	62%
Litter	24%	17%

In the SHORE 08/09 survey approximately half of both men and women reported having avoided drunk people and places, and been kept awake or disturbed at night due to the drinking of others in the past 12 months. More than 60% had been annoyed by vomit, urination or littering related to alcohol.

Feeling unsafe while waiting for public transport was reported by more women than men (18 vs 11%), but feeling unsafe in a public place because of strangers' drinking was reported by about 20% of both sexes. A quarter of women and a third of men had been verbally abused in the last 12 months by a stranger who had been drinking.<sup>24</sup>

As well as intimidation and nuisance, these alcohol-related behaviours divert considerable police resources from other activities. In 2007/8, there were 21,263 incidents where police were diverted from other duties to pick up intoxicated people from the streets to avoid harm to themselves or others.<sup>27</sup>

### **Box 1. Summary of available data on harm due to some one else's drinking**

Variables	Alcohol-involved cases per year	% of total cases	Years of data
Police records			
All offences	118,829	31–46%	2007/8
Violent offences	20,447	33%	2007/8
Homicides	23 (mean)	44%	1999–2008
Family violence homicides		37%	1999–2008
"Use of force" incidents		59%	2007/8
Taser incidents		35%	2007/8
Self-reported physical assault (HBS)	62,832	54%	2003/4
Self-reported sexual assault (HBS)	10,053	57%	2003/4
Self-reported all violence (NZCASS)		41%	2006
Self-reported partner aggression (Gen07)		21% women 37% men	2007
Self-reported traffic crashes (ADUS07)	30,700		2007/8
Injuries due to road traffic crashes (CAS)	5,535	12%	2003–7
Deaths due to road traffic crashes (CAS)	60		2003–7
Deaths in residential fires	2	11%	1997–2003
Fetal Alcohol Spectrum disorder	Approx 600	1%	US data
Substantiated child abuse/neglect	Approx 4109	33%	Australian data

## **Discussion**

The information summarised in this paper focuses on aggression and violence, and on unintentional injury due to fire and traffic crashes. While these are two substantial areas of harm to others from drinking, the summary reflects the availability of data, and therefore to some extent the limited awareness of the range and magnitude of collateral damage from drinking.

Police data suggest that at least a third of offences involve someone who has been drinking, although information about alcohol is not always available and 50% of all offences is a better estimate. The involvement of alcohol is more often reported in more serious offences.

In general, the proportion of violent incidents involving alcohol is higher when people are reporting their own experiences. Several data sources report that stranger violence is more likely to involve alcohol than family violence, although common in both.

We have also estimated the number of secondary victims in traffic crashes and fires due to drinking. About 40% of all those injured in alcohol-related traffic crashes and 24% of those killed in alcohol-related fires are not the drinker responsible, making up about one in eight of all traffic injuries and fire deaths.

Self-reported data and administrative or service use data provide different perspectives on harm. From services such as the police we see a subset of harm that is usually at the serious end of the spectrum and may have taken time and an element of chance to come to attention.

The level of service provision may affect these data, both for the population as a whole and for subgroups in the population. On the other hand, survey data from the general population give us a picture of how widespread the secondary effects of drinking are, including less severe impacts on wellbeing. These data usually suffer from under-representation of the members of the community most affected, and low prevalence of the most serious outcomes, due to non-response biases.<sup>41 42</sup> Thus, both official data and surveys are likely to produce estimates that are conservative.

One of the limitations of existing data is that different criteria for alcohol involvement have been used in different sources. Of particular note is the use of a BAC of 0.08 in the Fire Service study, so that if the person responsible had a BAC of 0.05 this was not considered alcohol-involved. In the analysis of car crash data we included crashes where the driver had a BAC of 0.03 or more, based on evidence about the effects of alcohol on driving ability.<sup>43</sup>

When considering these data there is an implied causal attribution of events to drinking, but it is not possible to establish this. In general, where alcohol consumption is associated with a much higher risk of an event occurring, such as a ten-fold increase in risk, the proportion of events that would be avoided if no one drank alcohol (the attributable fraction) is very high, and so a causal attribution is reasonable.<sup>44</sup> However, there are many unknown quantities in these data and the true attributable fraction is not known.

## Gaps

Harm from others' drinking has had little research attention in New Zealand and there are several important areas where there is no accessible research or administrative data. The value of routinely collected data being usable and available for research does not seem to have been widely recognised or adequately resourced in the agencies and services dealing with these issues. A notable exception is the system of traffic crash information, designed and maintained to enable research by a government department, and made accessible.

Even in the police, where data are collected, they are not easily used. For example NZ Police data are not regularly extracted from the numerous databases as they were for the report on 2007/8, and therefore reliable trend data are not available. Police data are very difficult to access by independent researchers even when de-identified, and this is particularly so for Alco-link data, and family violence data.

A very significant gap in current knowledge is the harm to children. Children of heavy drinkers may be at risk of violence and emotional abuse, but also unintentional injury, loss of educational opportunities, conduct disorders, poor mental health, drug and alcohol problems of their own, and poor models of behaviour and of parenting.<sup>45</sup>

<sup>46</sup> The range and extent of such harm in the population remains unmeasured. In the main government agency information dealing with abuse and neglect of children no data are accessible for research.

Other gaps included any existing data on harm from others' drinking in the workplace, or any service use information from community agencies that could produce reliable estimates of the burden relating to other people's drinking.

The first attempt to gain reliable self-reported information about harm from others' drinking in a survey of a representative population sample in New Zealand has recently been made.<sup>24</sup>

## Implications

The range and magnitude of harm from other peoples' drinking are substantial, but not well described. The lack of adequate data systems in public agencies means that effective surveillance cannot be carried out.

Public health surveillance, defined as "the ongoing, systematic collection, analysis, and interpretation of data on specific health events for use in the planning, implementation and evaluation of public health programmes"<sup>47</sup> is what is required for control of the public health problem of alcohol-related harm.

The inability to estimate magnitude of problems and characterise who is most affected also contributes to a weak policy response and makes advocacy difficult. Where interventions are being developed and implemented, monitoring of effectiveness is hampered, and patchy information creates the misperception that the issues that are best measured are the most important.

There are other costs to society accompanying current drinking patterns, beyond those described here. These include the burden on the police, the judicial system, the penal system, healthcare resources, the traffic safety agencies, and education provision. The costs of these public services dominate public spending and alcohol-related harm creates a diversion of resources from more constructive uses.

As well as this, individuals experience the trauma and distress of alcohol-related crime and violence, loss of productivity, costs of theft and vandalism, the increased need to be vigilant about ones safety, and the loss of neighbourhood amenity that may result from others' drinking. It affects the way people feel about their communities and how they function in them.

The alcohol scenario contrasts with the harms resulting from tobacco which are predominantly contributions to disease. While the emergence of evidence about the health effects of passive smoking by non-smokers has strengthened political resolve to control damage from tobacco, evidence of secondary effects of alcohol use is sparse and has been more difficult to disentangle from its social context. Much more

of the harm from alcohol occurs as a result of its effect on social interactions with others.

While it is true that some of the harms to families, friends, strangers and communities are intangible, many have simply not been measured systematically. Until they are accounted for, the burden of alcohol in communities will continue to be underestimated, which could result in an inadequate level of policy response.

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## One in three New Zealand drinkers reports being harmed by their own drinking in the past year

Jessica Meiklejohn, Jennie Connor, Kypros Kypri

### Abstract

**Aim** To quantify the prevalence and distribution of negative effects of drinking among New Zealand adults.

**Methods** A postal survey was completed by 1924 people aged 18–70 randomly selected from the New Zealand electoral roll (49.5% response). Information on drinking patterns, demographics and specific alcohol-related harms and troubles in the previous 12 months was collected.

**Results** 33.8% of current drinkers reported that they had been adversely affected by their own drinking in one or more specified domains in the past 12 months (“harm”) and 12.7% reported one or more specified alcohol-related “troubles”. Men were more likely to report alcohol-related harm ( $OR=1.3$ ; 95% confidence interval [CI] 1.0–1.7) and alcohol-related trouble ( $OR=1.5$ ; 95%CI 1.1–2.1) compared to women. People of Māori ethnicity and those with an NZDep06 score of 9–10 were at increased risk of both harms and troubles. The odds of reporting a harm or trouble in the past year decreased substantially with age. Heavy episodic drinking and level of average daily consumption were both associated with increased risk of both alcohol-related harm and trouble, but this did not explain all of the variation.

**Conclusions** Prevalence of harm and trouble resulting from drinking is high in the general population as judged by the drinkers themselves. These findings support the association of heavy alcohol consumption with increased risk of alcohol-related harm. They also suggest that being male, young, Māori or living in a very deprived area in NZ are associated with a higher risk of alcohol-related harm.

It is well reported that alcohol, especially consumed in large amounts, can have negative effects on the drinker and on others. It has the potential to cause harm to health via three broad mechanisms: toxicity, intoxication and dependence, and is strongly linked to over 60 negative health outcomes.<sup>1,2</sup> Research has also identified a variety of social harms to drinkers and those around them including legal problems, harmful impacts on employment, finances, relationships with family and friends and problems with violence.<sup>3</sup>

A recent cross-sectional survey of New Zealand adults found that exposure to heavy drinkers had a negative impact on an individual’s self-reported wellbeing and health status.<sup>4</sup>

Alcohol is the most commonly used recreational drug in New Zealand, as it is in many countries, but alcohol-related harms are not well characterised or widely appreciated. While particular consumption patterns are associated with more harm,

demographic and social factors may also change the likelihood of individuals experiencing alcohol-related harm.<sup>2</sup>

There is plenty of international research to demonstrate that individuals with higher average alcohol intake are at increased risk, and that pattern of consumption is also an important factor in the risk of experiencing alcohol-related harms, with regular heavy episodic drinkers being at significantly more risk of harm.<sup>3,5,6</sup> Many studies have shown that men and young people have higher risk of both heavy episodic drinking and of alcohol-related harms.<sup>6,7</sup>

The New Zealand Law Commission's review of alcohol use in New Zealand concluded that over 80% of New Zealand adults drank alcohol at least occasionally and that approximately a quarter of the adult population reported drinking large quantities when they drink. This suggests a significant proportion of the population is likely to be contributing to harm to themselves and others.<sup>2</sup>

There is some recent literature that has reported the experience of alcohol-related harm in the New Zealand population. On a population level the 2007/08 New Zealand Alcohol and Drug Use Survey collected data on both consumption patterns and harm from drinking. Current drinkers were asked if there had been a time when they felt their alcohol use had had a harmful effect on their friendships or social life, home life, work, study or employment opportunities, financial position, legal problems, difficulty learning or physical health/injury.<sup>8</sup> In this sample, 12.2% of current drinkers reported having experienced at least one of the problems listed, with men, people in the youngest age group, people of Māori ethnicity and those living in the most deprived areas at significantly increased risk.<sup>8</sup> This reflected the findings of the earlier Health Behaviours Survey (2004) which also found males and people of Māori ethnicity to be at increased risk of harm.<sup>9</sup>

A national survey of drinking in New Zealand in 2000 asked respondents about their experience of 15 alcohol-related problems (which varied in severity) in the previous year. The survey found that 61% of men and 49% of women reported having experienced at least one of the 15 problems, while 11% of men and 7% of women reported experiencing five or more.<sup>10</sup> A 2005 study of New Zealand University students found that heavy episodic drinking and associated harms to health and social factors were common amongst students.<sup>11</sup>

Alcohol-related harm is not confined to the individual doing the drinking. Many of the consequences drinkers experience as a result of their own drinking can also have negative effects on those around them. A 2009 New Zealand study on physical and sexual assault showed that alcohol use by someone other than the victim of the assault is involved in over half of reported events.<sup>12</sup>

Also, a recent paper on the involvement of alcohol in aggression between intimate partners showed that the involvement of alcohol in partner aggression was associated with increased severity of aggression and that a pattern of heavy episodic drinking was associated with higher reporting of aggression within intimate relationships.<sup>13</sup>

The aims of this study were to:

- Examine the prevalence and distribution of two groups of negative drinking-related experiences in a sample of New Zealand adults. These were: 1. subjectively assessed adverse effects of drinking, including effects on family, finances and physical health, and 2. the experience of alcohol-related troubles, more objective events such as trouble with the law, loss of job, and aggression due to alcohol.
- Examine factors associated with higher risk of experiencing these harms and troubles.

## Methods

**Setting**—In 2007, New Zealand had a population of approximately 4 million people, with 77% of people listing their ethnicity as European, 15% as Māori, 7% as Pacific, 10% as Asian and 1% as Other (percentages add to more than 100% as individuals can identify as having more than one ethnicity).<sup>14</sup>

**Participants and procedures**—This was a cross-sectional survey of a nationally representative sample of New Zealand residents aged 18–80 years, randomly selected from the electoral roll, conducted using a postal questionnaire that was completed by the respondent and mailed back to the investigators in a reply-paid envelope. The data collection methods have been described in more detail in a study of alcohol involvement in partner aggression in New Zealand.<sup>13</sup>

**Measures**—The questionnaire was based on the expanded core GENACIS questionnaire from the International Research Group on Gender and Alcohol (IRGGA). A copy of this questionnaire is available at the following link: [www.genacis.org/questionnaires/exp\\_core.pdf](http://www.genacis.org/questionnaires/exp_core.pdf) This questionnaire has been used in approximately 40 countries to provide data that are directly comparable for cross-national studies.<sup>15</sup>

The questionnaire contained 100 items and took 20–30 minutes to complete. It covered the following areas: demographic information (age, sex and ethnicity), social networks, respondent's alcohol consumption, drinking contexts, drinking consequences, intimate relations and sexuality, violence and victimization, and health and lifestyle.

From the residential address listed on the electoral roll a New Zealand Deprivation Index 2006 (NZDep06) decile was obtained for each respondent and used as an indicator of socioeconomic position. NZDep06 is a small area deprivation measure, based on 9 items from the national census at the meshblock level. Meshblocks are the smallest unit of the census and include about 100 residents on average. NZDep06 deciles assign a score of 1–10 to participants on the basis of their residential address, with 1 representing the least, and 10 the most, deprived 10% of the population.<sup>16</sup> Ethnicity was categorised as European, Asian, Māori and Other, due to small numbers of participants of other ethnicity.

**Alcohol consumption**—Respondents were asked about drinking frequency and quantity of alcohol consumed per typical drinking occasion in the previous 12 months. Quantities of alcohol were reported in standard drinks (defined as 10g of pure ethanol). A pictorial guide was provided to assist participants to convert common beverages to standard drinks.

**Harms and troubles due to drinking**—Current drinkers (having consumed any alcohol in the previous 12 months) were asked about drinking-related adverse experiences. These experiences were divided into two categories. Drinking-related harms were self-assessed personal problems resulting from an individual's drinking. Drinking-related troubles encompassed legal and social problems that the respondents could have experienced due to their heavy drinking. These related to specific, more objective events.<sup>17</sup>

**Harms:** In the last 12 months has your drinking had a harmful effect on: (1) work, studies or employment opportunities, (2) housework or chores around the house, (3) marriage/intimate relationships, (4) relationships with other family members, including children, (5) friendships and social life, (6) physical health, (7) finances. Responses for each item were no, yes once or twice, or yes more than twice.

**Troubles:** In the last 12 months have you had any of the following experiences? (1) trouble with the law about your drinking and driving, (2) an illness connected with your drinking that kept you from working or your regular activities for a week or more, (3) lost a job, or nearly lost one, because of your drinking, (4) been annoyed by people criticising your drinking, (5) had a spouse or someone you lived with threaten to leave or actually leave due because of your drinking, (6) lost a friendship because of your drinking, (7) got into a fight while drinking.

Responses for each item were no, yes once or twice, or yes more than twice.

### **Analysis**

**Drinking behaviours:** Two drinking variables were used in these analyses. Heavy episodic drinking (HED) was defined as 5 or more drinks per occasion at least once a month in the past year, and high average daily consumption was defined as more than 20 grams of pure alcohol per day for women; and more than 30 grams per day for men. These correspond to the maximum consumption levels recommended by the Alcohol Advisory Council of New Zealand.<sup>18</sup>

**Experience of alcohol-related harms and troubles:** The prevalence of each harm and trouble as well as the prevalence of experiencing any alcohol-related harm or trouble in the last 12 months was calculated for the sample.

**Regression models**—Logistic regression models were used to calculate the odds of respondents identified as current drinkers reporting any alcohol-related harm and trouble in the past year by sex, age, NZDep06 quintile, ethnicity, heavy episodic drinking in the past 12 months, and average daily consumption. Odds ratios for each variable were calculated controlling for all other variables. 95% confidence intervals were calculated for all odds ratios.

**Ethical approval**—This study was conducted with the approval of the University of Otago Human Ethics Committee (06/171).

## **Results**

**Characteristics of the study population**—There was a response rate of 49.5% for the survey with 1924 completed surveys returned and 110 people found to be ineligible. Of the sample 1723 (89.6%) were identified as current drinkers (having consumed alcohol in the previous 12 months).

Table 1 shows the basic demographics and drinking behaviours for the current drinker population (n=1723). The sample over represented women and people aged 35 years and underrepresented people from the most deprived NZDep06 levels. The sample was predominately European, and under-represented those of Māori and Asian ethnicity.

The proportion of male respondents identified as heavy episodic drinkers was almost twice that of female respondents (27.9% versus 14.7%), while men and women had similar proportions of people in each average daily consumption level.

**Experience of alcohol-related harms and troubles**—Among respondents identified as current drinkers 36.2% reported experiencing any alcohol-related adverse event. Having experienced any alcohol-related harm in the past 12 months was reported by 33.8% of current drinkers (29.8% of women and 39.0% of men) and 12.7% reported having experienced any alcohol-related trouble (9.9% of women and 16.4% of men). The prevalence of current drinkers experiencing three or more alcohol-related harms in the previous year was 13.4% while the prevalence of experiencing three or more troubles was only 1.4%.

Table 2 shows the prevalence of each of the 7 harms and 7 troubles in current drinkers. The most reported harm was that respondents drinking had a harmful effect on their physical health (18.0% once or twice in 12 months, 3.8% more than twice in

the previous year. Harmful effects on housework, intimate relationships and finances were also common amongst this current drinker population.

**Table 1. Characteristics of current drinker population and distributions of alcohol-related variables**

Variable**	n*(%)	Heavy episodic drinking (%)	High average consumption† (%)	Any harm (%)	Any trouble (%)
<b>Gender</b>					
Male	760 (44.1)	27.9	14.2	39.0	16.4
Female	963 (55.9)	14.7	15.9	29.8	9.9
<b>Age</b>					
18–24 years	129 (7.5)	48.4	14.6	58.9	41.7
25–34 years	264 (15.3)	29.8	10.9	44.1	16.9
35–44 years	390 (22.6)	19.6	10.9	37.3	11.6
45–54 years	452 (26.2)	19.5	18.7	33.1	11.7
55–64 years	362 (21.0)	8.9	15.2	20.9	4.9
65–70 years	126 (7.3)	10.7	25.9	10.8	2.7
<b>NZDep06</b>					
1–2	450 (26.6)	16.6	14.5	28.2	9.1
3–4	408 (24.1)	24.0	17.3	36.6	13.1
5–6	352 (20.8)	18.4	13.7	34.4	13.0
7–8	272 (16.1)	20.9	15.8	30.8	11.4
9–10	213 (12.6)	27.2	15.4	45.0	21.4
<b>Ethnicity</b>					
European	1468 (85.3)	19.6	15.8	32.0	10.9
Asian	66 (3.8)	10.3	1.8	26.6	3.1
Māori	147 (8.6)	35.3	15.6	57.0	34.1
Other	37 (2.2)	25.0	6.9	29.0	20.6

\*Due to rounding percentages do not always add to 100%; \*\*Where there was missing data (<5% of sample in all cases) for a variable those individuals were excluded from that analysis.

†More than 20 grams per day for women, more than 30grams per day for men.

