Uncovering the truth about drug use

Professor Mark Harris explains the role that economists can play in understanding societal health problems, and specifically his work getting to grips with the under-reporting of drug use

Can you begin by introducing your major research focus?

My areas of expertise lie in the application and development of mathematical (econometric) methods and models across a wide variety of areas. Lately I have developed a strong interest in health economics in general, and in particular health behaviours related to licit and illicit substances. I believe that this is an increasingly important area, to better know and understand the complex inter-relationships in areas such as these, and therefore to be able to supply policy makers with as much information as possible to better inform policy and therefore more effectively control these socially adverse behaviours.

What can economists such as yourself bring to the study of drug use and its consequences that is not provided by more traditional actors working in this sector?

Economists can make a unique contribution to understanding drug consumption by providing important insights on its demographic and socioeconomic drivers, and also the impact of drug use on educational attainment, the labour market and so on. Such findings will be important for drug campaigns and the effectiveness

of policies such as taxation and licensing. Economists also make an important contribution towards estimating more accurate prevalence rates of drug use in the population, which is commonly known to be underreported with important consequences on policy formulation.

With this in mind, what are the goals of your research into misreporting of drug use?

We have several major goals for this broad area of research. Firstly, we want to bring these reporting issues to the forefront of research based on data of this sort. Secondly, we wish to provide researchers with the appropriate tools with which to address and quantify these effects. Finally, we want to give policy makers and healthcare professionals alike more reliable rates of participation in such behaviours, and to more accurately identify and quantify the drivers of this.

Do you use a similar approach for a variety of different drugs, regardless of how 'hard' they are?

To a certain extent the general approaches we've been using are driven by what variables and data are available to us. We suspect that the same broad set of drivers will be applicable for most drugs, although their effects are likely to differ vastly across these. However, the 'harder' the drug, the lower the recorded participation rates are likely to be, and the more difficult it is to get more

precise estimates of 'true' participation rates, misreporting rates, and so on.

Globally there seems to be a shift in attitudes to certain illegal drugs, particularly as more and more countries make moves to legalise cannabis. Do you think this attitude shift will have an impact on the inaccurate reporting of drug use?

One would expect that the legalisation of cannabis would dismiss any fear of legal consequences and would also reduce the social stigma associated with cannabis use. Consequently, people would have an incentive to more truthfully report their consumption. However, this hypothesis is yet to be validated. If proven, there are likely to be similar knock-on effects with the reporting of other drugs.

Is your work applicable in the study of other 'social bads' that might go under-reported?

Yes, the modelling approach is applicable to any data collection where respondents have an incentive to misreport activities that can be regarded as socially undesirable or which are associated with perceived social stigma or legal consequences. Some examples are the prevalence of mental health issues, gambling and sexual behaviours.

A better basis for drug policies

*In collaboration with an international team, a researcher at **Curtin University** has set out to uncover the factors influencing the underestimation of drug use in Australia, and suggest measures to collect more accurate data*

In recent years, societal attitudes to recreational drugs have changed considerably in some parts of the world. Perhaps the best example is cannabis, a widely used substance that has been decriminalised or legalised in various jurisdictions from the US to Portugal. However, even in places where such shifts have taken place, recreational drugs still remain largely taboo, meaning people are likely to be unforthcoming when asked about their own drug-taking habits.

This is a problem for health professionals and policy makers trying to establish effective measures to deal with the use of such drugs. While attitudes to these substances are indeed changing, the fact remains that even if used in a regulated context recreational drugs can have all sorts of harmful effects. Making effective interventions requires knowledge of the demographic and individual factors affecting drug use, and to do this researchers need access to accurate data. Misreporting of drug use among survey participants can be a major barrier to the collection of such data, and it is one that Professor Mark Harris, an expert in econometrics at Curtin University in Perth, Australia, has set out to overcome.

WHY MISREPORT?

For Harris, it's obvious that there can be many reasons underlying someone's decision to misreport their use of drugs. 'Clearly participants, especially substance users, are faced with numerous concerns about reporting their use accurately,' he

says, highlighting the perceived social undesirability of such substances, as well as social stigma and potential legal ramifications. 'Put simply, jointly these mean that the raw numbers obtained from large scale surveys regarding the number of users in the population, and the consumption levels of such (and so on), are likely to be somewhat unreliable.' Specifically, he says, such surveys are likely to underestimate the prevalence of these behaviours.

