

Title: Tools for Policy and Prevention: the Australian National Alcohol

Indicators Project (NAIP)

Author: Tanya Chikritzhs PhD

Correspondence: Dr Tanya Chikritzhs
National Drug Research Institute
Curtin University of Technology
GPO Box U1987
Perth WA 6845
Phone: 08 9426 4209
Fax: 08 9266 1611
Email: T.N.Chikritzhs@curtin.edu.au

Abstract

Alcohol is a leading cause of preventable death, disease and disability in Australia. The National Alcohol Indicators Project (NAIP) is funded by the Commonwealth government of Australia to monitor and report on trends in alcohol consumption and related harms across states and communities with special emphasis on the wide dissemination of information and evaluation of policy change. Using aetiological fraction and surrogate methods, the NAIP has established a minimum set of reliable indicators of alcohol-related harms for monitoring and evaluation purposes, including: alcohol-attributable deaths and hospitalisations; police-reported road crash and violent offences related to alcohol intoxication; alcohol sales data and national alcohol consumption surveys. The NAIP uses a range of strategies for maintaining policy relevant outputs that are both scientifically rigorous and readily accessible by non-researchers including: dissemination modes which potentially appeal to diverse audiences; pro-active communication of outputs to potential audiences and timely response to key stake-holder information needs; and a strong commitment to capitalising on opportunities for alcohol policy evaluation.

Background

For decades, alcohol has been a leading cause of preventable death, disease and disability in Australia, the economic costs of which measure in the billions every year (Collins and Lapsley 2002). Yet, before the late 1990s, alcohol consumption and related harms were only occasionally attended to, by a number of different organisations, in an un-coordinated and piece-meal manner across the various states and territories. Forward-thinking members of the (now disbanded) National Expert Advisory Committee on Alcohol (NEACA) managed to turn this around with their recommendation of and support for a national minimum data set on alcohol. The National Drug Research Institute was identified as the most appropriate centre to conduct the project and the Australian Commonwealth Department of Health and Ageing provided the basic financial resources. Since its inception the National Alcohol Indicators Project (NAIP) has had a strong focus on collaboration and Melbourne's Turning Point Alcohol and Drug Research Centre has played a major collaborative role in the project, especially during the first five years.

The raw materials: identification, access and assembly

The primary aim of the NAIP is to track and report on trends in alcohol consumption and related harms across jurisdictions and communities with special emphasis on the wide dissemination of information. Ultimately, the objective is to use these tools to evaluate the efficacy of alcohol policy and strategies. As such, the first requirement of the NAIP was to identify and bring together relevant and reliable data. The project concentrated on obtaining access to data already collected on a regular basis by other agencies – as opposed to collecting new or primary data (which, in any case, was precluded by the modest budget). Improvements in information technology have

encouraged many administrative systems to move to electronic records management and this has vastly increased the research potential of such information.

At the outset, a number of potential sources of secondary data relevant to a national monitoring approach for alcohol were readily identifiable: mortality records; morbidity records; national alcohol consumption surveys; police reported road crashes and assault offences; and alcohol sales data (see Table 1 for details).