**Table 2. Prevalence of alcohol-related harms and troubles in current drinkers**

In the last 12 months has YOUR drinking had a harmful effect on your:	No (%)	Yes, once or twice (%)	Yes, more than twice (%)
Work, studies or employment opportunities	94.4	4.1	1.5
Housework or chores around the house	83.4	13.2	3.4
Marriage/intimate relationship	87.2	10.9	2.0
Relationships with other family members	93.3	5.7	1.0
Friendships or social life	93.9	5.4	0.7
Physical health	78.2	18.0	3.8
Finances	87.9	8.3	3.8
In the last 12 months have you had one of the following experiences:			
Trouble with the law about your drinking and driving	99.1	0.9	0.1
An illness connected with your drinking	98.9	0.8	0.4
Lost a job, or nearly lost one because of your drinking	99.6	0.4	0.0
People annoyed you by criticising your drinking	93.3	5.8	0.9
Spouse or someone you lived with threatened to leave or left because of your drinking	98.9	1.0	0.1
Lost a friendship because of your drinking	98.9	0.9	0.2
Got into a fight while drinking	92.7	6.2	1.1

**Note:** Due to rounding percentages do not always add to 100%. Where there was missing data (<5% of sample in all cases) for a variable those individuals were excluded from that analysis.

Much smaller numbers of respondents reported experiencing the alcohol-related troubles. There was a significant number of drinkers who reported having been annoyed by others criticising their drinking in the last 12 months (5.8%). Having got into a fight while drinking in the last 12 months was the most commonly reported alcohol-related trouble, 6.2% of current drinkers reported having experienced this once or twice in the previous year and 1.1% more than twice in the year. Of those who reported having been in a fight while drinking in the last 12 months 63.4% were male and 33.3% were aged under 25.

**Demographic characteristics and drinking behaviour**—Table 3 shows the odds of reporting alcohol-related harm or trouble in the previous 12 months by demographics and drinking behaviour. Men were significantly more likely to have reported both alcohol-related harm (OR=1.3 [1.0–1.7]) and trouble (OR=1.5 [1.1–2.1]) compared to women.

**Table 3. Odds of reporting any harm or any trouble by demographic characteristics and drinking behaviour of current drinkers**

Variable	Harm OR* (95% CI)	Trouble OR* (95% CI)
<b>Sex</b>		
Female	1.0	1.0
Male	1.3 (1.0–1.7)	1.5 (1.1–2.1)
<b>Age</b>		
18–24 years	1.0	1.0
25–34 years	0.7 (0.4–1.1)	0.3 (0.2–0.5)
35–44 years	0.6 (0.4–1.0)	0.2 (0.1–0.4)
45–54 years	0.5 (0.3–0.7)	0.2 (0.1–0.3)
55–64 years	0.3 (0.2–0.5)	0.1 (0.1–0.2)
65–70 years	0.1 (0.0–0.2)	0.0 (0.0–0.2)
<b>NZDep06</b>		
1–2	1.0	1.0
3–4	1.2 (0.9–1.7)	1.2 (0.7–1.9)
5–6	1.2 (0.8–1.6)	1.2 (0.7–2.0)
7–8	0.9 (0.6–1.3)	0.9 (0.5–1.6)
9–10	1.6 (1.0–2.5)	1.9 (1.1–3.4)
<b>Ethnicity</b>		
European	1.0	1.0
Asian	0.6 (0.3–1.2)	0.3 (0.1–1.2)
Māori	2.0 (1.3–3.0)	3.5 (2.1–7.2)
Other	0.6 (0.2–1.6)	1.3 (0.4–3.9)
<b>Heavy episodic drinking</b>		
No	1.0	1.0
Yes	4.3 (3.2–5.8)	4.6 (3.2–6.6)
<b>Average daily consumption†</b>		
1	1.0	1.0
2	2.7 (1.9–3.7)	3.9 (2.6–5.9)

\*Adjusted for all other variables in table; † 1 = ≤ 20grams of alcohol per day for women, ≤ 30 grams per day for men; 2 = >20 grams per day for women, >30grams per day for men.

With increasing age of respondents there was decreasing odds of having experienced alcohol-related harm and/or trouble and it appears that those in the most deprived group (NZDep06=9–10) were more likely to report both alcohol-related harm

(OR=1.6 [1.0–2.5]) and trouble (OR=1.9 [1.1–3.4]) than the least deprived group. People of Māori ethnicity were significantly more likely to have experienced harm and trouble due to alcohol compared to those who described themselves as European.

For both men and women, increased consumption of alcohol resulted in higher odds of having experienced these harm and/or troubles in the last year. Respondents identified as heavy episodic drinkers were 4.3 (3.2–5.8) times as likely to have experienced alcohol-related harm and respondents with the highest level of daily consumption were 3.9 (2.6–5.9) time as likely to report alcohol-related trouble.

## Discussion

This research shows that alcohol-related harm is reported by one in three current drinkers in New Zealand. Fighting due to drinking and being the subject of criticism for drinking behaviours are commonly experienced alcohol-related troubles, especially for young men.

Overall the findings of this study support the existing evidence that increased alcohol consumption results in increasing risk of experiencing alcohol-related harms, but in New Zealand this affects a substantial proportion of the general population. Higher average daily intake of alcohol and being a heavy episodic drinker were independently associated with an increased risk of both alcohol-related harm and trouble.<sup>3,5,8,9</sup>

High average daily consumption was associated with increased risk of both harms and troubles after controlling for heavy episodic drinking which suggests that steady heavy use, not just “binge drinking” is a pattern of drinking associated with high rates of alcohol-related consequences.

Controlling for broad differences in drinking behaviour, men, people of Māori ethnicity, and people living in the most deprived areas were significantly more likely to report both harms and troubles.<sup>8,9</sup> The odds of Māori reporting alcohol-related troubles - which were events that were potentially more serious compared to those classified as harms - were particularly high in this analysis. This reflects previous findings in the 2004 Health Behaviours Survey, which also showed that people of Māori ethnicity were at increased risk of alcohol-related harm.<sup>9</sup> However, it must be borne in mind that the adjustment for consumption pattern was limited to two crude dichotomous variables.

While harm is experienced by more men than women, the prevalence of harm in women drinkers was substantial. Heavy episodic drinking is about half as prevalent in women as men in this sample but drinking above the recommended limits is more common in women than men. Thirty percent of women report some harm from their drinking and 10% report more serious and objective measures of trouble.

No social gradient was identified in the prevalence of heavy episodic drinking or in the prevalence of exceeding the consumption guidelines, using the NZDep quintiles as a measure of socioeconomic position. There may be differences in the frequency of heavy drinking episodes or actual volumes drunk in excess of guidelines that were not captured by these dichotomous variables, but the pattern of prevalence of harms or troubles observed was very similar. The most deprived quintile of NZDep had the highest prevalence of both heavy episodic drinking and of reported harms and

troubles, and the NZDep category 3–4 had the next highest level of these indicators, as well as the highest prevalence of drinking above the guidelines.

A limitation of this research is that the cross-sectional nature of the study constrains the interpretation of associations and precludes causal inference. We cannot determine, for example, the nature of the association between living in the most deprived areas and reporting more alcohol-related harm. Contributions of causal relationships in both directions as well as confounders are likely.

The study uses self-reported data that maybe subject to social desirability bias, and alcohol consumption is known to be under-reported in population surveys.

Respondents were also required to determine for themselves whether they had suffered harm due to their drinking. It is possible that some harms or troubles were ambiguous due to the wording of the questions and therefore it is possible that each respondent would interpret these questions differently.

The response level of the survey was modest and there is evidence from this survey and others that this is likely to produce a sample that under represents the most harmful patterns of drinking.<sup>19,20</sup> Therefore these findings are conservative.

The high prevalence of harm identified in this study results from widespread hazardous drinking that is occurring across the social spectrum in both men and women. This means that targeted interventions and individual approaches are unlikely to affect much change, and population-based strategies are the most suitable approach.

The most effective population-based strategies to reduce hazardous drinking and associated harm are policy interventions that reduce the availability and promotion of cheap alcohol.<sup>2,21</sup>

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## The Christchurch Breast Cancer Patient Register: the first year

Valerie Davey, Bridget Robinson, Birgit Dijkstra, Gavin Harris

### Abstract

**Aims** The aim of this article is to present the first year's findings of the Christchurch Breast Cancer Patient Register (CBCR) to establish the incidence and management of breast cancer in the Canterbury region.

**Methods** CBCR commenced recruitment of breast cancer patients in Canterbury from June 2009. Ethical approval was granted by regional ethics committees to collect data. Patient data is recorded onto the database once informed consent is obtained.

**Results** A total of 337 patients (including one male) consented. At diagnosis, 231 (68.5%) were aged 50 years or over. 48 (14.2%) patients had carcinoma *in situ* with no invasive component. 289 (85.8%) patients had invasive carcinoma with 47.4% undergoing mastectomy and 44.6% breast conserving surgery whereas 8% had no primary surgery. Nodes were positive in 102 (38.8%), and the predominant tumour type was Ductal NST (no special type) in 68.9% (199) of patients with invasive carcinoma. Additional data incorporating ethnicity, oncology, additional surgical management and pathological variables are also presented in detail.

**Conclusion** Findings on 337 patients recruited and recorded on CBCR database in the first year are discussed. Due to the short follow up, outcome data is not analysed.

The New Zealand Cancer Control Strategy was launched in 2003 and one of its goals is to reduce the incidence and impact of cancer through research and surveillance in New Zealand.<sup>1</sup> As an initiative to fulfill this goal, the New Zealand Breast Cancer Foundation (NZBCF) funded the establishment of breast cancer registers at four main centres of Auckland, Waikato, Christchurch and Wellington.

Established in 2009, Christchurch Breast Cancer Patient Register (CBCR) is the only register in the South Island collecting breast cancer data for the Canterbury region. Based at Christchurch Hospital, the CBCR governance group consists of a breast surgeon, anatomical pathologist and oncology consultant.

To date, 750 breast cancer patients are on the Register comprising 92% of eligible patients. Combined with the Cancer Society Tissue Bank<sup>2</sup> based at University of Otago, this provides a powerful research facility. The database employed by the four registers consists of core data fields and CBCR has updated the local database with additional data fields for self-declared ethnicity; clinical notes; reconstruction surgery and pathological data.

Because of local and growing international interest in prognostic factors of lobular carcinoma *in situ* (LCIS), patients with such lesions are also eligible and recorded on the database.

In this article we present the first year's findings on 337 patients recorded on the database. The aim of the CBCR is to prospectively record clinical and pathological data and outcomes of breast cancer patients in the Canterbury region.

## Methods

All eligible breast cancer patients treated at breast centres in Canterbury are invited by clinical staff to consent to join CBCR at the time of establishing their diagnosis. The software CBCR uses, Microsoft Access Database (2007 version), has common components to the database used by the other three established registers.

Patient confidentiality is maintained at all times with password protected access to the database held by the data coordinator. Ethical approval was granted by the Upper South A & B Regional Ethics Committees in Aug 2007 to collect data on consented breast cancer patients.

Types of data collected from patients' clinical records include clinical; pathological; surgical and/or oncological management and follow up status (outcome). Data collation and analysis is undertaken by the data coordinator who is also a registered nurse with the findings presented to the governance group for further analysis and discussion.

The main breast centres in the Canterbury region are Christchurch and Ashburton Public Hospitals and private facilities at Canterbury Breastcare and St George's Cancer Care Centre. Breast cancer registration data is provided by New Zealand Cancer Registry (Ministry of Health) to ensure completeness.

Three main laboratories process and report on breast samples in Christchurch: Canterbury Health Laboratories (public), Medlab South (private) and Southern Community Laboratories (private). Original pathology reports are obtained for each individual patient. Fluorescent *in situ* hybridisation (FISH) assessment for further HER2 proto-oncogene verification has been undertaken by LabPLUS and from 1 Sept 2010 IGENZ in Auckland which is subsidised by Roche Pharma.

The inclusion criteria for the Register include Canterbury or West Coast residents who are diagnosed with breast cancer after June 2009 receiving treatment at breast centres in the Canterbury region.

Patients are excluded from the Register for the following reasons: previous history of breast cancer before June 2009; residents outside Canterbury or West Coast regions; patients who have declined or deceased before consent was obtained. These patients are recorded separately as a breast cancer diagnosis in order to determine the proportion entered onto the database.

## Results

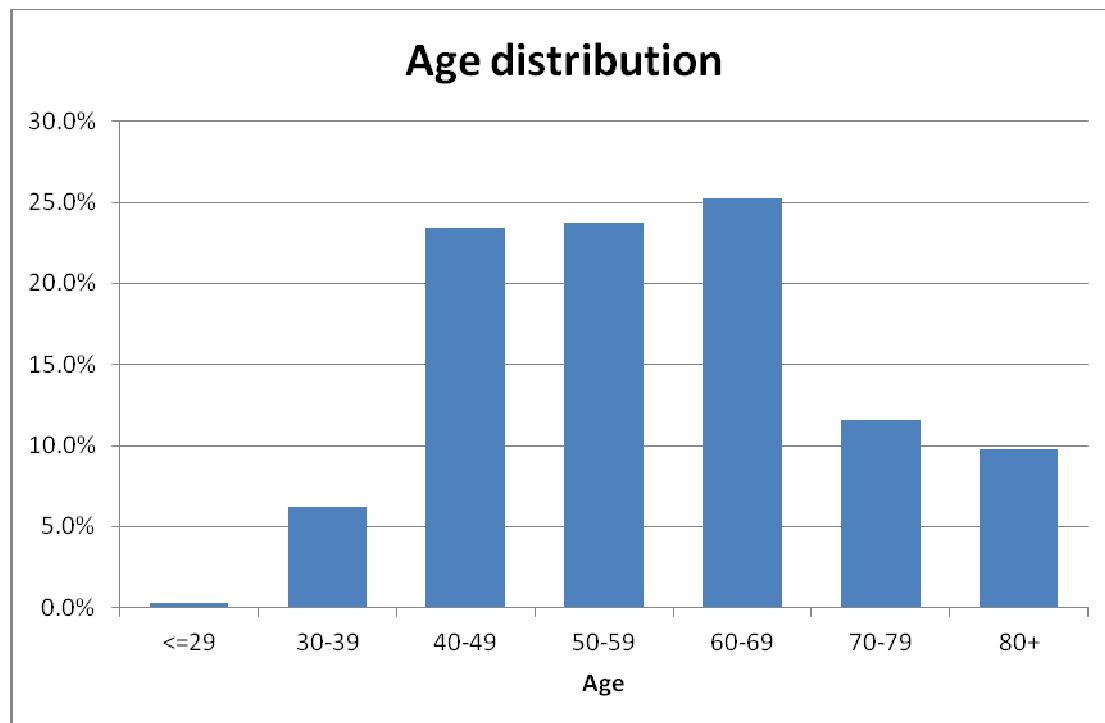
### Demographics

In the first year of recruitment (from 15 June 2009 to 15 June 2010), a total of 337 patients (including one male) consented comprising 202 (60%) from the public sector and 135 (40%) from the private sector. 289 (85.8%) patients had invasive breast carcinoma whereas 47 (13.9%) patients had ductal carcinoma *in situ* (DCIS) with no invasive component and one (0.3%) patient with lobular carcinoma *in situ*.

The consent rate was 93.6% with 360 eligible patients. Patients not consented include 12 who had declined to participate; eight who had deceased before consent was given with three remaining patients who are yet to give consent.

Menopausal status of female patients included 113 (34%) premenopausal; 196 (58%) post; 16 (5%) peri and 11 (3%) unknown status. At diagnosis, 231 (68.5%) were aged 50 years or over. Figure 1 shows the age distribution of all registered patients.

**Figure 1. Demographics: breast cancer by age group for all registered patients (n=337)**



Self-declared ethnicity data (based on the 2006 Census) is collected by CBCR to ensure accurate categorisation of ethnic groups, including Maori, affected by breast cancer. The demographics of patient ethnicity recorded on CBCR comprise of Asian 14 (4.1%); European 297 (88.1%); Maori 15 (4.5%); Other 5 (1.5%) and Pacific Islander 6 (1.8%). This is consistent with census data for the Canterbury region<sup>3</sup>.

### Detection methods

146 (43.3%) patients presented with a screen detected abnormality and 191 (56.7%) symptomatically. Of those presenting with clinical symptoms, 171 (89.5%) patients had a lump while remaining patients had nipple, skin or other changes.

### Surgical treatment

**Invasive carcinoma**—Twenty-three (8%) of 289 patients with invasive carcinoma did not undergo any primary breast surgery. Of these, eight (34.8%) patients had metastatic disease at the time of diagnosis; 11 (47.8%) were elderly or unfit for surgery and received endocrine therapy alone. The remaining four (17.4%) patients either had inoperable locally advanced disease or declined surgery.

Breast surgery such as mastectomy or breast conserving surgery was performed on 266 (92%) of 289 patients with invasive carcinoma. All types of breast conserving

surgery including wide local excision (WLE), either by palpation or hook wire localisation, and excision biopsy are categorised into “WLE” in this article.

The majority of patients were self-declared European, 5% were Maori, and 7% were of other ethnicities, including Asian and Pacific Island. Surgery type by ethnicity for patients with invasive carcinoma is shown in Table 1 and surgery for patients with invasive carcinoma, as well as DCIS, by tumour size, in Table 2.

Mastectomy was performed in 50.6% (43) of women under 50 years of age, 41.9% (57) of those 50-69 years of age, and 54.4% (37) of those older than 70 years.

Multifocal invasive cancer was present in 62 women (21.4%).

**Table 1: Types of surgery by ethnicity – invasive carcinoma**

Ethnic group	No primary surgery	MAST	WLE	Number of cases	Percentage
European	21	122	111	254	87.9%
Maori	-	4	10	14	4.8%
All Others	2	11	8	21	7.3%
Total	23	137	129	289	100%

**Ductal carcinoma *in situ* (DCIS)**—Forty-seven patients were diagnosed with DCIS without any invasive component, including one patient with Paget’s disease of the nipple. Whilst 33 (70.2%) patients did not require axillary surgery, 12 (25.5%) patients had sentinel node biopsy (SNB) and two (4.3%) others had axillary node dissection (AND) without SNB. One of the patients who had AND was found to have enlarged lymph nodes intra-operatively and a decision was made by the surgeon to perform immediate AND. All the patients who had axillary surgery were found to be node negative.

**Table 2: Types of surgery by tumour size – invasive carcinoma & DCIS**

Tumour size	No primary surgery	Mastectomy	WLE	Number of cases	Percentage
<b>Invasive carcinoma</b>					
≤ 2cm	-	58 (36.9%)	99 (63.1%)	157	54.3%
2 – 5cm	-	67 (69.8%)	29 (30.2%)	96	33.2%
> 5cm	-	10 (90.9%)	1 (9.1%)	11	3.8%
Unknown	23 (92%)	2 (8%)	-	25	8.7%
Total	23	137	129	289	
Percentage	8%	47.4%	44.6%		100%
<b>DCIS</b>					
≤ 2cm	-	2	24	26	55.3%
2 – 5cm	-	4	7	11	23.4%
> 5cm	-	5	2	7	14.9%
Unknown	-	1	2	3	6.4%
Total	-	12	35	47	100%
Percentage	-	25.5%	74.5%		100%

Of 202 breast cancer patients, with invasive carcinoma and/or DCIS only who were treated at Christchurch Hospital, 147 (72.8%) had voluntarily donated their tissue to the Cancer Society Tissue Bank for use in breast cancer research.

### Axillary staging – invasive cancers

263 patients with invasive carcinoma had axillary surgery to assess their nodal status. Of these, 191 (72.6%) patients had SNB with or without AND whereas 72 (27.4%) had AND without SNB. There were three patients who had SNB followed by immediate or delayed AND with final histology showing node negativity.

One of these patients had isolated tumour cells identified in three of her sentinel nodes but was advised to have delayed AND following a multidisciplinary team discussion. The other two cases had immediate AND following SNB due to sentinel nodes being unidentifiable by blue dye or isotope so AND up to level one was undertaken.

Amongst the patients who had AND without SNB (n=72), 22 (30.6%) patients were found to be node negative while 50 (69.4%) of them were node positive. Table 3 shows the overall nodal status of patients who had SNB with/without AND.

**Table 3. Nodal status for patients undergoing sentinel node biopsy & axillary dissection for invasive carcinoma**

Axillary surgery	Nodal status	Number of cases	Percentage
SNB + AND	Negative	3	1.6%
SNB, no AND	Negative	136	71.2%
SNB + AND	Positive	48	25.1%
SNB, no AND	Positive	4	2.1%
Total		191	100%

### Pathological characteristics

**Invasive carcinoma**—Amongst 289 cases with invasive carcinoma, 23 (7.9%) patients did not undergo any primary surgery hence their histological tumour size, grade and type were classified as “unknown” or “no primary surgery”.

