VOLUME THREE: METHODS AND MEASUREMENTS

Introduction

Susanne MacGregor and Betsy Thom

Overview

The articles in volume three illustrate developments in methodologies and measurement tools. They show the influence of growth in specialist knowledge and in innovative technologies. The articles also demonstrate the role of institutions in the accumulation and mobilisation of evidence. These processes reflect features of the second half of the 20th century when the study of drugs and alcohol expanded. This period saw improvements in the collection of national statistics and the creation of data-bases, along with support for research from national governments and international bodies, such as the World Health Organisation **(**WHO), United Nations Office for Drugs and Crime (UNODC) and European Monitoring Centre on Drug Dependence and Addiction (EMCDDA) as well as philanthropic foundations. International alliances and networks, such as the International Drug Policy Consortium (IDPC), the International Harm Reduction Association (IHRA), and Kettl Bruun Society, played a key role in the spreading of ideas and practices. Sources such as the Global Health Observatory and the statistical database Global Information System on Alcohol and Health and the production of annual World Drug Reports provided material for analysts to work with and indicators were developed for mortality, harm, misuse and diversion. These built on and were paralleled by similar activities at national level, especially in the USA, Canada, Europe and Australia. In 1996, the WHO Global Alcohol Database (now known as the Global Information System on Alcohol and Health - GISAH) was established with the first Global Status Report on Alcohol being published in 1999. The GISAH documents global patterns of alcoholic beverage use, health consequences, and national policy responses by country and is the world's largest single source of information on alcohol.

Today, 'information is the key ingredient of our social organisation,' (Castells 1996: 477). We live in an era in which the scientist, the researcher and the information analyst have become major players in social and political life: no policy or practice can be legitimate without appearing to have a base in evidence.

The written word is important in the mobilising of evidence and presenting 'plausible stories' . For a number of years, for example, there has been an introductory chapter to the annual report of the International Narcotics Control Board (INCB). This reflected awareness of the importance of a statement and an accessible summary (Ghodse 2008). Key documents, statements and presentation of evidence play an important agenda-setting role.

Three broad types of research can be identified: *basic, strategic* and *applied*, with *evaluation* studies being an important sub-set. There is curiosity-driven research for knowledge and research for management, planning and policy - since authorities need to measure if they are to manage effectively. Research initiated to address a specific knowledge gap or that has been commissioned by policy-makers tends to have a greater chance of being taken into account in decision-making - be it routine monitoring or evaluation of specific interventions or policies. However, building upon research findings to initiate or support policy changes is a complicated process. Many players are involved, and cooperation is needed between research, politics and practice. Attention has also to

be paid to dissemination: this has increased in recent years and there are now numerous research journals.

Many problems have been identified with research and evidence in the drug and alcohol field: for example, facts may be unreliable when we are dealing with a hidden problem (cf Spreen 1992) and all data are subject to contrasting interpretations and political manipulation. Much officially funded research is skewed towards quantitative data. On top of this are the questions 'what gets funded' and 'what gets published'.

Research has aimed to measure individuals, populations or harms, reflecting the varying purposes of projects. Governments often want to know the size of a problem and whether it is growing or reducing. Thus much work has focused on attempts to measure *prevalence* or *dependence* or the number of *problem substance users* (cf Bejerot and Maurice-Bejerot 1974; Hoffmann and Bahr 2010). Defining these categories has led to much discussion: one tendency has been to focus attention on the most severe cases, such as people who are dependent on alcohol or injecting drug users. But understandings of prevalence are sometimes complicated by adoption of wider definitions, such as *lifetime ever use* of a substance rather than *recent* or *regular* use. In reading reports of evidence, it is important to look carefully at the categories being applied and the specific research methods and measures.

Commonly used methods and measurements reflect contextual factors, such as how a problem is seen and related policy responses: these in turn act back upon perceptions and proposed solutions. Theories and explanations differ considerably, depending on the discipline involved (illustrated in volume two) and the historical and cultural setting (shown in volume one). Other influences are the institutional base (university, research centre, government department or hospital, for example) and patterns of funding: for example, more than 80 per cent of all research has been generated by the USA and much funding is oriented towards biomedicine. Prospective longitudinal studies are rarely done because of cost considerations and the unwillingness of some funders to think long-term. Longitudinal studies are however essential to a life course perspective in research and treatment (cf Hser et al 1993; Hser et al 2009). Repeat surveys like the European School Survey Project on Alcohol and Drugs (ESPAD) can make an important contribution in monitoring populations over time and allowing comparisons across countries.

An important feature has been the tendency for studies of drugs or alcohol to form separate and distinctive fields, involving different sub-groups and networks of researchers who can find it difficult to talk to each other. Sub-specialisms use different languages, concepts, tools and instruments. Because of the huge growth of information and data and in number of publications, researchers naturally focus on narrower topics. However advances in information technology and computing and refinements in statistical methods have helped to manage the amount and complexity of data (cf Roberts et al 2010). Qualitative methods have also advanced and claim special insight into complex social phenomena. The case study method helps to deal with complexity and can be useful in comparative studies. Community studies have used quite different methods, such as focus groups and open-ended interviews administered by trained field assistants, and mapping exercises. These do not try to hold constant certain variables (count and classify) but are part of action research (like participatory action research or health assessments) aiming at improvements in services or policies.