Table 1: Secondary data sources of alcohol-related harm indicators

| Data source | Measure | Comment |
|--|--|---|
| Wholesaler records of alcohol purchases made by liquor retailers. Collected by liquor licensing authorities in some states/territories | Per capita pure alcohol consumption; volume of pure alcohol consumption by beverage type | From 1990-1996, it was possible to access electronic records of annual volumes of alcohol purchases made by licensed retail outlets utilised by licensing departments to calculate licensing fees. These data enabled estimation of per capita alcohol consumption, an invaluable alcohol indicator (e.g. Catalano <i>et al.</i> 2001). Most jurisdictions stopped collecting these data after a 1997 High Court ruled that raising taxes on alcoholic beverages, tobacco and petrol by states/territories was unconstitutional. The ruling did not preclude the collection of wholesale alcohol purchase data by liquor licensing authorities but, for most jurisdictions, the incentive for continued collection was lost. Only Western Australia and the Northern Territory continued to collect these data. |
| Individual state/territory police services | Numbers/rates of police-reported violent offences (e.g. violent assault, disturbances, drunk and disorderly conduct) | Police reports of violent offences are a potentially rich source of information. However, without a central collation agency, data were not readily accessible. Individual agreements were reached with data custodians in each jurisdiction allowing transfer of de-identified unit records. Data typically included: time of day of offence; type of offence; sex and age of offender; and location of offence. (Mathews <i>et al.</i> 2002) |
| State/territory police services | Numbers/rates of police-reported road crashes and impaired driving offences | For several years, the Australian Transport and Safety Bureau (ATSB), collated unit record police reports of road crashes from all jurisdictions. Driver-based data included: severity of injury, time of crash, location, sex and age. Many cases included breath alcohol level but compliance varied considerably between jurisdictions (Chikritzhs <i>et al.</i> 2000b). In the late 1990s, completeness of ATSB data holdings declined considerably, severely reducing utility. |
| Australian Bureau of Statistics (ABS) collates data from all jurisdictions | Numbers/rates of alcohol-attributable deaths | Includes de-identified information on deceased individuals (e.g. cause, date, sex, age, location). Use of ICD codes and established methods for estimating alcohol-attributable deaths (Chikritzhs <i>et al.</i> 2003) has meant that accessing these data is a NAIP priority. |
| Australian Institute of Health and Welfare (AIHW) collates data from all jurisdictions | Numbers/rates of alcohol-attributable hospital admissions | As for mortality data, use of ICD codes and application of the population aetiologic fraction method allows alcohol-attributable hospitalisations and related outcomes (e.g. bed days, PYLLs) to be estimated (Chikritzhs <i>et al.</i> 2003). |
| Local emergency department(s) | Numbers/rates of emergency | Systematic reporting and ICD coding of ED presentations is not wide-spread in Australia, and standardised, nation- |

| | | |
|--|--------------------------------------|---|
| (ED). State/ territory health departments (where available) | department presentations | wide identification of alcohol-attributable conditions is not yet possible. Some analysts have focused on only injury-related presentations or surrogate measures (e.g. night-time injuries). Use of subjective reports of alcohol-related admissions should be treated with caution (NDRI 2007). |
| ABS and AIHW large-scale, representative national alcohol consumption surveys | Self-reported alcohol consumption | Every three years, the AIHW conducts the National Drug Strategy Household Survey (NDSHS) – the only substance-use-specific national survey. The ABS conducts the National Health Survey (NHS), which asks questions about a range of health issues including alcohol and drug use. Methods used and response rates achieved vary considerably (Clemens <i>et al.</i> 2007). |

Access to data collected by a centralised agency (e.g. ABS mortality data) was relatively straight-forward with a short data transfer period. Securing access to other non-centralised data, especially police-reported information, was a laborious process and in some cases, delays of up to 18 months occurred between the initial data request and actual data transfer. The inability to guarantee access and to directly control reporting processes is one of the limitations inherent to studies which rely heavily on data collected by others for their own specific purposes.

NAIP data requests typically occur on an annual basis. Fortunately the financial cost of obtaining official administrative information is relatively small. Most government agencies charge a minimum cost-recovery rate as opposed to the high costs associated with private data collection companies and population surveys.

In large part, the harm indicators selected for this project were determined by practical considerations, including access to electronic records. This ‘selection bias’ admittedly produces only a partial picture of the actual impact of alcohol consumption on a population. Emergency department (ED) data is a case in point – these data are a rich source of information and hold particular potential for monitoring alcohol-related harms but, for the reasons described below, do not yet form part of the NAIP collection.

Emergency department data has a particular capacity to capture alcohol-related injuries which do not appear in official hospital admission records (and include large numbers of less serious injuries). The high frequency of events and the broad spectrum of conditions which present to ED s are likely to prove especially instructive where hospital admissions and/or deaths are relatively infrequent (e.g. small communities, rural areas). Unfortunately, unlike hospital separations, there is currently no systematic or standardised approach to recording ED presentations in Australia. The use of electronic record management packages (e.g. Emergency Department Information System) which potentially identify presentations by ICD code is typically left to the discretion of individual hospitals and as a result, application is generally piece-meal and many non-urban hospitals continue to use pen-and-paper records.

In addition to ED records, there are other data collections which may provide relevant and valuable information, including but not necessarily limited to: local and state alcohol, crime and social surveys; ambulance call-outs; police drunk and disorderly reports; liquor infringement notices; reports of child abuse; sobering-up shelter admission; and admissions to women's refuges. For the most part, application of these data across all Australian jurisdictions for comparative purposes is not currently possible, as standardised reporting and recording systems have not yet been established.

