

PREVENTION OF YOUTH SUICIDE IN NEW SOUTH WALES

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Introduction

The NHMRC funded Translational Australian Clinical Toxicology (TACT) Program is a collaborative research group based at the University of Sydney. This submission provides a brief and not exhaustive overview of our work over the past 30 years in suicide and deliberate self-harm.

The collaboration includes the NSW and other Australian Poisons Information centres, Tertiary Hospital Clinical Toxicology treatment units as well as clinicians and academics with established expertise in research on deliberate self-harm (attempted suicide), reducing repetition of deliberate self-harm, and reducing successful suicide through means restriction such as changing schedules and prescribing guidelines for high risk pharmaceuticals. We have established the two largest clinical cohort studies on poisoning in the world which enable us to conduct population based studies into poisoning and its treatments and prevention.

Deliberate self-poisoning (DSP) is a major health problem disproportionately affecting adolescents and young adults. Integrated care addressing acute medical management and mental health, drug and alcohol co-morbidities is best practice and NSW policy, but only a few hospitals have dedicated toxicology services.

Each year there are 20,000 presentations of deliberate self-poisoning (DSP) to NSW Emergency Departments. While there is a high prevalence of significant mental health and/or drug and alcohol problems within these patients much of this behaviour falls outside a psychiatric framework. There are also increasing presentations of individuals with 'recreational' drug poisonings including alcohol, these individuals have a higher risk of deliberate self-harm.

The NSW Poisons Information Centre (PIC) provides a 24/7 free service and takes 100,000 calls per year. It is the major referral service for DSP management advice, annually providing 10,500 consultations to NSW's rural and urban hospitals. The majority of presentations are to hospitals without local specialist toxicology, self-harm or addiction services. All callers receive advice from a Poisons Information Specialist with some callers referred immediately to a medical consultant. Demographic and clinical data is entered at the time of the call into the PIC database. In addition to the PIC data our network of NSW Toxicology services (Newcastle Mater, Prince of Wales, Royal Prince Alfred and Westmead-Blacktown Hospitals) treat an additional 4000 patients. In effect our collaboration has direct detailed capture of data on more than 70% of DSP presentations in NSW.

While the core part of our acute service is to provide comprehensive management advice of the acute toxicity the main role of our data is to inform and measure effects of public health interventions. We have provided examples of our work in three interrelated areas of public health.

1. **Toxicovigilance:** The identification of patterns of poisoning including deliberate self-harm. In addition to demographics this describes the agents used in poisoning. The databases used for this purpose include NSW Poisons Centre data, Hospital data, National Coronial data, Prescribing data and internet surveillance.
2. **Reduction in access to lethal methods of self-harm:** Methods include introducing more restrictive availability of compounds taken in deliberate self-harm through poison's regulations and bans. We also provide data used in clinical guidelines that might encourage reduced prescribing of more toxic drugs to at-risk groups.
3. **Improvement in clinical care:** In addition to improving direct medical care of poisoning, our group has also focused on interventions to improve coordinated models of care and reduce repetition of DSP.

Reduction in access to lethal methods of self-harm

Here we provide some examples of our work in both identifying problems in deliberate self-harm and monitoring the effects of interventions.

Alprazolam

In the first example (figure 2) the benzodiazepine alprazolam had been identified as being commonly abused and over represented in suicide. Poison centre data, coronial data and information from addiction specialists was presented to the national advisory board for scheduling of medicines (on which we have representation). The intention to reschedule alprazolam to make it more difficult to access was announced in early 2013 with the rescheduling taking place in February 2014. This intervention showed a reduction in prescribing and dispensing, particularly in younger people, and also a greater reduction in deliberate self-poisoning.