To deal with complexity, some researchers have developed multi-disciplinary teams and used mixed methods. For example the article by *Ames et al 2009* begins with a literature review which highlights their research question about the role of occupational setting on norms and behaviour. They argue that longitudinal survey data can be informative but alone is insufficient to answer all the questions. A fuller explanation was made possible by adding extensive ethnographic research to the array of methods utilised. To do this required building a methodologically diverse research team. They describe their approach as *trans-disciplinary,* meaning that investigators work together using a common conceptual framework informed by theories, concepts, and methodologies drawn from multiple disciplines. This they contrast with *multidisciplinary* research, where team members work separately from discipline-specific bases, and *interdisciplinary* approaches, where researchers work together but still from discipline-specific bases. In this research, the key disciplines involved were *social psychology* (focusing on measuring normative beliefs), *public health* (measuring drinking quantity, frequency, and outcomes over time), and *anthropology* (using semi- structured interviewing and observations to explicate beliefs, policies, and group interactions that inform drinking behaviour). Importantly in this study, equal prestige was accorded quantitative and qualitative methods, distinguishing it from those studies where qualitative research is the supplementary handmaiden to dominant quantitative approaches.

Systematic reviews are increasingly used as a way to make maximum use of accumulations of evidence, aiming to focus on higher quality and comparable data (cf Amato et al 2011). Tools such as synthetic reports targeted to decision-makers, or guidelines for practitioners based on the latest scientific evidence, play a significant role in bridging gaps between research, practice and policy.

The article by *Foxcroft and Tsertsvadze 2012* illustrates this method. They aimed to examine the effectiveness of school-based, family-based and multi-component universal alcohol misuse prevention programmes for children and adolescents. Three Cochrane systematic reviews were performed mobilising electronic searches in MEDLINE, EMBASE, PsycINFO, Project CORK and the Cochrane Register of Controlled Trials. The references of topic related systematic reviews and included studies were hand searched. Unpublished reports, abstracts, dissertations, brief and preliminary reports were also included. Two independent reviewers identified eligible studies and any discrepancies were resolved via discussion. This led to a total of 85 trials which could be included in the review. Individual study findings were summarized qualitatively. They noted that the reporting quality of trials was often poor. The conclusion of this review is that 'In order to better understand the importance of content and context for effective prevention, replication studies and more systematic reporting of programme content details and delivery contexts are needed' and that it is important to undertake studies with sufficient statistical power to detect small effects.

In the absence of relevant scientific data and where administrative data are unreliable, expert commentaries can be a valuable alternative. The article by *Nutt et al 2007* illustrates one way to use expert knowledge and is an interesting exercise in linking research findings to questions of decision making and policy formulation. In this influential paper, an attempt was made to assess the harms of a range of substances, importantly including alcohol and tobacco as well as a range of illicit and licit drugs. A nine-category matrix of harm was created and utilised through an expert delphic procedure to produce rankings of drug harm. This method is offered as an alternative to the process of classification used in existing UK policy, where a combination of expert committee members, civil

servants and government ministers contribute to decision-making, arguably a less 'rational' and 'evidence based' process than the one presented here (but cf Caulkins et al 2011).

The judgements of the experts consulted were based on accumulated evidence and their experience in the addiction field over a considerable period of time. Clearly an issue is who constitute the expert bodies doing the assessing and would different groups come up with different results? However Delphic principles offer a new approach that is being used widely to optimise knowledge in areas where issues and effects are very broad and not amenable to precise measurements or experimental testing, and are becoming the standard method by which to develop consensus in medical matters.

A shared characteristic of all these approaches is adherence to principles of scientific method, defined at its simplest as mobilising evidence in a systematic and rigorous way to help to answer questions. Basic sciences aim to identify causes, provide proof or forecast future trends, (although strictly speaking, the main aim should be hypothesis-testing, with hypotheses being written in ways amenable to falsification (Popper 1939)). The shared view of researchers is that judgements, evaluations or conclusions should be based on systematically collected evidence not just on random observations or opinions. The humanities end of the spectrum aims to understand what happens while the science end aims at proof. Social sciences stand somewhere in the middle sharing elements of each. Linked here also are ideas of the value of promoting 'evidence-based medicine', or 'evidenced-based policy and practice', with some arguing that there is a hierarchy of evidence where the gold standard is the randomised controlled trial: this is disputed by most humanities and some social scientific scholars.