Shaping the measurement tools: fashioning administrative data sets into indicators of alcohol-related harm

Data which are primarily collected for non-research purposes typically require a substantial amount of time and effort to shape into relevant, reliable and consistent measurement tools. This is especially the case where data are collected independently from separate jurisdictions and where there is no nationally standardised recording system (e.g. police assault data). In order to shape these data into appropriate measurement tools or ‘alcohol indicators’ the NAIP has used a number of approaches, two of which will be discussed in detail in this section: (i) the population aetiologic fraction method and the (ii) surrogate method. Both of these methods are well established in the epidemiological research literature, however, wherever possible and appropriate, the NAIP has sought to improve upon the standard approach with tailored modifications. This section describes each of these methods and their application by the NAIP.

Estimating alcohol-attributable mortality and morbidity using the aetiologic fraction method

Typically, routinely collected death and hospitalisation data do not provide information about each individual’s level or pattern of alcohol consumption. The population aetiologic fraction method provides a means of estimating the number of alcohol-attributable cases given: (i) the prevalence of drinking in the population from which the cases are derived and, (ii) the relationship between consumption and specific disease or injury (i.e. relative risk or odds ratio). A multiplication of the number of people with each particular condition by the population alcohol aetiologic

fraction (PAAF) specific to that condition, followed by a sum of the results, produces an estimate of the number of alcohol-attributable deaths or hospitalisations in a given population (see English *et al.* 1995; WHO 2000).

The PAAF for a particular illness or injury attributable to various levels of drinking is the proportion of cases with that condition in the population that can be attributed to such drinking. For some conditions (such as alcoholic liver cirrhosis and alcohol dependence), the PAAF is one (1), because such conditions are – by definition – wholly attributable to alcohol. For other conditions (e.g. assault, road crashes and stroke) the PAAF is less than one, because they are only partially attributable to alcohol. In these instances, the PAAF is a function of both the strength of the causal relationship between a particular level of drinking and the condition (measured as a ‘relative risk’) and the proportion of the population drinking at that particular level (i.e. drinking prevalence). There are more than 40 conditions for which there exists sufficient research evidence to support a causal relationship with alcohol consumption (English *et al.* 1995).

PAAFs have the potential to vary widely over place and time. In part, this is because consideration of drinking prevalence within the population of interest is a critical component in their estimation. As is the case for many countries, there is substantial variation in levels and patterns of alcohol consumption throughout Australia. It has been estimated for example that per capita alcohol consumption in the Northern Territory and some northern non-metropolitan areas of Western Australia is at least one and a half times greater than the national level (Catalano *et al.* 2001). Prior to the NAIP however, Australian estimates of alcohol-attributable mortality and morbidity

typically adopted a one-size-fits-all approach to drinking prevalence. Most studies assumed that a measure of drinking prevalence taken from one population at one point in time could be reliably applied across different populations and over different time periods – usually an estimate of drinking prevalence which covered the entire nation (e.g. Chikritzhs *et al.* 2002).

The NAIP addressed this substantial variation in drinking levels by using, for the first time, drinking prevalence estimates specific to each state and territory in the estimation of alcohol-attributable morbidity and mortality. In addition, since accurate documentation of trends over time were a primary goal of the NAIP, in the absence of annual surveys of drinking, per capita alcohol consumption was used to adjust prevalence estimates over time (Chikritzhs *et al.* 2000a; WHO 2000). These additional efforts proved worthwhile when it was demonstrated that alcohol population aetiologic fractions for the Northern Territory were between 50% and 75% greater than those for Australia as a whole (Chikritzhs *et al.* 2000a). Using a similar approach, the most recent NAIP bulletin (No.11) estimated Indigenous alcohol attributable-deaths based on levels of alcohol consumption drawn specifically from representative Australian Indigenous populations. The use of Indigenous-specific drinking prevalence data as opposed to the standard approach of using national non-Indigenous levels of drinking prevalence dramatically increased the underlying PAAFs and the subsequent harm estimates. Compared to PAAFs based on non-Indigenous specific drinking prevalence (i.e. general population surveys), Indigenous-specific PAAFs are some 12% and 30% larger for chronic and acute alcohol-attributable conditions respectively (Chikritzhs *et al.* 2007).