JAMA Internal Medicine

Interrupted Time Series Analysis of the Effect of Rescheduling Alprazolam in Australia

Taking Control of Prescription Drug Use

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JAMA Intern Med. 2016;176(8):295-299. doi:10.1001/jamainternmed.2016.2992

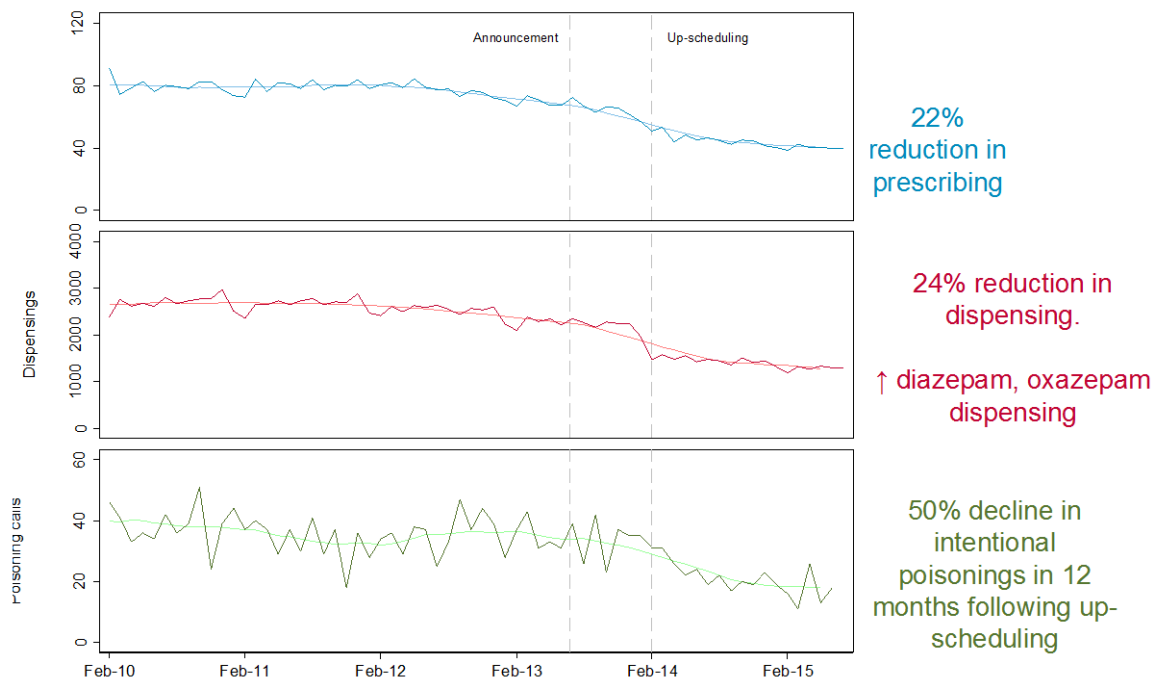


Figure 2 : Effects on prescribing, dispensing and intentional self-poisoning after the announcement and subsequent rescheduling of alprazolam

- Schaffer, Andrea L, Nicholas A Buckley, Rose Cairns, and Sallie-Anne Pearson. "Interrupted Time Series Analysis of the Effect of Rescheduling Alprazolam in Australia: Taking Control of Prescription Drug Use." JAMA internal medicine 176, no. 8 (2016): doi:10.1001/jamainternmed.2016.2992.

Codeine

The second example (figure 3) examines the effect of rescheduling codeine. Codeine and other prescription opioids cause death more frequently than illicit opioids such as heroin. Data from our group and other Australian researchers have confirmed that we are on a similar trajectory to the USA (where the opioid epidemic is being declared a National Emergency by the Presidential Opioid Commission). The intervention we examined was rescheduling so that codeine containing compounds had to be dispensed by a pharmacist rather than bought of the pharmacy shelf. Our data shows that this low level intervention had no apparent effects on reported self-harm as the numbers continued to rise.

