

SINNOVATION

**How markets can solve
public health problems -
but government gets in the
way**



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Introduction

In a complex world, there will be times when our actions have consequences that we could not have foreseen, however good our intentions were. This complexity is one of the major challenges in public policy: it is what divides people with similar goals, and what demands rigorous analysis of public policy.

It's worth bearing this in mind when considering the public health debate. It's easy to depict this debate as a war about ends. On the one side are hardline libertarians who refuse to concede any role for the state. On the other are paternalists who think they know better than grown-ups about what's good for them. Smokers should have the right to smoke and drinkers the right to drink, and the harms are theirs to take if they want – or, both are addicts who cannot make a rational judgment about their habits and need the government to do it for them.

But these two positions are not the whole debate. Most people fall somewhere in the middle. They regret the harms that alcohol and tobacco cause to heavy users, but also believe that those users should have the right to take those if they are aware of the harms and aren't hurting other people. For these people, though they are not libertarians, liberal harm reduction is the key – not rigid prohibitionism.

But 'liberal harm reduction' is a goal, not a policy. The challenge is to figure out how to achieve it.

It is in this spirit that this collection has been put together. For the authors of the papers in this book, government bans on harmful behaviour do not automatically reduce harm. Indeed, because of the complexity of society and the difficulty of making good public policy, these bans (or other restrictions) may have the opposite effect, and increase harm to the public.

By stifling innovation, regulation may freeze products in a state that is far less safe than free-wheeling capitalism would otherwise provide. Given that most smokers or drinkers would prefer not to die young or suffer from chronic illnesses, there is a clear (and perhaps very strong) profit incentive for the firm that can replicate the experience of smoking a cigarette without producing the harm that cigarettes do. That products like this are finally making their way to market is evidence of the power of this incentive: they are replacing the more harmful original options in spite of, not because of, regulation.

The collection begins with Guy Bentley's account of the quest for synthetic, reduced-harm alcohol. Pioneered by Dr David Nutt, a former government advisor who was forced to step down after publishing an editorial in the *Journal of Psychopharmacology* comparing the risks of horse-riding with those of taking ecstasy, synthetic alcohol may offer something of a miracle for many people: a replication of the feeling of being drunk without the hangover or the liver damage.

In interviews with our author, Dr Nutt describes the hurdles and challenges he has faced in bringing his product to market. The picture he paints is damning: of hurdles and barriers at every turn, creating a market so difficult to navigate that nearly everyone has kept out. The regulations stifle a safer alternative to alcohol.

Why might that be? Our 'complexity' explanation may not be the whole story. Jeff Stier's piece on the mindset of public health cam-

paigners who oppose e-cigarettes and other reduced-risk tobacco products draws on the public choice school of economics to create a fuller understanding of their motivations. There comes a point when honest disagreement and confusion no longer explain much, and that seems to be the case when it comes to e-cigarettes. Found by Public Health England (an exception to the general public health opposition to e-cigarettes) to be at least 95% safer than real cigarettes, e-cigs have already been taken up by an estimated 2.8 million people. They are literally saving smokers' lives, and doing so by giving them a better choice, not by bludgeoning them with taxes and regulations.

But as Jeff points out there is a fundamental problem for public health officials here. This is a solution that has come from the market, not from officials, and for the £200m-per-year anti-smoking industry to survive (depending, as it does, on public funds) they cannot be seen to be eclipsed by the market. What is the point in an expensive anti-smoking media campaign when private firms will happily advertise something that smokers actually want to use?

Prediction markets may not seem like an obvious topic for inclusion in this collection, but fans of Intrade, an online website where users bet money on real-world events like which Eurozone economy would fall into recession next, will remember the legal struggles it faced before shutting down altogether under the pressure of US gambling laws. Michael Story, a Superforecaster at the Good Judgement Initiative, explains why it is that the wisdom of crowds, weighed by willingness to pay (a proxy for certainty), can often beat experts in making predictions – and why attempts by the state to shut down such markets can backfire and hurt our ability to anticipate and plan for the future.

The most dramatic public health prohibition of all, of course, is the War on Drugs. It's this that led to rise of 'legal highs', psychoactive

substances that occupied enough of a grey area legally that they could be bought and used with much less risk of prosecution than conventional drugs. Dr Henry Fisher's account of the rise and partial-fall of psychoactive substances points out that many of these, like 'synthetic cannabis', were considerably more harmful than the banned substances they were replacing. Illegal drugs are, of course, already widely available, badly misused and can be immensely harmful, so the government's solution of banning all psychoactive substances unless special exception has been made is hardly an improvement. Dr Fisher points out that flexible regulatory systems that adapt and learn from their mistakes are far less vulnerable to these sorts of problems than Britain's current approach – whack-a-mole regulation can be lethal.

At the heart of all these pieces is the idea that regulators can err, and that regulation should include feedback loops so that bad rules can be identified and improved as time goes by. This means that hardline approaches really cannot work.

And it means that policymakers concerned about public health should draw back from the heavy-handed approach based on the precautionary principle that they currently take. The precautionary principle assumes that the status quo is acceptable – with so many people dying of smoking-, alcohol- and drug-related illnesses that is clearly not the case. A new drug or reduced-risk tobacco product that kills some users may still be a massive improvement if it kills one-twentieth as many users as the thing it's replacing. Our rules go way beyond basic safety standards – they impose a massive burden of proof on anyone trying to market a product that competes with the existing vices that harm people every day.

A 'permissionless innovation' approach may be the best way forward. In this framework, firms are free to innovate and markets anything they like to consumers, with the proviso that untested products must

be explicitly marketed as such, with the firm forced to pay the price if and when things go wrong. A regulatory approach on this basis would create a pathway for new reduced-risk products that were, if not 100% safe (such a thing is impossible), a lot safer than the things they were replacing.

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1. Alcohol

Synthetics and prospects for a harm reduction revolution

The history of humans relationship with alcohol is as varied and rich as the history of humanity itself. From the provinces of China and the mountains of Georgia to the plains of Mexico, humans have been brewing alcoholic beverages for medicinal, religious and recreational purposes for thousands of years.

Alcohol remains one of the world's most popular drugs and in many societies occupies a place of cultural respect and acceptance rarely granted to an intoxicating substance.

According to latest data from the Office for National Statistics published in 2014, almost 60% of UK adults reported drinking alcohol in the past week. Although alcohol and the places where it is served are often celebrated as a source of pleasure, socialization, and cultural enrichment the flip side is a variety of problems including crime, depression, disease, dependency, and anti-social behavior.

While the vast majority of those who consume alcohol do so with a large degree of control and benefit from the pleasures alcohol brings,

a minority of drinkers find themselves in a position where their lives are put in turmoil by drink.

Moral crusaders and public health professionals have sought to combat the problems associated with alcohol with a string of policies intended to punish both drinkers and the industry which serves them.

The most infamous of these is the 18th amendment to the constitution of the United States which prohibited the manufacture, sale, and distribution of intoxicating beverages. The so-called “noble experiment” is widely seen as a disaster with black markets and criminal syndicates running rampant and swathes of Americans dying from unsafe moonshine. Judged by its own goals it had some successes, massively reducing alcohol consumption and resultant liver diseases.¹ And some evidence suggests that though violent crime rose rapidly during the period, it was not associated with the alcohol trade.^{2 3}

But the public was disgusted with the hypocrisy, corruption, sleaze, and organised crime that permeated American life during the prohibition years. Americans also developed a profound distaste for the attempt to impose the morality of abstinence through legislation and the busy bodies who made it their mission to police the drinking habits of their neighbors. Americans also thought the tax revenues forgone by prohibition would be useful in 1932-33 as the economy faced extreme economic distress.⁴

“A prohibitionist is the sort of man one couldn’t care to drink with, even if he drank,” wrote the journalist and satirist H.L. Mencken. While prohibition is now a distant memory, the battle over how society responds to the costs and benefits of alcohol rages on. But as of yet, there is no serious safer alternative to alcohol that can both mimic its beneficial effects but avoids the health and social harms associated with it.

