

BULLETIN NO 1: OVERVIEW OF THE DRUG POLICY MODELLING PROJECT

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Overview

The goal of the Drug Policy Modelling Project (DPMP) is to create valuable new drug policy insights, ideas and interventions that will allow Australia to respond with alacrity and success to illicit drug use.

Stage One has:

... produced new insights into heroin use, harms, and the economics of drug markets, as well as foreshadowed the value that can be extracted from existing data sets which have not previously been collated and combined;

...identified major gaps in what we know about what works (through systematic reviews), as the foundation for significant intervention studies;

...assessed different dynamic modelling approaches for their value as decision support tools; and

...researched the policy-making process, especially as it is informed by evidence, as a prelude to building highly effective research-policy interaction in the next stage and to undertaking significant new research in this area.

Stage One of DPMP (January 2004 to December 2005) has established 'proof of concept' for a range of innovative new approaches. The individual projects are summarised in 18 Bulletins and described in detail in the technical reports. Some of our findings have included:

- That Australian governments spend \$3.2 billion each year on the drug problem, of which the majority is spent on drug law enforcement (suggesting that greater policy evaluation in law enforcement is likely to reap the greatest rewards).

- That proactive drug law enforcement is more effective than reactive drug law enforcement.
- That quantitative policy analysis using a cost-effectiveness approach produces an unambiguous outcome when you compare prison with treatment.
- That by 2015, we predict there will be 140,000 heavily dependent injecting drug users and another 250,000 Australians who occasionally inject drugs such as heroin, amphetamines and cocaine. Just as worryingly, we expect there will be 1.2 million cannabis users by 2015 (using the stocks and flows system dynamic modelling).
- That state and territory governments spend significantly more than the federal government and may therefore be a more potent focus for evidence-informed policy.
- That it is feasible to map the Australian policy structures and the people who are influential, leading to improved understanding of the policy-making process and the research-policy nexus such that new strategies and techniques for helping policy makers and researchers interact more productively can be developed.
- That Australia has the capacity to conduct detailed price series analysis, and that the price per pure gram of heroin can be used as a sentinel measure for policy evaluation. For example, we have mapped the relationship between the price of heroin per pure gram and non-fatal overdose and shown a high concordance between the two.
- That simple ‘back of the envelope calculations’ can be extremely valuable in revealing key facts about illicit drug. For example, we can calculate the ratio of heroin seized to heroin consumed, which illuminates the effectiveness of interdiction.
- That it is feasible to interview experienced policy makers in the illicit drugs area, and that they disclose important information about what they need (for example outcomes that can be acted on in the short-term; ways of evaluating multiple sources of evidence; accounting for party politics).
- That a multi-agent systems model (agent-based model, *SimDrug*) is a feasible and productive approach to improve the evidence-base for illicit drug policy and can explicate the ways in which interventions may impact on each other and the dynamic nature of the illicit drug system.

- That we can develop new tools for policy makers that use state-of-the-art dynamic modelling approaches from other disciplines.
- That the stocks and flows modelling approach can provide a policy simulation tool to assess the effects of new or altered interventions on prevalence and social cost (for example, if we doubled the successful abstinence rate from treatment for dependent heroin users, the number of users would remain stable at around 100,000, instead of rising to 150,000 by the year 2015).

Introduction

Illicit drug abuse is a serious problem in Australia. The latest data suggests that approximately 15% of Australians use illegal drugs every year. In spite of the change in heroin supply in 2001, the prevalence of injecting drug use remains high and will soon pass the peak observed in 1999. When surveyed, drug users report illicit drugs are easy to obtain.

This drug abuse leads to real and significant costs to our community. Heroin overdose is the second most common cause of death among young people in Australia. In Melbourne, approximately 20 people die from a heroin overdose, while another 150 people require assistance from ambulance paramedics after overdosing on heroin every month. The effects of drug abuse in terms of crime are also substantial. In 2003/04, there were 79,000 arrests for illicit drug offences, of which 15,000 were for supplying or distributing drugs. The Australian Institute of Criminology also estimates that 40% of property crime and a quarter of other crime can be attributed to illicit drug use. Across Australia, this means that approximately 50 of the burglaries reported each day are due to illicit drug abuse.