Lack of impact of codeine rescheduling on misuse: A retrospective review of calls to Australia's largest poisons centre

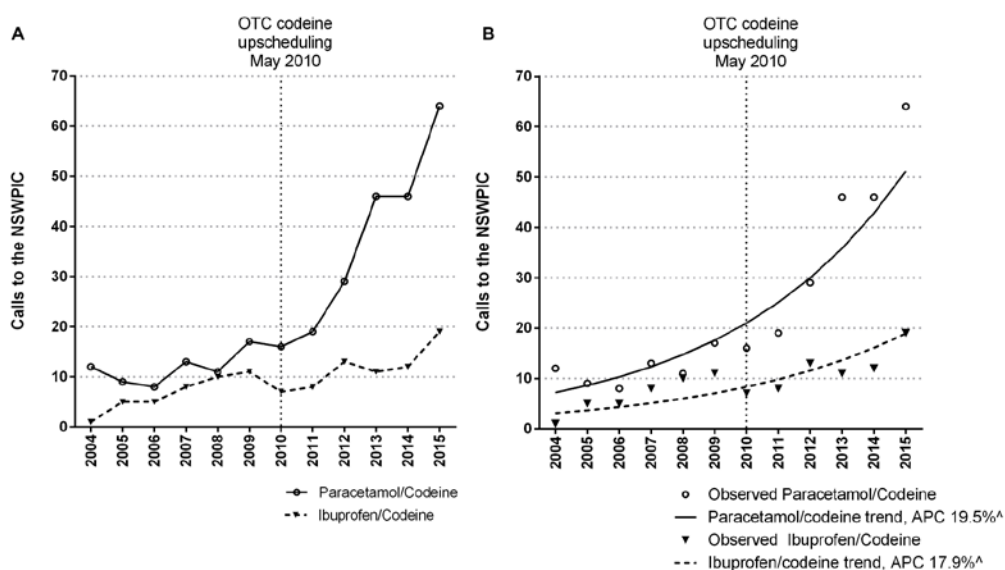


Figure 3: Effect of rescheduling codeine containing compounds from pharmacy only (off the shelf) to pharmacist dispensing

We have also done research that suggests increasing slow-release paracetamol and other large pack sales of paracetamol by pharmacies is leading to higher amounts of paracetamol being taken in overdose and increasing the risk of acute liver failure and death.

- Cairns, Rose, Jared A. Brown, and Nicholas A. Buckley. "The impact of codeine re-scheduling on misuse: a retrospective review of calls to Australia's largest poisons centre." *Addiction* 111.10 (2016): 1848-1853.
- Cairns, Rose, et al. "The impact of Australian legislative changes on synthetic cannabinoid exposures reported to the New South Wales Poisons Information Centre." *International Journal of Drug Policy* 43 (2017): 74-82.

Pesticides

The third example (figure 4 and 5) shows the effect of banning certain pesticides on hospital deaths and national suicide deaths in Sri Lanka. Using the case-fatality methodology we had developed in Australia we identified 3 pesticides that caused a disproportionate number of suicide deaths in Sri Lanka. We then engaged with policy makers and had these pesticides banned and phased out over 3 years (finishing in January 2011).

We demonstrated that the bans successfully removed the compounds from the market place and that the bans were associated with a 50% reduction in hospital deaths (figure 4). Examining the national data showed that this reduction occurred throughout the country and contributed to an overall reduction in suicide (Figure 5).

Effect of Bans:

Interrupted Time Series Analysis Agrochemical mortality

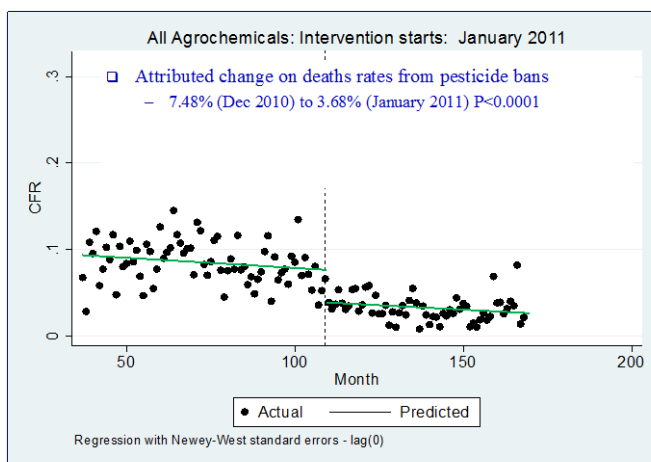
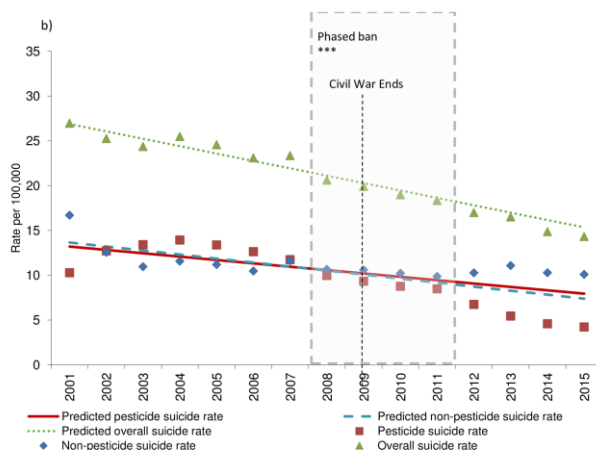