THE COSTS OF ALCOHOL

The harms of alcohol are well known and ever-present in the public discourse around how the government and society should treat alcoholic drinks. There were 8,697 alcohol-related deaths in the UK in 2014, down after peaking in 2008, but still higher than in 1994, according to the ONS.⁵ According to the temperance group Alcohol Concern, 10% of the UK's burden of disease and death is attributable to alcohol, with more than 60 medical conditions associated with alcohol use, including liver and breast cancer.⁶

The cost of alcohol-related on the government, including the health care system, welfare, and crime totals up to a gross cost of £3.9 billion, possibly an overestimate.⁷ But the direct cost the taxpayer is overstated: drinkers actually provide a net benefit of around £6.5bn to the Treasury, thanks to revenues from alcohol taxation of more than £10 billion. However, crime has costs other than to just the exchequer, and according to one estimate, the 1m crimes it's associated with generate around £11bn of social costs on top of the cost to the police.⁸ The problem with these estimates is that it's hard to disentangle how many alcohol-related crimes are alcohol-caused (i.e. would not have happened without drinking). Accounting for this would significantly reduce our estimates of the external costs of drinking, and without doing so it's hard to say whether or not alcohol taxes cover the externalities of alcohol drinking.

The private costs to individuals themselves can be substantial, but since these are internalised in the decision to buy and consume alcoholic drinks, they are less concerning from a policy perspective. The most obvious cost is the alcohol itself, with UK drinkers paying some of the highest alcohol taxes in the western world on top of the price. Brits pay a staggering 40 percent of the European Union's alcohol tax

bill, on top of the price of the drinks themselves.

Alcohol Concern claims a cost of £7.3 billion in lost productivity, based on a report for the Cabinet Office from 2003.⁹This cost is borne by individual drinkers who sacrifice higher wages and promotions due to their lower productivity. There are also intangible costs such as emotional distress stemming from alcohol abuse. Despite these costs, most consumers believe the benefits are enough to outweigh these considerations.

POLICY STALEMATE

The focus of temperance and public health groups has been to continually bear down on alcohol consumption, ostensibly to reduce harm, with recommendations to decrease the affordability, availability, and advertising of alcohol. These groups often fail to explicitly recognize any benefits of alcohol either as a social lubricant or enjoyable on its own terms. Too often public health dismisses these benefits as trivial or non-existent compared to their costs, with any decrease in consumption is viewed as a desirable outcome.

Failing to sufficiently recognize the voluntary trade-offs consumers make between health and pleasure leaves these groups acutely out of step with the public and with a fundamentally flawed analysis of the costs and benefits of alcohol. Furthermore, the very measures being advocated by public health groups, such as higher prices and clampdowns on the availability of alcohol, are more likely to punish the majority of consumers rather than reduce harms caused by the few problem drinkers. Higher alcohol prices, for instance, may not reduce consumption among those who suffer most from alcohol-related problems. This is because the demand for alcohol is relatively inelastic compared to other consumer products and drinkers have a range of options substitute their consumption habits or cut back on

other expenditures.

While campaigns to raise the price of and restrict the use of cigarettes in public places have been almost entirely successful, the same cannot be said for those seeking a radical interventionist change in alcohol policy.

The European Court of Justice's ruling that Scotland's plan for minimum unit pricing was in breach of EU law at the tail end of 2015 was a blow to the temperance lobby.¹⁰ In 2013, George Osborne scrapped the beer duty escalator eliciting cries of outrage from temperance groups.¹¹ Campaigns for health warnings on alcoholic beverages and restrictions on advertising have also failed to make an impact thus far.

Part of the reason for this may be that there has been a substantial decline in alcohol consumption in recent years, making the issue less salient. Per capita alcohol consumption peaked in 2004 but fell by an impressive 17% between 2005 and 2013, the largest reduction in the UK drinking rates since the 1930s.¹² The fall in consumption has been especially pronounced among young adults, who drink less now than in 2005 according to the ONS.¹³ Alcohol abstinence is now higher among amongst 16 to 24-year-olds than amongst pensioners. The moral panic of the early and mid-noughties about out-of-control teenage binge drinking has largely subsided and the pandemonium that was predicted to follow the 2005 Licensing Act has not come to pass.

But despite this large reduction in alcohol consumption, the health harms related to alcohol have not declined as much temperance groups might expect, with 14.3 people per 100,000 dying of alcohol-related disease in the UK in 2014 compared to 15 per 100,000 in 2004.

So with a mixed picture, the debate on the future of alcohol policy

appears to be in a stalemate. Public health groups continue to push for lower consumption while their opponents point out that prices are already high and licensing laws are hardly a free for all and consumption is down.

Unfortunately for drinkers, there has been precious little thinking around alcohol innovation and harm reduction as an alternative to neo-temperance policies. As of yet, there is no product that can replicate the enjoyable sensations of alcohol while largely avoiding the health risks associated with it.

SYNTHETIC ALCOHOL: A HARM REDUCTION ALTERNATIVE

The vaping revolution transformed the landscape of nicotine consumption and produced a booming new industry where innovators, scientists, and entrepreneurs work hard to create and sell enjoyable products that smokers can switch to or use to help get the enjoyment of smoking without its large health costs.

E-cigarettes are 95% safer than combustible cigarettes, according to Public Health England, and new “heat-not-burn” smokeless tobacco products could prove just as or even more popular.¹⁴

Thanks to rapid scientific advances our knowledge of the brain has improved significantly, and it may be possible to create an enjoyable harm reduction product that can compete with alcohol much as e-cigarettes compete with tobacco.

While working for the UK’s Foresight Initiative in 2004, Professor David Nutt began to ask why there wasn’t a safer alternative to alcohol given its well-known dangers. Nutt began developing a synthetic alcohol which targets one or more neurotransmitter systems in the

brain such as gamma-aminobutyric acid or Gaba. Some of the pleasurable effects of alcohol work by mimicking and increasing the Gaba function. According to Nutt, there is also a range of Gaba subsystems that can be targeted by selective drugs.

One of his new synthetic alcohols, named “alcosynth” for the time being, reduces the gastric damage and cardiac damage of alcohol but produces a feeling similar to that of being tipsy. Alcosynth is a positive allosteric modulator (PAM) of the Gaba system and Nutt believes it is possible for this substance to be made without being addictive. “Modern science allows us to target the relaxing and intoxicating part of alcohol effects while avoiding the bad parts like addiction and withdrawal,” Nutt told the Guardian in 2014¹⁵. Nutt believes these substances haven’t come to the fore because too many people assumed that alcohol was a unique substance and couldn’t be replicated in any significant way. But if these chemical compounds could mimic the effects of alcohol and be delivered through cocktails or other drinks they could prove to be a tempting alternative.

Such synthetic alcohols would have obvious benefits to consumers, who would be able to experience some of the pleasurable effects of alcohol while avoiding most of the health-related harms. Nutt estimates these alcohol alternatives could be up to 100 times safer than the real thing. Furthermore, a harm reduction alternative could prove attractive to those who have a difficult relationship with alcohol but for whom abstinence from intoxication is either too unappealing or just unrealistic. If these products entered the market, we could also see the emergence of the alcohol equivalent of dual users of e-cigarettes and tobacco, with drinkers opting to cut down on their usage with the aid of synthetics, thereby reducing their risk profile.

Further developments in synthetic alcohol could be directly beneficial to alcoholics who could use these alternatives to help them

abstain from real alcohol. As well as being safer than alcohol, synthetics could also be completely hangover free. These types of products could be ideal substitutes for those wanting to enjoy the social benefits of alcohol during the working week but wish to avoid the subsequent hangover which hampers their productivity, affecting both their pay packets and company performance. Another group that could be set to benefit are the already teetotal. Those who are currently alcohol-free and wish to remain so would have the option to partake in some of the enjoyable social effects alcohol rather than having to stick to soft drinks or water.

To complement alcosynth, Nutt is also developing a second drug “Chaperone” which reduces the intoxicating effects of alcohol. Chaperone would allow consumers to use alcohol but effectively sober up allowing safer journeys home and possibly reducing the rate of drunk driving accidents.