The predominant tumour type was Ductal NST (no special type) affecting 199 (68.9%) patients while 26 (9.0%) patients had lobular subtypes, 41 (14.2%) had “other” tumour types. The tumour size for two surgical patients was also recorded as “unknown” as the pathologist was unable to establish a final tumour size.

Comparisons by ethnicity are not made here as there are still too few cases to establish any significance. Table 4 lists the prognostic indicators of tumour size compared with tumour grade.

**Table 4. Prognostic indicators of tumour size & grade – invasive carcinoma**

Tumour size	Grade 1	Grade 2	Grade 3	Not Stated	Number of cases	Percentage
≤ 2cm	28	76	53	–	157	54.3%
2 – 5cm	4	35	57	–	96	33.2%
> 5cm	1	8	3	1	13	4.5%
Unknown / Not stated	–	–	–	23	23	8%
Total	33	119	113	24	289	100%
%	11.4%	41.2%	39.1%	8.3%	100%	

A total of 26 (9%) of 289 invasive carcinoma patients did not have any form of axillary surgery. Of this group of patients, 23 also did not undergo any primary surgery while the remaining three patients were either very elderly or frail with multiple comorbidities whereby axillary surgery may not have any significant impact on their long term survival. Table 5 shows the number of nodes involved for 263 pts who had axillary surgery including SNB and/or AND.

**Table 5. Nodal status – Invasive carcinoma**

Nodal positivity	Number of cases	Percentage
0 nodes	161	62.1%
1-3 nodes	76	28.9%
4-9 nodes	15	5.7%
10+ nodes	11	4.2%
Total	263	100%

Molecular markers such as oestrogen (ER), progesterone (PR) and proto-oncogene HER2 are used as a guide to clinical management of the patient with invasive breast carcinoma.<sup>4</sup>

Table 6 lists ER and PR receptor results from invasive cancers of all patients who had primary breast surgery. Patients who had ER and PR results via fine needle aspiration or core biopsy are not included in this table.

**Table 6. Oestrogen & progesterone receptor results – invasive carcinoma**

ER result	PR result	Number of cases	Percentage
Negative	Negative	44	17.6%
Negative	Positive	1	0.4%
Positive	Negative	37	14.8%
Positive	Positive	168	67.2%
Total		250	100%

In New Zealand, HER2 is routinely assessed by immunochemistry (IHC) for protein over-expression and a result of IHC zero to 1+ is considered negative while IHC3+ is positive for HER2. An equivocal result IHC2+ is sent for fluorescent *in situ* hybridisation (FISH) for further verification. There were 34 (11.8%) patients who were not tested for HER2 as this is not routinely tested for patients older than 75 years of age as they are unlikely to be considered for chemotherapy with trastuzumab therapy.

Table 7 shows results of 255 (88.2%) of patients with invasive carcinoma who were tested for HER2 overexpression from either core biopsy (n=29, 11.4%) or histology samples (n=226, 88.6%). Of these, 11% (28) patients were ER, PR and HER2 negative.

**Table 7. HER2 receptor results & testing techniques - invasive carcinoma**

HER2 result	IHC test	FISH test	Total	Percentage
HER2 positive	25	24	49	19.2%
HER2 negative	120	86	206	80.8%
Total	145	110	255	100%

**DCIS**—Of the 47 patients with DCIS, 22 (46.8%) had high-grade tumours; 20 (42.6%) intermediate grade; 4 (8.5%) low grade and 1 patient (2.1%) with Paget's disease had no grade reported and this was recorded as "unknown". One of these patients had bilateral DCIS with high grade in one breast and intermediate grade in the other breast.

### Systemic therapies

Amongst patients with invasive carcinoma (n=289), 19 (6.6%) received neo-adjuvant chemotherapy; 95 (32.9%) adjuvant chemotherapy and 28 (9.7%) declined chemotherapy, while more than half (50.8%, n=147) did not require chemotherapy.

Seventy-four (25.6%) patients received both hormonal therapy and chemotherapy. Overall 172 (59.5%) of patients received hormonal therapy with/without chemotherapy while 98 (33.9%) of patients received hormonal therapy alone.

Two hundred and seven (71.6%) patients had invasive cancers which were positive for ER and/or PR receptors as confirmed by histology. Of these, 146 (70.5%) patients commenced on hormonal therapy, 42 (20.3%) were not recommended hormonal therapy while 19 (9.2%) patients declined therapy.

More than two-thirds (67.3%, n=33) of patients who were HER2 positive (total 49) received neo-adjuvant or adjuvant trastuzumab therapy. Reasons why HER2 positive patients did not receive trastuzumab included low distant recurrence risk and pre-existing comorbidities, as well as patients' decision not to receive chemotherapy with trastuzumab therapy after discussion with their oncologist.

## Radiation therapy

Patients with invasive breast carcinoma are referred for consideration of radiation therapy if they had WLE for breast surgery; are node positive or have features of their primary tumour indicating significant risk of recurrence or as primary therapy for patients with no primary breast or axillary surgery.

As for systemic therapies, clinicians may deem radiation therapy unnecessary or the patient may decline therapy for various reasons. Table 8 shows the uptake of radiation therapy by surgery type.

**Table 8. Radiation therapy by surgery type – invasive carcinoma**

Radiation therapy	Mastectomy	WLE	No primary surgery	Number of cases	Percentage
Yes	59	118	9	186	64.3%
Patient declined	4	2		6	2.1%
Not recommended	74	9	14	97	33.6%
Total	137	129	23	289	100%

For patients with DCIS alone, all 12 (25.5%) patients who had a mastectomy did not require adjuvant radiation therapy. Eight (17%) patients who had WLE did not require radiation therapy and this included patients with low recurrence risk (low grade and/or small tumours) and some elderly women with clear surgical margins. Of the remaining WLE patients, one (2.1%) declined adjuvant radiation therapy while the remaining 26 (55.3%) received the recommended therapy.

## Outcomes

Amongst 289 patients diagnosed with invasive breast carcinoma recruited in the first year, eight (2.8%) patients presented with metastatic disease at the time of diagnosis. Four (1.4%) patients had local regional recurrence (with/without systemic recurrence) within their first year of diagnosis and all four patients are deceased.

One of the patients who had local recurrence had been unable to have axillary surgery due to pre-existing comorbidities. Since diagnosis, 26 (9%) patients have developed metastatic disease and 15 (5.2%) patients in total are deceased from various causes since diagnosis. However, because of the short duration since the inception of the CBCR in June 2009, follow up status and patient outcomes are incomplete at this stage and will be reported in the future.

## Discussion

The establishment of Christchurch Breast Cancer Register in 2009 has enabled the collection of vital and comprehensive breast cancer data for the Canterbury region. Not only that, this data may be used collaboratively to form a complete picture of breast cancer in New Zealand as well as for comparison to data in other centres such as Auckland<sup>5</sup>, Waikato and Wellington. In this first year dataset, we present data on 337 consented breast cancer patients.

Using Ministry of Health Registry data, we were able to confirm complete ascertainment of cases, and attained a consent rate of 94%, across both the public and private hospitals. Our data confirm the predominance of older ages, and high proportion of hormone receptor positivity seen when all cases are reviewed.<sup>4,5</sup>

Rates of wide local excision and mastectomy for invasive cancers were similar to each other in this cohort, where 54% of invasive tumors were less than or equal to 2 cm and 33% 2-5 cm. The mastectomy rate of 47% for invasive cancer compares with 56% for the Auckland Registry<sup>5</sup> and 25% for DCIS compared to 33% for Auckland. United States SEER data for 2000-2006 show mastectomy rates of 28.6% for Stage 1 and 48.5% for Stage 2 invasive cancers, and 27.6% for DCIS<sup>6</sup>.

Overall, mastectomy rates have decreased over time in the US from 76.5% in 1988, to 38% in 2004, associated with the recommendations supporting breast conserving therapy in the 1990's<sup>7</sup>. There have been some recent reports of increasing mastectomy rates, and many reasons have been proposed, including greater use of MRI detection of additional breast abnormalities, and choices reflecting socioeconomic factors<sup>8</sup>.

Over the last 10 years, sentinel node biopsy has been introduced for early breast cancer, with equivalence to axillary node dissection for the clinically negative axilla demonstrated in the NSABP B-32 trial<sup>9</sup>.

In New Zealand, the SNAC (Sentinel Node Axillary Clearance) Trial Group of the Royal Australasian College of Surgeons (RACS) and the NHMRC Clinical Trials Centre carried out the SNAC1 trial exploring arm swelling, and the SNAC2 trial is ongoing for larger or multi-centric tumours<sup>10</sup>.

In our series, 27% of those having axillary staging had axillary node dissection without sentinel node biopsy, while 73% had initial sentinel node biopsy. After SNB, 71% had negative nodes and had no axillary clearance, potentially reducing lymphoedema; further follow up will include lymphoedema and recurrence rates.

For all the invasive cancers, 39% were node-positive, yet 66% received adjuvant systemic therapy, suggesting that risk factors in addition to nodal status were used to estimate risk of distant recurrence, and hence need for adjuvant systemic therapy. 19.2% had HER2 positive cancers, which is in line with other published series<sup>11</sup>. Due to the short follow up available, outcome data is not discussed here, but will be published in future reports.

CBCR is the only South Island breast cancer register collecting breast cancer data. This provides an extremely effective, readily accessible and economical audit tool for clinicians and central government agencies as well as being a powerful research resource, particularly when combined with the Cancer Society Tissue Bank (CSTB).

The strength of the Register is that it is a shared resource of the Departments of Surgery, Pathology and Oncology, guided by a representative of each, and is regarded as available to all involved in the care of patients with breast cancer. The Register helps support the required Surgical audits, and provides detailed clinicopathological data to support tissues collected for research by the CSTB, and can also provide follow up data.

During its first year, several clinician queries have been answered, and data has been provided to support scientific publications of the Mackenzie Cancer Research Group,

as well as other New Zealand researchers who have used tissues from the CSTB. The Registry also collaborates with the Regional Cancer Genetics Service, and has particular value in correlations of clinicopathological data with BRCA gene mutations, and supporting research into new genetic changes associated with breast cancer risk.

The strength of the data collated lies in the high level of detail collected and degree of clinical input, which ensures information likely to be of utility now and in the future is recorded. The CBCR is seen as an essential component of excellent quality care for breast cancer.

**Competing interests:** None declared.

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## Foot problems in Māori with diabetes

Belinda Ihaka, Angela Bayley, Keith Rome

### Abstract

**Aim** The prevalence of diabetes and its associated manifestations is higher in New Zealand Māori than New Zealand Europeans. There is no current evidence regarding podiatric clinical characteristics of Māori with diabetes. The aim of this study was to determine the clinical and foot characteristics of Māori with diabetes using a podiatry-specific assessment tool.

**Method** This study used a cross-sectional design. Participants with diabetes were recruited from two Māori Primary Health Organisations. Podiatric-specific characteristics (vascular, neurological and musculoskeletal) were recorded. Patient demographics and general medical conditions were also recorded.

**Results** Fifty-three participants were recruited and displayed risk factors for diabetes-related complications (mean disease duration 12 years, mean HbA1c 8.3%) including 49% of participants with hypertension. Podiatric-specific characteristics revealed unremarkable neurovascular results. However, many participants presented with pre-ulcerative lesions and current pedal ulceration (53% and 8% respectively). Although many participants had good foot-care knowledge (>85%), a modified classification tool of foot risk status determined that a high percentage of participants required regular podiatric management and screening (60%).

**Conclusion** Despite this population living with a chronic condition for more than 10 years and displaying poor long-term glycaemic control, there was no evidence of microvascular or macrovascular complications in the lower limb. However, there was a high prevalence of pre-ulcerative lesions which unmonitored and undetected may predispose the foot to ulceration. The detection of current ulceration in this study alongside other risk factors for diabetes-related complications necessitates the need for appropriate podiatric screening and podiatry management.

Diabetes Mellitus (DM) presents as a global economic burden.<sup>1</sup> In New Zealand, the prevalence for undiagnosed DM in Māori is higher than that for non-Māori, presenting as an opportunity to reduce significant mortality and morbidity in this population.<sup>2</sup>

Complications arising from DM account for 20% of all deaths among Māori as compared to 4% in other New Zealanders.<sup>3</sup> In one study, a high proportion of ulceration and amputation as a consequence of diabetes was observed in Māori.<sup>4</sup> A further study reports that Māori were less likely to have on-going DM related-care due to poor perception of risk.<sup>5</sup> Therefore for Māori, non-participation in ‘ongoing care’ can intensify the problem due to the inability to detect or manage signs or symptoms of diabetes-related complications.<sup>6</sup>

When undetected and untreated, the effect of foot problems in people with DM can progress rapidly and lead to morbidity and mortality from complications such as

ulceration, gangrene and amputation.<sup>3,7</sup> Appropriate screening ensures effective targeting of at-risk populations, early intervention, and surveillance of those detected with significant pathology.<sup>8-9</sup>

Previous studies have reported on the major contributing factors to diabetic foot pathology, which often occurs in conjunction with other organ complications.<sup>8,10-11</sup> Of these, neuropathy and mechanical stress are the key factors in predisposing the foot to increased plantar pressures effectively resulting in ulceration.<sup>10,12-13</sup> Furthermore, peripheral arterial disease, infection, patient disability, maladaptive self-care behaviour and access barriers consequently place the foot at higher risk of a major complication.<sup>7,10,14</sup>

The national introduction of the ‘Get Checked Programme’ provided the first opportunity to gather information pertaining to glycaemic control, lifestyle behaviour, diabetes-related cardiovascular disease, renal disease, retinal screening, and foot screening data.<sup>3</sup> However, the programme was not designed to identify the level of susceptibility of risk to the foot.

The need to undertake an assessment that includes the identification of the level of risk was therefore required.<sup>3</sup> The assessment should also indicate frequency of monitoring and classification of risk status, in order to implement effective management plans.

Therefore, whilst it is clear that Māori are more significantly at risk of diabetes-related complications, data regarding characteristics and management for foot pathology is limited in this population.

The aim of this study was to select Māori with Type 2 diabetes, who had either not received an annual ‘Get Checked’ review or who presented with features of an at risk foot; and through the use a podiatric diabetic assessment tool, determine clinical and foot characteristics.

## Methods

**Study design**—This study used a cross-sectional design and was undertaken in the Waitemata district, Auckland, New Zealand. The study was conducted between 2007 and 2008. Ethical approval was obtained from the Auckland University of Technology University ethics committee (07/198) for review prior to submitting to Northern Y ethics committee (NTY/05/08/055).

Participants were recruited from two Māori Primary Health Organisations (PHOs) and identified by a data search using Medtech-32. A query build function was set up to include participants with T2DM; ≥18 years old; Māori; who had not received a national diabetes assessment for >12 months;<sup>3</sup> had undetected pedal pulses, absence of sensation, previous history of peripheral vascular disease, or ulceration as determined by the ‘Get Checked’ Programme.<sup>3</sup>

Two research investigators accessed electronic patient records. One investigator was responsible for initial contact with the participants via telephone to explain the aim of the study. Informed consent was obtained from all participants.

Exclusion criteria included those who were not registered with the PHO; who had a below knee amputation or who attended regular podiatry appointments. Two experienced podiatric practitioners involved in working with Māori undertook all podiatric assessments. To ensure consistency between the two practitioners, each practitioner undertook a single training session prior to data collection.

Demographic characteristics including age (years), gender, body mass index ( $\text{kg}/\text{m}^2$ ), disease duration (years) and medical conditions were recorded. Smoking status was also reported. Perception of risk, past history of foot or leg ulceration/amputation, past history of lower extremity revascularisation were also recorded.

Clinical data including; serum glycated haemoglobin levels HbA1c and HbA1c >8% over a 6-month period; pharmacological management for DM (insulin, and oral hypoglycaemic agents), as well as regular (daily) and irregular (every other day) self-monitoring of blood glucose levels were collected. Foot risk status was recorded using a modified classification based on a previously published classification system.<sup>10</sup>

The podiatric diabetic assessment tool included a neurovascular, musculoskeletal and education component. The vascular assessment included a history of intermittent claudication.<sup>15</sup> Pedal pulse assessment, visual identification of skin integrity, and ankle-brachial index (ABI) were obtained.

The neurological assessment was based on the neuropathy signs (NDS) and symptom scoring system (NSS).<sup>16</sup> The musculoskeletal assessment included the evaluation for limited joint mobility in the hands<sup>17</sup> and feet. Lower extremity nail and skin conditions were also recorded.<sup>18</sup>

Participants were asked to report on self-care behaviours and self-knowledge which included daily foot inspection, application of skin moisturises, avoiding situations of risk (avoiding heaters or walking barefoot); as well as understanding the benefits of good glycaemic control, and foot problems associated with neuropathy.<sup>3,8,19</sup>

Participant's responses were recorded as either 'yes' or 'no', for example, 'yes' if the patient had a level of understanding and if they practiced self-care behaviours regularly.

**Statistical analyses**—Age, BMI, disease duration, HbA1c, ABI, NSS and NDS were described as a mean (SD). All other demographic, clinical, general medical and foot education characteristic scores were described as percentages (%). Data was analysed using SPSS version 17.0 software.

## Results

Fifty-three Māori participants with diabetes had a mean (SD) age of 53.7 years (10.7 years). The cohort consisted of 47% of women. The mean duration of diabetes was 12.0 (5.2) years. The mean (SD) BMI was 37.8 kg/m<sup>2</sup> (8.1). Of this cohort, 25% of participants were current smokers and 28% had a low perception of how these risk factors impact on diabetes-related complications.

Foot ulceration/amputation history was reported in 17% and 6% reported a past history of lower extremity re-vascularisation. The majority of participants were classified in category 2 or category 3 as demonstrated in Table 1. Regular and irregular self-checking of blood glucose levels were reported (46% and 41% respectively) and elevated HbA1c levels (>8%) were common amongst 42% of participants. Pharmacological management is demonstrated in Table 1.

Other risk factors for diabetes-related complications such as obesity, hypertension, dyslipidaemia and retinopathy were reported (62%, 49%, 55%, 21%). No participants were diagnosed with end-stage renal failure requiring dialysis.

Intermittent claudication was present in 11% of participants. ABI mean (SD) are reported in Table 1. The mean (SD) for the NSS was 3.2 (2.8), and NDS score was 2.0 (2.0). Dry skin featured highly (70%).

Hallux valgus (bunion) deformity was observed in 11% of participants and 30% of participants demonstrated hallux limitus. Clawing of the lesser toes was found in 38% of participants. A high number of participants presented with nail conditions (64%). Charcot foot was not observed. Many participants presented with pre-ulcerative lesions (53%) and 8% with current ulceration.

**Table 1. Screening characteristics**

<b>Podiatric assessment and current management</b>	<b>Results</b>
Insulin	11 [21%] n, [%]
Oral Hyperglycaemic Agents	48 [91%] n, [%]
Classification of foot risk status	n [%]
	Category 2: 19 [36%]
	Category 3: 24 [45%]
	Category 4: 6 [11%]
	Category 5: 2 [4%]
	Category 6: 2 [4%]
ABI: Right DP	1.07 (0.16) Mean (SD)
ABI: Right PT	1.12 (0.17) Mean (SD)
ABI: Left DP	1.08 (0.16) Mean (SD)
ABI: Left PT	1.12 (0.17) Mean (SD)
Achilles Tendon Reflex: Right	n [%]
Present	33 [65%]
Reinforcement	8 [15%]
Absent	10 [20%]
Achilles Tendon Reflex: Left	n [%]
Present	33 [65%]
Reinforcement	10 [20%]
Absent	8 [15%]
Biothesiometer (V): Right	19.3 (13.8) Mean (SD)
Biothesiometer (V): Right	16.2 (11.2) Mean (SD)

Diabetes-related knowledge was favourable in this cohort (98%), and positive foot care behaviour was present in 32%. Previous foot care from podiatrists (more than one year ago) had been received from 62% of the participants, whilst 4% reported previous use of a public orthotic service. Other features of the self care behaviours and knowledge are demonstrated in Table 2.