The aim of the Drug Policy Modelling Project (DPMP) is to create valuable new drug policy insights, ideas and interventions that will allow Australia to respond with alacrity and success to illicit drug use. DPMP is developing new models and tools to describe and enhance the evidence-base for drug policy, taking full advantage of successful modelling and other decision-support tools, most of which have not previously been applied to illicit drugs. The effectiveness of Australian illicit drug policy could be significantly improved by better dynamic integration of the four key strategies - law enforcement, treatment, harm reduction and prevention – which currently exist in different policy and research silos. This is a key aspect of DPMP.

The feasibility stage of DPMP (January 2004 to December 2005) has established 'proof of concept' for a range of innovative new approaches. The individual projects are summarised in 18 bulletins and described in detail in the technical reports (available December 2005). We focused on heroin, which is associated with significant harms and which is the backbone of the illicit drug trade. It provides a solid foundation for further research on the full range of illicit drugs, which is proposed for the next stage of DPMP. We worked on global, national, state and local scales, with different projects taking different emphases, again as a prelude for the next stage, where each project will aim to work across all scales.

The principle researchers involved in Stage One are [See Bulletin No 18]:

A/Prof Alison Ritter, Program leader, Turning Point Alcohol and Drug Centre

Prof Margaret Hamilton, University of Melbourne

Dr Gabriele Bammer, National Centre for Epidemiology and Population Health, The Australian National University and Hauser Center for Nonprofit Organizations, Harvard University

A/Prof Lorraine Mazerolle, School of Criminology and Criminal Justice, Griffith University

A/Prof Paul Dietze, Senior Research Fellow (Epidemiology) Turning Point Alcohol and Drug Centre

Dr Pascal Perez, Human Ecosystems Modelling with Agents (HEMA), Australian National University, Canberra

Tim Moore, Senior Research Fellow (Economics) Turning Point Alcohol and Drug Centre

Dr Gerald Midgley, and Dr Wendy Gregory, Institute of Environmental Science and Research (ESR), New Zealand; Centre for Systems Studies, University of Hull, UK.

Prof Jonathan Caulkins, Professor of Operations Research and Public Policy, Carnegie Mellon University

Prof Peter Reuter, School of Public Affairs, University of Maryland

DPMP seeks to describe the optimal policy mix of elements of law enforcement, treatment, prevention and harm reduction. However, the notion of one optimal mix is flawed. The analysis will depend upon a number of aspects: the particular situation or current context (such as the state of the current investment mix); the overriding policy goal (whether it is to reduce numbers of drug users, harms to drug users, or harms to the community for example); and the unit of analysis (whether at a global, national, state or local level). There is not one optimal solution. The DPMP takes this explicitly into consideration through the use of multiple methods and models.

Fourteen research projects were completed within Stage One. They cover four major areas:

- producing new insights into heroin use, harms, and the economics of drug markets, as well as foreshadowing the value that can be extracted from existing data sets which have not previously been collated and combined;
- identifying major gaps in what we know about what works (through systematic reviews), as the foundation for intervention studies;
- assessing different dynamic modelling approaches for their value as decision support tools; and
- researching the policy-making process, especially as it is informed by evidence, as a prelude to building highly effective research-policy interaction.

Current understandings of heroin use, harms and the economics of drug markets

Establishing the extent of heroin use in Australia is vital to the overall DPMP endeavour. The number of users, extent of harm, types of users (whether recreational or dependent) provides the baseline information upon which models can be built as well as the foundation for the evaluation of different policy responses. In itself, the work to establish reliable and valid numbers is highly complicated. As will be seen below, some models focus upon prevalence of drug users (ie. the number of users), whereas other models can focus upon harms (such as overdose). Thus we need good information about harms as well as numbers of users. This is important because it links back to our policy choice goals. We have chosen not to presume that the overall policy goal (and hence optimal mix) is solely one where the numbers of users is reduced, but we endeavour to accommodate models for the optimal mix where reduction in harm is the goal. The Stage One feasibility work in this area, led by Dr Paul Dietze, has used new data sources and closed population capture-recapture techniques to derive estimates of heroin users [See Bulletin No 7]. The work has also identified gaps in Australia's data collection systems.