Figure 4: Percentage of patients dying from agrochemicals each month and the effect of the bans of 3 pesticides: Paraquat, Fenthion and Dimethoate

Sri Lankan National Death Data



Knipe DW, Chang SS, Dawson A, Eddleston M, Konradsen F, et al. (2017) Suicide prevention through means restriction: Impact of the 2008-2011 pesticide restrictions on suicide in Sri Lanka. PLOS ONE 12(3): e0172893. doi:10.1371/journal.pone.0172893 <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0172893>

Figure 5: Effect of pesticide bans on national suicide rates in Sri Lanka

- Knipe, Duleeka W, Shu-Sen Chang, Andrew Dawson, Michael Eddleston, Flemming Konradsen, Chris Metcalfe, and David Gunnell. "Suicide Prevention Through Means Restriction: Impact of the 2008-2011

Pesticide Restrictions on Suicide in Sri Lanka." PLoS one 12, no. 3 (2017): doi:10.1371/journal.pone.0172893.

- Pearson, Melissa, Chris Metcalfe, Shaluka Jayamanne, David Gunnell, Manjula Weerasinghe, Ravi Pieris, Chamil Priyadarshana, and others. "Effectiveness of Household Lockable Pesticide Storage to Reduce Pesticide Self-poisoning in Rural Asia: A Community-based, Cluster-randomised Controlled Trial." *The Lancet* (2017)doi:10.1016/s0140-6736(17)31961-x.
- Pearson, Melissa, Anthony B Zwi, Nicholas A Buckley, Gamini Manuweera, Ravindra Fernando, Andrew H Dawson, and Duncan McDuie-Ra. "Policymaking 'under the Radar': A Case Study of Pesticide Regulation to Prevent Intentional Poisoning in Sri Lanka." *Health Policy Plan* 30, no. 1 (2015): doi:10.1093/heapol/czt096.
- Dawson, Andrew H, Michael Eddleston, Lalith Senarathna, Fahim Mohamed, Indika Gawarammana, Steven J Bowe, Gamini Manuweera, and Nicholas A Buckley. "Acute Human Lethal Toxicity of Agricultural Pesticides: A Prospective Cohort Study." *PLoS Med* 7, no. 10 (2010): doi:10.1371/journal.pmed.1000357. <http://dx.doi.org/10.1371%2Fjournal.pmed.1000357>.

Improvement in clinical care

Training and Guidelines

Our group has been extensively involved in the development and delivery of guidelines. These have spanned from development of models of care for deliberate self-harm in hospitals, interventions for substance abuse, national and international guidelines for treatment of toxicity, and a distance learning course to train clinicians.

We recently completed a pilot study of providing life skills training to 150,000 school children in Sri Lanka.

- Whyte, I M, A H Dawson, N A Buckley, G L Carter, and C M Levey. "A Model for the Management of Self-poisoning." *Medical Journal of Australia* 167, no. 3 (1997): 142–146-142–146.

Reducing repetition of deliberate self-poisoning

These studies provide example of our use of clinical units to recruit patients to test interventions that could be scaled up if successful.

Postcard Interventions

We had previously established in one of our collaborating clinical units (Newcastle) that the majority of patients who subsequently had a repeat deliberate self-poisoning could not be accurately predicted. In this context we needed to trial the effectiveness of an intervention that could be delivered cheaply to a large number of “low risk” patients. This study randomised almost 800 patients, half to receive a postcard contact from the toxicology service on 8 occasions in the year after their admission. We then followed patients for 5 years. There was a significant reduction in repeat self-poisonings. However, rates of subsequent death of 1.4% over 5 years were not significantly different in either group.