A REGULATORY DEADZONE

Since these types of synthetic alcohol are entirely novel products there is no regulatory environment or government guidance about how to introduce them onto the market at either the UK or EU level. This makes it especially difficult for companies such as Nutt’s Alcarelle to introduce their products into the marketplace. In an interview with the Daily Telegraph in 2015, Nutt estimated it could take 3-5 years for these products were to be licensed under UK drug laws and could cost as much as £1 million in legal bills and human trials and safety costs.¹⁶ Nutt has, so far, applied for 85 new chemical compounds to be patented under the synthetic alcohol concept.

The uncertainty about what regulatory structure is in place to deal with synthetic alcohol leaves innovators in the dark as to how to proceed. This lack of certainty also breeds skepticism among inves-

tors about the potential of these products, making them reluctant to take a gamble on something that regulators could decide should not be allowed on the market at all or doesn't meet consumer safety standards. "I can't help them because no one knows. Someone has to try and discover what the regulatory pathways are. It's never been defined before because it's never been seen as a concept before," says Nutt.

Given that these are entirely new products, the UK or any other government wishing to see a harm reduction alternative to alcohol has a blank slate to create a regulatory structure that could birth a new industry which offers real, pleasurable alternatives to alcohol while reducing health-related harms and possibly improving public order. Nutt's concept of synthetic alcohol has been around for several years and it is disappointing to see there has been no governmental interest in mitigating the regulatory uncertainty surrounding an alcohol alternative.

If the government signaled that these products could be introduced onto the market in the same way as a regular alcoholic drink, a soft drink or a foodstuff it would give a green light not just for Nutt but also to others who may be willing invest and research¹⁷ the concept of synthetic alcohol. The current deadzone of regulatory uncertainty holds back investment and disincentivizes innovation—a fact demonstrated across practically every industry in academic research. Such governmental ignorance and inertia harms not only the possibility of new businesses arising but also delays or destroys the chances of consumers improving their health and avoiding alcohol-related harms with the help of substitutes.

The principle value proposition of these products is that they are a safer alternative to alcohol. This suggests that the producers of synthetic alcohols have strong incentives to make them as safe and enjoy-

able as possible compared to their rivals. Since these products would be safer than alcohol and could reduce alcohol-related harms it would make less sense to impose heavy regulatory or financial burdens.

There is even some cause to believe the UK may be ideally suited to creating a hospitable climate for a safer alternative to alcohol. When it comes to harm reduction products for smoking, UK regulators have been relatively liberal compared to their counterparts. The UK is at the center of the vaping revolution, with the government avoiding the kinds of excessive regulation that has engulfed countries such as the US and Australia. A similar approach of restraint and tolerance for synthetic alcohol would be welcomed by those developing alternatives to alcohol.

A post-Brexit Britain has a remarkable opportunity to fashion its own regulatory regime with regard to synthetic alcohol. Free of EU institutions, there would be fewer entry points for potential opponents of synthetics to influence regulatory standards in a harmful way. But that is not to underestimate the domestic government's vulnerability to special interests who may seek to impose a harmful regulatory structure.

Ensuring low barriers to entry would be crucial to ensure strong competition and in turn greater innovation and prices low enough to attract large uptake among consumers. As synthetic alcohols develop and if consumers warm to them, the traditional alcohol industry could enter the fray bringing substantial resources to bear on research and development—just as with e-cigarettes. Even the soft drinks industry may begin to diversify into safer non-alcoholic products that provide intoxication.

Advertising has the potential to be an area of conflict with those skeptical of the merits of an alcohol harm reduction product wanting to

keep its exposure to a minimum. But for synthetics to fully compete and provide a genuine alternative for the public their advertising should be no more regulated than their chief rival. The UK already has one of the strictest regimes for alcohol advertising in the developed world, so imposing any additional burdens on a safer alternative would be nonsensical. Synthetics must be allowed to explicitly state and market themselves as a safer alternative relative to alcohol so they can effectively communicate their chief value proposition to the public. Such a market could the UK become a center of alcohol harm reduction. “Britain leads the world in vaping, just like Britain led the world in harm reduction, with needle exchanges for heroin,” says Nutt.

Alcohol is taxed to account for the external costs it imposes on those not involved in the transaction—duty is a ‘Pigovian Tax’ without which, according to economic theory, more alcohol would be consumed than is optimal. If the social costs of synthetics are lower than alcohol, as they would surely be, then it would be appropriate to tax synthetics less, in proportion to their lower social costs. This would require calculation, and the exact levels are “up for grabs”, depending on how much less crime and ill health synthetics cause, in comparison to traditional alcoholic drinks.

OPPOSITION

It is unlikely that these innovations would be wholly welcomed. There could be a negative reaction from some parts of the public health movement, just as there has been with e-cigarettes. For some in public health, the very idea that people want to consume nicotine for pleasure is an anathema. It would be unsurprising to see similar attitudes toward synthetic alcohol from campaigners who do not want to see a safer form of intoxication encouraged and who might

claim innovations of this sort are a distraction from trying to reduce alcohol consumption or encouraging abstinence.

But given that a majority of the public regularly consume alcohol and the harms of alcohol are well-known, public support for a safer alternative could be incredibly strong. As we already know with vaping, very few people consume safer alternatives as a “gateway drug” to the harmful original form.

One of the chief criticisms of e-cigarettes is that we do not know what impact their long-term use has on health. This is, of course, true simply because the products are so new. But all of the existing evidence suggests they are significantly safer than cigarettes. As with e-cigarettes, the question is not whether synthetic alcohols are totally safe but whether they are safer than the existing products they hope to compete with. According to Nutt, this is certainly the case with synthetics meeting pharmaceutical levels of safety. Attempts to stifle such new innovations on the grounds that we do not know for certain what the effects of long-term use are would be extremely misguided.

NONALCOHOLIC BARS AND PLURALIST PUBS

One of the central propositions of synthetic alcohol is that it seeks to replicate the social benefits that come with drinking alcohol. So pubs, bars and other venues where alcohol is currently sold would be just as appropriate for synthetic alcohol.

Given that the first generation of synthetic alcohols would not intoxicate users to the same degree as a large amount of alcohol would, we could see the emergence of bars that only serve synthetics for those who would want to avoid being an environment of drunkenness.

Synthetics need not revolutionize institutions such as bars and pubs but they do offer the possibility of substantially modifying our relationship with alcohol. The possibility of intoxication without booze will be an appealing one to many just as is nicotine without the smoke. Whether or not these products succeed, they should be taken seriously as goods that have the potential to provide enormous health and social benefits and given the regulatory guidance to ensure they can compete on the open market.

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2. Tobacco

The market is your ally, not your enemy: lessons from e-cigarettes in improving smokers' health

E-cigarettes have split the public health lobby in two. On one side are those focused on harm reduction, who see e-cigs as a substantially safer alternative to cigarettes for people who are already smokers. On the other are those who see fundamental lifestyle change as the goal for smokers, and e-cigs as an obstacle to that.

Unfortunately, this latter group seems to be winning out. Although Public Health England found that e-cigarettes are 95% less harmful than tobacco cigarettes, many public health activists and lawmakers remain staunchly opposed to the very products smokers are choosing.¹

Why? This essay attempts to understand the motivations of public health campaigners against e-cigarettes, and outline how, despite their rhetoric, their actions are making the product landscape worse for smokers' health.

THE CHALLENGE

For decades now, the dangers of smoking have been well-

known and widely publicized. Scientists have a detailed, though incomplete, understanding of why smoking harms so many functions of the human body.

Professor Michael Russell observed that “people smoke for the nicotine but they die from the tar” forty years ago. In his 2009 obituary, *The Guardian* said Russell “is rightly regarded as the father of effective treatment to help smokers quit.”²

Governments have tried countless different approaches to get people to stop smoking, including warning labels, plain packaging experiments, smoking bans, public service campaigns, counselling and sin taxes. These have worked with varying degrees of success. Anti-smoking campaigners frequently overstate their efficacy – for example, recently, Action on Smoking in Health (ASH) attributed a fall in smoking numbers to plain packaging, a policy that had not yet been introduced during the sample period.³

Yet in terms of the speed and volume with which they have been adopted by smokers, in e-cigarettes and other reduced-risk tobacco products it is the private sector, driven by the profit motive, that may have the final answer to the early death and disease that harms smokers. Smokers want an enjoyable nicotine delivery without the harm, and if you offer that to them they will take it.