From the varying discipline-based methodological approaches derive specific methods of research and measurements. The object of study varies too. Common items which researchers have tried to classify into types or measure by degrees are:- substance use, dependence or addiction; socio-economic characteristics of users; harms and nuisances; interventions, treatments, services and policies; criminal behaviour; and patterns of injecting, especially prominent in the post-AIDS era (cf Maher 2002). Some groups have been given more attention than others, such as young people or heroin users. Neglected groups or topics include women, older users and patterns of co-morbidity. Some topics have been studied more than others precisely because they are more amenable to measurement.

An important set of activities has related to the development of standardised measures, tools and instruments, in order to produce reliable data to allow comparisons across different countries or clinical settings: this assumes a shared underlying reality (cf Room 2006). Cross-national studies looking at diseases and putative risk factors are difficult to conduct: they have however led to the development of international classifications and standardised tools and measurements. The size and complexity of data has led researchers to develop *indicators* or proxy measures. These have been used to try to identify trends and patterns across settings or over time. Indicators can be useful if used carefully, that is if they are seen as can openers not used as labels. A range of indicative measures have been devised, for example of outcomes, effectiveness, cost-effectiveness, costs and benefits, quality, health status and criminality. The danger in practice is that reliance on simple measures can distort the complexity of reality and skew behaviour within organisations towards meeting these targets.

Underlying the increasing complexity of methods and measurements is the question of the quality of the data – the observation 'rubbish in - rubbish out' draws attention to the details of how information is collected, and the importance of adhering to core principles of good social research practice. Issues that researchers need to pay attention to include, for example, the proportions of (and explanations for) non-response to surveys, the reliability of self-reported data, how questions were framed, interpreted and answered and other contextual factors, including where the research was carried out and how independent were the researchers? If these are neglected, research can be worthless: training in social research methods is essential.

The articles in volume three illustrate these issues. As we have noted, much research in the field of drug and alcohol studies is applied, that is, it focuses on implications for policy and practice. One key issue is the population observed, especially whether these are treatment populations (cf Hjern 2004) or community samples. Much evidence is derived from people in treatment and is thus highly skewed. It is important to look at the details of how populations were recruited (cf Jansson and Spreen 1998; Maxwell and Pullum 2001). Often populations are defined in terms of use of a specific substance – like alcohol or heroin – but in practice most users take a variety of substances.

Sub-sets of studies are treatment studies, which focus on individuals, and prevalence studies, which focus on populations. A middle layer of studies has looked at groups, institutions or services operating at the meso level.

Treatment studies

While the bulk of research in the drug and alcohol field involves socio-demographic, cognitive and psychological measures, more recent studies have incorporated neuro-imaging methods, such as functional magnetic resonance imaging (fMRI), electroencephalography (EEG) and positron emission tomography (PET). The American Society of Addiction Medicine's definition of addiction (ASAM 2011) states there are multiple areas of the brain involved in addiction to food, sex, alcohol and other drugs. Addiction is thus not specific to particular substances. Neuro-scientific approaches to research focus on the role of regions of the brain and link to addiction-related symptoms. Neuro-imaging is playing an increasingly important role in addiction medicine. It is a growing field of research with implications for both treatment and policy.

As an illustration of the revival of interest in the brain disease model of addiction and development of related methods of measurement, the article by *Amen et al 2012* outlines the use of brain SPECT imaging. The article argues that in the clinic, brain imaging could replace the complex measures and methods which have developed, including clinical histories, symptom clusters, self-rating questionnaires and mental status examinations. Such studies in future may influence the shape of treatment and represent a sub- set of research projects developing relatively separately from most research in the drug and alcohol field as yet.

In general however, more traditional research relating to treatment, such as interventions in treatment and care and questions of effectiveness, form a larger sub-set. Specific items observed and measured here may include, for example: length of time receiving a methadone prescription; heroin use in the last thirty days; proportion injecting or proportion sharing needles; degree of social

integration; availability of access to residential rehabilitation; or retention in treatment after two months. To measure outcomes at programme level, indicators of the quality of services may be derived, such as, for example: average medication dose; patient satisfaction; perception of treatment by staff and patients; or availability of ancillary services. The aim is often to compare outcomes of different *treatment modalities*. Various tools have been developed relating to patient outcomes (well-regarded ones include MAP and TOP in the UK and, in the USA, RADARS and ASI, the Addiction Severity Index (McLellan et al., 1980)). ASI identifies a number of problem domains arising from addiction: psychological; social adjustment; legal; health; and employment. This measure has shown good reliability and correlates well with other measures of the problem domains assessed.

The article included here by *Saunders et al 1993* describes the development of the Alcohol Use Disorders Identification Test (AUDIT). This evolved from a WHO Collaborative Project where the aim was to develop standardised measures applicable across cultural and national settings. AUDIT is a screening instrument, a 10-item questionnaire, and provides a simple method of early detection of hazardous and harmful alcohol use in primary health care settings.