Aside from the epidemiological analyses, we have also sought 'baseline' data on the current Australian policy mix, as measured by the investment mix. There are a number of different approaches to describing the current policy mix in Australia – one can review the policy documents which outline Australia's policy directions and priority areas; or one can interview key policy makers at each level of government. Lastly, one can use the current investment as the indicator of current policy. We have favoured this last approach. The money spent on each drug policy element (law enforcement, treatment, harm reduction and prevention) is a very

direct way of describing the current Australian drug policy. It reflects the actual investment in the different policy options, rather than the supposed or presumed investment, and manages to neatly side-step the problem of rhetoric in policy documents. At a pragmatic level, we also require the government investment data to use as baseline data in our models, so the effort serves dual purposes.

The detailed specification of government spending, completed by Tim Moore, provides the basis for being able to manipulate the investment mix in our models. Our work estimated that illicit drug-related spending in 2002-2003 totalled \$3.2 billion. Proactive expenditure (that is, direct spending on drug interventions) was \$1.3 billion, and represents 41% of total spending, while \$1.9 billion is spent by governments on the consequences of illicit drug use. In the proactive expenditure, law enforcement and interdiction accounted for 56% of all expenditure. Prevention (22%) and treatment (19%) account for approximately one-fifth of expenditures, while harm reduction (2%) and expenditure not elsewhere included (1%) are negligible components [See Bulletin No 2].

The heroin trade in Australia, including the importation of heroin, the wholesale operations, the dealers and local street markets, forms the fundamental basis for evaluating any drug policy response. The kinds of data from this “heroin market” include: price, purity, consumption, seizures, and numbers of actors (importers, wholesalers, dealers, users). Knowledge of the higher levels of the market (production and distribution) can assist in designing and evaluating global and national interdiction and other law enforcement efforts [see Bulletin No 10]. At the local level, understanding the operations of the retail market can assist in designing and evaluating harm reduction, treatment and law enforcement interventions. A review of the existing information on the Australian heroin drug markets has formed background information for some modelling approaches; provided a beginning step for the economic analyses being conducted within DPMP; and has identified gaps in knowledge and pertinent research that could be pursued.

The economic aspects of the drug market such as price and elasticity of demand have been pursued in order to again establish the set of baseline facts about Australian heroin use [See Bulletin No 8]. This work, led by Tim Moore, is also complex. For example there are three main sources of price information – law enforcement data (such as buy-busts); self-report data from convenience samples of heroin users (the IDRS being the prime example); and from one-off ethnographic research in select markets (such as that by Maher). Price alone is insufficient – information in relation to purity and weight are also important, in order to report in a standard metric (price per gram) and to understand the structure of the market (for

example price-ups). The relationship between these different data sets, the reliability and validity and the measurement error all need to be evaluated. Work from Stage One by Jonathan Caulkins, Caroline Godkin and Paul Dietze compares retail, low-level wholesale and wholesale heroin seizure purity data for Victoria [See Bulletin No 9]. There appears to be little evidence of any differences in heroin seizure purity across the three seizure weights. This information is fundamentally important to our understanding of heroin markets as it suggests that, once heroin reaches Victoria, there is little adulteration or “cutting” across the supply chain.

An important consideration in the epidemiological and economic work has been the timeframe to which the data apply. The numbers are constantly changing, and in the case of the drug market, the price and purity can vary enormously. Each local drug market operates differently and evolves in response to environment, drug control strategies and externalities. In addition, Australia has experienced a reduced supply of heroin, with marked differences between “pre-drought” and “post-drought” on many key variables, especially harm such as overdose. The timeframe needs to be considered in the different modelling approaches.