**Table 2. Foot care behaviours and knowledge characteristics**

<b>Participant knowledge and foot care behaviours</b>	<b>Results n [%]</b>
Smoking effects on circulation	46 [86%]
Neuropathy and foot problems	52 [98%]
Circulation and foot problems	50 [94%]
Understands the causes of amputation	51 [96%]
Use of moisturisers	51 [96%]
Drying feet after bathing	52 [98%]
Avoiding heaters and barefoot	51 [96%]
Footwear advice	51 [96%]
Understands the benefits of exercise	52 [98%]
Contacting podiatrist	51 [96%]

## **Discussion**

Māori are over-represented in diabetes-related complications compared with New Zealand Europeans. The podiatry assessment tool in this study was used to determine clinical and foot characteristics in a selected group of Māori with diabetes. One feature of the assessment tool is screening for peripheral neuropathy.

Peripheral neuropathy is a consequence of hyperglycaemia, increasing age and progression of DM.<sup>16</sup> We found that the majority of participants in this population did not display clinical evidence of distal symmetrical sensorimotor neuropathy as compared to a large multi-centred trial.<sup>16</sup>

Of the four signs which comprise the neuropathy disability score, loss of vibration sense featured highly although this did not affect the overall score. The inclusion criteria was designed to capture those with ‘at risk’ foot characteristics as determined by the ‘Get Checked’ initiative.<sup>3</sup> The podiatry assessment tool is therefore useful in detecting further signs of neuropathy.

The vascular assessment included a non-invasive clinical test (ABI) to detect clinical signs of peripheral arterial disease (PAD). The current study demonstrated mean ABI readings of normal range, despite claims of that ABI assessment is impractical and nondiagnostic in people with diabetes.<sup>20</sup> Whilst having a low ABI is an independent risk factor for cardiovascular disease (<0.9), having an ABI reading of >1.3 is indicative of arterial wall calcification, a common finding in people with DM.<sup>20</sup>

A small number of participants in this study complained of symptoms associated with PAD, which is consistent with other studies.<sup>20</sup> However, symptomatic pain query as well as relying on absent pedal pulses can underestimate the prevalence of PAD. More than half of the participants in this study displayed risk factors for PAD such as poor blood glucose control, dyslipidaemia and hypertension.

The musculoskeletal assessment screened for limited joint mobility. Limited joint mobility has been suggested to be a major contributing factor to increased forefoot plantar pressure.<sup>21,22</sup> Hyperglycaemia contributes to collagen cross-linking and reduction in elasticity in tendons.<sup>21</sup> Hence, the arch loses stability during propulsion ultimately increasing pressure particularly to the metatarsophalangeal joints.<sup>21</sup> This could explain why some participants in this cohort displayed evidence of pre-ulcerative lesions.

A previous study has reported that when tendon and joint stiffening occurs, neuropathy is usually present.<sup>16</sup> However, a limitation of previous studies is that they have not taken into consideration specific ethnic characteristics that may affect plantar fascia thickness and plantar pressure in the forefoot. Comparative studies on Māori with and without diabetes are required.

A modified classification of foot risk status was adapted in order to determine the level of risk in which the foot is susceptible to developing foot ulceration.<sup>10,19</sup> A high number of participants in the current study displayed clinical evidence that would support regular review from their podiatrist for management and surveillance of foot risk factors.

There are no current guidelines for podiatrists or referrers to podiatrists in New Zealand. Therefore, the modified classification used in the study is useful for determining management plans that include primary and secondary referral.

The modified classification fits with other studies, although the categorisation used is more sensitively designed for the likely health issues arising from within specific populations.<sup>10</sup> In addition, the modified classification builds on and refines the approaches already identified as being effective in this field. To that extent, the modified classification used in our study is more detailed and has the added benefit of targeting risk factors efficiently, permitting even more appropriate referral.

The classification builds upon the information gathered from the podiatric diabetic assessment tool and participants are able to move between risk depending on their collective assessment. Each category is then deliberate in its attempt to prompt the clinician to manage the patient accordingly.<sup>19</sup>

Previous studies indicate the success of podiatry-specific foot education programmes in diabetes.<sup>8-9</sup> Foot-care behaviour was positively modified in 70% of participants with established neuropathy contributing to the reduction of foot ulcerations significantly.<sup>9</sup> Furthermore, previous work has reported that foot care behaviours reduced the incidence of callosities in a podiatrist led group as compared to a control group, reducing plantar pressure.<sup>8</sup>

The programme used in the current study could offer support as to reasons why the study population did not attend with major complications such as neuropathic ulceration indicating the benefits of foot care education. However, in order to sustain positive behaviour, podiatry led-programmes need to be sustainable and implemented before or as close as possible to the diagnosis of neuropathy in order to achieve clinical benefits.<sup>8-9</sup>

We found a small number of the current population had an overall low perception of their risk of diabetes-related complications, although almost all participants had good general knowledge about diabetes and its associated complications which is partly in agreement with an earlier study.<sup>5</sup> We also found that many of the participants in this study had visited a podiatrist more than a year prior to the study.

This result may be largely due to the podiatrist's long history with both medical centres, and may not be representative of regional podiatry services. However, the current results are encouraging and indicate that previous education may be significant in influencing foot care behaviour.

A high number of people in this study had never smoked cigarettes, or had ceased smoking cigarettes (more than one year abstinence). Our findings are similar to that of a previous South Auckland survey, where participants with diagnosed diabetes also reported low cigarette smoking rates.<sup>5</sup>

These findings conflict with another study, which report a high prevalence rate of smoking among Māori as compared to non- Māori (35% and 13% respectively) with diabetes.<sup>23</sup> However, there is no data reflecting current cessation rates between these two groups in people without diabetes. The findings from the current study deserve further exploration and offer encouraging results.

There are several limitations to this study that warrant discussion. The current study had no comparison or control groups so we do not know if the podiatry program reduced the impact of diabetes-related complications. Future randomised longitudinal intervention studies are warranted to address this as well as compare Māori and non-Māori utilising this programme.

The modified classification tool and self-reported knowledge questions used in the current study have not been assessed in terms of validity or reliability in the current population. The tool was developed by clinicians to incorporate foot-related problems within the multidisciplinary diabetes team.

Although the assessment tool was designed to be consistent with Māori aspirations and culturally acceptable for Māori,<sup>19</sup> future work is required to evaluate the tool that includes reliability, content, construct and face validity. Questions regarding impaired mobility were self-reported, which may lead to recall bias. There were no specific measures used to determine functional impairment and disability.

The size and selection of the population was limited compared to other studies.<sup>8-9</sup> Only those registered with either medical centre were invited due to access to and recording and storage of electronic data. Participants with previous amputations were not recruited because their data may skew results, specifically neurological and musculoskeletal data.

The size of the cohort may be attributed to Māori being suspicious of participatory research.<sup>24</sup> For future studies, effective partnership between researchers and Māori communities are recommended. Regular Hui (meetings) at the medical centres and local marae need to occur from the inception of the idea, through to the conclusion of the study.

## Conclusion

The aim of this study was to select Māori with Type 2 diabetes, who had either not received an annual ‘Get Checked’ review or who presented with features of an at risk foot; and through the use a podiatric diabetic assessment tool, determine clinical and foot characteristics.

The current study has highlighted low prevalence of vascular and neurological foot characteristics in this sample of Māori people with Type 2 diabetes. However, there was an increased occurrence of pre-ulcerative lesions in this group indicating a need for podiatric intervention. We also found participants in this study had good general knowledge of diabetes and diabetes-related complications yet the validity of this characteristic remains unclear.

Overall, the current study demonstrates that there could be a place for standardised podiatry assessment in New Zealand to monitor and review people with Type 2 diabetes. Future studies that include randomised controlled clinical trials are needed to evaluate the clinical effectiveness of diabetic foot-related podiatry programs in clinical practice.

**Competing interests:** None declared.

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## Providing care for women with gynaecological malignancy: the need for a coordinated national approach

Peter Sykes, Michelle Vaughan, Kathryn Chrystal, Nieves Ehrenberg, Martin Hefford, Sarah Hutchings, Ai Ling Tan, Bryony Simcock, Digby Ngan Kee

### Abstract

Gynaecological cancer services in New Zealand have followed an evolutionary process rather than being centrally organised according to evidence on best practice. A report was recently commissioned by the Ministry of Health to review gynaecological cancer services and to provide guidance on the most efficient and effective way to delivery high quality, equitable care for women diagnosed with gynaecological cancers.

It is apparent the sustainability of current services is compromised by disparities in access to evidence-based multidisciplinary care, significant workforce shortages and a lack of standardised formal referral protocols. Key recommendations of the report include the establishment of an overarching national gynaecological cancer steering group and ultimately a four centre hub and spoke model of care provision.

Gynaecological cancer services are a small, vulnerable but essential service for New Zealand women and their families. Access to gynaecological cancer services varies throughout the country and the quality of services is inconsistent. In addition resources are unequally distributed.

There are many similarities between public health services in the United Kingdom (UK) and New Zealand. In 1995, following reports of poor survival from cancers of multiple types in the UK as compared to its European neighbours, the Calman-Hine report was published.<sup>1</sup>

Cancer services including gynaecological cancers<sup>2</sup> were subsequently reorganised, with one of the basic premises being the recognition of centres that provide specialist care and the formalisation of referral patterns and communication with referring services. The reorganisation of services is considered to have been successful and there is some evidence of improved outcomes.<sup>3</sup>

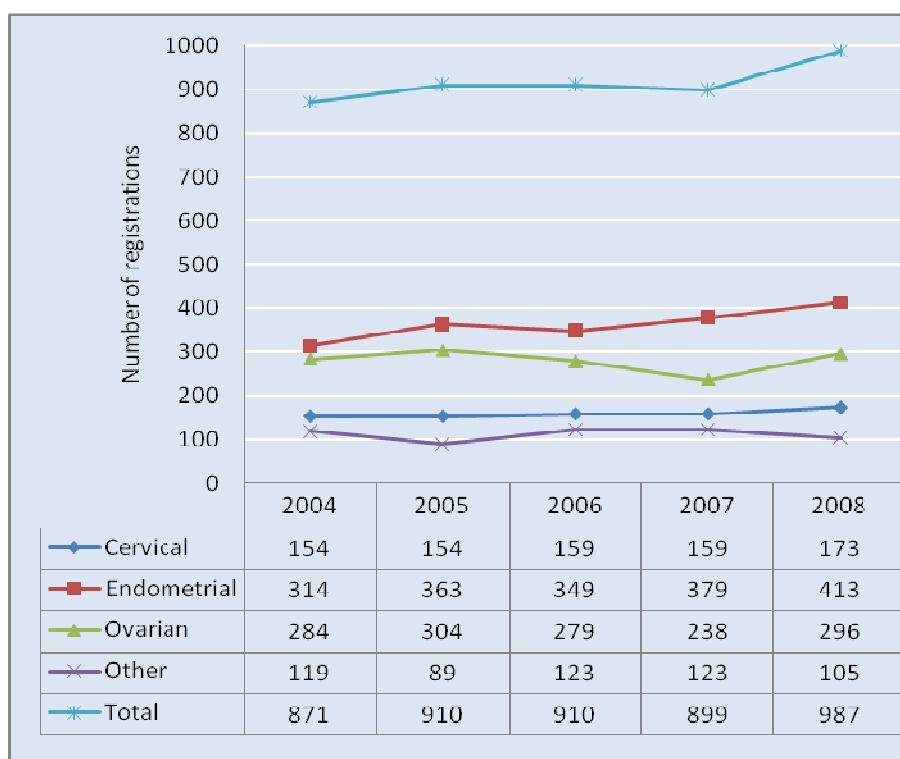
There is increasing recognition within the sector that national coordination of gynaecological cancer services is necessary in order to ensure all women with gynaecological cancer have equal and timely access to appropriate multidisciplinary specialist services into the future.

Recently a report to provide guidance on the configuration of gynaecological cancer services was commissioned by the Ministry of Health. This will soon be made available on the ministry of health website. Some of the major issues discussed in this report are highlighted in this paper.

## Gynaecological cancer in New Zealand

Gynaecological cancers account for approximately 10% of cancer registrations and 10% of cancer deaths in New Zealand women. In 2008, 987 women had a new diagnosis of a gynaecological cancer, 413 with endometrial cancer, 296 with ovarian cancer and 173 with cervical cancer (see Figure 1).

**Figure 1. Gynaecological cancer new registrations by type and by year, 2004–2008**



In addition 107 women developed cancers at other sites including the uterine muscle, fallopian tube, vulva and vagina. An undocumented number of women will also have developed gestational trophoblastic neoplasia (GTN)(molar pregnancy or choriocarcinoma).

In 2007 there were 199 deaths from ovarian cancer, 81 from endometrial cancer, 65 from cervical cancer and 57 from other gynaecological cancers<sup>4</sup>.

Despite the reduction in cervical cancers due to cervical screening and a further anticipated reduction due to the HPV vaccine, a significant increase in gynaecological cancer presentations can be anticipated due to the increasing age and incidence of obesity in our population.

## **Overview of gynaecological cancers and their treatment**

Endometrial cancer, the most common gynaecological cancer, is associated with obesity and nulliparity. It normally occurs in postmenopausal women and comorbidity is a frequent problem. Fortunately the majority of patients present with early stage disease and are cured following hysterectomy. However a significant proportion have advanced disease or high risk histological types which require complex management. In order to optimise care, it is important that multimodality treatment including surgery, radiotherapy and chemotherapy and other medical interventions are considered.

Ovarian cancer is the fifth most common cause of cancer mortality for New Zealand women. It constitutes a remarkably diverse range of diseases with different biological behaviours requiring differing therapeutic approaches. Generally, patients with ovarian cancer present at a mean age of 64 and unfortunately tend to present with advanced stage disease. The best outcomes are achieved through a combination of chemotherapy and radical surgery. However radiotherapy and novel therapeutic drugs have an important therapeutic role.

The cervix remains an important site of cancer where it often occurs in relatively young women. The fact that this is more common and associated with a worse prognosis in Maori women is well documented. Treatment involves careful pre-treatment evaluation, radical surgery, radiotherapy and chemotherapy.

The uncommon vulval and vaginal cancers are treated with a combination of radical surgery and radiotherapy. A coordinated approach between gynaecologists and medical oncologists with relevant expertise is also required for the treatment of GTN.

Psychosocial support, palliative care and familial cancer services are essential aspects of care for women with gynaecological cancer. While this is true for many who suffer from cancer there are unique aspects of gynaecological cancers that make coordination between specialty services and community based care a specific requirement.

## **Personnel and other requirements**

To provide an appropriate standard of care, it is clear a team approach is required<sup>5,6</sup>. This team must include a gynaecological surgeon with specific expertise in gynaecological cancer (gynaecological oncologist), a medical oncologist with specific expertise in gynaecological cancer, a radiation oncologist with expertise in gynaecological cancer and brachytherapy, an expert gynaecological pathologist, a radiologist with experience in the field, and nursing staff with appropriate skills and experience.

For the service to be able to operate 52 weeks a year there needs to be duplication of these personnel and to ensure that the service is sustainable, training positions are required.

In addition external beam radiation and brachytherapy facilities are necessary as well as imaging, operating theatres and high dependency post operative facilities.

These resources can only be assembled in a tertiary referral service. To achieve an adequate case load to maintain expertise and support a comprehensive service, a referral population of approximately 1,000,000 is required.<sup>1</sup>

Although more recent publications suggest a population of 750,000 may be adequate. While in the past many gynaecologists have offered treatment for gynaecological malignancies, this is no longer considered to be within the field of practice of general obstetrics and gynaecology.

Subspecialty training and accreditation in gynaecological oncology has been recognised by the royal Australia and New Zealand college of Obstetrics and Gynaecology since 1988 and similar subspecialty accreditation exists in the UK, North America and Europe.

To ensure the optimal distribution and use of subspecialty units are achieved it is important that their development is organised and that communication with secondary and primary health services patients and their families is excellent.

## **Evidence to support tertiary care**

The organisation of subspecialty services is rarely without controversy. While the potential advantages are easily argued, potential concerns include costs, unnecessary or unwanted travel for patients, cross DHB funding, disagreement between health professionals regarding who should provide care, down skilling of general specialists and ongoing difficulties staffing small and potentially vulnerable services.

However in the current environment we cannot go without subspecialty gynaecological cancer services. Some treatments can only be offered by subspecialty surgeons and oncologists that have had the appropriate training and have access to appropriate facilities. For other patients there is some degree of choice about where and by whom treatment is delivered. For these women it is important to recognise there are a large number of publications that document that women with ovarian cancer have a better prognosis if they are cared for in a tertiary referral unit and are operated on by a gynaecological oncologist.<sup>7-10</sup>

A recent Cochrane review adds weight to this argument.<sup>11</sup> There is also evidence that multidisciplinary meetings make an important contribution to patient care<sup>12,13</sup> and that women with endometrial cancer have improved outcomes when treated in specialist units.<sup>14</sup>

Cost efficiencies may be gained in larger units due to familiarity with treatments and careful evidence based protocol development.<sup>7,15</sup> It is therefore considered important that all women have their case presented at a regional MDM and that decisions regarding treatment are made in conjunction with the regional gynaecological cancer team.

The role of ongoing research in the improvement of patient care must be acknowledged. Tertiary referral units with links to academic institutions are best placed to make a significant contribution to clinical research. Involving more New Zealand women in large international multicentre clinical trials will ensure treatments are consistent with international best practice and will contribute in the long term to improvements and efficiencies in care.

## Personnel shortages

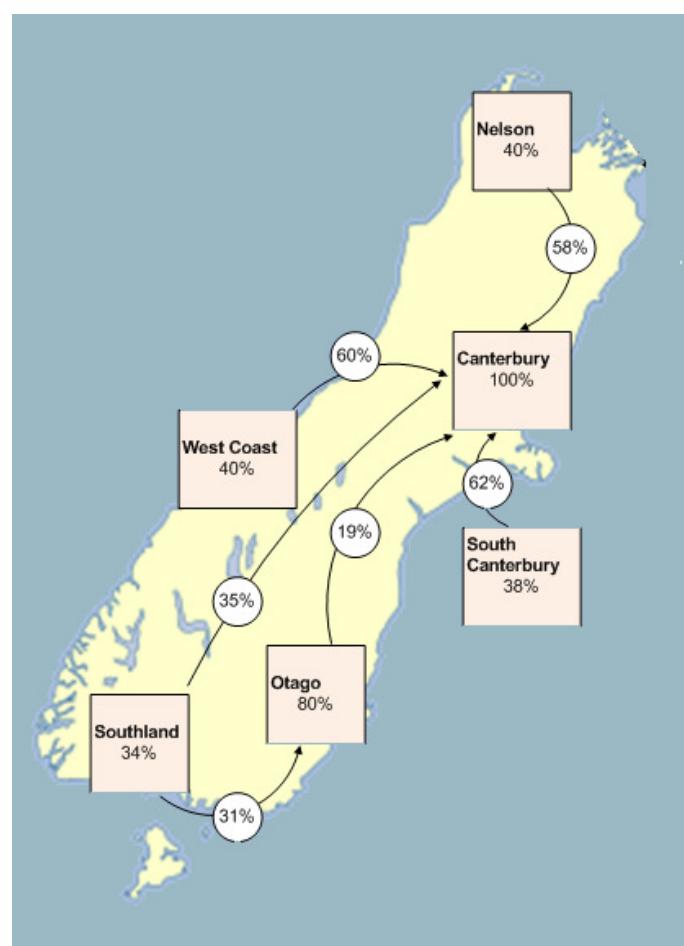
Staffing of specialty services in a small nation such as New Zealand represents challenges. It is estimated that the country is currently short of at least 3.7 full time equivalent (FTE) gynaecological oncologists. There are also workforce shortages in all other disciplines including medical and radiation oncology, gynaecological pathology and gynaecological cancer nurse specialists.

In order to plan workforce development, DHBs will need to fund the required FTEs. This will in turn create career pathways for trainees. Training positions for senior registrars in gynaecological oncology and related disciplines need to be developed and where necessary accreditation of overseas trained specialist should be supported.