The research reported here in *Hartnoll et al 1980* was an early test of the value of heroin prescribing when compared with oral methadone, an issue which continues to elicit much debate. Patients were recruited from London drug dependence clinics to a trial between 1972 and 1975 and followed up over a 12 month period. This involved social research outside the clinic and acceptance of the researchers by the patients. Ethical questions influenced recruitment criteria: participants had to be confirmed injecting heroin addicts refusing other forms of treatment. However, patients did not know they were in a trial. Today, with stricter attention to ethics and governance issues in the conduct of research, this lack of informed patient consent would not be acceptable. Researchers are now expected to follow Good Clinical Practice Guidelines and operate in accordance with the Declaration of Helsinki.

The article by *Bell and Salmon 2012* draws attention to some of the problems associated with standard research governance and ethical approval procedures when illicit drug use is the topic of research. They note that people who use illicit drugs are frequently identified as a *vulnerable population* requiring special protection and additional safeguards in research. In practice, members of research ethics committees often operate on the basis of biased opinions and untested assumptions. Bell and Salmon from their experience highlight a number of ethical issues and consider each of these in turn. They conclude that there are no easy answers: the issues are complex but can be dealt with if researchers and committees are sensitive and reflective.

Research may also aim to measure costs and benefits. These can cover a wide range, counting specific treatment costs but also costs to housing, law enforcement, lost productivity and so on (cf McCollister et al 2010; Mäkelä 2012). Cost and benefits may be assessed over periods of time: the longer the period of time following an intervention or treatment, the more other factors can enter in, making it difficult to attribute change to the specific intervention.

The research reviewed in *Cartwright 2000* illustrates the way in which attention to service-costs has become more prominent over time. This research involved a systematic analysis of 18 studies, all conducted in the USA between 1970 and 1999. The article is valuable in showing how complicated a matter it is to assess treatment, intervention or policy costs and benefits. This is salutary, given the lure of simple figures to show *treatment works* (or does not work) in political debate: for example, a

benefit–cost ratio of 4.1 may be interpreted to indicate that for each dollar society spends on treatment, there are 4.1 dollars in benefits. Studies usually rely on administrative data and may involve measures of pre- and post- treatment outcomes and costs. Clear presentation of assumptions, formulae and parameters is essential in cost–benefit analyses. Analyses need to adjust for confounding factors. Effectiveness may be measured for a range of outcomes, such as patterns of substance use, criminality, health care utilization, employment and welfare transfers.

In estimates of the burden on society of the total social costs of drug abuse, the largest share of costs often relates to criminal activity. The research described in *Gossop et al 2003* was influential in legitimising drug treatment in UK at the time and the acceptance of policies diverting problem drug users from the criminal justice system into treatment. Building on the growing interest in assessing treatment effectiveness, NTORS was the first prospective national study of treatment outcome among drug misusers in the United Kingdom. NTORS investigated outcomes for drug misusers treated in existing services in residential and community settings and used a longitudinal, prospective cohort design. Data were collected by structured interviews at intake to treatment, and informants followed up at 1 year, 2 years and 4–5 years. Attrition is a key problem for cohort studies: follow up was relatively successful here with 88 per cent retained at 2 years and 76 per cent at 4-5 years.

Large-scale, prospective, multi-site treatment outcome studies play an important role in improving our understanding of treatment effectiveness (Simpson 1997). Previous treatment effectiveness studies in the USA such as the Drug Abuse Reporting Program (DARP), the Treatment Outcome Prospective Study (TOPS) and the Drug Abuse Treatment Outcome Study (DATOS) form the background here (Hubbard *et al*. 1989; Simpson & Sells 1990; Hubbard *et al*. 1997). The question for policy and research was how far recommendations from studies carried out in the USA are applicable to other countries. *Gossop et al* concluded that there are many similarities between the two countries (USA and UK) in outcomes from large-scale, multi-site studies.

Notable in this research is the post AIDS era interest in measuring injecting patterns and sharing of equipment. Another interesting finding was that results of urine screening provided evidence of the validity of self-reported drug use.

Among both professionals and the wider public, there is continuing interest in the value or not of heroin prescribing. Some argue that the best way to answer these questions is through a Randomised Controlled Trial (RCT). However researchers often find it difficult to engage participants in addiction research and effective implementation of randomization to placebo or control treatment is seen as one of the most significant barriers with the likelihood of significant early drop-outs in the control arm.

The article by *Oviedo-Joekes et al 2009* illustrates some of the ethical, regulatory, logistical, methodological, and political challenges that may arise. The North American Opiate Medication Initiative (NAOMI) aimed to be a RCT to evaluate the hypothesis that pharmaceutical grade heroin, diacetylmorphine (DAM) is more effective in retaining patients and improving their outcomes than Methadone Maintenance Treatment (MMT) among those with chronic, refractory injection opioid dependence. The trial was initiated in March 2005 at two Canadian sites (Vancouver and Montreal).