In summary, the epidemiological and economic research programs of DPMP have led to the establishment of simple baseline data on: numbers of heroin users (by type of user); the extent of harms; government investment in law enforcement, prevention, treatment and harm reduction; heroin price and purity time series analyses; and understandings of the operations of the Australian heroin market.

Systematic reviews

In order to improve the evidence base and dynamically integrate law enforcement, treatment, harm reduction and prevention policy options, we need to know the efficacy and effectiveness of the interventions. The reviews had three purposes – to synthesise current knowledge of the effectiveness of interventions; to develop effect sizes to be used in the models; and to establish potential interventions for demonstration projects in Stage Two.

The law enforcement systematic review, led by Lorraine Mazerolle, has been completed, with both a narrative and a quantitative review of drug law enforcement interventions [See Bulletin No 6]. The most effective interventions were found to be: drug nuisance abatement and civil remedies; community policing (drug hotlines, neighbourhood revitalization); CPTED and CPTED combined with drug nuisance abatement strategies; arrest referral and diversion; and combinations of reactive/aggressive and proactive/partnership strategies. Proactive and

partnership policing strategies appear to have stronger supporting evidence than reactive policing strategies. This is the first systematic review of all law enforcement interventions and has been accepted as a Campbell Crime and Justice Group publication. It will provide the foundation for examining law enforcement responses in our various models, and be used to select appropriate interventions for the demonstration projects. The challenges associated with the law enforcement systematic review have included: the dearth of published evaluations; lack of methodological rigour to the existing research; and the reliance upon American data (the Australian research is extremely limited).

The treatment review, led by Alison Ritter, has not entailed the calculation of effect sizes for different treatment interventions. Existing literature on treatment systematic reviews is strong and covers this terrain. Instead we chose to focus on Australian treatment data only, and establish the basic parameters around Australian heroin treatment. These parameters are used in the modelling approaches. Of particular interest is parameterisation of: numbers initiating treatment; length of treatment; abstinence rates; relapse and lapse rates; amount of drug consumed; transference from primary drug to other drugs; length of drug use career(s); treatment effect within program (reduction in heroin use while in program); treatment effect post-intervention (proportion abstinence); and costs of treatment (per day, per episodes). With such data we can then model any number of different treatment effects, and model the impact of varying treatment effects. By way of example, we have completed a cost-effectiveness comparison of pharmacotherapy maintenance, prison and therapeutic community using the Australian treatment data (see below under modelling for more information about this work, and Bulletin No 12).

The harm reduction systematic review covers ten different types of harm reduction interventions. As with the law enforcement systematic review, we are seeking ways of quantitatively representing the effect of harm reduction for our models. For the most common harm reduction intervention – needle and syringe programs – there is ample literature to complete a meta-analysis. For other harm reduction interventions, such as supervised injecting facilities or naloxone distribution, there is insufficient literature to undertake a quantitative review. Hence, we are conducting qualitative reviews.

A diverse set of strategies are encompassed in the prevention category, including those targeted at the whole populations, such as mass media campaigns, those concerned with community strengthening, programs targeting at-risk groups, and drug education. The work in Stage One, led by Lorraine Mazerolle, has focussed on school-based interventions. An important criterion for the work was that the articles for inclusion make reference to a drug-

related outcome. In addition to a meta-analysis, the team are documenting Australian best practice examples of school-based drug prevention.

The systematic reviews of law enforcement, prevention, treatment and harm reduction have been important products in their own right. The reviews also serve a more important purpose as a means to use real data in the models and to test the dynamic effects of different interventions. Used in this way, it will be important over the life of Stage Two to continue to monitor publications in the relevant areas such that the reviews can be updated as new research comes to hand.