The rapid adoption of e-cigs has been remarkable. Nearly 3 million Britons use e-cigarettes, virtually all of whom are either current smokers or people who have given up smoking entirely.⁴ A 2013 study found that even at that early stage, and before widespread advertising of e-cigarettes, three-quarters of US smokers were aware of the devices and almost half were

open to using them in the future.⁵ And multiple studies⁶ have concluded that smoking e-cigarettes is at least 95% safer than smoking conventional cigarettes.⁷

Professor Russell would have marveled at the simplicity: nicotine, delivered satisfyingly, without the smoke (and other dangerous ingredients in burned tobacco).

Yet the well-intentioned public sector is failing its own mission by opposing e-cigarettes and similar products after years of trying to help smokers quit.

They can be forgiven for not coming up with the answer themselves, but their failure, and the systemic reason for it, provides insight into their vehement opposition to the best solution.

Most big tobacco companies had nothing to do with the first e-cigarettes, but now virtually all are investing in these less harmful alternatives to cigarettes. They, like the pioneering e-cigarette advocates, understand smokers better than old-school public health authorities.

This point bears considering. Despite spending around £200 million of taxpayer money per year on anti-smoking campaigns (and recently asking for a 50% budget increase, paid for by even more taxes on smokers), Britain's public health lobby has been rapidly eclipsed by a private sector whose only real aim is to make a profit.⁸

Because their interests coincide with their customers', both benefit from safer nicotine-delivery products, and they deliver genuinely effective harm reduction – products that smokers

actually use –far better than the public health lobby’s. There is no substitute for profit and loss.

Lower-risk nicotine products, and even products that contain zero nicotine but mimic smoking, have ignited debate throughout the world. The debate is fueled by smokers who want the pleasure without the harm versus the regulators who see this phenomenon as a fundamental threat to their basis for constantly expanding regulatory control. It is a battle between harm reduction and absolutism.

THE SELF DEFEATING HEALTH LOBBY

Because e-cigarettes are so much safer, and so effective at getting smokers to quit or cut down, though the lens of harm reduction every vape shop employee who works with a smoker to identify a satisfying and appealing e-cigarette should be viewed as a front-line quit-smoking counsellor. This counsellor picks up where existing resources couldn’t or wouldn’t effectively reach. In fact, the vape shop worker has the potential to be far more effective, especially for entrenched smokers. Furthermore, he or she doesn’t cost the taxpayer a penny (unless we count the lost tax revenue that will be lost when the customer quits smoking and no longer has to pay sin-taxes on cigarettes).⁹

So-called “public health” officials and campaigners are actively working to restrict marketing of e-cigarettes, even to adults.¹⁰ Yet the advertising of lower risk products to adult smokers should be heralded as a public health innovation; a privately funded, effective, public service campaign.

The measures in the EU’s Tobacco Products Directive (TPD)

that will affect e-cigarettes are wide-ranging and sharply restrict the freedom of e-cigarette producers to sell their products to smokers, let alone to market them effectively or create new, improved products.

These measures include a prohibition on making health claims about e-cigarettes, including their ability to help smokers quit or to make comparisons between different kinds of e-cig.

Not only does this sharply curtail information available to smokers (the lowest-information smokers are also likely to be the poorest and most vulnerable in society), it massively reduces the rewards to firms from creating a better, safer e-cig or reduced-risk product.¹¹ If you cannot tell people that and why your e-cig is better than the alternatives, and hence cannot profit from making it safer, then where is the incentive to do so?

Other measures include the facilitation of blanket advertising bans, which the Scottish government is considering; a requirement that 30% of the packaging be dedicated to a large health warning (about the addictiveness of nicotine – which of course other addictive products like coffee and alcohol are not required to carry); and strenuous standards about the device itself.

All of these measures will make it harder for firms to compete on safety to deliver a better, safer product. And yet the TPD was warmly welcomed by anti-smoking public health groups like Cancer Research UK,¹² and even those like Action on Smoking and Health who are open to e-cigarettes as a tool for reducing the harms of smoking.

MOTIVATIONS

So why do these supposed-champions of public health turn a blind eye to the overwhelming evidence that promoters of dramatically lower-risk nicotine products should be cast not as villains, but as allies for anyone interested in reducing the harms caused by smoking?

Perhaps it is due to influence from the pharmaceutical industry, which offers highly regulated (nicotine and non-nicotine) alternatives to smoking. Big Pharma, which already paid the price of admission through regulation, sees innovation as a threat. It is no wonder that they fund heart associations, lung associations and cancer groups, to sow doubts about e-cigarettes.¹³ In the wake, these groups betray their mission and leave smokers with often ineffective pharmaceutical products, destined for a quit or die future. And they don't always quit.

Maybe they realize that people enjoy nicotine and other products which provide pleasure. Perhaps they believe that if some of these products look like cigarettes, they are, by definition, bad. Perhaps a best-case defence of this might be that e-cigs 'normalise' smoking and so encourage impressionable youngsters to take up the real thing – a proposition that is defensible but in direct contradiction to the evidence, which suggests that bans on e-cigarettes lead to significant rises in teenage smoking rates, indeed it “counteracts 70 percent of the downward pre-trend in teen cigarette smoking for a given two-year period”.¹⁴

Maybe it's all about money. With high cigarette taxes and many people still smoking, government officials rely on smokers for the revenue, as if the authorities are just as addicted to cigarettes

as the smokers. But if that were the key basis for the opposition, it could quickly be resolved by taxing e-cigarettes the same as cigarettes. This “solution,” while profoundly harmful to the proposition of harm reduction, and thus public health, is already being imposed in some U.S. states. But even this hasn’t satisfied opponents.

The answer, I believe, is more foundational, and has to do with an ongoing power struggle between people whose jobs depend on government on one hand, and private enterprise on the other. This explanation is rooted in the public choice school of political economy, which views government officials as rational, self-interested agents in the same way we view consumers, private firms, and workers.

In this model, public health officials who depend on government support have a very real stake in being seen to be the only people who can help people stop smoking. Their own power and incomes depend on it.

Christopher Snowden’s IEA paper *Sock Puppets: How the Government Lobbies itself and Why* lays out in detail the history and strategies of public health “charities”—often 90% or more public funded.¹⁵ Action on Smoking and Health, for example, as well as Alcohol Concern, have always had a model of ‘state-funded activism’, even according to official archive documents. In ASH director David Simpson’s words “it was a curious form of brinkmanship, having in one’s daily work to attack the government that was funding you. But this was expected, and encouraged, so that there was a lot of cooperation behind the scenes.” Public health bureaus and government had a symbiotic relationship, each enhancing each other’s power in the name of wellbeing. How could private alternatives help?

And their methods for protecting their power and income generally mean restrictions on the liberty of others. H.L. Mencken pointed out that “the whole aim of practical politics is to keep the populace alarmed (and hence clamorous to be led to safety) by an endless series of hobgoblins, most of them imaginary.” As Ronald Reagan explained with simplicity how this affects our freedom: “as government expands, liberty contracts.”

To protect their influence on health policy, boosters of more government control need to advance the fiction that industry, driven only by the profit motive, must always be reined in by government regulations. In asserting their right to regulate, public health officials will point to the harmfulness of cigarettes. But does that mean there should be no end to regulation of not only cigarettes, but to their alternatives?

In the regulators’ myopic worldview, industry, driven by greed, is the only problem, and government is the only solution.

And then came along the e-cigarette, shattering the always-bigger-government narrative. Here, you’ve got a private sector, profit-driven innovation that has the potential to save more human lives than any tobacco tax, warning label, or regulation ever has.

People are using these products to quit smoking not because of the government, but despite it. Public Health England’s emphatic e-cigarette endorsement is the exception to the rule.

This differing approach is the driving force behind the divide between those who support e-cigarettes as well as newer,

perhaps more satisfying products, and those who support a “tobacco end-game” which can, by definition, only include solutions either developed or at least endorsed by government.