A key measure when assessing the effectiveness of services is retention rates. However these can be influenced by the context within which a service operates. In the case of this trial, the context was one where the relatively repressive and controlling philosophy in North America influenced the likelihood of success, through factors like police attitudes, neighbourhood attitudes, and the availability of other services. Another constraint on this trial was that recruitment was restricted to those who had not been in any treatment program in the previous six months. None of the European HAT trials imposed this restriction: indeed some of them required that volunteers had to be on MMT to be eligible. As a result, recruitment into NAOMI took much longer than anticipated, illustrating the common problem of much slower and lower recruitment to RCTs than anticipated in research proposals. An interesting feature of the design of this trial was the use of financial incentives for research visits to encourage participation in research – this is increasingly the case in research studies, although it carries with it its own problems.

Prevalence studies

Unlike RCT studies which try to find causes, the key measure in prevalence studies is of correlation: researchers calculate odds ratios which are a measure of association not causation. Epidemiological methods play an ever more important role in drug and alcohol research. One approach common in population health studies involves calculating the value of a life saved, using a measure of DALYS: these combine years of life lost due to premature death and years of life lived with disabilities into one indicator that assesses the total lost years of full health from different causes (WHO 2013).

Prevalence studies have been important in constructing new concepts, such as of hazardous, harmful and problematic drug and alcohol use, or of binge drinking or episodic heavy consumption. Spatial analyses have encouraged better targeting of responses. Data analysis is of critical importance here, involving sophisticated statistical methods, and care in selection of conceptual tools (cf De Angelis et al 2004; Caulkins et al 2004). Researchers have also warned against over-reliance on the average as this can obscure important variations in patterns.

Prevalence studies look at patterns at population level and may reveal issues of co-morbidity as in the seminal paper by *Regier et al 1990.* This utilised data from the National Institute of Mental Health Epidemiologic Catchment Area Program to assess the co-morbidity of alcohol, other drug abuse, and other mental disorders based on the estimated true prevalence rates of these disorders in the community and institutionalized population of the United States. It used a standardised research tool, the NIMH Diagnostic Interview Schedule, which is a highly structured diagnostic instrument for assessing ADM disorders in the same interview. Designed specifically for use in large epidemiologic studies, the Diagnostic Interview Schedule was administered by trained lay interviewers.

The findings reported in this article provide clear and persuasive evidence that mental disorders must be addressed as a central part of substance abuse prevention efforts: they are also important in showing the high prevalence of mental and addictive disorders in the prison population. Such studies do not tell us however whether mental disorders are the cause or consequence of use of alcohol and drugs.

The article by *Cervantes et al 2012* describes an environmental survey instrument (ESI) which was a 53-item self-report survey tool to collect data on alcohol consumption patterns and risky behaviours. It was developed to evaluate a Texas program where ten community coalitions in seven counties implemented an environmental strategy to reduce underage and college age binge drinking. Items included measured perceived access, perceived risk, community norms, individual norms, peer norms, family norms, knowledge of legal consequences, perceived enforcement and perceived physical harm. The ESI was available in Spanish and English. The survey was conducted by phone, using trained interviewers. Interestingly the refusal rate among those contacted was approximately 48 per cent. These researchers comment that phone surveys are becoming increasingly difficult to conduct, especially with participants aged 18–25. Many young people have cellular phones, reducing access to their phone numbers. This is a common problem for researchers today who need to adapt their methods to contemporary use of smart phones, tablets and social media.

Midford et al 1998 reports on a community-based study carried out in Australia which used an innovative software technique (GIS). This allowed researchers to describe, in geographical terms, the nature and strength of the relationship in Western Australia between alcohol consumption and rates of related injury. Items observed included night-time assaults, minor night-time road crashes weighted by traffic density and hospital data on cause of morbidity, weighted by alcohol aetiologic fractions. The discovery of spatial variations argued for targeted policy responses.

Public health analyses, such as that reported by Midford et al, use routinely collected administrative data or specific survey results to arrive at calculations of, for example, per capita consumption. A range of sources for data may be available, from hospitals, police, licensing authorities etc and these can be combined to produce prevalence measures and estimates of relative risk for specific conditions. This effort involves careful statistical analysis and is made possible by advanced computing systems. The MAPP project (of which this article is a part) shows how existing alcohol databases can be used in a more integrated and effective way and can be tools for greater community understanding and control of alcohol programs.

The article by *Stockwell et al 1996* emphasises the importance of taking care in analysis of data, especially avoiding over reliance on averages. This paper offers a critique of the *preventive paradox* (Kreitman 1986) which had noted that most people who experience some adverse consequence relating to their recent drinking typically consume only small or moderate amounts of alcohol per week. They recognise that Kreitman should be credited with the important observation that alcohol-related harm is not confined to a few dependent drinkers. However Stockwell and colleagues argue that a 'commonplace truth' underlies Kreitman's apparently paradoxical findings. They show that 'the preventive paradox disappears' when consideration is given to the *amount* of alcohol consumed on either the day of highest alcohol intake out of the last four or the day on which acute alcohol-related harm occurred. Episodic heavy consumption by people whose average alcohol intake can be classified as 'low' or 'medium' risk contributes, they demonstrate, to the bulk of experiences of harm. It is *intoxication* - as a public health and safety issue – which is important. Different messages are required for the prevention of different alcohol-related problems: intoxication presents one set of harms (accidents, violent arguments, time off work); regular use another set (liver cirrhosis, breast cancer, cognitive impairment). These writers argue that there would be more traction in campaigns for a reduction in episodes of intoxication rather than advising everyone to drink less.