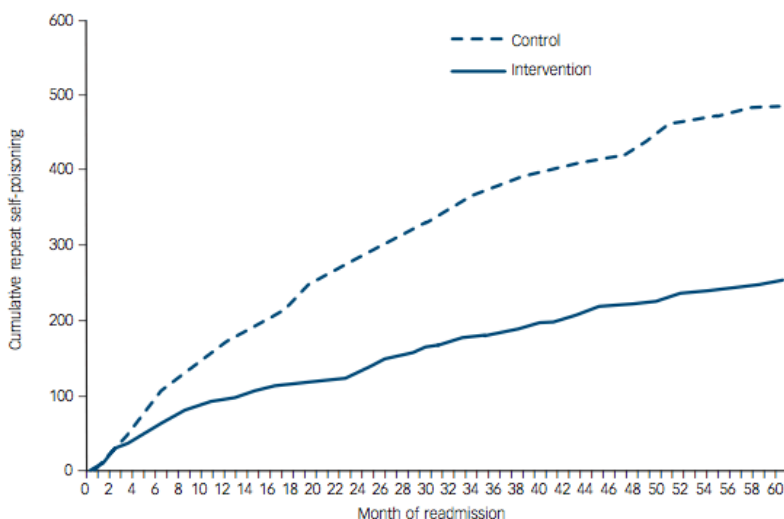


Figure 6: Rates of repeat poisoning following postcard intervention.

- Carter, G L, K Clover, I M Whyte, A H Dawson, and C D'Este. "Postcards From the EDge Project: Randomised Controlled Trial of An Intervention Using Postcards to Reduce Repetition of Hospital Treated Deliberate Self Poisoning." *BMJ* 331, no. 7520 (2005):.
- Carter, Gregory L, Kerrie Clover, Ian M Whyte, Andrew H Dawson, and Catherine D'Este. "Postcards From the EDge: 24-month Outcomes of a Randomised Controlled Trial for Hospital-treated Self-poisoning." *The British journal of psychiatry : the journal of mental science* 191 (20

- Carter, Gregory L, Kerrie Clover, Ian M Whyte, Andrew H Dawson, and Catherine D'Este. "Postcards From the EDge: 5-year Outcomes of a Randomised Controlled Trial for Hospital-treated Self-poisoning." *The British journal of psychiatry : the journal of mental science* 202, no. 5 (2013)

A randomised control trial of an internet-based treatment for problematic drinking in young adults after deliberate self-harming.

Alcohol is commonly associated with self-harm (up to 50% of our patients) and suicide (23%). Alcohol use remains the most modifiable of the risk factors associated with suicidal behaviour. Intervening at the time of hospitalisations due to self-harm may provide a means to engage patients to change their attitudes toward alcohol use. This may not only improve multiple adverse outcomes associated with alcohol misuse, but also prevent recurrent self-harm and even suicide. In this work we utilise a youth-focused, internet-based comorbidity intervention which been tailored specifically to address depression symptoms and alcohol use in young people with comorbid problems with alcohol use.

Opportunities

Patient consultation and follow-up

Within NSW there is an opportunity to improve both patient consultation and follow-up by the NSW Poisons Information Centre. Currently the NSW Poisons Information Centre cannot access medical records of hospital patients when it has been consulted. Increasing access would allow improved information transfer and follow-up. The most obvious avenue is direct access to the hospital electronic medical record. As the NSW Poisons Information Centre employees are all part of NSW Health an application for policy support to enable this has been submitted.

Provision of extended advice to clinicians

Hospital calls to the NSW Poisons Information Centre are initiated by clinicians. Many of these clinicians may be remotely located and relatively inexperienced. The consultation provides an opportunity for the poison centre to deliver more comprehensive advice on holistic patient management. Such advice would be comparable to care in tertiary units and could include structured advice and prompts on further mental health and drug and alcohol assessment, including directions to local resources.