Until recently, and despite a heavy-handed regulatory threat, cigarettes remained a scourge. I frequently wonder why the most popular consumer products, from telephones to automobiles, and even carbonated soda have undergone dramatic safety improvements in my lifetime, yet the cigarette hasn’t really changed.

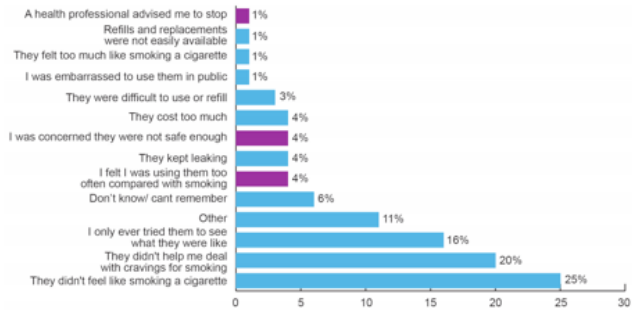
Consumers have accepted and embraced the concept of harm reduction when it comes to products such as soda. Consider that even excessive amounts of Diet Coke don’t cause obesity and lead to diabetes. Too much regular Coca-Cola, like all other sources of calories, can lead to disease. Diet soda is a harm reduction product.

Just as caffeine addiction may lead some to drink too much Coke, few (except the biggest nanny-states) suggest that caffeine should be regulated or banned to fight obesity, despite similarities to nicotine. But with cigarettes, nicotine has become the target, even though it’s not the cause of the harm.

THE FUTURE

E-cigarettes aren’t the answer. While they’ve helped a significant segment of smokers not reached by government-endorsed methods, the fact that people still smoke cigarettes is evidence that more innovation, as well as more accurate information, is necessary. A survey published by Action on Smoking and Health this May provides key clues to our public health riddle.

Figure 8: Main reason for stopping using an e-cigarette among current smokers (2016)

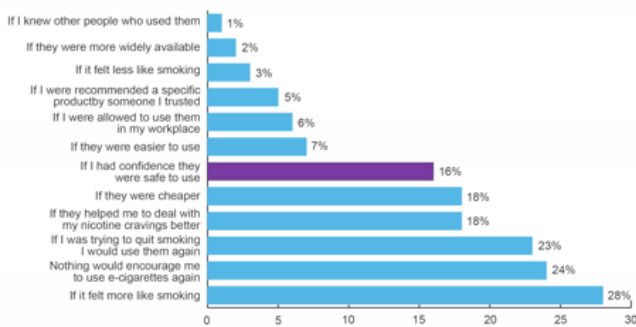


Unweighted base: GB adult current smokers who have tried but no longer use e-cigarettes n=703

Source: http://www.ash.org.uk/files/documents/ASH_891.pdf

Among current smokers who had tried using e-cigarettes, but stopped, 25% said it was because vaping didn't feel like smoking a cigarette. Another 20% cited the fact that it didn't help them deal with the cravings for smoking. In case the clues in Figure 8 weren't enough, the results displayed in Figure 9 essentially give away the answer. It's no longer much of a riddle, and was never so complicated to begin with: it's just a matter of providing smokers the satisfaction of smoking without the same harm.

Figure 9: What would prompt smokers to try e-cigarettes again (2016)



Unweighted base: GB adult current smokers who have tried but no longer use e-cigarettes n=703

Armed with the ASH survey, a reasonable person might think that government agencies around the world would now be racing to come up with a satisfying product that would put an end to combustible cigarettes. Incentivized by the goal of saving lives, even a Nobel Prize, we should be seeing requests for proposals, grants to favored academics, and legislative fact-finding hearings with smokers in the witness seats, testifying about what it is that they find so satisfying about smoking. Only this will enable the government to construct the proper alternative to the cigarette.

If this sounds absurd, it's because it is. Innovative products aren't developed by governments, because governments, by their nature, aren't set up to be competitive risk takers in the marketplace.

Yet the private sector, rightfully driven by the profit motive, tempered by tolerance for risk, rewards innovation. Perhaps that's why leading global tobacco companies, from Phillip Morris International, British American Tobacco, and Japan Tobacco International, as well as non-tobacco companies and investors, are all plowing funds into coming up with a range of next generation products that seek to incorporate the successes of e-cigarettes, as well as learnings from the shortcomings of the e-cigarette experience. Just like the vape shop employee, these investors are the true public health heroes – not those who are trying to stymie them.

Many of these next generation products heat tobacco enough to release nicotine and flavor, while drastically reducing the exposures caused by combustion. Again, this should be good news for public health.

If a significant percentage of smokers wind up preferring safer heated tobacco to cigarettes, these companies will be swiftly rewarded by the market, provided that firms are actually allowed to sell their reduced harm products. Sadly, regulators are more apt to punish, rather than reward, those who come up with solutions that regulators aren't equipped to answer.

There are enough smokers in the world to have several tranches of products for various individuals. Some individuals who can't or won't quit may be willing to use a product that removes almost all the risk, and much of the satisfaction. For others, even a modest reduction of risk would be an advantage over smoking, and that choice should exist for those who want it. And consumers deserve to know the differing risks.

But the options aren't necessarily a linearly connected risk-satisfaction model. With enough profit-motivated risk-taking to support research and development, the brightest engineers may envision products that make cigarettes truly obsolete.

CONCLUSION

Imagine products that are at once more satisfying to smokers and less harmful than not only yesterday's cigarettes, today's e-cigarettes, and tomorrow's heated tobacco. And imagine that they were less expensive than the more harmful options. The cigarette would go the way of the rotary phone and horse-and-buggy.

Academics and regulators who fantasize about a zero-risk world are the primary obstacle to this type of innovation. Regulatory threats and uncertainty are already putting a damper on investment.

Consider the Tobacco Products Directive, discussed above. Its specific proposals to control the sale and marketing of e-cigarettes are bad enough by themselves, but they are evidence of a much deeper misconception of the issue. They so tightly restrict marketing, not only because they ignore the benefits of smokers switching to e-cigs, but because they ignore the benefits of better e-cigs and reduced-risk products coming to market. If there is no pathway to marketing a safer product to consumers as being safer, then there is no incentive for safer products to be developed.

Regulators are focused on demanding increasingly more restrictive and punitive approaches towards smokers, rather than fostering and encouraging innovative and satisfying alternatives.

They are currently faced with the challenge of regulating reduced-risk products, and they face a clear choice: to treat them like cigarettes, because they have tobacco in them, or to treat them like e-cigarettes, because they may be considerably safer than smoking. If regulators go down the first path, they will kill reduced-risk products dead, and smokers will suffer. Preventable deaths will likely happen, because some smokers who would have switched to reduced-risk products will not hear about them or know that they're safer.

But if they're regulated like e-cigarettes, and indeed if the whole regulatory framework for lower-risk products of all kinds is reformed to encourage innovation then governments can say that they've learned from their mistakes and they're working with the private sector to improve smokers' lives. The objective should be to give smokers a better, healthier option that they will willingly choose, not to cut off every option except quitting

altogether. It's the harms of tobacco we should care about, not tobacco itself.

The World Health Organization's "World No Tobacco Day" campaign illustrates how badly public health campaigners have gone wrong, how they've ignored Professor Russell, ignored the data from Public Health England, and worst of all, ignored the needs of smokers.

But most fundamentally, they've ignored the underlying justification for their authority to regulate us. The deal we had under the social contract was that we would give up some of our freedoms, and they would protect our health. But instead of "World No Tobacco Disease" day, all they've delivered is a pipe dream.

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3. Betting Markets

Not perfect, but the best means we have to predict the future

Prediction markets and betting exchanges in which ordinary citizens come together and bet real money on future outcomes have come in for a bit of a battering recently – hived off in a legal grey area in the United States, criticised for mispricing Brexit in the UK and, most damaging of all, called ‘failing’ by Andrew Gelman and David Rothschild in Slate.¹

This is happening at a crucial moment because for the first time the US authorities have begun to open up to the idea of allowing more prediction markets to operate legally in the United States.