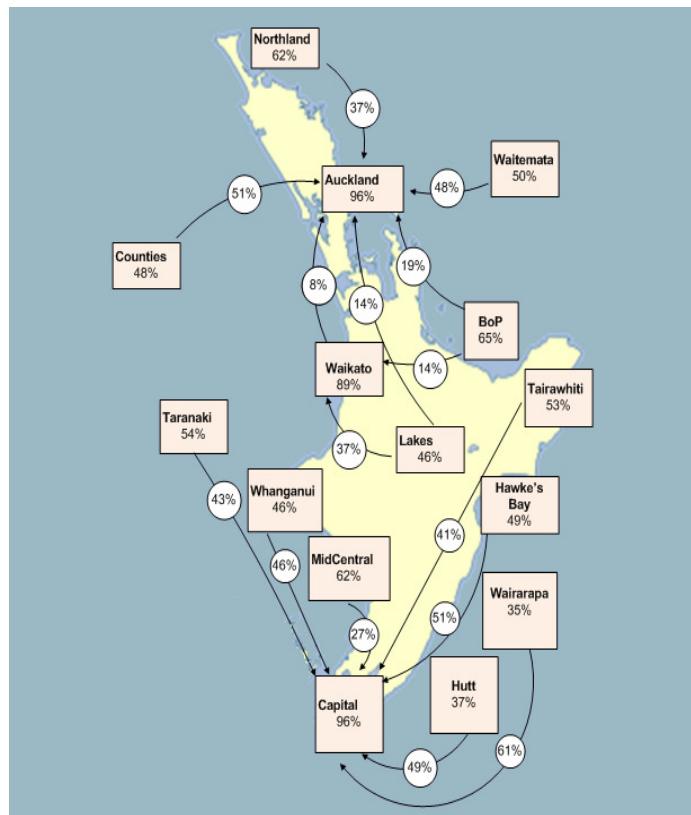
## Distribution of care

It is clear that gynaecological cancer treatment resources are not evenly distributed throughout the country. Figures 2 and 3 demonstrate referral pathways for gynaecological cancer patients receiving gynaecological surgery in New Zealand. These reveal quite significant differences in referral patterns geographically.

**Figure 2. Gynae-oncology surgery volumes from 2004–2008 cohort in the South Island**



**Figure 3 Gynae-oncology surgery volumes from 2004–2008 cohort in the North Island**



**Figure 2 and 3.** Percentage figures represent the percentage of women with gynaecological cancer receiving surgery in that site, for example for women from the Bay of Plenty 65% receive their surgery locally, 14% travel to Waikato Hospital and 19% to Auckland whereas in Nelson and Greymouth 40% is done locally and 58 and 60% of patients travel to Christchurch Hospital.

In the South Island, about 60% of women in smaller centres receive surgery in tertiary subspecialty services. In the North Island where there are only 3 subspecialty accredited gynaecological oncologists in the public sector, all of whom are based in Auckland, a lower and more variable percentage of women are able to access subspecialty services. For example only 37% of women with gynaecological cancer from northland receive surgery in a tertiary centre and from the Bay of Plenty only 19% receive surgery under the care of a gynaecological oncologist.

With a population of about 1 million, well established referral pathways and adequate specialist staffing, the South Island perhaps offers the most functional model of tertiary referral. Christchurch is able to offer a comprehensive service, has a weekly multidisciplinary meeting, its resources include 2 resident subspecialty accredited gynaecological oncologists and brachytherapy services. It operates a hub and spoke type model with a regional service in Dunedin.

In Dunedin a multidisciplinary meeting is held every 2 weeks in conjunction with local gynaecologists, medical and radiation oncologists and a visiting gynaecological

oncologist from Christchurch. Gynaecologists from Southland are able to teleconference into this meeting.

### **A four centre model**

The UK has successfully organised its gynaecological oncology services<sup>2</sup>, utilising the concept of comprehensive centres and smaller satellite units similar to the model in the South Island. This is backed up with excellent teleconferencing facilities which facilitate multidisciplinary care for patients in smaller centres. The authors believe this model is well-suited to the needs of the New Zealand population and geography.

Following the Ministry's commissioned review of gynaecological cancer services, extensive discussion with medical practitioners providing care for women with gynaecological cancer, and a survey of interested parties, it was considered that four comprehensive gynaecological cancer centres in Auckland, Hamilton, Wellington and Christchurch would best meet the needs of New Zealand women.

Services in Hamilton and Wellington are particularly vulnerable due to significant staff and resourcing issues. In addition, the referral population for Hamilton (Midland region) is low at 669,000 (in comparison to the 750 thousand to 1 million population required to support a gynaecological cancer centre). It is clear that the establishment of sustainable comprehensive services from these centres is a long term plan. In the interim the support and development of these two centres and ensuring that New Zealand women have equity of access to treatment will be immediate goals.

### **Need for national coordination body**

In order to further develop national gynaecological cancer services in a coordinated manner the formal establishment of a gynaecological cancer steering group is proposed. This group would include representatives from all 4 major centres and all key medical and nursing disciplines as well as other key stakeholders including the Royal Australian and New Zealand College of Obstetricians and Gynaecologists. This group would work with the Ministry of Health, regional cancer networks and District Health Boards, to support the establishment of these four comprehensive centres and to facilitate the most efficient use of available resources, until the centres are fully established.

In addition a work program on common treatment protocols referral guidelines and data collection would commence. Similar national approaches to cancer services are underway for lung cancer and paediatric oncology.

### **Conclusion**

The reorganisation of New Zealand gynaecological cancer services is necessary to ensure sustainable and more equitable access to high quality care. Lack of clarity regarding models of care has contributed to a fragmented approach to service delineation and service development.

A recent report submitted to the Ministry of Health offers a framework for the development of a sustainable, equitable national gynaecological cancer service. The Ministry of Health has recently requested regional health boards establish 8 national tumour stream advisory groups. The gynaecology group has been asked to advise the

ministry on the appropriate number of tertiary gynaecological centres for New Zealand and to develop standards for service provision.

The authors hope that for the sake of New Zealand women and their families that such initiatives will continue to be supported in a way that will lead to a coordinated national approach and improved equitable outcomes for women with gynaecological cancer.

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## What's in a cost? Comparing economic and public health measures of alcohol's social costs

Eric Crampton, Matt Burgess, Brad Taylor

### Abstract

Studies based on a cost of illness method frequently assert large social costs from a variety of risky activities, the harms from which most typically fall upon the risk-taker himself. Many of these costs are inadmissible in a standard economic framework; consequently, figures derived by the cost of illness method are not comparable with other economic notions of cost and are of very limited policy use.

While all forms of consumption bring both costs and benefits, not all such costs and benefits are socially relevant. Because we expect individuals to discount costs borne by others, consumption of products that can have negative health consequences and that thereby impose costs via the public health system may also require excise taxes to force the internalisation of these otherwise externalised costs.

Measuring correctly the costs that individuals impose on external parties is an important first step in ensuring that tax and regulatory policy is set correctly. Unfortunately, adequate assessment of such costs is the exception rather than the rule.

We here summarise findings from our work<sup>1</sup> comparing the social cost estimation method used in the public health literature with that used in the economic literature. We find the former suffers from a cost-inflating bias. Not only are social costs and private costs conflated, but, in important cases, categories of cost are double-counted.

As exemplar, we analyse studies finding social costs of alcohol in New Zealand of \$4.8 billion<sup>2</sup> and of \$15 billion in Australia,<sup>3</sup> finding that only a fifth of those figures could plausibly be counted as an upper bound measure of actual external, policy-relevant, social cost. Nevertheless, the figures have been influential in policy debate.

While we do not wish to diminish the very real harms of alcohol use, it remains important that policy be based on sound measures that are comparable across different cost areas.

The economic framework for cost analysis allows us to compare the otherwise incommensurable. Stepping too far from that method prevents derived results from being useful for policy purposes and instead generates figures more suited to advocacy.

We illustrate the difference between the economic method and the public health method as we work through categories of cost found in these two influential policy reports. We begin with those tabulated costs that are best viewed as policy-relevant from an economic perspective and then move towards those that are generally inadmissible in an economic analysis. We then discuss the critical difference between marginal and total costs in economic analysis and its relevance for policy.

## **Policy-relevant costs**

### **Crime and motor-vehicle accidents**

Some drinkers go on to commit crimes, or to cause car accidents, that would not have occurred but for intoxication; these costs are imposed by drinkers on others, are significant in magnitude, and policy-relevant. Where the economic method and the public health method diverge is in determination of causality in crime and in setting the boundaries of which costs are policy-relevant among those suffering costs of drink driving accidents.

Both Business and Economic Research Limited (BERL) and Collins & Lapsley (CL) use survey methods to assign the proportion of crime attributable to alcohol. In the New Zealand case, BERL used an existing survey of prisoners who were asked to reveal the extent to which alcohol contributed to their current incarceration. Those answering “some”, “a lot”, or “all” were deemed to have committed a crime that would not have been committed in the absence of alcohol. Positive responses were sorted by category of crime, and that proportion of each crime’s aggregate cost was attributed to alcohol.

CL used two separate pre-existing surveys.<sup>4,5</sup> Police detainees indicating that they had consumed five or more standard drinks any time in the prior month (three or more for women) and that they had consumed any alcohol at all in the 48-hours prior to detention were deemed to have committed an alcohol-caused crime if they also revealed alcohol dependence through positive answers to three of six indicator questions.

A husband and wife who shared a bottle of wine with dinner the day before committing a jewellery heist, and who indicated signs of alcohol dependence in survey questions, would be deemed to have committed an alcohol-caused crime. Costs of imprisonment are apportioned through use of prisoner self-reports of intoxication at the time of committing the offence.

Neither method is adequate for assessing alcohol’s causal role in crime. Prisoner self-report of intoxication may be viewed as exculpatory if subsequently attending alcohol treatment programmes helps earn early release. In our review of BERL, we downgraded their assessed crime costs by a third to remove those answering “some” to the survey question; in our review of CL, we noted the grave problems with their estimate but did not adjust their figure other than by removing costs attributed to forgone prisoner earnings.

Similarly, costs imposed on others by drink drivers should be tabulated in any economic accounting of the costs of alcohol use. But the public health method diverges from the economic method in determining which costs count.

Consider first the case of a drink driver who dies in a single-vehicle accident in his own car on a little-used road without incidental property damage to others. The public health approach counts as socially relevant the mortality costs falling on the drinker himself and the damage to the drinker’s car; in an economic framework, the only policy-relevant costs are those imposed on emergency services in responding to the accident.

## **Private and external cost**

Why do the two methods so diverge? Economists are not so amoral as to consider it irrelevant that someone has tragically died. But measures of private costs borne by drink drivers are only economically meaningful if offset by the consumption benefits enjoyed by all drinkers who took similar risk and did not have an accident.

Consider, by analogy, skiing, which would be utterly socially wasteful if we counted all of the accident costs suffered by skiers while taking no consideration of that all skiers derive at least some enjoyment from their risky activity. And here, from an economic perspective, the public health literature goes seriously awry.<sup>6</sup>

BERL simply assumes that harmful drinkers enjoy no benefits from their consumption;<sup>7</sup> they consequently deem all private costs as socially relevant because there are no offsetting private benefits. CL take a rhetorically different but substantially equivalent approach by assuming any potential market failure in alcohol consumption sufficient reason for dismissing all private consumption benefits.<sup>8</sup>

Market failures such as imperfect information can result in excess consumption, and the excess of costs over benefits for the erroneously consumed alcohol can then count as social, but simply assuming away all private benefits because of the potential for market failure is completely at odds with standard economic method. We could similarly assume that imperfect information in the used car market means nobody derives any benefit from buying a vehicle.

This substantial difference results in the biggest divergence between the public health and the economic approach to tabulating the costs of alcohol use. Where public health figures include all of the costs drinkers impose upon themselves, the economic method would either leave those costs to the side or incorporate them only if offsetting private benefits were simultaneously estimated and included.

Drink-driving costs falling upon those external to the vehicle should be counted as policy-relevant from both an economic and a public health perspective. From an economic perspective, costs falling upon the driver should be deemed private and irrelevant for policy unless weight is given to benefits enjoyed by the set of drivers taking similar risk but who suffer no adverse outcome.

Whether those inside the vehicle with the drinker bear public or private costs is less clear. A strict interpretation of the economic approach would hold that passengers' agreement to ride with an intoxicated driver makes them party to the driver's decision; resultant costs or benefits they bear can then hardly be deemed external.<sup>9</sup> If we wished to take a less strict line, we would again wish to count the benefits enjoyed by the passengers of drink drivers who do not suffer accidents against the costs falling on those who do.

It is easy to scoff at the potential existence of such benefits, but it puts a heavy thumb on the scale if we simply assume them away. In any case, the mortality costs of drink driving accidents falling on those inside the drinker's vehicle other than the driver are a small proportion of overall tabulated mortality costs.

## **Health care costs**

In a strict economic framework, the majority of alcohol-related costs borne by the public health system would be considered a transfer rather than as a true economic cost; only the identity of the payer changes rather than the existence of the cost.

If health care costs fell privately, it is likely that drinkers would take more care in avoiding such costs;<sup>10</sup> the increase of net costs under a public health system as compared to a private system can be considered a real external cost of alcohol use, though whether it should be tallied as a consequence of alcohol consumption or as a consequence of a policy decision that the tax system should be used to defray the health costs of drinking is, at best, debatable.<sup>11</sup>

We assumed that policy's intention is to offset transfer costs with excise taxes and so included all of these transfer costs as policy relevant.

CL assessed health care costs through alcohol-attributable aetiological fractions applied to total medical and hospital expenditures in Australia. For some disorders, costs to the public health system are reduced because of alcohol consumption – the burden of heart disease is lessened by alcohol consumption while the system bears greater costs of cirrhosis. While we questioned some of their fractions, our report excised only that portion of health care expenditures borne privately by drinkers using private health care.

BERL's method began with CL's aetiological tables, but set equal to zero any disorder's fraction where CL had determined that alcohol reduced rather than increased health costs; BERL assumed that harmful drinking, by definition, cannot improve outcomes on any health dimension. This is clearly out of step with the bulk of the epidemiological literature that finds, in particular, reductions in coronary heart disease even among heavy drinkers.<sup>12</sup>

Overall mortality is certainly increased by heavy drinking, but the net effect is smaller than BERL estimates. We were unable to reverse-engineer BERL's figures to impose CL's fractions; we instead deducted only that portion of the health care bill paid privately by the drinker.

## **Productivity and absenteeism**

If a drinker dies early, he is no longer earning income or producing output. Economists typically find that workers are roughly paid their incremental contribution to the firm's bottom line—their marginal product. In that case, the only economically relevant productivity cost that results is the search cost borne by his employer in finding a replacement. If the death is unanticipated, that search cost is policy relevant. If the employee's heavy alcohol consumption were well known, these cost risks would be already factored into the employee's pay.

Similarly, most taxpayers contribute less than their service cost to the government under progressive taxation regimes where high income earners pay the greatest portion of the cost of government services.<sup>13</sup> Any forgone tax revenue then needs to be weighed against reduced government liability for superannuation and other benefits that impose cost at the margin. By way of example, the alcoholic who dies prematurely neither contributes tax revenues nor consumes subsidised rest-home care.

Forgone wages plus employer hiring costs then constitute an upper bound on gross productivity losses consequent to premature mortality; policy relevant costs will be those borne unexpectedly by the employer. Both BERL and CL instead effectively take per capita Gross Domestic Product as measure of forgone production – a figure much larger than the aggregate wage bill as GDP includes payments to capital. The difference is substantial—BERL adds over \$650 million to headline costs by using per capita GDP rather than wages.

There are three substantial problems with this approach:

- First, where the death is incurred by the drinker, costs are properly considered internal rather than external; only increased employer search costs are plausibly external.
- Second, using per capita GDP rather than wages as measure of forgone output requires very strong assumptions about worker irreplaceability and about capital-labour complementarity—a method rejected by the World Health Organization (WHO).<sup>14</sup>
- Finally, both BERL and CL go on later to include intangible costs of loss of life. As we will discuss in the ‘Intangible costs’ section, below, using both measures together constitutes double-counting.

We consequently made very large adjustments to estimated social costs of productivity losses and absenteeism.

### **Intangible costs**

Premature death is costly; people value their own lives. Pain and suffering associated with alcohol-related disability and disease are real. Intangible costs falling on the victims of alcohol-caused crime and the victims of drink drivers should be tallied in an economic measure of alcohol’s social cost, but costs borne by the drinker can be included only if taken net of private benefits; estimating those private benefits would be a significant task.

We consequently followed the standard economic approach of excluding privately-borne costs. But both reports suffer from an additional substantial problem: private costs are significantly overestimated by inclusion of both intangible costs of life lost and forgone productivity.

Value of statistical life estimates used by both CL and BERL are inclusive figures; they do not provide a value of statistical life net of productivity. CL use Australian Bureau of Transport Economics figures on the Value of a Statistical Life (VSL) based on willingness to pay for incremental safety improvements. That measure weighs all of the benefits from lives saved by those safety initiatives. Adding wages to the VSL measure then is double-counting.

BERL uses New Zealand Ministry of Transport figures that similarly are inclusive of productivity losses with premature mortality. Indeed, the Ministry of Transport tabulation of the cost of road accidents excludes forgone earnings among those killed in road accidents for precisely this reason.<sup>15</sup>

BERL therefore double-counts.<sup>16</sup> BERL counts \$1.52 billion (CL: \$4.5 billion) in intangible costs of lives lost and \$1.5 billion (CL: \$3.5 billion) in forgone production, but a substantial portion of the latter is included in the former. It makes little difference to the bottom line in an economic costing as both types of cost are largely excluded as borne by the drinker, but it does matter if we wish an accurate assessment of costs borne privately by drinkers.

### **Resources used in abusive consumption**

Is it a social cost that a drinker spends \$10 on a bottle of wine? Both BERL and CL deem drinkers' expenditures on alcohol to be a social cost. This constitutes a sixth of CL's headline social cost figure, and fifteen percent of BERL's, but none of it is admissible in an economic measure of social cost. The counting of such expenditure as social cost is a curious by-product of assuming all private benefits away.

### **Summing up**

Considering only policy-relevant costs reduced measured social cost substantially. Some \$967 million of BERL's \$4.8 billion could be considered external and policy-relevant as a first cut, though we note substantial problems remain uncorrected, including overestimation of health care costs through their adjustment to CL's aetiological tables.

In CL's case, some \$3.8 billion of their \$15 billion can be considered potentially external, though we also note grave uncorrected problems in assessment of causality in the crime. Both figures are close to collected aggregate alcohol excise tax takes.

### **Margins and averages**

In his address to the New Zealand Police, Sir Geoffrey Palmer<sup>17</sup> contrasted BERL's measured social cost of alcohol with the aggregate excise tax take and took the difference as sufficient justification for large increases in taxation and regulation. Even leaving aside that the difference between the two figures drops considerably when normal economic method is applied to BERL's figure, differences between aggregate social cost and the excise tax take do not necessarily inform discussion of appropriate tax and regulation. Rather, we need to assess the marginal effect of a tax increase.

Alcohol excise taxation is necessarily linear in alcohol consumption while external costs are more plausibly J-shaped; when aggregate excise taxes entirely offset external harms, they necessarily impose too great a cost on moderate drinkers and too small a cost on harmful drinkers.<sup>18</sup> Policy then must weigh the costs imposed on moderate drinkers against the harms avoided when heavy drinkers curtail consumption.

By the best existing estimates,<sup>19</sup> a 10% increase in the price of alcohol induces heavy drinkers to curb their use by only 2.8% while cutting average consumption by 4.4%. If benefits to moderate drinkers matter, then we can do net harm by increasing excise taxes if the cost imposed on moderate drinkers, multiplied by the large number of moderate drinkers, exceeds the aggregate harm avoided by the smaller reduction in heavy drinkers' consumption. Measures targeting heavy drinkers might be preferred

on economic grounds, though any measure would need evaluating on its own merits at the margin.

In short, differences between aggregate social cost and the aggregate excise tax take tell us little about whether alcohol taxation or regulation is too strong or too liberal. Instead, we need to assess whether net marginal harm is reduced by any new measure, while taking seriously the burden those measures impose on drinkers who do not cause harm. And, ideally, we would attempt to devise policy instruments that curtail harms imposed by heavy drinkers at lowest collateral cost to moderate drinkers.