Modelling approaches

We now come to the crux of the DPMP – building dynamic systems models. There are many different modelling approaches. We chose four approaches for Stage One: complex system science (agent-based modelling), stocks and flows (epidemiological models); systems models; and economic models. Each modelling approach has its own disciplinary integrity; the models are different in approach, style and underlying assumptions; and the models lend themselves to different aspects of the drug policy problem. Thus, some models are best suited to modelling the dynamic relationship between drug policy interventions and numbers of users (stocks and flows models) at a state or national level. Other models are best suited to modelling the effect of interventions on the behaviour of users in local drug markets (agent-based modelling). For each modelling approach we have chosen a different ‘problem’ or focus. The stocks and flows have focussed on prevalence of heroin users; the agent-based model on local drug markets (hotspots), the systems model on harms, public amenity and policy decision-making processes; and the economic model on cost effectiveness. This is not to suggest that the models cannot be used in other ways. There are some well-developed stocks and flows models of harms (rather than prevalence); and agent-based modelling could be used for prevalence estimation.

Each modelling approach offers a unique perspective and there is not one modelling approach that will be the preferred one. The audiences to the models (policy makers) will gravitate to the model that suits their own cognitive style and view of the world. Thus some will prefer the statistical stocks and flows model, whilst others will prefer the more apparently qualitative models such as soft systems or ABM. Ultimately the goal of DPMP is to develop tools for policy makers, and having multiple tools that can be tailored to the particular policy question as well as to the audiences’ learning style is very important. There are modelling approaches that we have not explored in Stage One. These include network analysis and spatial analysis,

futures approaches, and biological models. Further exploration of the potential for these approaches to inform policy decision-making will be undertaken in Stage Two.

The stocks and flows model, led by Paul Dietze, has been developed with a view to understanding the dynamics of Australian drug use over time as well as project the effects of plausible changes in these dynamics (through, for example enhanced intervention effectiveness) [See Bulletin No 14]. "Stocks" currently included in the model representing drug-use states are: cannabis use only, non-injecting use of illicit drugs other than cannabis, light IDU (with stocks for those who escalate to heavy IDU and those that don't) and heavy IDU. Parameters for the flows between these states have been developed from a variety of data sources available in Australia. From this work a coherent prototype stocks and flows model has been produced that can be used for policy simulation purposes.

The agent-based model, led by Pascal Perez, has produced a prototype model that includes users, dealers, wholesalers, outreach workers and police [See Bulletin No 13]. The model is focussed upon local drug market and the hot spots (of which there are five). The time span for the model is 4 years, and the team endeavoured to replicate the period of the Australian heroin drought. (One interesting question has been whether the drought was an emergent phenomenon or caused by externalities, and the ABM model lends itself to these questions.) The model, called *SimDrug*, has demonstrated the plausibility of using a multi-agent system model to describe the relationships between heroin users, dealers, their surroundings and the two interventions modelled (outreach workers and police). The model is robust. Policy makers will be able to use the model to determine potential scenarios as a result of their intervention. For example, the impact of doubling the police resources can be evaluated in the simulation. Further work is required to produce the model in a user-friendly format. Then it will be tested with policy makers as a tool to enhance their policy decision-making.

The economic model, led by Tim Moore, has focussed on cost-effectiveness comparisons of three policy options: pharmacotherapy maintenance, therapeutic community and prison [See Bulletin No 12]. The initial model assumes a one year intervention period, accommodates drop-outs and calculates cost effectiveness based on the reductions in drug use that occur within the time of the intervention. This is very simplistic and presumes no long term effect of the interventions (clearly not realistic). Hence the next stage of modelling entailed examining the cost effectiveness over a number of different intervention effects (we varied the post-intervention effect from 0% to 100%). Pharmacotherapy maintenance is the most cost-effective intervention under all scenarios. The third extension to the model (and where dynamic interactions begin to play out) is in examination of the cost-effectiveness of

combined options – such as a default prison term if the treatment intervention is not successful. This work represents the ‘diversion’ policy scenario as we currently see it in programs such as the drug courts and other post-sentencing diversion programs.

The systems thinking work, led by Gerald Midgley and Wendy Gregory, represents a synthesis across the various modelling approaches and the policy mapping work [See Bulletin No 11]. Systems thinking, as argued by Midgley and his team, provides an array of approaches for influencing policy. Six approaches are focussed on: system dynamics; viable system diagnosis; strategic assumptions surfacing and testing; interactive planning; soft systems methodology; and critical systems heuristics. Each of these approaches can be seen as ways of developing and influencing drug policy. The Stage One work had two components: in-depth interviews with experienced policy makers and a small demonstration project. The in-depth interviews explored the six systems approaches identified above and asked policy makers to reflect on their utility, benefits and problems. The small demonstration project, run with Turning Point staff, used a combination of systems approaches to address the problem of public injecting.