In the UK, with bookies on the high street and websites like Betfair exchange open to taking punts on almost any topic, it’s hard to understand just how restricted political betting is in the United States. There are very few legal ways for Americans to stake money on future events – which matters even if you aren’t a gambler, because prediction markets are one of the best, cheapest and most reliable tools we have to learn about the future.

The Iowa Electronic Market was historically the only significant legal US betting market, having received a ‘no action’ letter from the Commodity Futures Trading Commission in 1992. This

allowed them to operate an exchange provided that it made no profits, that no one person risked more than \$500 at a time, and that some contracts were restricted to academics only. Despite these restrictions, market prices were reliable enough to out-forecast polls and other methods for many political results, including US presidential elections, particularly in the era before scientific polling.

After a brief period when US traders were able to exploit regulatory gaps and participate in the Ireland-based Intrade market, before first being forbidden from using a US bank to deposit money in their accounts, and then finally barred altogether in 2012, regulators did authorise any substantial new exchanges until allowing the New Zealand's PredictIt to operate in the US on the same 'no action' basis at the end of 2014.

PredictIt operates on the Iowa model, though with larger financial limits (\$850 per question and a limit of 5,000 people participating in any one market) and it still isn't legal in Nevada and Washington states – hardly comparable to the options available elsewhere in the world.

Though regulators see big differences between prediction markets in which traders buy and sell futures contracts, traditional bookmakers who offer odds, and betting exchanges which allow customers to make bets with each other and simply take commission, all involve the same principle – regular people make personal forecasts about the likelihood of some future event, convert that probability into a price, stake their cash and if they were right, take home their winnings.

Markets serve as a clearing house, aggregating all available knowledge and offering a winning incentive to those whose

models, information sources or hunches are correct to come and reveal their forecast in the form of a price.

Though legally limited in size, IEM and PredicIt are producing valuable data in the form of market prices, shared with a consortium of 50 universities around the world. So why are these prices so valuable that universities would fight through heavy regulations to operate the exchanges? Why are betting markets so useful?

EVEN WHERE YOU CAN POLL, POLLS ARE EXPENSIVE AND RARE. MARKETS ARE MORE COMMON AND PAY FOR THEMSELVES

In the era of scientific polling there are arguments that we don't need prediction markets for elections because we can rely on better and better polls. There is some evidence for this perspective – the gap between market prices and polling has narrowed to almost non-existence where comprehensive scientific polling is available but to rely on this finding to dismiss markets altogether is unwise – setting up a market for a particular question is a lot easier than conducting a poll, as proved by heavily restricted betting markets having greater coverage of recent elections than polling.

THEY WORK FOR EVERYTHING, NOT JUST ELECTIONS

When it comes to an event as overwhelming as a presidential election, a poll is relatively straightforward to run. There is sponsorship funding from broadcasters or sometimes private

institutions, widespread interest in the outcome and most importantly, there is a population to poll which will decide the result.

Even sticking to major electoral politics, if you want to know something like the resignation date of a party leader, polling will give you some clue but it's certainly not the final answer. Participants in a betting market for the exit date of Theresa May will have to make assumptions about her health, political choices, the opposition ranged against her, her likelihood of calling/winning an election and aggregate this information into a price representing their probability estimate.

THEY UPDATE QUICKLY

If anyone has reliable information which might affect the outcome and isn't accounted for in the market price, they are strongly incentivised to seek out a market, bet their money, and move the price in the direction of probability and do so as quickly as possible. As soon as information becomes widely available then all prices adjust so swift updaters take advantage of public information and flock to markets when important news breaks.

A PROVEN CONCEPT

Major corporations are increasingly using internal prediction markets to harvest information within their organisations – Google, Intel and Hewlett Packard have all experimented with the method and early data from corporate schemes suggested that market prices became more accurate over time, suggesting that players respond to incentives and learn which forecasts are likely to pay off.

AVAILABLE MARKETS DETECT AND DISRUPT HONESTY

Markets are not just useful as a source of data. They can serve to clean a debate by identifying dishonest or morally posturing arguments.

When people make public forecasts they are rarely incentivised solely to make accurate predictions. As Phil Tetlock found in a landmark 20 year study of prominent pundits, those whose forecasts were less accurate were more likely to be listened to in public: their noisy, exciting, alarming forecasts were just plain wrong, but news producers and broadcasters booked them anyway. Though they are often loathe to admit it, broadcast news often prioritises entertainment over information.

Pundits also tend to make morally pleasing or worldview satisfying predictions which sit well with an audience- an audience of Marxists will delight in a forecast that Capitalism is due for collapse, regardless of accuracy, just as anxious homeowners watched mortgage industry representatives confidently assuring the public that there was nothing to worry about in the pre-crash housing finance sector.

If a pundit is sincere in their belief that an event is 60% likely and there is an available prediction market which prices it at 50%, they should be buying. If they aren't, why not? What do they say when you ask them?

WHAT ABOUT MARKET MANIPULATION?

A common criticism of prediction markets is that, by being open to anyone, they open the door to market manipulation and lose their price-predictive value.

In the UK it's legal to bet on an election in which you are a candidate – disgraced Liberal MP Clement Freud famously bet on himself to win his first election and funded his office staff from the proceeds, which raised eyebrows but was well within the law. But what if a political candidate bets on themselves, not because they think they'll win, but to lower their odds and create the perception of success? It's a charge which was levelled at several politicians whose odds spiked suspiciously far out of sync with polling data, though very difficult to prove.

The main thing to understand about this phenomenon is that it doesn't matter at all. Ill-informed or malicious bets only increase the incentives for those with accurate probability estimates to enter the market and actually has the effect of increasing the accuracy of the pricing – 'wrong' money in a market is there for 'right' money to take.

What about Brexit? Surely the fact that betting markets got the EU referendum 'wrong' means we should ignore them?

The first response to this argument is to point out that the odds of Leave victory were 25% across most markets. A well calibrated forecast of 25% means that one in four times, that outcome will occur and is not itself evidence of forecasting failure.

Secondly, the social utility of betting markets is in their ability to aggregate information. Deep, open currency markets, pollsters and even the Leave campaign themselves thought Remain had mostly likely won at the close of polls. If anyone knew that Leave

victory was more likely than was understood beforehand there was a massive amount of money on the table for anyone willing to deploy it. And looking to the future, there is a huge incentive for anyone who develops a model to take into account some of then novel features of the EU referendum. An instant correction was visible in the days after the referendum when market prices for a Trump Presidential victory shifted upwards on the discovery that, contra prior assumptions, outsider campaigns could encourage historic non-voting, socially excluded people to the polls.

This self-correcting incentive towards greater accuracy is exactly why markets are so valuable.

PEOPLE AREN'T RATIONAL:

There have been a series of discoveries in behavioural economics about the supposed irrationality of markets, much too much to summarise here, but the most important part of this story is that there's a constant self-correcting incentive to get better.

Yes, punters may be prone to excessive betting on long shots or fall victim to scope sensitivity (a difficulty in distinguishing between degrees of scale, for example bets on whether an event will occur in the next six months or in the six months after that should sum to the same probability as the event occurring in the next year, but often they don't). But each time such widespread patterns are discovered, they provide incentives for traders to enter the market and bet against the known bias until its advantage is eroded.

Long shot bias, in which people routinely overestimate the likelihood of rare events can be corrected for by applying an

‘extremising’ algorithm which routinely underweighs very low and high forecasts. The firm Good Judgment (disclosure: where I am a senior consultant) has identified that the most accurate forecasters (known as Superforecasters) have learned to self correct for this and that algorithmic corrections add no accuracy benefit. As soon as patterns of cognitive bias are exposed, they are incorporated into the next generation of traders.

PREDICTION MARKETS OPEN THE DOOR TO PROBLEM GAMBLING

Critics of political prediction markets often point to the social costs of gambling. While it’s important to take gambling addiction seriously we should be cautious about applying some of these costs to political prediction markets.

Gambling addicts, like most punters, actually tend to favour bets with a high degree of uncertainty – markets where time investment pays off the least and anyone has, by pure chance alone, the possibility of striking it rich. It’s not a coincidence that no-skill lotteries, slots and scratchcards are one of the most popular form of gambling.