Throughout the late 1990s and early 2000s a variety of alcohol-attributable mortality and morbidity estimates were published by several independently funded research centres. The range of estimates available did little to improve general levels of understanding concerning alcohol and harm but highlighted the regrettable absence of a consensus among researchers as to the most appropriate methodological approach. For example, Chikritzhs *et al.* (2001) estimated that there were 3,290 deaths due to hazardous and harmful alcohol consumption in 1997. For the same year, Ridolfo and Stevenson (2001) and Higgins *et al.* (2000) estimated 3,411 and 3,668 such deaths respectively. Mathers *et al.* (1999) estimated that during 1996 there were 7,157 lives saved and 4,492 lives lost due to drinking, producing a net saving of 2,631 lives. The NAIP sought to address this disparity among findings by bringing together a consortium of Australian alcohol researchers to agree upon and establish a set of consensus recommendations in relation to the quantification of alcohol-attributable mortality and morbidity. The recommendations included guidelines for the adoption of standardised methodological and reporting practices for analysts involved in disseminating epidemiological information about alcohol-attributable morbidity and mortality (see Chikritzhs *et al.* 2002).

The application of alcohol-related surrogate measures

It is rare that alcohol's role in events, which cause individuals to come to the attention of government agencies or authorities, can be reliably and directly discerned from official records. For instance, even though legal maximum breath alcohol levels for driving have been in place for decades in Australian states and territories, the reporting of driver breath alcohol concentrations for those involved in road crashes is not mandatory across all jurisdictions and is often left to the discretion of the

reporting officer (especially where drivers and passengers have escaped non-fatal injury) (Chikritzhs *et al.* 2000b). Moreover, to date, reporting systems which make allowance for an entry identifying whether or not alcohol was involved, such as an ‘alcohol flag’, rarely manage to achieve adequate levels of objectivity, compliance and reliability to be given serious consideration for monitoring purposes.

For monitoring trends over time as opposed to estimating population prevalence, measures which do not necessarily capture all alcohol-related events but which reliably identify events for which alcohol is highly likely to be a major contributor – although not necessarily the only contributor – may well suffice. For example, the use of the surrogate measure ‘single-vehicle night-time road crashes’ (e.g. crash occurred between midnight and 1am and involved a lone driver veering off a highway into a lamp post) in the road safety research literature demonstrates how, in the absence of breath alcohol data, time of day and crash circumstances can be effectively used to identify crashes likely to be a result of intoxication (e.g. Holder and Wagenaar 1993).

Based on the surrogate approach, the NAIP has used fatally injured drink-driver blood alcohol data to identify specific times of the day and particular days of the week which were likely to be either alcohol or non-alcohol-related for each jurisdiction.

Across the country, the most common times for alcohol-related crashes to occur were during the hours of 10pm and 2am on Friday, Saturday and Sunday nights, although longer hours were evident for Saturdays. Day-time hours between 6am and 2pm on most weekdays were commonly associated with large numbers of non-alcohol-related injuries.

Using these temporal parameters, trends in alcohol-related fatalities/serious injuries versus non-alcohol-related road injuries (Chikritzhs *et al.* 2000b) and alcohol-related versus non-alcohol assaults were able to be made (Mathews *et al.* 2002). Thus, where the degree of alcohol involvement in an incident is uncertain or unknown, an effective alternative is to identify cases which are highly likely to be alcohol-related, given what is known about other characteristics associated with the event that are likely to be both accurate and reliable.

Being and staying policy relevant

Commentators on the transfer from research evidence to uptake of evidence-based policy (or lack of) have observed that ‘researchers and policy makers work to different imperatives’ (Lin 2003:285). From the outset, the NAIP has sought to conduct research which is scientifically rigorous and which has policy relevant outcomes that may be readily accessed by non-researchers. As described below this is achieved using a range of strategies.

Packaging the tools: modes of dissemination

Rather than assume the one-size-fits-all approach to dissemination typical of academic research (i.e. peer review journal publications), the NAIP uses a range of modes for dissemination which potentially appeal to diverse audiences. One of the project’s most innovative and main-stay modes of information dissemination is the four-page, colour print ‘bulletin’ which document trends for a range of alcohol indicators and population sub-groups. The bulletins have proven a highly successful means of presenting information on alcohol consumption and harms and feedback has indicated that their appeal lies in their use of plain-language, colour maps and

uncomplicated figures, dot-point summaries and brevity (see www.ndri.curtin.edu.au/publications/naip.html).