This observation linked into an emerging concern in research and policy with *binge drinking* (cf Gmel, Kuntsche & Rehm 2010).

Qualitative approaches

Qualitative research aims to explain behaviour, answering the why questions not just describing or counting behaviours. Methods used include open-ended interviews, topic guides, and tape-recording, transcribing and thematic analysis of interviews.

Qualitative research linked to the HIV/IDU link played a major part in shaping new policy responses. Expertise was built up through contacts between researchers in different countries, learning to use for example indigenous field workers. Very detailed work on understanding the nuances of behaviour associated with injecting and sharing needles played a key role in building an evidence base for harm reduction programmes. All this had direct practical relevance in terms of what sort of services should be provided. It allowed researchers to give detailed information to international development funders about what sort of packages of interventions to fund and support.

Sophisticated qualitative interviews offer enhanced reliability (cf Järvinen and Ravn 2011). But this has to be offset by the impracticability of using this method on a large scale. Qualitative research is useful in questioning taken for granted assumptions in survey research, it can help to identify questions on which to focus and to formulate questions, and is often used in piloting questionnaires. Qualitative studies have helped to answer questions around how to measure consumption. It is common to ask people to report their consumption in terms of standard drinks but this can ignore the meanings of drinking and drink that can affect the behaviours reported. Qualitative research thus focuses on context and meanings, and questions whether policy and practice that ignores these influences will be adequate in changing behaviour.

As we have seen, in population surveys much research focuses on patterns of consumption and how to measure these, an issue discussed in the article by *Strunin 2001,* which adds a commentary from qualitative research to the dominant quantitative approaches used in many studies. The question is whether the responses given to standardised survey questions or instruments can be relied on; what is the influence of the setting in which the interview takes place, the status of the interviewer and the understanding of language used in questioning? Strunin focuses on the problem of a common apparent under-reporting of consumption in self-report surveys. The method used here was an open ended, qualitative interview conducted in a school setting. Interviews were analysed using Ethnograph software, a text retrieval program geared toward depth exploration of data. The study shows how beliefs and norms about drinking affect reporting of amount. Strunin is also critical of the ways in which ethnic categories are sometimes used in surveys, where groups with different cultures are lumped together in broad categories which do not represent differences of norms and values. The advantage of qualitative interviews is to more accurately capture drinking patterns, including the amount and type of alcohol consumed in different contexts. This study also raises the issue of whether standard measures developed from studies of adults are suitable for adolescents or for other groups like women or people from different ethnic or religious groups.

In epidemiology, the *attributable fraction* denotes the proportion of an outcome which could have been reduced had a given exposure not occurred: assessing this using survey methods can be difficult. In the article *Gmel et al 2010,* researchers used data from Swiss participants in the 2007 European School Survey Project on Alcohol and Drugs (ESPAD). The alcohol-use measures were frequency and volume of drinking in the past 12 months and number of risky, single-occasion (greater than five drinks) drinking episodes in the past 30 days. The findings give measures of exposure to alcohol, measures of adverse consequences of alcohol drinking and measures of risk. The study looked in particular at how answers were affected by whether or not alcohol was mentioned in the questioning.

The above studies illustrate how more refined and appropriate measures have developed over time. However, this can involve increased costs, complexity and length of studies. In the real world, especially in rapidly changing situations or in resource limited contexts, there is a need for simpler but also reliable methods. Hence we have seen the emergence of rapid assessment methods.

In *Stimson et al 2006* data were derived from RAR studies conducted in Beijing, China; Bogotá, Colombia; Greater Rosario, Argentina; Hanoi, Vietnam; Kharkiv, Ukraine; Minsk, Belarus; Nairobi, Kenya; Penang, Malaysia; St. Petersburg, Russia; and Tehran, Iran. The explicit purpose of this research was to more effectively link assessment to the development of appropriate interventions. This is applied research which has value in public health research and planning.

The rapid assessment approach is characterised by speed and the use of multiple methods (including analysis of existing data, key informant interviews, focus groups, observations, mapping, and population estimation) and multiple data sources. It requires an investigative orientation, involving data triangulation, inductive modes of analysis and multilevel evaluations, including community involvement, and collaboration between partners is a key element. One contrast between applied research and scientific research is in the form of publication: most rapid assessment guides and reports remain in the unpublished literature. This along with the general issue of publication bias (where successful projects are more likely to be reported than failed ones and there are constraints on reporting lengthy process information) has implications for the way evidence is constructed.

Compared to studies looking at individual behaviours, different techniques are needed to study groups. Examples of methods used here in the drug and alcohol field are ethnography and vignettes.