Political markets are at the other end of this spectrum – if you wade in ignorant you are likely to lose your shirt – and so tend to be much less attractive to sensation seeking gamblers and return the highest levels of social utility from their predictive power.

Beyond these myths, betting markets suffer from deeper hostilities: perverse incentives and deeply-ingrained psychological biases – not within the markets, but about them.

Firstly, within organisations, prediction markets are often too

effective at harvesting information, undermining the role of managers' seniority and status. As Robin Hanson put it, many individuals in organisations are incentivised not to 'change perceptions of what is knowable and who knows what'

THE PSYCHOLOGY OF PREDICTION MARKETS

Though many critics of betting exchanges cite the supposed irrationality of markets and individuals, they rarely look at the known cognitive and emotional biases affecting the creation and acceptance of markets themselves.

In 2012, Inbar Pizarro and Cushman examined how people react to those who benefit from the misfortunes of others – short sellers of doomed stocks, or those profiting from payouts on natural disasters – and found that these bad-luck beneficiaries, though having nothing at all to do with causing the problems from which they profited, were held to be morally blameworthy for their costs.

This came as a late explanation for the great clash of moral discomfort and market social utility in 2003. Only two years after 9/11 and willing to explore every option, the Pentagon's DARPA (Defence Advanced Research Projects Agency) created a restricted but real-money prediction market to test the foreign policy and geopolitical forecasting potential of market technology. The Policy Analysis Market would initially focus on 'safe' international events like foreign elections but was planned to eventually include forecasts about terrorist attacks.

Reaction followed the pattern: Senate Democratic leader Tom Daschle called the idea "a plan to trade in death". Senator Ron

Wyden of Oregon took the same view: “The idea of a federal betting parlour on atrocities and terrorism is ridiculous and it’s grotesque.”

A potential project to help predict the most important possible outcomes was undone, and it would be years before a heavily restricted replacement project could be founded.

SO WHERE DOES THAT LEAVE US NOW?

Betting markets are a tool which has proved its usefulness time and time again. While cognitive and moral biases prejudice us against their adoption, we face more uncertainty than we need to.

Liberalising betting markets will give everyone – from policymakers to voters – access to a powerful predictive tool and incentivise anyone with information and analysis to put their money where their mouth is.

Michael Story is a Superforecaster with the Good Judgement Initiative and author of ASI paper “Free Market Welfare”

4. Legal Highs

The drugs that prove the prohibition of entire markets inevitably leads to unintended consequences

In 2013, Blackburn council made an interesting foray into uncharted drug policy territory, and in doing so, predicted what lay ahead for the rest of the UK. The council had received multiple complaints concerning the city's head shops selling legal highs, and decided to take action. Through the use of Trading Standards orders, the council successfully prevented all outlets from selling legal highs in the town centre.

In creating a vacuum on the supply side of the legal highs market in Blackburn, while demand still remained, the council created the perfect environment for the market to be exploited by illegal street dealers.[1] While the business practices of the closed legal high shops could have been improved, for example with intelligent regulations or incentives to encourage responsible use of their products, they were nonetheless leagues above those of the street dealers. Street dealers' customers have no recourse to legal action when products turn out to be dangerous. Worse still, street dealing relationships are unable to use any of the methods available in legal markets that ameliorate "information asymmetries"—situations where seller and buyer have different information about the quality or safety of a product. Used car salesmen can have their wares independently checked, or build

an impressive forecourt to convince buyers they'll stick around. By contrast, street dealers have short relationships with clients that make it hard for honesty norms to develop and sustain.

This resulted in limited enforcement of age restrictions, poor practice, and poor product quality. Products were decanted from their original packaging into unmarked bags of unknown quantity. And aggressive market practices were extended: sellers introduced offers and free packets of rolling papers for loyal, offered all-hours home delivery, credit—directly frustrating the council's goals. One of these entrepreneurial sorts ran a cash-for-clothes store: payment was accepted in garments and bedding, which led to addicts stealing hostel sheets or relatives' clothes to pay for their products.

In order to appease vocal elements of the local community, Blackburn council lost control of the local legal highs market. Rather than trying to improve practices with incentives or limited regulations, the council drove legal highs underground. This ultimately caused much greater damage to those most affected: users and their friends and family.

Not heeding the lessons learnt in Blackburn, in 2015 the UK Government proposed what ultimately became the Psychoactive Substances Act, which came into force in 2016. It prohibited the production, sale, import and export of all psychoactive substances, barring those specifically exempt, aimed specifically at targeting the same legal highs as those sold in the Blackburn head shops. Its successes have been immediately visible: high street head shops have closed or turned overnight into vape shops, and there has been a noticeable reduction in the use of nitrous oxide outside clubs and at festivals, a cause of littering that was the primary complaint from many local councils

regarding the drug due to the high expense involved in clearing up the metal cannisters.

The unintended consequences of this legislation will take longer to show up, as the majority of the demand for legal highs has been displaced to the illegal market, i.e. into the hands of street dealers and online. Early indication of who will control these markets has been seen at festivals. Nitrous oxide is widely available, but with organised crime operations replacing the lone opportunistic salesmen of previous years. The increased threat of up to a seven year prison sentence means that it is only organised crime gangs that are now willing to take such risks.

THE ROOT OF THE PROBLEM

The Psychoactive Substances Act is a troubled piece of legislation, but it must also be viewed in the context of its surrounding legislative and cultural environment.[3] It was created to remedy a problem created by the Misuse of Drugs Act 1971, which prohibits the sale and possession of psychoactive substances that have existed for decades, centuries or millennia. In prohibiting a legal market in these substances, the UK Government has allowed the illegal trade to flourish, which it has duly done in the intervening 45 years.

It has been argued that a much harsher prohibition regime than ours could stem the drug trade, although brutal regimes around the world don't seem to have succeeded.[4] Consider parts of the world where prohibition has been pursued far more ardently such as in Southeast Asian countries like Indonesia or the Philippines, or in South America, and where violence relating to the drug trade exists on a scale orders of magnitude greater than that seen in Europe.

More fundamentally, even if some extreme level of policing and surveillance were able to contain the illegal drug markets, it's unclear whether a goal of total prohibition would be worth such a cost to our civil liberties. In terms of practicality, enacting such policies would be extremely costly and require huge amounts of time from police forces, customs and other security organisations. Ethically, the extension of police powers to enable such a policy (increased stop-and-search, constant surveillance, unwarranted home invasion) would find us living in little better than a police state. Such a response would be overwhelmingly heavy-handed, given that nine in every ten people who use drugs report no significant negative consequences. The remaining ten per cent are better served by health-based approaches rather than criminal sanctions.

Besides increased violence and a continually expanding illegal trade, prohibition of traditional drug markets also created an incentive to find a legal alternative to those drugs listed in the MoD Act. With the right technology and circumstances, producers of a legal alternative would be able to repeatedly take chunks out of the market share of the illegal drugs trade, since products' prices are artificially inflated there due to the risk of trading an illegal good.

It was just such circumstances that precipitated the sudden cultural emergence of legal highs in the last ten years. Legal highs had been around a lot longer, existing in the fringes of drug culture and generally only sought out by dedicated psychonauts. As soon as a substance gained sufficient notoriety and popularity - MDMA in the 1980s, 2C-B in the 1990s or ketamine in the 2000s - the drug was scheduled under the MoD Act, becoming the latest illegal product. By the later 2000s, however, the

internet allowed for much faster sale and uptake of new legal highs, which also coincided with the rise of Chinese labs that could produce such substances quickly and in bulk.[5]

In 2008, a huge shipment of safrole, the precursor chemical to MDMA, was seized, leading to a global drought in the drug, and huge reductions in the quality and strength of ecstasy pills. During the same period, cocaine strength was also being reported as historically low. New stimulant mephedrone was released into this environment, sold cheaply and legally online, at high purity and with effects conveniently between cocaine and MDMA. Its popularity mushroomed as people switched from poor quality, expensive and illegal alternatives. The rapid uptake fuelled a media furore with ‘meow meow’, as it was dubbed, spuriously linked to deaths and hospitalisations across the UK.