Information uptake

Getting the information ‘packaged’ right is an important first step toward bridging the information gap but it is not sufficient to ensure uptake. Policy makers are subject to a range of competing pressures and attendance to objective research evidence is, at best, likely to be a low priority (Lin 2003). To encourage information uptake, NAIP outputs are pro-actively *communicated* to potential audiences. This is largely achieved by strategic use of the media (e.g. media releases), electronic mailing lists, NDRI and associated agency web-site (e.g. Commonwealth Government’s National Drug Strategy) and list server postings.

The strong collaborative links with other national and international alcohol and drug agencies is also important. For example, the Indigenous NAIP Advisory Committee, comprised of prominent members of Indigenous alcohol and drug agencies, played a crucial role in facilitating access to Indigenous-specific health information and in ensuring the wide dissemination of the first Indigenous NAIP Bulletin. Recognising and responding to the information requests of key stakeholders as they arise is also important for maintaining currency; several bulletins have arisen directly from requests received by external agencies.

Making the most of opportunities for evaluating policy

The NAIP has a strong commitment, not only to monitoring indicators, but also to the evaluation of alcohol policy throughout Australia. A notable example is the evaluation

of the Northern Territory's Living With Alcohol (LWA) programme. The LWA program was introduced in 1992 and was initially funded by the imposition of a small levy on all alcoholic beverages sold in the Northern Territory containing 3% alcohol by volume or greater. The LWA Levy effectively raised the retail cost of these beverages by about 5 cents per standard drink. The Levy was removed in 1997 which in turn resulted in a fall in the real price of alcoholic beverages with more than 3% alcohol by volume. Nevertheless, LWA programmes and services continued to operate until 2002 and were funded from redirected taxes collected by the Commonwealth. The public health, safety and economic impact of the LWA program was initially evaluated by Stockwell *et al.* (2001) and found to have resulted in a significant cost saving to the Northern Territory during its first four years of operation. A subsequent evaluation showed that without the support of the price increase, the LWA programmes and services intended to reduce alcohol-related harms would have had limited impact on reducing 'acute' harms (e.g. road injury and violent assault) (Chikritzhs *et al.* 2005).

Results from these studies presented a strong argument for alcohol taxes combined with comprehensive programmes and services designed to reduce the harms from alcohol. By capitalising on the occurrence of a 'natural experiment' the NAIP was able to provide robust evidence for the efficacy of reducing the economic availability of alcohol in an Australian context. Contextually and culturally relevant research evidence is likely to stand a better chance of influencing policy than evidence derived elsewhere. It is far more difficult to disparage the significance of local evidence on the grounds that it lacks domestic relevance than it is to argue-away, on the same

grounds, an entire suit of concurring scholarly reviews and articles from the international literature.

Conclusion

The NAIP outgoing costs are small – the project operates on a modest budget with a small core research team. Yet, the resources generated and their uptake by a range of health professionals, communities, academics, government and non-government organisations in order to argue for evidence-based alcohol policy in Australia has been substantial. As to whether such efforts will be rewarded with tangible positive change, time will tell.

References

- Catalano, P., Chikritzhs, T., Stockwell, T., Webb, M. & Dietze, P. (2001). *Trends in Per Capita Alcohol Consumption in Australia, 1990/91-1998/99*. National Alcohol Indicators, NDRI Monograph No. 4. Perth: National Drug Research Institute, Curtin University of Technology.
- Chikritzhs, T., Jonas, H., Heale, P., Dietze, P., Stockwell, T., Hanlin, K. & Webb, M. (2000a). *Alcohol-caused deaths and hospitalisations in Australia, 1990-1997*. National Alcohol Indicators, Technical Report No.1. Perth: National Drug Research Institute, Curtin University of Technology.
- Chikritzhs, T., Stockwell, T. Heale, P., Dietze, P. & Webb, M. (2000b). *Trends in Alcohol-related Road Injury in Australia, 1990-1997*. National Alcohol Indicators, Technical Report No.2. Perth: National Drug Research Institute, Curtin University of Technology.