Because of an interest in the role of research in rapidly changing conditions and the question of what are appropriate methods, the article *Power 2002* draws attention to the potential of ethnographic methods in such situations. Again the emphasis is on useful knowledge. Power argues that ethnographic methods can contribute in many ways: as part of a multi-indicator research strategy; in developing action research projects; in formative evaluations and rapid assessments; as part of social network and mapping exercises; in setting the scene for prevalence surveys; complementing epidemiological studies; confirming and augmenting other research findings; as an integral part of process evaluation; in the context of randomised controlled trials; and are of value in their own right.

But exactly what is the ethnographic method? (cf McKeganey 2003). One key feature is participant observation. In classical anthropology, the method involves total immersion in the field of study. It covers a range of techniques such as the use of diaries and field notes and contains a reflective

element. Observations focus on social relationships and culture (rather than individual behaviours). Such in-depth study usually requires considerable time commitment.

Bourgois and Schonberg 2007 is an example of research from leading ethnographers in this field. Bourgois' earlier study (2003) is a famous and classic example of anthropological method (cf also Bourgois 2002; and Williams 1989). In the study included here, Bourgois collaborated with Schonberg to report on ten years of participant-observation fieldwork and included innovatively the use of photography. A key concept in this literature is that of *habitus* (Bourdieu 2000) and the organising paradigm is one which sees systematic connections between macro structural features and social relations at the micro level. The observations accumulated are interpreted through use of theories derived from wide reading and construction of new concepts (such as *intimate apartheid*) to explain the complexities involved. This approach differs from positivist methods which assume an objective reality amenable to measurement using universal categories and standardised tools. The main interest of these researchers is in observing and explaining everyday practices. The lives of homeless injectors in San Francisco are as valid and legitimate as the lives of any others – for example politicians, business people or the sailors studied in the first article in this volume. The assumption of pathology which runs through much of the literature on drugs and alcohol is absent here.

However since the extensive periods of study required in anthropological research are not always possible, Power argues that there can be value in even brief observations. Direct observation can provide a check on one of the main problems with much research in the field of drug use, which is an over-reliance on self-reported accounts, especially concerning risk behaviour. It can however begin to merge with inspection and audit if not carried out sensitively and with regard to the uses to which findings are put.

Whereas ethnographic methods observe responses to real life situations, interviews and vignettes uses hypothetical situations to try to access social processes. *Vignettes* refers to a technique used in structured and depth interviews as well as focus groups, providing sketches of fictional (or fictionalized) scenarios. In the article by *Jenkins et al 2010* an account is given of the use of *developmental vignettes*. These are hypothetical scenarios which unfold through a series of stages, adding an interactive component, and focus on situated data on group values, group beliefs and group norms of behaviour. The aim is to achieve insight into the social components of participants' interpretative frameworks and perceptual processes.

Conclusion

The articles selected for volume three illustrate the vast range and variety of approaches and methods used in research in this field, which can be pure and specialist or multidisciplinary and applied. The result has been the accumulation of a mountain of evidence on the broadly defined phenomena of drug and alcohol use. Volumes one and two showed that morals, habits and values are as important as evidence in framing discussions. In looking at the articles in volume four, it will be interesting to consider in what ways, if at all, does evidence link to policies and, in volume five, how far has research shaped the development of specific interventions?

References

Laura Amato, Marina Davoli, Simona Vecchi, Rober Ali , Michael Farrell , Fabrizio Faggiano, David Foxcroft, Walter Ling, Silvia Minozzi, Zhao Chengzheng (2011) 'Cochrane systematic reviews in the field of addiction: What's there and what should be' *Drug and Alcohol Dependence* 113: 96–103

Daniela De Angelis, Matthew Hickman and Shuying Yang (2004) 'Estimating Long-term Trends in the Incidence and Prevalence of Opiate Use/Injecting Drug Use and the Number of Former Users: Back-Calculation Methods and Opiate Overdose Deaths' *American Journal of Epidemiology* Vol. 160, No. 10: 994–1004

ASAM (American Society of Addiction Medicine) (2011) *Public Policy Statement: Definition of Addiction* http://www.asam.org

Nils Bejerot and Carol Maurice-Bejerot (1974) 'Methods of Studying Prevalence and Incidence of Drug Abuse' *Scand J Public Health* 1974 2: 99-104

P Bourdieu (2000) *Pascalian Meditations* Stanford University Press: Stanford

P. Bourgois (2002), 'Anthropology and epidemiology on drugs: The challenges of cross-methodological and theoretical dialogue', *International Journal of Drug Policy*, 13 : 259–269

P Bourgois (2003) *In Search of Respect: selling crack in El Barrio* Cambridge University Press: New York

Manuel Castells (1996) *The Rise of the Network Society* Blackwell: Oxford

J P Caulkins, D A Behrens, C Knoll, G Tragler and D Zuba (2004) 'Markov Chain Modeling of Initiation and Demand: The Case of the US Cocaine Epidemic' *Health Care Management Science* 7, 319–329