Understanding policy processes

The development of a comprehensive database of all drug policy responses has been an important platform [See Bulletin No 5]. We have collated over 80 different policy responses, and applied various classification systems to them. In the first instance this work has been important to document all the policy responses and to communicate about our work and the classifications we use (and compare it to other classification systems of relevance in other countries). Secondly we have mapped the different policy goals, or outcomes against possible policy strategies. This means that the database can be searched for outcomes matched to policy responses, for example those policy responses that address overdose, or those that address prevalence.

The ANU team led by Gabriele Bammer have completed pilot studies on three interrelated aspects of policy activity: structural and institutional analysis; reputational influence mapping; and interviews with influential policy makers and researchers [See Bulletin No 3]. We identified and mapped national illicit drug policy structures in Australia in the areas of prevention, treatment and law enforcement at the local, state, national and international levels, as well as structures for cross-sectoral and cross-level interactions. The reputational influence mapping demonstrated that it is feasible to use snowball sampling to identify the individuals considered to be the most influential in shaping Australian policy relating to illicit drugs. The

study demonstrated that the social network of people regarded as influential does not have a random topography. Rather, it appears that a small number of people are considered to be particularly influential, insofar as relatively large numbers of informants nominate them as influentials. The interviews with senior policy makers demonstrated that it is feasible to conduct in-depth interviews with many of the people who are particularly influential in the policy and research communities, and that they are willing and able to provide valuable insights into how they operate. In particular, they provide understanding of the behind-the-scenes drug policy activity, the role of advocacy coalitions and of the personal attitudes and values of the players. On the one hand, its value for the DPMP is that the information obtained in this manner from the influential people in illicit drugs policy can become inputs to comprehensive policy analysis, and alternatively, will contribute to understanding how other forces operate. These insights can then be used by those developing strategies and techniques for helping policy makers and researchers to interact more productively, and for the products of the DPMP to reflect the realities of the day-to-day worlds of policy makers.

Aside from the need to continue to develop these methods and conduct research beyond pilot stage, the policy mapping research work highlights the importance of bringing together the policy activity research and the proposed evaluation of tools for policy makers. The work entails collaborating with the modellers to develop the tools, translating the models into actual tools of utility in policy activity environments, and then conducting systematic implementation, analysis and evaluation of the outcomes. Understanding diffusion of technology and the translation from research into policy are key issues to examine in Stage Two.

The work on Executive Sessions, led by Gabriele Bammer, is another aspect to improving the policy-practice nexus with approaches that involve dialogue between influential leaders, academics and practitioners [See Bulletin No 4]. We are especially interested in how to bring together different combinations of high-level practitioners and researchers to advance thinking on complex problems. Harvard-style Executive Sessions are one relevant approach. Gabriele Bammer's work has entailed a detailed document review of past Executive Sessions and consideration of the potential of the method for illicit drugs policy.

Underlying organising principles – integration and uncertainty

Integration and Implementation Sciences (IIS), a new academic specialisation, which has been the focus of Gabriele Bammer's work [See Bulletin No 17]. The development of this new specialisation, which aims to help researchers focus their efforts when tackling complex

problems, provides DPMP with a set of theories and methods. Some of the features of Integration and Implementation Sciences include: application of integrative concepts; use of multiple research epistemologies; attention to emergent properties; understanding policy, product development and action and how these can be influenced by research; application of knowledge management concepts; tools for dealing with uncertainty; managing less than perfect outcomes; change management and innovation theory and methods; and participatory and collaborative methods.