The question, then, is how to deal with the 'excess zeros' (resulting from false reporting) that arise in survey data owing to these factors. Harris, together with colleagues from various international institutions, took as his data set the Australian National Drug Strategy Household Survey – a nationally representative survey of the Australian civilian population aged over 14 years. Such a large scale survey can broadly be seen as indicative of the Australian population as a whole, and it provides ample data for researchers like Harris and his team.

The team proposed a modelling framework in which individuals decide whether to participate or not, and then for participants, they decide whether to misreport or not. They have equations relating to people's propensities for consuming a particular drug, misreporting of use, and then also consumptions levels. 'By careful choice of variables that should ostensibly only affect

one of these propensities, we are able to probabilistically group individuals into the various categories of: genuine non-participant; a misreporting user who stated zero consumption, an accurately reporting user, and an accurately reporting infrequent user,' explains Harris.

SIGNIFICANT UNDERESTIMATION

The results of this work are astounding. While observed participation rates for cannabis, for example, were around 12 per cent, the true participation rates that Harris and his team worked out are nearly double that at 23 per cent. Similar results were found for speed and cocaine, which both showed true participation rates that were over double that of the participations rates originally recorded. Moreover, their results showed that the harder the drug, the more likely someone is to misreport their use of it. The estimated chances of someone misreporting use of cocaine, for example, are 65 per cent, compared to 31 per cent and 17 per cent for cannabis and speed, respectively.

For Harris, these results chimed with previous studies undertaken in the US and the UK, and therefore broadly met the expectations of his team. Certain characteristics affect an individual's likelihood of misreporting, such as gender, age, income and education. The key point that has arisen out of this work, however, is an indication of how steps can be taken to

ameliorate this situation. 'We expected survey design and administration to influence drug misreporting, which our research confirmed,' says Harris. 'Our findings suggest that the extent of misreporting can be significantly affected by how the survey was administered, how trusting participants were of the survey in general, and a third party presence when the survey was undertaken.'

Seeing as the surveys themselves may be partly responsible for the underestimation of drug use prevalence in Australia, this seems like an obvious target for improvement. Harris' work highlights particular aspects that can be targeted, and in doing so the people managing future surveys should be able to collect better data.

STABLE FOUNDATIONS
This area of research has been largely neglected, and that is a great pity, seeing as the data under consideration have an influence on big decisions made by policy makers. Taking cannabis as an example, this is a drug that places a huge social and economic cost on society, resulting in huge quantities of public funds flowing into campaigns to prevent its use and rehabilitation programmes to deal with people who are suffering as a result of overuse. These measures have been matched by a significant research effort to ensure that they are evidence-based. However, if the very foundations upon which such research is built – i.e. the data – are shaky, then much of the resulting efforts will be rendered meaningless. This, of course, is where Harris and his team come in.

'Our findings have important implications for policy making given we estimate more accurate measures of drug prevalence in the population,' says Harris. On top of this, estimates made by the team of the effects of demographic and socioeconomic determinants will help identify the groups that are best to target when undertaking anti-drug campaigns. Young people, for example, were more likely to misreport their drug usage, suggesting that they are the best people to target such messages towards.

Though Harris' work is based on Australian data and is therefore specific to Australia, he notes that it is likely that similar untruthful reporting of drug use is common worldwide – at least in developed countries where anti-drug stigma tends to be more significant. Furthermore, the same principles and approaches can be applied to other behaviours where people have an incentive to under-report. Harris thinks that this kind of work has direct applications in the economics of health, and would like to see it having real-world impact: 'We would like to see more widespread acknowledgement of these issues and the adoption of appropriate techniques to adjust for such,' he explains. 'Ultimately this will lead to better informed, and therefore more successful, relevant policies.'

KEY STUDIES
Brown, S., Harris, M. N., Srivastava, P. and Zhang, X. (2016), Modelling illegal drug participation. *J. R. Stat. Soc. A.* doi:10.1111/rssa.12252

Greene, W., Harris, M. N., Srivastava, P. and Zhao, X. (2017), Misreporting and econometric modelling of zeros in survey data on social bads: An application to cannabis consumption. *Health Econ.* doi: 10.1002/hec.3553

Project Insights

PROJECT COORDINATOR BIO
Professor Mark Harris studied economics as an undergraduate at the University of Sussex, UK, and then completed a PhD in Econometrics at Monash University, Melbourne, Australia. He currently works at Curtin University in Perth, Australia. Prior to this, he held teaching and research appointments at Monash University and the University of Melbourne, Australia.

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