Caulkins J. P., Reuter P., Coulson C. (2011) 'Basing drug scheduling decisions on scientific ranking of harmfulness: false promise from false premises'. *Addiction* 106: 1886-90

Hamid Ghodse (ed) (2008) *International Drug Control into the 21st Century* Ashgate: Aldershot

Gerhard Gmel, Emmanuel Kuntsche & Jürgen Rehm (2010) 'Risky single-occasion drinking: bingeing is not bingeing' *Addiction* doi:10.1111/j.1360-0443.2010.03167.x

Anders Hjern (2004) 'Illicit drug abuse in second generation immigrants: a register study in a national cohort of Swedish residents' *Scandinavian Journal of Public Health* 32: 40-46

John P. Hoffmann and Stephen J. Bahr (2010) 'Estimating the Prevalence and Frequency of Adolescent Drug Use: Do the Models Fit the Measures?' *Journal of Drug Issues* 40: 871 -900

Yih-Ing Hser, M. Douglas Anglin, Keiko Powers, (1993) 'A 24 year follow up of Californian Narcotics Addicts' *Arch Gen Psychiatry* 50: 577-584

Yih-Ing Hser, Alison Hamilton and Noosha Niv (2009) 'Understanding Drug Use over the Life Course: Past, Present, and Future' *Journal of Drug Issues* 39: 231-236

Hubbard, R. L., Marsden, M. E., Rachal, J. V., Harwood, H. J., Cavanaugh, E. R. & Ginzburg, H. M. (1989) *Drug Abuse Treatment: a National Study of Effectiveness*. Chapel Hill: University of North Carolina Press.

Hubbard, R. L., Craddock, S. G., Flynn, P. M., Anderson, J. & Etheridge, R. M. (1997) 'Outcomes of one year follow up outcomes in the Drug Abuse Treatment outcome Study (DATOS)' *Psychology of Addictive Behaviors*, **11**, 261–278.

Ingegerd Jansson and Marinus Spreen (1998) 'The use of local networks in a study of heroin users: assessing average local networks' *Bulletin de Methodologie Sociologique* 59: 49-61

Margaretha Järvinen and Signe Ravn (2011) 'From recreational to regular drug use: qualitative interviews with young clubbers' *Sociology of Health & Illness* Vol. 33 No. 4: 554–569

N Kreitman (1986) 'Alcohol consumption and the preventive paradox' *British Journal of Addiction* 81: 353-364

Lisa Maher (2002) 'Don't leave us this way: ethnography and injecting drug use in the age of AIDS' *International Journal of Drug Policy*, 13, 4, : 311-325

K Mäkelä (2012) 'Cost of alcohol studies as a research programme' *Nordic Studies on Alcohol and Drugs* 29: 321-343

Jane Carlisle Maxwell and Thomas W. Pullum (2001) 'Using a modification of the capture-recapture model to estimate the need for substance abuse treatment' *Evaluation and Program Planning* 24: 257-265

Kathryn E. McCollister, Michael T. French, Hai Fang (2010) 'The cost of crime to society: New crime-specific estimates for policy and program evaluation' *Drug and Alcohol Dependence* 108: 98–109

Neil McKeganey (2003) 'The bitter sweet poison of ethnographic research' *International Journal of Drug Policy* 14: 123-125

McLellan, A.T.; Luborsky, L.; Woody, G.E.; and O'Brien, C.P. (1980) 'An improved diagnostic evaluation instrument for substance abusers: The Addiction Severity Index' *J Nerv Ment Dis* 168:26-33,

Karl Popper (1939/1959) *The Logic of Scientific Discovery* Routledge Classics: London

Eric T. Roberts, Samuel R. Friedman, Joanne E. Brady, Enrique R. Pouget, Barbara Tempalski, Sandro Galea (2010) 'Environmental conditions, political economy, and rates of injection drug use in large US metropolitan areas 1992–2002' *Drug and Alcohol Dependence* 106: 142–153

Robin Room (2006) 'Taking account of cultural and societal influences on substance use diagnoses and criteria' *Addiction,***101** (Suppl. 1), 31–39

Simpson, D. D. & Sells, S. B. (1990) *Opioid Addiction and Treatment*. Malabar, FL: Robert E. Krieger Publishing Co.

Simpson, D. D. (1997) ‘Effectiveness of drug abuse treatment: a review of research from field settings. In: Egertson, J., Fox, D. & Leshner, A., eds. *Treating Drug Abusers Effectively*, pp. 41–73. Oxford: Blackwell

Marinus Spreen (1992) ‘Rare populations, hidden populations, and link tracing designs; what and why? ‘ *Bulletin de Méthodologie Sociologique* 36: 34-58

WHO 2013 WHO website - DALY calculations http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/index.html Accessed 10/08/13

Terry Williams (1989) *The Cocaine Kids: the inside story of a teenage drug ring* Addison-Wesley Publishing: Massachusetts