Uncertainty surrounds us. As Gabriele Bammer wrote “Until fairly recently, a commonplace assumption was that any uncertainty could be overcome with sufficient information, time, and intelligence. Nowadays we recognize that some uncertainties are irreducible and we must often make important decisions without sufficient information”. There is a growing recognition that uncertainty is a major concern cutting across disciplinary and practice boundaries. Nonetheless, little has been done to exchange across those boundaries ideas and frameworks for effectively managing and dealing with uncertainty.

We held a two-day symposium, covering the disciplines of statistics, physics, history, futures, art history, integration, philosophy, law, complexity, theology, economics and psychology. Practice-based perspectives included government policy, hazards, intelligence, music, law enforcement and politics; and problem-based perspectives were environment, communicable diseases and illicit drugs [See Bulletin No 16]. The symposium has sharpened our thinking about uncertainty and will provide the basis for more sophisticated levels of analysis in Stage Two around managing uncertainty. Both integration and uncertainty represent potential theoretical and methodological underpinnings for DPMP.

Conclusions

Stage One will be completed in December, 2005. A monograph series containing all the detailed results summarised above will then be available. Stage One has enabled us to examine the feasibility of a variety of new methods to improve illicit drug policy in Australia. The new tools (such as ABM and stocks and flows) have proved extremely useful and capable of delivering quantitative policy analysis. The collation and analysis of the current state of knowledge regarding effectiveness of law enforcement, prevention, treatment and harm reduction responses forms the basis for establishing which interventions should be actively pursued in a policy environment. Stage One has also reinforced the importance of foundation research (such as the price of heroin) for understanding policy impacts. We are in a strong position to now proceed to Stage Two.

DPMP strives to generate new policies, new ways of making policy and new policy activity and evaluation. Ultimately our program of work aims to generate effective new illicit drug policy in Australia through:

- developing new tools and methods;
- establishing new insights;
- seeking out drug research evidence;
- conducting independent analysis;
- improving the quality of the evidence;
- changing the tenor of drug policy processes;
- providing new tools and methods that are evaluated;
- building new measures of success based on policy makers' advice about their goals; and
- sustaining a drug policy research community.

This work is funded by the Colonial Foundation Trust.

Bulletin No 1 summarises the key findings, and lists the projects, workshops, students, presentations, publications, leverage and seeding money, and international links and collaborations.

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Completed research projects

1. Classification schema for drug policy responses
2. Australia's illicit drug-related policy costs: government spending
3. Review of available data sources for epidemiology of illicit drug use
4. Estimating the prevalence of heroin use in Melbourne
5. Examination of heroin and amphetamine purity in Victoria
6. Drug law enforcement: a systematic review
7. A systematic review of harm reduction interventions
8. Australian treatment for heroin dependence: effectiveness measures
9. A systematic review of drug prevention strategies: a focus on school-based interventions
10. Popular culture and the prevention of illicit drug use
11. Valuing the effects of illicit drug use: a review of Australian sources
12. Illicit drugs in Australia: what do we know about the role of price?

13. Developing a price series for heroin in Victoria
14. Back of the envelope calculations about Australia's heroin market
15. Complex systems science: applying an agent-based modelling approach to illicit drugs
16. A cost effectiveness comparison of three policy options for heroin use
17. Scoping the potential uses of systems thinking in developing policy on illicit drugs
18. Stocks and flows modelling approach for illicit drugs
19. Australian illicit drugs policy: mapping structures and enhancing processes
20. Exploring executive sessions to generate effective new approaches to illicit drugs
21. Integration in DPMP: an organising principle and an expanded set of tools
22. Improving methods to deal with uncertainty in illicit drug policy formulation

Researchers in DPMP

The following researchers have been involved in Stage One of DPMP:

Ali	Robert	Drug and Alcohol Services, South Australia
Bammer	Gabriele	National Centre for Epidemiology and Population Health, Australian National University
Bouhours	Brigitte	School of Criminology and Criminal Justice, Griffith University
Breen	Gabrielle	National Centre for Epidemiology and Population Health, Australian National University
Cameron	Jacqui	Turning Point Alcohol and Drug Centre
Caulkins	Jon	H. John Heinz III School of Public Policy and Management, Carnegie Mellon University, USA
Dance	Phyll	National Centre for Epidemiology and Population Health, Australian National University
Deane	Peter	National Centre for Epidemiology and Population Health, Australian National University
Degenhardt	Louisa	National Drug and Alcohol Research Centre
Dietze	Paul	Turning Point Alcohol and Drug Centre
Dovers	Steve	Centre for Resource and Environmental Studies, Australian National University
Dray	Anne	CIRAD Australia Research School of Pacific & Asian Studies, ANU
Foote	Jeff	Institute of Environmental Science and Research Ltd
Godkin	Caroline	H. John Heinz III School of Public Policy and Management, Carnegie Mellon University, USA

Gregory	Wendy	Institute of Environmental Science and Research Ltd
Hamilton	Margaret	Department of Human Services and University of Melbourne
Hickman	Matthew	Centre for Research on Drugs and Health Behaviour, Imperial College, UK
Homel	Ross	Key Centre for Ethics, Law, Justice and Governance School of Criminology and Criminal Justice, Griffith University
Jolley	Damien	Monash Institute of Health Services Research.
Kimber	Jo	Centre for Research on Drugs and Health Behaviour, Imperial College, UK
Mazerolle	Lorraine	School of Criminology and Criminal Justice, Griffith University
McDonald	David	National Centre for Epidemiology and Population Health, Australian National University
Midgely	Gerald	Institute of Environmental Science and Research Ltd
Monagle	Shannon	Turning Point Alcohol and Drug Centre
Moore	Tim	Turning Point Alcohol and Drug Centre
Newth	David	CSIRO Sustainable Ecosystems
Perez	Pascal	CIRAD Australia, Research School of Pacific & Asian Studies, ANU
Pruden	Jonathon	Turning Point Alcohol and Drug Centre
Reuter	Peter	School of Public Affairs and Department of Criminology, University of Maryland, USA
Ritter	Alison	Turning Point Alcohol and Drug Centre
Rombouts	Sacha	School of Criminology and Criminal Justice, Griffith University
Smithson	Michael	School of Psychology, Australian National University
Soole	David	School of Criminology and Criminal Justice, Griffith University
Stoove	Mark	Turning Point Alcohol & Drug Centre
Strachan	Alex	University of Glasgow
Wardlaw	Grant	Australian Federal Police
Williams	Rachel	CSIRO Sustainable Ecosystems
Winstanley	Ann	Institute of Environmental Science and Research Ltd

Presentations to date

- Bammer, G. 2005 'Integrating policy analysis and complexity – Developing the new specialization of Integration and Implementation Sciences' 1st International Workshop on Complexity and Policy Analysis, 22-24 June 2005, Cork, Ireland
- Dietze, P., Caulkins, J., Quinn, C., & Godkin, C. (2005). Changes in heroin seizure purity in Victoria, Australia: A description of the purity changes associated with the heroin 'drought'. *Paper presented at the 16th International Conference on the Reduction of Drug-related Harm, Belfast, March.*
- Dietze, P., Hickman, M., & Kimber, J. (2005). Estimating the prevalence of problematic drug use in Melbourne/Victoria. Presentation to the Premier's Drug Prevention Council, Melbourne, June.
- Dietze, P., Hickman, M., & Kimber, J. (2005). Estimating the prevalence of problematic drug use in Melbourne/Victoria. Presentation to the Injecting Drug Harm Reduction Network, June.
- Longford, S. and Plant A. Confronting uncertainty: intelligence, epidemics and decision making. ANU-Toyota Public Lecture Series. The Australian National University, 13th April 2005. Associated with the 'Uncertainty Symposium'.
- Mazerolle, L. Soole, D. Rombouts, S. & Bouhours B. (2005) Systematic review of drug law enforcement. Paper presented at the 2005 Australian and New Zealand Society of Criminology annual conference
- Moore, T.J. (2004). Show me the money: Economics in A&D research and advocacy. Presentation at the Turning Point *Work In Progress* Symposium, Tuesday 17th August 2004.
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International links and collaborations

The Beckley Foundation, UK, International Network for Drug Policy Analysis

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