## Conclusion

It is easy to generate arbitrarily large figures purporting to tabulate the social costs of any activity if we use a method that never counts benefits while counting all of the costs, and some of those costs twice. While the resulting figure is useful for generating headlines that spur voter demands for action, it otherwise does little to inform policy development.

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## Pulmonary infiltrates with eosinophilia syndrome in ibuprofen overdose

Nicole Vogts, Simon Young

### Abstract

We describe the case of a 45-year-old female who developed pulmonary infiltrates and mild eosinophilia following an overdose of ibuprofen. We believe this was a case of pulmonary infiltrates with eosinophilia (PIE) syndrome and discuss the relevant literature. Although rare, PIE syndrome should be considered in those taking nonsteroidal anti-inflammatories who develop unexplained pulmonary infiltrates.

A rare complication of non-steroidal anti-inflammatory drug (NSAID) use is pulmonary infiltrates with eosinophilia (PIE) syndrome.

We report a case of suspected PIE syndrome in the context of NSAID overdose.

### Case report

A 45-year-old female with background of opiate addiction presented with a 2-day history of drowsiness following a drug overdose of 72 Neurofen Plus tablets (containing codeine and ibuprofen). Blood tests revealed acute renal failure, markedly deranged electrolytes and features of renal tubular acidosis.

A chest X-ray (CXR) showed bilateral patchy peripheral infiltrates, affecting the right midzone and left upper lobe. A computed tomography pulmonary angiogram (CTPA) excluded pulmonary embolism (PE), but showed multiple areas of ground-glass attenuation affecting predominantly the peripheral upper lobe, along with trace pleural effusions.

The patient had no symptoms of infection and remained afebrile but slightly tachypnoeic. Her C-reactive protein was 53 mg/L and white blood cell count was  $17.7 \times 10^9 / L$ . The eosinophil count was initially normal but rose to  $0.6 \times 10^9 / L$  ( $N < 0.5$ ) after 3 days. She was treated with intravenous fluids and oral antibiotics for possible aspiration.

Her renal function and acidosis improved over 5 days. A repeat CXR showed reduced but persistent infiltrates that had resolved at follow-up after 4 weeks.

### Discussion

Pulmonary infiltrates with eosinophilia (PIE) syndrome is characterised by diffuse eosinophilia: peripherally, on bronchial alveolar lavage, and on lung biopsy.<sup>1</sup> Symptoms, where present, include fever, cough, dyspnoea, malaise and rash.<sup>2</sup> Typical radiological features are pleural effusions, bilateral upper lobe and peripheral infiltrates and areas of patchy consolidation.<sup>3</sup>

PIE syndrome has been described in the literature in association with around 50 classes of medication.<sup>1,4,5</sup> NSAIDs have been reported as causative agents and both selective COX2 inhibitors and non-selective NSAIDs have been implicated.<sup>1,6-8</sup>

The syndrome typically presents 1 to 2 weeks after drug exposure begins, and occurrence is believed to be unrelated to dose or duration of use.<sup>5</sup> A hypersensitivity reaction is the proposed causative mechanism due to the widespread eosinophilia, rash, and rapid response on drug rechallenge.

Symptoms and signs of NSAID-induced PIE syndrome typically resolve completely within 2 weeks of discontinuation of the implicated medication, although radiological findings may be slower to improve.<sup>3,8</sup>

Some case studies have suggested an apparent response to systemic or inhaled corticosteroids.<sup>5,6</sup> Permanent fibrosis is a proposed outcome of PIE syndrome but is rare.<sup>1</sup>

The actual incidence of PIE syndrome may be underestimated due to poor awareness of this diagnosis and the widespread use of these agents.

A drug reaction should be considered in patients taking NSAIDs who present with pulmonary infiltrates that are otherwise unexplained.

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## Corticosteroids and monocytosis

Simeon Barker, Marilyn Scott, George T C Chan

### Abstract

Although the association between steroid administration and neutrophilia is well known, the association with monocytosis is not as common and the mechanism less clear. This report illustrates the association and provides an update of postulated mechanisms and clinical significance.

### Case report

An 83-year-old man was admitted from a rest home for fatigue, retching, nausea, and weight loss of 18 kg in the previous 6 months. He was on prednisone 5 mg oral daily and methotrexate 15 mg oral weekly for polyarteritis nodosa and rheumatoid arthritis.

Other medical problems included obesity, hypertension, ex-smoker with 50 pack year history and stopped age 70, COPD, dermatitis, osteoporosis, chronic renal impairment and dementia. Other medications at admission included alendronate 70 mg weekly, omeprazole 20 mg daily, folic acid, and paracetamol as required.

He had no known drug allergies. He was not taking any other over-the-counter medications or complementary medications. Gastroscopy showed severe non-reflux oesophagitis consistent with chemical ulcer secondary to alendronate. There was no evidence of malignancy on CT chest abdomen pelvis.

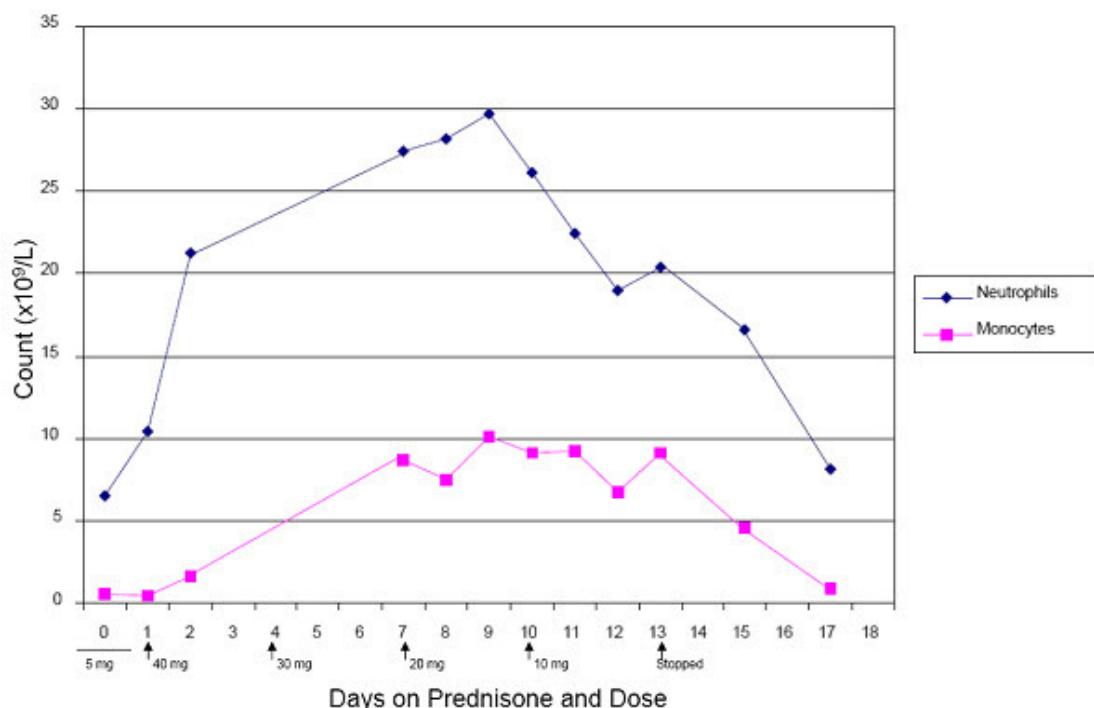
A severe red itchy rash developed on the patient's back during the admission. On dermatology review this was thought to be acantholytic dermatosis (Grover disease). Skin biopsy was consistent with either a fixed drug reaction or, more likely, urticated dermatitis. Prednisone 40 mg oral daily was started to control the rash. The patient developed a neutrophilia with accompanying monocytosis up to  $10.05 \times 10^9/L$ —see Figure 1.

There was no fever or other evidence of systemic infection, including multiple negative peripheral blood cultures. Blood film examination showed mild granulocyte left shift and neutrophil hypersegmentation, which could be explained by methotrexate, but not toxic change. The monocytes had normal morphology and there were no dysplastic features or abnormal cells.

The skin rash resolved with the oral steroid and following tapering of steroid therapy to his admission dose, total white cell count, neutrophil count and monocyte count returned to baseline.

The patient continued topical steroids and methotrexate. After discharge his rash remained well controlled.

**Figure 1. Neutrophil and monocyte count during prednisone therapy**



## Discussion

The association between corticosteroid administration and neutrophilia is well documented,<sup>1</sup> although accounts vary on the degree and mechanism of the effect.

The consensus is that corticosteroid increases neutrophils through increased bone marrow production and release, redistribution of the marginated and circulating neutrophil pools and reduced neutrophil movement into inflamed tissues. The degree of granulocyte left shift and the presence of toxic granulation on blood film examination may distinguish between neutrophilia caused by infection and corticosteroids.<sup>2</sup>

Although monocytosis may accompany the neutrophilia in corticosteroid use, this is less well documented and the mechanism is less clear. Corticosteroid has been shown to facilitate Interleukin-1 and Granulocyte-Monocyte Colony Stimulating Factor (GM-CSF) in inducing Colony Forming Unit – Granulocytes-Monocytes (CFU-GM) proliferation, which can increase monocyte production.<sup>3</sup> Monocyte number, however, has been observed to drop following administration of high dose corticosteroids, in contrast to the granulocytosis and overall leukocytosis.<sup>4</sup> Monocyte production and release was also suppressed in mice injected with hydrocortisone.<sup>5</sup>

The production and kinetics of the monocyte population, in both directions, are probably influenced by corticosteroid administration and also by the disease processes themselves.

In our patient's case, the rapid increase in leukocyte numbers with delayed but parallel increase in monocytes, their resolution on corticosteroid withdrawal, and the negative investigation findings for infection, suggest the monocytosis is secondary to prednisone use.

Recognition of this glucocorticoid side effect is useful to avoid unnecessary investigation and anxiety.

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## Creeping eruption

Narasimhalu C R Venkata, Alagesan Murali

**Clinical**—A 9-year-old boy was brought to us with a 1-month history of itchy lesions over his right foot. He was treated by a primary care physician but with no benefit. There were no systemic symptoms.

On examination there was a serpiginous, progressive lesion over the dorsum of the right foot with blisters over the lesion. His systemic examination and blood investigations were within normal limits.

**Figure 1. Serpiginous lesions over the right foot**



*What is the diagnosis?*

**Answer—***Cutaneous larva migrans*

**Discussion—***Cutaneous larva migrans* is also known as sand worms, creeping eruption, plumber's itch, duck hunter's itch and epidermatitis linearis migrans.<sup>1</sup> It is commonly seen in tropical countries including in travellers who walk barefoot or lie on sandy beaches or moist soft soil that has been contaminated with animal faeces.

Nematodes *Ancylostoma caninum*, *Ancylostoma braziliense*, *Uncinaria stenocephala*, *Gnathostoma spp*, *Dirofilaria conjunctivae*, and *Capillaria spp* can cause this condition.<sup>2</sup>

The embryonated eggs of nematodes which live in definite hosts such as cats and dogs are shed in the animals' faeces and reach the soil. Under appropriate conditions they hatch and release the active rhabditiform larvae. These mature and change into filariform larvae. When the larvae come into contact with humans they penetrate the epidermis of the skin and wander in a serpiginous route at the rate of about 3 cm per day and finally die in a few weeks. Clinically it presents as a pruritic, erythematous, serpiginous burrow.

The lesions are commonly seen on the distal lower extremities, including the dorsa of the feet and the interdigital spaces of the toes, but can also occur in the anogenital region, the buttocks, the hands, and the knees. Even though it is self limiting in 4–8 weeks, severe itching and secondary bacterial infection necessitates treatment.

For small and localised lesions, topical application of 10–15% thiabendazole solution/ointment until the lesions heal is efficacious and least toxic. The drug of choice is oral albendazole in the dose of 15 mg/kg/day for 1 to 7 days; thiabendazole, mebendazole and ivermectin can also be used.<sup>3</sup>

Our patient was treated with albendazole 15 mg/kg/day for 3 days orally, antihistamines, and topical steroids. The itching sensation reduced within 2 days and the lesion disappeared in 10 days (Figure 2).

**Figure 2. Healed lesions after treatment**



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## Fingernail lines

Sonali Kaushal, Vivek Kumar, Vishal Sharma

**Clinical**—A 35-year-old male presented with complaints of fever, cough with mucoid expectoration and progressive shortness of breath of 1 week duration.

A diagnosis of severe community-acquired pneumonia with acute respiratory distress syndrome was made, and the patient was shifted to intensive care unit for mechanical ventilation.

The patient gradually responded to antibiotics and supportive management, and was discharged after 10 days of hospitalisation.

Three weeks later, the patient came to the outpatient clinic and was completely asymptomatic. However, examination of the fingernails revealed transverse depressed grooves towards the proximal part in all of them (Figure 1).

**Figure 1**



*What are the lines called and what is their aetiology?*

**Answer**—A diagnosis of *Beau's lines* was made.

**Discussion**—Transient cessation of growth at the proximal nail matrix during *periods of acute stress* like severe systemic infection followed by normal growth later during recovery leads to formation of transverse and depressed grooves over the region of growing nail plates that corresponded to that period of acute stress.

These are known as *Beau's lines*.<sup>1</sup> They appear in most or all of the nails at the same time and progress distally with nail growth. In its severest form, a deep transverse groove may split the nail into two parts which is known as onychomadesis.

The timing and severity of acute stress can be judged from distance from nail bed and depth of groove, respectively. Severe metabolic stress, chemotherapeutic drugs and trauma are other important causes that can produce Beau's lines.<sup>1,2</sup>

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## Perioperative management of dabigatran: the Nelson experience to date

Dabigatran is a new anticoagulant that has been on the pharmaceutical schedule in New Zealand since 1 July 2011.<sup>1</sup> Dabigatran presents many challenges as it has an inherent bleeding risk.<sup>2</sup> To date an effective reversal method has not been developed and it is not possible to accurately measure the effect on coagulation with standard laboratory tests.

The pharmacologic properties of dabigatran have been studied and are used to guide the current clinical guidelines.<sup>3</sup> The protocols for anticoagulant reversal and management of bleeding have been developed on a theoretical basis with limited clinical experience as guidance.

Dabigatran has some advantages over warfarin as shown in the RE-LY trial.<sup>4</sup> However there is a large body of information regarding the management of haemorrhage on warfarin and reversal of anticoagulation if required. Comparatively dabigatran is unable to be reversed urgently - allowing time for renal clearance may necessitate deferring surgery to minimise residual anticoagulant effect.<sup>5</sup> This becomes a problem in an emergency when surgery cannot be delayed and in patients who develop acute renal impairment.

Another issue that arises is that it is difficult to monitor the anticoagulant effect and therefore hard to judge when levels are low enough for surgery to take place. The activated partial thromboplastin time (APTT) is unlikely to reliably measure the anticoagulant effect,<sup>5,6</sup> the INR is not sensitive enough and the thrombin time assay is too sensitive with no standardisation between laboratories.<sup>6</sup>

The aim of this study is to look at how dabigatran has influenced the management of patients who have been admitted to Nelson or Wairau Hospitals requiring surgery while anticoagulated on dabigatran. By analysing the Nelson data we hope to paint a picture of the impact dabigatran has had on surgical practice in Nelson.

**Methods**—A search of the clinical records between 1 July 2011 and 12 December 2011 was carried out using the hospital pharmacy's dispensing list. The records of patients on dabigatran were assessed in order to ascertain whether they required surgery and if so, how their dabigatran was managed.

The primary outcomes assessed for these patients were: delay in surgery, postoperative complications (primarily bleeding), time period preoperatively that dabigatran was stopped and time period postoperatively where it was restarted. The search returned 27 records of patients who had been admitted to Nelson or Wairau Hospitals.

**Results**—Four of the study participants required surgery resulting in five operations.

**Table 1. Indications for dabigatran treatment**

Indication	Atrial Fibrillation	VTE Prophylaxis	Total
Number of patients	25	2	27

**Table 2. Demographics of patient population**

Age	Mean	Median	Range
	77.8 yrs	80 yrs	63–87 yrs

**Table 3. Surgery required and perioperative management of dabigatran**

Patient	Specialty/Procedure	Preoperative Management	Postoperative Management	Complications
1	General Surgery - parathyroidectomy	Stopped 4 days prior	N/A	Acute Renal Failure & Death
2	General Surgery - mastectomy	Stopped 14 days prior	Restarted 7 days post-op	Nil
3	Urology – bilateral orchidectomy	Stopped 24 hrs prior	Restarted 24 hrs post-op	Nil
4	Orthopaedic – L toe arthrodesis (local)	Stopped 24 hrs prior	Restarted 24 hrs post-op	Nil
5	Cardiothoracic - Coronary Artery Bypass Graft (performed in Wellington)	Stopped 10 days prior	Not restarted due to poor renal function	Nil

Records from the patient who passed away demonstrate that she presented for an urgent parathyroidectomy with hypercalcaemia. The dabigatran was stopped 4 days preoperatively, as per the clinical guidelines.<sup>3</sup> In this case the patient developed acute renal impairment and her thrombin time was persistently prolonged requiring surgery to be postponed. Following this the patient became unstable and deteriorated clinically such that surgery was not an option.

She passed away 7 days after the original surgery was scheduled with the post mortem stating the likely cause of death as arrhythmia (consistent with hypercalcaemia) and cardiogenic shock.

**Conclusions**—Although this study is too small to draw any statistically significant conclusions it can provide information on how surgical patients on dabigatran are being managed in Nelson. The group who are being prescribed dabigatran are elderly and are therefore likely to have comorbidities potentially requiring surgery. They are also more likely to have renal impairment and thus may have problems clearing the drug.

It has been demonstrated in two cases that stopping dabigatran 24 hours preoperatively was adequate and in another two cases that a longer time period was also satisfactory. However it cannot be ignored that in the fifth case the dabigatran had been stopped with ample time but that the patient was unable to clear the drug.

Although these cases are rare and this study does not have a large enough sample to calculate a complication rate, it does demonstrate the potentially disastrous consequences in a specific clinical situation. Dabigatran may have a lower rate of bleeding complications than warfarin<sup>9</sup> but when they do occur the medical profession has limited options for treating these complications.

Dabigatran is a promising anticoagulant for the future.<sup>7</sup> In the right group of patients it provides an effective method of reducing thromboembolic risk without the use of warfarin. However it should be adopted with caution initially as there is limited experience with managing bleeding, surgery and trauma<sup>8</sup> whilst on dabigatran.

Similarly, ongoing review of the perioperative management of patients on dabigatran is needed and the clinical guidelines should be continually developed as experience educates medical professionals. Until an assay to measure the anticoagulant effect of dabigatran and an effective reversal method is developed surgeons must continue to make decisions on a case by case basis, as to whether the benefit of surgery outweighs the risk of bleeding from dabigatran in an acute situation.

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## Health and nuisance impacts from outdoor smoking on public transport users: data from Auckland and Wellington

Local governments in New Zealand have been progressing a range of outdoor smokefree areas, including playgrounds, parks, sports fields, sporting stadiums, and other settings such as zoo grounds.<sup>1</sup> There has also been some activity to develop smokefree streets,<sup>2,3</sup> and central government has mandated smokefree school grounds (see a recent review<sup>4</sup>).

Various reasons favouring outdoor smokefree areas include:

- To help to denormalise smoking,<sup>5</sup> so as to protect children from smoking uptake, to promote quitting and to protect ex-smokers who are at risk of relapse. This is particularly relevant for New Zealand given the Government goal of a ‘Smokefree Nation by 2025’.<sup>6</sup>
- To lower the public’s exposure to secondhand smoke (SHS) which is a proven carcinogen,<sup>7</sup> and a cause of coronary heart disease.<sup>8</sup> A range of New Zealand studies has found that SHS contributes to air pollution in city streets, including in areas around pubs and restaurants.<sup>4,9–15</sup> One of these studies<sup>10</sup> found relatively high levels of fine particulates (PM<sub>2.5</sub>) from SHS in Lower Hutt bus stops (up to 153 µg/m<sup>3</sup>). Other New Zealand work has also reported elevated peak levels of these fine particulates in transportation settings (e.g., 21 µg/m<sup>3</sup> in a 2006 study<sup>16</sup> and 62 µg/m<sup>3</sup> in a 2010 study<sup>4</sup>).
- To reduce nuisance impacts from the irritant effects of SHS. National “Tobacco Use Survey 2008” data indicate that SHS exposure at a bus stop or train station is still common (at 11.9% of respondents; 95%CI: 10.6–13.2%).<sup>4</sup>
- To reduce a range of fire and environmental cigarette butt litter costs and damage. These include street cleaning costs, the costs of removing or limiting the effects of this litter in storm water and sewage treatment systems, and ecological harm.<sup>17–19</sup> In Wellington, such cigarette butt littering commonly occurs even when litter bins are ubiquitous.<sup>20</sup>
- To help improve the images of areas or cities, especially where local authorities are interested in ‘healthy’ town or city branding.<sup>21</sup>

Despite such issues, not all train platforms are smokefree and no New Zealand towns or cities currently have smokefree bus stops (to our knowledge in July 2012).