- Chikritzhs, T., Jonas, H., Stockwell, T., Heale, P., & Dietze, P (2001). Mortality and life years lost due to alcohol: a comparison of acute and chronic causes. *Medical Journal of Australia*, 19 (174):281-284.
- Chikritzhs, T., Stockwell, T., Jonas, H., Stevenson, C., Cooper-Stanbury, M., Donath, S., Single, E., Catalano, P. (2002). Towards a standardised methodology for estimating alcohol-caused death, injury and illness in Australia. *Australian and New Zealand Journal of Public Health*. 26(5):443-450.
- Chikritzhs, T., Catalano, P., Stockwell, T., Donath, S., Ngo, H., Young, D. & Matthews, S. (2003). *Australian Alcohol Indicators, 1990-2001: patterns of alcohol use and related harms for Australian states and territories*. Perth: National Drug Research Institute, Curtin University of Technology.
- Chikritzhs, T., Stockwell, T. & Pascal, R. (2005). The impact of the Northern Territory's Living With Alcohol Program, 1992–2002: revisiting the evaluation. *Addiction*, 100: 1625–1636.
- Chikritzhs, T., Pascal, R. Gray, D., Stearne, A., Saggars, S. & Jones, P. (2007). *Trends in alcohol-attributable deaths among Indigenous Australians, 1998-2004*. National Alcohol Indicators, Bulletin No.11. Perth: National Drug Research Institute, Curtin University of Technology.
- Clemens, S., Donath, S., Stockwell, T. & Chikritzhs, T. (2007). *Alcohol consumption in Australia: National surveys from 1989 to 2004*. National Alcohol Indicators, Technical Report No.2. Perth: National Drug Research Institute, Curtin University of Technology.
- Collins, D. & Lapsley H. (2002). *Counting the cost: estimates of the social costs of drug abuse in Australia in 1998–9*. National Drug Strategy Monograph Series No. 49. Canberra: Commonwealth Department of Health and Ageing.

- English, D., Holman, C., Milne, E., Winter, M., Hulse, G., Codde, J., *et al.* (1995). *The quantification of drug caused morbidity and mortality in Australia*. Canberra: Commonwealth Department of Human Services and Health.
- Higgins, K., Cooper-Stanbury, M. & Williams, P. (2000). *Statistics on drug use in Australia 1998*. AIHW cat no. PHE 16. Canberra: AIHW (Drug Statistics Series).
- Holder H, and Wagenaar A, (1993). Mandated server training and reduced alcohol-involved crashes: a time series analysis of the Oregon experience. *Accident, Analysis and Prevention*, 26, 1: 89-97.
- Lin, V. (2003). *Improving the research and policy partnership: an agenda for research transfer and governance*. In V. Lin and B. Gibson (Eds) *Evidence-based health policy; problems and possibilities* Oxford: Oxford University Press: 285-297.
- Mathers, C., Vos, T., & Stevenson, C. (1999). *The burden of disease and injury in Australia*. Canberra; Australian Institute of Health and Welfare.
- Matthews, S., Chikritzhs, T., Catalano, P., Stockwell, T. & Donath, S. (2002). *Trends in alcohol-related violence in Australia, 1991/92-1999/00*. National Alcohol Indicators, Technical Report No.5. Perth: National Drug Research Institute, Curtin University of Technology.
- National Drug Research Institute (contributing authors: Chikritzhs, T., Gray, D., Lyons, Z. & Saggars, S.) (2007). *Restrictions on the sale and supply of alcohol: Evidence and Outcomes*. NDRI Monograph. Perth: National Drug Research Institute, Curtin University of Technology.
- Ridolfo, B. & Stevenson, C. (2001). *The quantification of drug-caused mortality and morbidity in Australia, 1998*. Canberra: AIHW

Stockwell, T., Chikritzhs, T., Hendrie, D., Fordham, R., Ying, F., Phillips, M., Cronin J., & O'Reilly, B. (2001) The public health and safety benefits of the Northern Territory's Living With Alcohol programme. *Drug and Alcohol Review*, 20: 167-180.

World Health Organization (2000). International guide for monitoring alcohol consumption and alcohol-related harm. In T. Stockwell and T. Chikritzhs (Eds.) Geneva. WHO/MSD/MSB/00.5