Internationally, smokefree policies for transport waiting areas are becoming common, with policies in three states and over 250 cities in the USA,<sup>22</sup> and policies in South Korea (Seoul),<sup>23</sup> seven Canadian cities,<sup>24</sup> and South Australia.<sup>25</sup> Given this background, we considered other data to inform further discussions around smokefree public transportation settings (and wider smokefree shopping street developments).

**Methods**—We considered smoking-relevant data from a PhD thesis (by one of us: MR) that studied how people used their time on public transport in New Zealand.<sup>26</sup>

This work included a survey in October 2010 of Auckland and Wellington adult (over 18) bus and train users (n=1039 returned written responses out of 2000 distributed at bus stops and train stations, an overall response rate of 52.0%). There were also semi-structured telephone interviews with 48 adult bus or train passengers in Auckland and Wellington (November 2009 to June 2010). A purposeful selection was made of nearly equal numbers of men and women who were recruited on the street near bus stops and train stations.

**Results**—When asked about any negative effects on their physical health from using public transport, some interview participants reported ‘people smoking at the station’ (along with ‘time being sedentary’ and ‘winter ills’). Some specifically reported that while waiting for public transport, they were annoyed by tobacco smoke and smoker behaviour:

*‘a lot of people smoke there every morning and that really affects those who don’t smoke, and the youngsters’*

(man, Tongan, aged 19, train, Auckland)

*‘the smoke was blowing right on us and I’m particularly concerned about my baby and for all of us really’*

(woman, Pākehā/NZ European, 35–44 years, bus, Wellington)

*‘at that time of the morning it is the last thing you want to inhale’*

(woman, Māori, 34–44 years, bus, Wellington)

*‘if they’re sitting at the top end of the seat it makes the rest of the seat uninhabitable’*

(woman, Asian, aged 18, bus, Wellington)

*‘I ended up smelling of smoke when I got to work’*

(woman, European, aged 21, bus, Auckland)

*‘I don’t really like it when people smoke in shelters’... ‘and specially if there are kids or elderly people around’*

(woman, Samoan, aged 22, bus, Auckland).

In response to such concerns, several respondents reported moving away (even running ahead of the smoker walking in front of them), while others seemed fatalistic: ‘...there’s not much you can do about them’ (man, European, aged 41, train, Wellington).

Nevertheless, some participants (from both Auckland and Wellington) reported that their train station was a designated no-smoking area and that they had not seen people smoking in these settings.

The survey of waiting time activities indicated that 5.1% (25/491) of respondents waiting for buses and 3.3% (18/548) waiting for trains reported that they smoked. This compared to texting or phoning at 21.1% and 17.4% respectively. Smoking while waiting declined with age: 8.3% (13/156) for respondents aged ≤24 years; 6.2% (24/389) for 25–44 year olds; 1.7% (6/351) in 45–64 year olds; and 0% (0/133) in the 65+ age group.

**Discussion**—Overall, these New Zealand findings have some similarity with international evidence. For example, research in London (n=1000 respondents) found

that smoking was ranked the third most anti-social behaviour on public transport (after ‘shouting/swearing at others’ and ‘not paying fare’).<sup>27</sup> It was ahead of 12 other anti-social behaviours including ‘spitting’, ‘drinking/being drunk’ and ‘dropping litter’ (though the latter is often related to smoking as well as per Wellington-based data<sup>20</sup>).

The smoking-related data from this public transport study in Auckland and Wellington indicates that some public transport users self-report smoking as an activity while waiting. This is a concern given that such smoking contributes to general city air pollution and direct SHS exposure to people waiting nearby. Indeed, some of the exposed people provided statements that such smoking was a nuisance and they were concerned around its health effects.

There is some survey evidence to suggest that there is New Zealand public support for greater areas with smokefree policies. In a 2010 New Zealand survey, 76% (54% of smokers) agreed that ‘smoking should be banned in all outdoor public places where children are likely to go’.<sup>28</sup>

These findings provide some additional arguments as to why local governments could consider expanding outdoor smokefree areas to include all bus stops and train platforms. Furthermore, if making the typical public transport experience more pleasant helps to shift people from private cars to public transport, this will have other health and environmental benefits (such as reducing air pollution, reducing carbon emissions and saving energy).

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## Computerised tomography indices of raised intracranial pressure and traumatic brain injury severity in a New Zealand sample

After traumatic brain injury (TBI) complex cellular and biochemical processes occur<sup>1</sup> including changes in blood flow and oxygenation of the brain; cerebral swelling; and raised intracranial pressure (ICP).<sup>2</sup> This can dramatically worsen the damage<sup>3</sup> and contributes to mortality.<sup>4</sup>

Brain imaging, including computerised tomography (CT), has a potential role in detecting raised ICP, thereby reducing the need for more invasive assessment procedures.<sup>5</sup> While numerous studies report a relationship between raised ICP and CT scan findings after TBI, these are restricted to severe TBI.<sup>5,6</sup> Yet mild TBI comprises >85% of all TBI;<sup>7</sup> and 4–58% of mild head injuries have intracranial lesions.<sup>8</sup>

We examined whether CT scan indices of raised ICP are present in individuals who have experienced a TBI, ranging from mild low risk to severe.

The 53 participants (mean age=40.66, SD=23.5; 66% male) were from a population-based TBI incidence study (see<sup>9</sup> for methodology). Participants provided informed written consent; and had undergone a CT scan during hospitalisation for TBI (mean=2.13 days post-TBI; SD=5.15).

In accordance with Servadei,<sup>8</sup> mild low risk TBI was defined as: GCS score of 15, with no skull fracture, neurological deficits, clinical findings (eg., vomiting, headache), or risk factors (eg., drug/alcohol consumption); medium risk mild was GCS score of 15, no skull fracture, neurological deficits, or risk factors, but ≥1 clinical finding; high risk mild TBI had GCS scores of 15 with/without clinical findings and either neurological deficits or skull fracture or risk factors; or GCS of 14 with/without clinical or radiological findings.

There were 3 (5.7%) with low risk mild injury, 11 (20.8%) mild-medium risk, 30 (56.6%) mild-high risk, 6 (11.3%) moderate injury, and 3 (5.7%) with severe injury. CT indices used were: Evan's ratio, bifrontal index; bicaudate index, Cella media index, and two ventricle brain ratios (VBRs).

Computerised CT scans were reviewed by two researchers (SBC, NS), 4mm thick, horizontal scans were used to take the relevant measurements. Six scans were assessed independently (MK), the resulting inter-rater reliability ranged from r=0.67 to r=0.98 with 7 of the 10 measures having very good reliability of r>0.90.

Power calculations using the data from Table 1 for the sample of 44 individuals with mild TBI suggest that this study had a 94% chance of detecting a relationship between the severity and the Evan's ratio (selected as it has the largest standard deviation value) at a two-sided 0.05 significance level, if the true change in the Evans' ratio is 3.0 units per one standard deviation change in the independent variable assuming a standard deviation of 5.51.

Table 1 presents CT scan measure by injury severity group.

**Table 1. Means and standard deviations of injury severity groups across CT scan indices**

CT INDICES	BRAIN INJURY SEVERITY GROUPINGS									
	Mild						Moderate		Severe	
	Low risk N=3		Medium risk N=11		High risk N=30		N=6		N=3	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Evans ratio	23.35	3.26	24.32	5.51	27.03	4.03	27.52	2.59	28.99	4.83
VBR A <sup>2</sup>	0.07	0.03	0.06	0.02	0.08	0.03	0.09	0.02	0.09	0.04
VBR B <sup>10</sup>	7.59	2.92	6.65	2.41	9.06	3.47	9.62	2.77	10.36	5.58
Bifrontal index	0.28	0.05	0.28	0.06	0.32	0.05	0.33	0.04	0.35	0.06
Bicaudate index	0.07	0.04	0.09	0.02	0.09	0.03	0.11	0.03	0.09	0.06
Cella media index	4.75	0.99	4.88	1.36	4.36	1.11	4.46	0.62	5.27	1.99

CT: computerised tomography; ICP: intra cranial pressure; VBR: ventricle-brain ratio.

Mean Evans ratio increased with severity from mild low risk to severe. Except for the mild medium risk group, this was also true for the two VBRs, and the bifrontal index. A similar increase was also noted for the bicaudate index from mild low risk to moderate injury severity, while measures on the Cella media index did not show any particular pattern of increase or decrease in relation to severity.

Non-parametric bivariate correlations between injury severity and CT measures indicate that when traditional severity groupings (mild, moderate, severe) were considered, there were no significant relationships. However, when Servadei's sub-classifications for mild TBI were included Evans ratio ( $\rho=-0.318$ ,  $p=0.020$ ), the two ventricle brain ratios ( $\rho=-0.290$ ,  $p=0.036$ ;  $\rho=-0.290$ ,  $p=0.039$ ), and the bifrontal index ( $\rho=0.340$ ,  $p=0.013$ ) were all significantly correlated with injury severity. While statistically significant, these correlations suggest that only from 8.4% to 11.6% of the variability in CT scan indices can be accounted for by TBI severity.

The findings suggest CT scan indices share a linear relationship with injury severity when five severity groupings are used. While the literature on raised ICP has focussed almost exclusively on severe TBI, CT scan indices of raised ICP may also be relevant to the mild TBI.

Despite the limitations of a small sample sizes, this shows that CT scan indices of raised ICP may be of relevance across the spectrum of injury severity. As TBI severity is predictive of TBI outcomes, our future examinations will explore if CT indices are linked to functional and cognitive outcomes following mild TBI.

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## Presidential Address: Alcohol

*Excerpt of a Presidential Address by H. V. Drew, F.R.C.S. Annual Meeting of the New Zealand Branch, Timaru, 1912. Published in NZMJ 1912 March;11(41):1–8.*

My next subject is alcohol and this was made an important question at the last general election, many thousands of people with no knowledge of the subject, voting for or against according to individual fancy, or by the direction of some equally innocent, but more interested person.

Alcohol, like most other intoxicants, may be used beneficially, or injuriously; and it seems a mistake to deal with it by attempting to abolish it from the country—I say attempt advisedly, for I have not yet heard how fermentation is to be prevented, and unless this can be done alcohol will be formed and used.

There seems to be a natural craving in the human race for alcohol and, subject to correction, I believe that every native race has some equivalent for "the wine of the country." If the manufacture and sale of alcohol could be stopped, it is, I think, very doubtful if some pernicious drug would not take its place.

The method advocated by some of attempting to deal with the subject by prohibiting some healthy people for the sake of attempting to reclaim a few degenerates who would, from a racial standpoint be far better out of the way, seems to me illogical and not worthy of a free and self-respecting people. This is another attempt to begin at the wrong end, which must result in disaster; for with prohibition would come laxity in training the children and the resisting power of the individual, as the result of moral training, would undoubtedly be weakened.

## Vitamin D and fracture prevention

The results of meta-analyses examining the relationship between vitamin D supplementation and fracture reduction have been inconsistent. This report concerns a meta-analysis of 11 randomised trials (31,022 people) comparing fracture rates in those taking vitamin D supplements or placebo. The researchers note that this report concerns subjects who actually took their vitamin D, rather than assuming what is prescribed is always taken.

Their conclusion was that high-dose vitamin D supplementation ( $\geq 800$  IU daily) was somewhat favourable in the prevention of hip fracture and any nonvertebral fracture in persons 65 years of age or older.

An editorial writer points out that barely 13% of the people in the study had their baseline concentration of vitamin D measured. His point being that only those deficient in vitamin D at the outset could benefit by supplementation. He also notes that the Endocrine Society guidelines recommend 1500–2000 IU per day.

N Eng J Med 2012;367:40–49 & 77–78.

## Arterial stiffness and cognitive decline

The authors of this paper point out that although arterial stiffness has recently been confirmed as a predictor of cardiovascular disease, the association between arterial stiffness and cognitive decline is less clear. They set out to clarify the situation in their review and meta-analysis of 6 relevant studies. In these studies the arterial stiffness along the aorta has been evaluated by comparing the pulse wave velocity between the carotid and femoral arteries.

They report that aortic stiffness was associated with cognitive decline as measured by Mini-Mental State Examination Scores. When data from one study involving younger people (median age 54 years) was excluded, the association became stronger. They note that there is insufficient evidence to implicate arterial stiffness and the development of dementia.

Int Med J 2012;42:808–15.

## Adverse respiratory effects of beta-blocker treatment in those with cardiovascular disease

These medications are traditionally avoided in chronic obstructive airways disease (COPD) and asthma, because of concerns about precipitating adverse respiratory events and worsening lung function. This is a problem as beta-blockers have well established value in those who have had a myocardial infarct and heart failure.

In this prospective study 64 patients with recent acute cardiac disease were randomised to receive beta-blockers or not to have them. Repeated measures of

spirometry and respiratory symptoms were assessed over 12 months. Respiratory exacerbations, cardiac events and survival were recorded over 6 years. Outcomes were compared according to beta-blocker exposure.

And the conclusions of the study were that long-term beta-blocker treatment did not adversely affect lung function, respiratory symptom scores or survival, but was associated with increased risk of respiratory exacerbations.

Int Med J 2012;42:768–93.

## **Metformin and insulin versus insulin alone for type 2 diabetes**

Current guidelines recommend combining metformin with insulin instead of using insulin alone to treat type 2 diabetes. This report from Denmark documents a meta-analysis of randomised trials which examine the issue of whether the addition of metformin to insulin is beneficial. Data was available from 23 trials involving 2117 patients.

The researchers report that compared with insulin alone, the combination treatment did not have a significant effect on all cause mortality or cardiovascular mortality. They note that severe hypoglycaemia was significantly more frequent with metformin and insulin than insulin alone. The combined treatment was associated with a greater reduction in HbAic.

BMJ 2012;344:e1771.

## **Another novel biological treatment for rheumatoid arthritis**

Treatment of rheumatoid arthritis is based on conventional or biologic (or both) disease-modifying drugs of which methotrexate is the most widely used. For patients who have an inadequate response to methotrexate, anti-tumour necrosis factor (TNF) biologic agents have proved to be effective as second-line treatment. Two papers in a recent NEJM document the use of a new biological—tofacitinib, a novel oral Janus kinase inhibitor. In one of these, tofacitinib proved to be significantly better than placebo in the management of rheumatoid arthritis. In the second report, tofacitinib was compared with adalimumab or placebo in patients who were receiving background methotrexate.

Tofacitinib produced significantly better results than placebo and was similar to adalimumab in efficacy. The down side is the adverse effects profile—elevation of LDL cholesterol levels, decreased neutrophil counts and increased risk of infections, the latter including very serious infections.

N End J Med 2012;367:495–507 & 508–519.

## Professional Misconduct (Med10/145P)

### Charge

A Professional Conduct Committee (PCC) charged that Dr Johannes Ignatius Viljoen Wilson (the Doctor) was guilty of professional misconduct. The particulars of the charge alleged that the Doctor:

1. Between August and October 2007, imported the non-consented medicine Jintropin, without being in possession of details of the specifications for testing the quality of that medicine or a certificate of the results of testing in respect of every batch of that medicine distributed in New Zealand, in contravention of section 42 of the Medicines Act 1981.
2. Between June 2006 and October 2007, at Auckland, prescribed large quantities of Xanax, a Class C controlled drug, to two patients in circumstances which departed significantly from the usual prescribing practice of general practitioners.
3. On or about 8 March 2001, at Auckland, prescribed the medicine Triject to a male Medsafe employee without beforehand completing a professional consultation with him.
4. On or about 8 March 2001, at Auckland, prescribed the medicine Xenical to a female Medsafe employee without beforehand completing a professional consultation with her.
5. Between 14 May 2003 and 4 July 2007, at Auckland, obtained large quantities of the non-consented medicine “MPO” (comprising 60mg ephedrine and 30mg caffeine) from Pharmaceutical Compounding NZ Ltd (PCNZ), and supplied this non-consented medicine to patients in a manner which posed a danger to the health and safety of the public.
6. Between July 2006 and July 2007, at Auckland, prescribed non-consented Human Growth Hormone products and non-consented testosterone products to Patient X in a manner which posed a risk to her health and safety.
7. Between 26 October 2007 and 10 December 2007, obtained large quantities of Sudomyl (a medicine containing the Class C controlled drug pseudoephedrine); and thereafter supplied Sudomyl to individuals who were not patients, and falsified patient records to indicate Sudomyl had been supplied to patients who in fact never received Sudomyl.
8. Between 2003 and 2007, exploited patients by charging an excessive margin for the non-consented medicine “MPO.”

### Finding

The Tribunal found the Doctor guilty of professional misconduct.

The Tribunal found all Particulars of the charge established.

Considered separately, the Tribunal was satisfied that Particulars 1, 2, 5, 6 and 7 would warrant discipline, having regard to the inherent seriousness of the allegation contained in each of those established Particulars.

Considered cumulatively, the Tribunal found that the eight established Particulars amounted to negligence, malpractice and the bringing of the medical profession into disrepute. The Tribunal found the Particulars amounted to a very serious situation involving multiple significant breaches.

The Doctor did not attend the hearing and his whereabouts was unknown.

Consequently, immediately following the hearing, the Tribunal issued a Minute recording the conclusion it had reached and arranged for it to be served via the means identified in the District Court order of substituted service.

## **Background**

The Doctor graduated from the University of Pretoria in 1984. At all material times the Doctor practised in Auckland (including at a small gym offering medical advice, and later at a medical practice that he owned and operated).

Between 1999 and 2008, the Doctor regularly came to the attention of the Ministry of Health, the Police drugs squad, and the Medical Council of New Zealand. There was a range of concerns relating to the prescribing of drugs of abuse, and the importing and prescribing of steroids and other medicines connected with sports and image enhancement.

In February 2001, Medsafe received information that patients were obtaining prescription medicines from a men's health clinic, without having had a prior consultation with a medical practitioner.

In March 2001, two Medsafe employees obtained medications from the clinic without any prior consultation with the Doctor.

In April 2001, the Doctor began obtaining compounded medicines from PCNZ; in September 2001 PCNZ began compounding ephedrine-based products for the Doctor; and in May 2003 at his request began compounding "MPO."

On 28 August 2003, the Ministry of Health visited the Doctor and informed him that he should be obtaining informed consent from patients when supplying them with imported medicines.

From May 2004, the Doctor began placing practitioner supply orders (PSOs) with a pharmacy in Newmarket for prescription medicine.

In October 2005, PCNZ, having discussed with Medsafe, required the Doctor to provide patient names when ordering MPO. From this point in time the Doctor complied with this request.

In May 2006, the Doctor began obtaining Xanax tablets from the Aviemore Pharmacy using PSOs. Between June 2006 and October 2007, the Doctor received 6,720 Xanax tablets from the Aviemore Pharmacy.

On 5 September 2006, following a meeting with Medsafe representatives, Medsafe wrote to the Doctor making it clear what the law and obligations were governing the use of unregistered medicines. In particular, the obligations under Section 42 of the Medicines Act 1981 were explained. The letter also stated clearly that informed consent needed to be obtained in respect of such unregistered medicines from patients.

In June 2007, a Medsafe Investigation and Enforcement Team commenced investigating the Doctor's activities.

On 9 July 2007, PCNZ stopped compounding MPO for the Doctor as it could no longer source ephedrine. The Doctor had obtained 1,110,400 MPO capsules from 14 May 2003 to 9 July 2007.

On 7 September and 11 October 2007, Customs intercepted parcels of medicines addressed to the Doctor from a UK supplier. These were subsequently found to contain a number of new medicines, including Jintropin.

On 26 October 2007, the Doctor began ordering large quantities of Sudomyl from the Newmarket Pharmacy via PSO.

On 31 October 2007, Medsafe delivered a letter to the Doctor requesting testing information for the unregistered overseas medicines that he had recently imported. The Doctor admitted that he did not have testing data. The Doctor was then advised that Medsafe had seized the medicines.

On 10 December 2007, the pharmacist supplying Sudomyl to the Doctor ceased, following a discussion he had with Medsafe. The Doctor had obtained 39,000 Sudomyl tablets from 26 October 2007 to 10 December 2007.

In January 2008, the Doctor was prescribing large amounts of Xanax and Sudomyl to individuals who were not registered with the practice.

On 17 January 2008, Medsafe concluded their investigation into the Doctor's conduct and lodged a formal complaint with the MCNZ. The Doctor continued to practice until June 2008, when another complaint was lodged with the MCNZ. Subsequently, the MCNZ suspended the Doctor's APC.

## **Reason for Finding**

The Tribunal held that the Doctor displayed a gross reckless handling of pharmaceuticals, (which included importation, supply and prescription) due to the following reasons:

- the behaviour was sustained (involving a period of at least seven years);
- there were multiple and serious examples of mishandling and misprescription;
- there was persuasive evidence that the Doctor created risk to both patients to whom he prescribed and to the public more generally.

The Tribunal also arrived at the finding of professional misconduct due to the following factors:

- the enormous volume of prescriptions for drugs that were capable of being diverted for illicit purposes (Xanax, MPO, and Sudomyl), whether by the Doctor himself or by patients to whom the products were supplied;
- the wide range of misconduct, which in its scale and breadth gives rise to grave concerns;
- the obviously deliberate nature of some of the misconduct (e.g. importing of unconsented pharmaceuticals in non-compliance with Section 42 of the Medicines Act, even when warned that compliance with legislation was required); and
- the haphazard and disorganised way in which Dr Wilson appeared to operate, which took deliberate and cynical advantage of patients.

## **Penalty**

The authorities required the Tribunal to consider whether any penalty short of cancellation could responsibly be considered. The Tribunal in doing this concluded that for the above reasons, no outcome other than outright cancellation could be considered. Therefore, the Doctor's registration was cancelled.

The Tribunal fined the Doctor \$20,000 to illustrate that such conduct should be denounced in the strongest possible terms.

The tribunal ordered costs at the level of 50%. Accordingly, the Tribunal ordered that the Doctor pay:

- \$55,000 in respect of the costs and expenses of the PCC; and
- \$11,000 in respect of the costs and expenses of the Tribunal.

The full decisions relating to the case can be found on the Tribunal website at [www.hpdtnz.org.nz](http://www.hpdtnz.org.nz)  
Reference No: Med10/145P.

## Professional Misconduct (Med10/161P)

### Charge

The Professional Conduct Committee (PCC) brought a charge of professional misconduct against Dr Ratilal Magan Ranchhod (the Doctor). The particulars of the charge are detailed below:

1. The Doctor practised medicine on or about 17 July 2009 to 30 October 2009 while not holding a current Annual Practising Certificate or Interim Practising Certificate.
2. The Doctor practised medicine on or about 20 November 2009 and 17 February 2010 outside the conditions imposed on his Interim Practising Certificate.
3. The Doctor practised medicine on or about 12 February 2010 and 17 February 2010 during the period of suspension imposed by the Health Practitioners Disciplinary Tribunal.

### Finding

The Doctor signed an agreed summary of facts and confirmed his admissions at the hearing.

The Tribunal was satisfied on the facts that each of the particulars were established. The Tribunal noted that these were significant breaches of standards which warranted disciplinary action and found the Doctor guilty of professional misconduct.

### Background

The Doctor provided medical services to various organisations, including rest homes, the New Zealand Police, the Department of Corrections (Auckland Prison), after hour's private practices, group medical centers as well as patient's homes and workplaces. This service was provided through his company Housecall Services Limited within the wider Auckland area.

In February 2007 a Performance Assessment Committee review instituted by the Medical Council was undertaken. On 12 February 2008 the Medical Council imposed conditions on the Doctor's scope of practice. The conditions included weekly monitoring of the Doctor's clinical notes and decision making and weekly attendance at a group practice meeting with peers. The conditions imposed would cease to have effect once the Doctor had sat and attained a pass mark in the Primex examination.

In December 2008 the Medical Council met and resolved not to issue the Doctor with an Annual Practising Certificate (APC), they did however issue an Interim Practising Certificate (IPC) for one day only to enable the Doctor to sit the Primex examination.

The Doctor was advised on 9 December 2008 that he would no longer be able to treat patients whilst he did not have an APC. In December 2008 the Doctor passed the written component of the Primex examination, but failed the clinical component.

The Medical Council subsequently discovered that the Doctor had continued to practise medicine without an APC between December 2008 and January 2009 and that he had altered his previous, expired APC and provided it to an Auckland rest home.

On 21 April 2009 the Medical Council declined his application for an APC but established a pathway for him to return to practise.

On 17 July 2009 and 30 October 2009 AXA medical examinations were conducted by the Doctor while he did not hold an APC.

On 2 November 2009 the Medical Council issued an IPC with conditions for the period 2 November 2009 to 31 May 2010. On 20 November he conducted an AXA medical examination in breach of the IPC conditions.

On 14 December 2009 the Health Practitioners Disciplinary Tribunal imposed penalties, including suspension from practice for two months from 18 December 2009. On 12 and 17 February 2009 he conducted AXA medical examinations in breach of the Tribunal Orders.

## **Penalty**

Following an appeal to the High Court this matter was referred back to the Tribunal to rehear the matter of penalty and costs. After the rehearing on the matter of penalty and costs the Tribunal ordered:

1. The Doctor be suspended for a period of seven months.
2. The following conditions be imposed for a period of three years after the resumption of practice:
  - The Doctor is to work in a group practice, approved by the Medical Council.
  - The Doctor is to be supervised by a supervisor approved by the Medical Council. He is to meet with the supervisor monthly on a one to one basis and the focus of supervision is to include clinical issues and issues of professional compliance in respect of obligations of a regulatory nature. The supervisor is to report to the Medical Council quarterly and the costs of supervision are to be met by the Doctor.
  - The Doctor is to meet with peers in a group practice weekly to review the clinical management of his cases. The details of the Doctor's participation in a peer group are to be approved by his supervisor.
3. The Doctor pay costs of \$14,310.00.

The Tribunal directed a copy of this decision and a summary of it be published on the Tribunal's website. The Tribunal further directed that a notice stating the effect of the Tribunal's decision be published in the New Zealand Medical Journal.

The full decisions relating to the case can be found on the Tribunal website at [www.hpdtnz.org.nz](http://www.hpdtnz.org.nz)  
Reference No: Med10/161P.

## Professional Misconduct – Possession of Objectionable Matter (Med11/175P)

### Charge

A Professional Conduct Committee (PCC) charged Dr Andrew Jeremy Dunkley (the Doctor) on the basis that he had been convicted and sentenced in the District Court on six counts of possession of objectionable material.

The particulars of the charge were as follows:

1. The Doctor pleaded guilty and was convicted of six charges of possession of objectionable material, including material containing sexual abuse images of girls aged 12 to 14 years under section 131[A](1) of the Films, Videos and Publications Classification Act 1993.
2. The Doctor was sentenced to 160 hours of community work and placed on intensive supervision for 18 months.

The PCC charged that the conduct reflected adversely on the Doctor's fitness to practise as a medical practitioner.

### Finding

The Doctor admitted the charge and accepted that he was guilty of professional misconduct.

The Tribunal had no hesitation in concluding that the Doctor's conduct was a major departure from the applicable standards of legal and ethical behaviour reasonably expected of a medical practitioner. His conduct reflected adversely on his fitness to practise and it warranted discipline.

### Background

Examination of the Doctor's computer by Police revealed over 50,000 images of predominantly young teenage girls in sexually explicit poses.

The Doctor pleaded guilty to six counts of possession of objectionable material, including material containing sexual abuse images of girls aged 12 to 14 years. The Doctor was convicted in the District Court and the Judge sentenced him to 160 hours of community work and placed on intensive supervision for 18 months. The Doctor was ordered to undertake assessment and complete the WellStop programme; undertake any other counseling and treatment as directed by the Probation Officer and not to own or possess a computer or any electronic equipment capable of internet access, except for legitimate work purposes.

There was an order for the destruction of the seized equipment.

The PCC submitted that the Court had noted that although there were a large number of images available, there was no suggestion that the Doctor had downloaded them and there was no basis to conclude he had viewed every image.

At the time of offending he had a promising career, and was only four weeks away from completing a five year specialist training course in diagnostic and interventional radiology in order to become a Consultant Radiologist.

The Doctor voluntarily ceased practising from 18 October 2010 and surrendered his practising certificate on 24 November 2010 advising he would not seek to have it renewed.

## **Penalty**

The Tribunal was mindful to impose a penalty or penalties which were sufficient to bring the message home to the Doctor so as to prevent any such future behaviour or risk of offending; and to protect the public. There was no evidence before the Tribunal that any patients were compromised by the Doctor's actions.

The Tribunal considered the following factors:

Aggravating factors:

1. Such offending is inherently premeditated.
2. It took place over a longer period of time with a large number of images.
3. Inherent in the course of offending that victims somewhere have been exploited.

Mitigating factors:

1. The Doctor's guilty plea.
2. His responsible cooperation with the police, his employer and the professional body responsible for his career.
3. No previous convictions.
4. That he referred himself to appropriate counselling and he was committed to continuing.
5. That he was genuinely remorseful

The Tribunal was of the view that the matter was not sufficiently severe to justify removing the Doctor's name from the register, although that has occurred in other cases, those cases were distinguishable because of their severity.

The Doctor voluntarily ceased practising 5 months prior to the hearing, which the Tribunal took into account. The Tribunal was of the view that the Doctor should be removed from practice for a period of 9 months. Because of the period of voluntary removal, that leaves approximately 4 months.

The Tribunal censured the Doctor.

The Tribunal imposed the following conditions:

- a. The Doctor was to undertake, at his own cost, clinical and psychological treatment, assistance and other rehabilitation steps as required by WellStop and the Medical Council. This is to include a mentoring relationship with an appropriate radiologist specialist or other medical practitioner as approved by the Medical Council, which will include regular meetings to assist in early identification of triggers as established in the WellStop individual relapse prevention programme.
- b. Undertake a psychological assessment, at his own cost, as directed and approved by the Medical Council prior to resumption as a medical practitioner.
- c. To give an undertaking, in writing, not to access material, images or publications that are deemed objectionable under the Films, Videos and Publications Classification Act 1990.
- d. Comply with the special conditions of intensive supervision imposed by the District Court, including not owning or possessing a computer or any electronic equipment capable of internet access, except during the legitimate course of employment, for a period of 18 months.

The following conditions were imposed and apply from the resumption of practice as a medical practitioner:

- e. For a period of three years, to advise any future employer of the convictions, the findings of the Tribunal and these conditions.
- f. For a period of three years, any examination or physical treatment of female patients under the age of 18 years is to be done in the presence of a chaperone that must remain present at all times during the examination or treatment. The cost of the chaperone is to be borne by the Doctor.
- g. For a period of 18 months, the Doctor is subject to professional supervision by a clinical psychologist and / or medical practitioner, as chosen by the Medical Council with regularity and detail of supervision.

The Doctor was ordered to pay \$6000 towards the cost of prosecution, to be divided equally between the PCC and the Tribunal costs.

The Tribunal directed a copy of the decision be published on its website. The Tribunal further directed that a notice stating the effect of its decision be published in the New Zealand Medical Journal.

The full decisions relating to the case can be found on the Tribunal web site at [www.hpdtnz.org.nz](http://www.hpdtnz.org.nz)  
Reference No: Med11/175P.

## Professional Misconduct (Med11/181P)

### Charge

A Professional Conduct Committee (PCC) laid a charge against Dr Hong Sheng Kong (the Doctor) on the basis that he had been convicted and sentenced in the District Court on 16 counts of dishonestly using a document with intent to obtain a pecuniary advantage under section 228(b) of the Crimes Act 1963, and the offences reflected adversely on the Doctor's fitness to practise as a medical practitioner.

The offences involved the Doctor defrauding the New Zealand Government by falsely representing that patients were eligible to attract capitation based funding when they were not. The Doctor was sentenced in the District Court to a period of 12 months home detention and 400 hours community work.

A second charge was laid by the PCC which was stayed by the Tribunal by agreement.

### Finding

The Doctor pleaded guilty in the District Court. The Doctor, in an agreed summary of facts, acknowledged that his conduct reflected adversely on his fitness to practise as a medical practitioner.

The Tribunal found that the convictions did reflect adversely on the Doctor's fitness to practise.

### Background

Following a change to the way that funding was allocated to doctors from the Ministry of Health in 2003, the Doctor joined the AuckPac Primary Health Organisation (PHO) and was funded through them.

A feature of this structure of funding was that once a patient enrolled with a general practitioner, that practice would receive funding for that patient for three years from the date of enrolment or the date of the last consultation regardless of whether there was a consultation within that three year period.

The Doctor was required to maintain and update his patient register. The funding for the practice was honesty based and relied on practitioners to comply with the requirements and to only record patients as being enrolled if they were actually enrolled. The Doctor inflated the number of patients on his register and therefore the funding to which he was entitled. The Doctor entered false clinical notes in his patient records and wrote false prescriptions giving the impression he had seen the patients concerned when he had not. The alterations to patient records ran into the thousands in terms of individual entries and were made manually by the Doctor. Some of the

changes were made at the Doctor's direction by an employee, these were manual changes and changed patient records from blank to "confirmed registered" status. The Doctor also engaged an AuckPac contractor to run a particular computer script which automatically enrolled patients into his database for whom he was not entitled to claim.

The Doctor's conduct had a degree of naivety on his part; he was open with his staff in making the changes and approaching the contractor to invest in the computer script to make the changes. The amount of fraudulent conduct was determined to be \$183,143.59 which the Doctor had repaid in full, so there had been no direct loss caused to the Auckland District Health Board.

## **Penalty**

The Doctor was suspended from practice for 12 months from 07 January 2012. The doctor was censured.

The Doctor was ordered to pay costs to the PCC and the Tribunal of \$12,700.

The Tribunal recommended to the Medical Council that at the resumption of practice, the Doctor undertake a full competence review and that he comply with any orders made by the Medical Council at the conclusion of that competence review.

The Tribunal referred the Doctor to the Health Committee of the Medical Council so that issues relating to his stress and depression could be considered and ordered him to comply with any conditions imposed upon him by the Health Committee. The Doctor was ordered to establish and maintain a therapeutic relationship with his medical practitioner, the identity of whom is to be advised to the Medical Council. The Doctor was ordered to authorise the medical practitioner to inform the Medical Council if at any time the Doctor's fitness to practise is in question.

The Tribunal ordered the Doctor not to have any financial interest in any practice in which he is employed, nor to have the management of that practice.

The Tribunal further ordered the Doctor advise any employer or professional medical practitioners who are working with him of the above conditions.

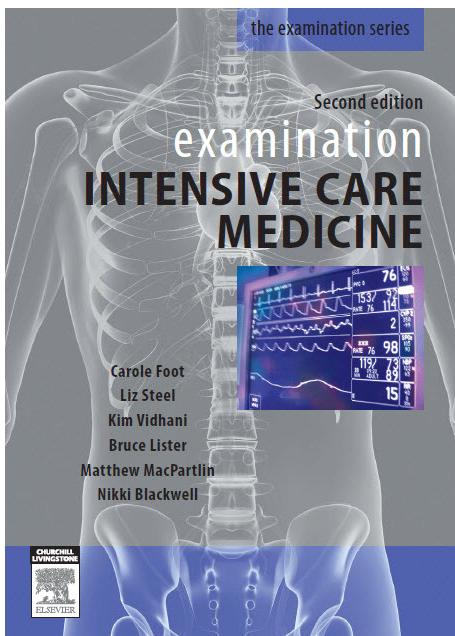
The Tribunal directed the decision be published on the Tribunal's website and a notice stating the effect of the decision be published in the New Zealand Medical Journal.

The full decisions relating to the case can be found on the Tribunal website at [www.hpdtnz.org.nz](http://www.hpdtnz.org.nz)  
Reference No: Med11/181P.

## Examination Intensive Care Medicine (2nd edition)

Foot C, Steel L, Vidhani K, Lister B, MacPartlin M, Blackwell N. Published by [Churchill Livingstone \(Elsevier Australia\)](#), 2011. ISBN 9780729539623. Contains 338 pages.

*Examination Intensive Care* was first published in 2006 and ever since has been a core text for Australian and New Zealand trainees attempting to pass the final Fellowship in Intensive Care Medicine.



The publication of the *2nd edition* reflects many of the changes that have affected our specialty over the last few years. The most obvious change is that the "...& anaesthesia" has been dropped from the title. This omission reflects the current spirit of independence that permeates throughout critical care in Australia and New Zealand.

Where anaesthesia chapters once reigned (anaesthesia made up 23% of the *1st edition*) information on the new Intensive Care Primary and overseas ICU examinations (European and United Kingdom diplomas) fill the void. The book therefore seems to be attempting to appeal to ICU trainees throughout their whole training journey and in a broad range of examination jurisdictions.

The book also contains the now ubiquitous accompanying DVD containing many hidden extras.

The first part of the book covers generic training and exam preparation. Chapter 1 describes the examination structures of some of the popular ICU examinations throughout the world. I am unsure what purpose this serves other than documenting that there are several ways of assessing ICU examination candidates. Chapter 2 covers exam technique right down to nutritional advice and travel tips. I think this chapter will be skim-read or bypassed altogether by many trainees. It does however remind us that becoming a hermit and reading academic tomes are not necessarily a guarantee of exam success.

The second part of the book focuses on the basic sciences. The physiology, pharmacology, physics and statistical knowledge required are normally gleaned from the bowels of several weighty textbooks. The book attempts to cover these gargantuan topics in a mere 42 pages and the authors concede that they really only skim the surface. I suggest that this chapter would be most useful to someone who has covered the topics in detail at least once and needs some last minute revision.

The third part of the book is the business end of the book and focuses on passing the final fellowship examination of the College of Intensive Care Medicine of Australia and New Zealand (FCICM). Chapter 4 and 5 cover equipment and procedural skills respectively. These chapters attempt to describe the multitude of equipment and practical procedures a practising Intensivist should be familiar with.

The accompanying DVD certainly complements these short chapters. Despite this, the book really just scratches the surface and describes a clear approach to equipment and procedural issues that still rely on a trainee examining patients and thinking about equipment lying around a typical department.

Chapter 6 is data interpretation and covers radiology, biochemistry and ventilator waveforms in great detail. I found this chapter invaluable in the *First Edition* and I still refer to it about once a month when I need reminding of one of those pesky rules or disease patterns. The updated version expands its focus on ECHO and introduces newer topics such as thromboelastography. I was very disappointed to see that the excellent microbiology section has been completely dropped from the *Second Edition*, as this is weak subject for many trainees.

Problem-focused-clinical-examination of a critically ill patient in an ICU is the most feared and yet arguably the most relevant part of the FCICM exam. The *First Edition* was the first real attempt, by a book, to tell you how to approach this part of the exam. The *Second Edition* again spends a lot of time advising approaches to this part of the exam and I found the “flow-man” diagrams particularly useful and a few more of these would have been helpful.

The paediatric section covers the final 10% of the book and is crammed full of facts, techniques and reducing font size. It covers a lot in a short space of time, would serve an adult FCICM candidate well and would be a great start for a budding paediatric ICU doctor.

The final part of the book is housed within the accompanying DVD. It contains chapter supplements, data interpretation and advice on clinical cases. I really liked the pharmacology quiz, but it seemed like an afterthought and other quizzes would have been great. I found the “useful resources” section particularly useful as it contained a multitude of links to several key online ICU resources. This section would act as a great starting block for a trainee to formulate a very personal revision plan.

Overall this book represents an essential part of any ICU library and I would be surprised if any current FCICM candidates go through the final exam without referring to one of the *Examination Intensive Care* series. My main criticism of the text is that I think it is attempting to be too broad. Its core audience is still the final FCICM candidates, but European Diploma, CICM primary and Paediatric Intensivists will still find the structured, systematic and succinct approach a great supporting revision aid.

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