The sudden spurt in popularity of this new drug revealed the unwieldiness of the MoD Act: it took two years from emergence of mephedrone until its eventual banning, despite additional pressure from the media-generated panic surrounding the drug, and with the Government still wedded firmly to the idea that the only solution to the emergence of a new psychoactive substance was to ban it. To improve upon the timeframe in which new drugs could be controlled, Temporary Controlled Drug Orders (TCDOs) were subsequently introduced, which allowed the Advisory Council for the Misuse of Drugs (ACMD) to temporarily schedule a new psychoactive substance while it undertook a more thorough review, thus shortening the window of opportunity for such substances to be sold legally.

By the end of 2010, mephedrone was no longer a legal high. Being largely a drug of convenience for most of those who used

it, the majority of its user base left it. Its legacy, however, was far more persistent: the blueprint had been laid out for all future legal highs.

UNINTENDED CONSEQUENCES

One curious phenomenon potentially linked to the mephedrone boom in the UK was the reduction in accident and emergency admissions attributed to cocaine - a figure which again started to increase in 2011 after mephedrone was scheduled. Academics have suggested that the adoption of mephedrone over cocaine had a sizeable impact on reducing the harms suffered by users through those years.[6] The adoption of mephedrone in preference to cocaine and its subsequent banning could be framed as a missed harm reduction opportunity, although it was seen in no such terms by the government or the press at the time.

Another case study in unintended consequences comes from dissociative drug ketamine, used in a medical setting as a powerful anaesthetic, which has seen low level recreational use for decades. The 2000s saw a sharp rise in its recreational use, particularly in club settings, which resulted in its scheduling in Class C in 2006.

The emergence of methoxetamine in 2010, temporarily a legal alternative to ketamine, can be attributed both to the rapid rise in ketamine popularity, and also to its subsequent scheduling: methoxetamine plugged holes in the ketamine market, appearing as national and international restrictions tightened. A lesson learnt from rapid rise of mephedrone and its subsequent banning under the MoD Act was that any legal market in an alternative to an illegal drug would be likely to be short-lived, and so the

retailers of methoxetamine marketed the drug aggressively, giving it the tabloid-friendly name 'roflcoptr'. This was picked up instantly by the UK press, which gave the drug column after column of free publicity as it became the drug scare story du jour. Despite this, the drug found a limited audience, not least because of the relative inexpensiveness and wide availability of ketamine at the time.

Methoxetamine became the first drug to be controlled by TCDOs in spring 2012, being subsequently moved to Class B in 2013 alongside a host of related compounds. However, unlike mephedrone, which saw a rapid decline in use upon its scheduling, methoxetamine's story is markedly different. Towards the end of 2013, India, the source of the majority of the world's ketamine (both licit and illicit) tightened down on the labs producing surplus supplies for the illegal market. Following the crackdown, illegal supplies of ketamine plummeted, resulting in a drought lasting throughout 2014 and 2015. Waiting in the wings and already known to ketamine consumers was methoxetamine, now with a higher price tag due to its illegality. It returned to become, for a short while at least, the primary drug in the recreational dissociatives market, both being sold as a drug of choice itself, and also mis-sold as ketamine.

Ketamine was rescheduled up to Class B in 2014, at the recommendation of the ACMD. At the time of the rescheduling this was hailed by then Minister for Drugs, Norman Baker, as having "a value in giving a steer to people at the very least". Far from stemming the flow of ketamine up clubbers' nostrils, Chinese labs picked up the slack from India and returned ketamine to the market in 2015 and 2016. Most consumers returned to their drug of choice, with only a few stalwarts loyal to methoxetamine.

In recent years ketamine has come under increasing attention for its ability to act as a novel fast-acting antidepressant. An often-missed fact is that methoxetamine was also briefly investigated for this purpose, with promising results. In all the furore around its marketing, banning, resurgence, and eventual fall from favour, the medical potential of methoxetamine was all but forgotten.[8] It would be an interesting reversal for a drug originally created purely for recreational purposes to ultimately find medical use, not least because recent history shows us the opposite direction is far more frequently the case, whether it has been LSD, MDMA, or indeed ketamine, all primarily developed as medicines. Sadly it would require a huge shift in public perception of the substance before this could become reality.

CAT AND MOUSE

The creation and proliferation of mephedrone and methoxetamine in place scarce illegal drugs, highlights how prohibition of one substance yields others that can have unpredictable knock-on effects. The greatest example of how prohibition can distort a market into worse form, came with the emergence of synthetic cannabinoid receptor agonists (SCRAs). These are misleadingly referred as 'synthetic cannabis', and given brand names like 'Spice', 'Clockwork Orange' and 'Black Mamba', whereby plant matter is sprayed with the psychoactive substances to mimic cannabis, incidentally making reliable dosing of these substances impossible, and adding to their unpredictability and potential for harm.

Cannabis, while not risk free, is relatively benign in comparison to many of the SCRAs, which are all considerably more potent than THC, the principle psychoactive component of cannabis.

THC is what is known as a partial agonist of cannabinoid receptors, its psychoactive effects being caused by its action at the CB1 receptor found in the central nervous system. SCRAAs, by comparison, are full agonists, which explains their increased potency, while also meaning their effects can be unpredictable and far more extreme than those of THC itself.

SCRAAs have seen the most innovation and evolution of any class of psychoactive substance during the last ten years, as wave after wave has been created and subsequently legislated against. The system of TCDOs, initially introduced to expedite the process of controlling new substances, ultimately contributed to the increasing danger of SCRAAs, as the accelerated banning procedure simply fuelled the creation of new SCRAAs, ultimately resulting in substances of ever-increasing potency and ever-less well-understood effects.

In a twist of all-too-familiar irony, the first generation of SCRAAs originated in research facilities as tools for cannabinoid research; substitutes for the cannabinoids found in cannabis itself, as obtaining licences to conduct research with the plant-derived substances proved too costly and and time consuming. Years later, when the substances emerged as components of legal highs, the original inventors were shocked and dismayed to find their creations repurposed for human consumption, a use they had never been designed or tested for. This first generation of SCRAAs were banned in the UK around 2009, sparking their spiralling chemical arms race - which in comparison to other psychoactive substances are far more diverse in their chemical structures, and so provide far more potential for chemical tinkering.

The process of ‘cat and mouse’ production and legislation

exemplified by SCRA is what ultimately drove governments in the UK and elsewhere to adopt blanket bans on all psychoactive substances in an effort to break the cycle, but the damage has already been done. SCRA is hugely popular in certain populations, notably marginalised groups such as homeless people and prisoners. Their high potency, invisibility on drug tests, lack of odour and low cost give them several advantages over the cannabis they were created to mimic, and their low manufacturing costs mean that, even more so than with mephedrone or methoxetamine, now they are here, they're here to stay. More worryingly, their production will be able to undercut either an illegal or a legal cannabis market, and so are a problem that could persist until policies sufficiently favour the use of cannabis.

FINDING A WAY OUT OF PROHIBITION

New Zealand made a serious attempt at a more progressive drug policy with its 2013 Psychoactive Substances Act. This policy included an unprecedented clause that could allow for a psychoactive substance to be regulated, should it be proven not to exceed a certain level of risk, according to animal and human trials. While touted as potentially revolutionary upon its introduction, flaws in the Act soon materialised, that have as yet meant no new psychoactive substances have been regulated. The Act has run into difficulties, including the requirement for safety testing recreational drugs on animals, where animal rights laws make that impossible until they are proven safe—a catch-22 situation. Equivocation around the Act's definition of a 'low risk of harm' has also proved a major stumbling block.

Another shortcoming of the New Zealand Act was its stipulation that drugs already controlled by the New Zealand Misuse of

Drugs Act (largely similar to the UK's) could not be put through the testing procedure themselves, and so could not be regulated. Not only did this affect drugs that had been controlled for decades, such as cannabis and MDMA, it also applied to many of the new psychoactive substances that had been controlled early on in the 2010s using New Zealand's own TCDOs. These were often considered to be potentially safer than the substances that remained uncontrolled. Had a more enlightened approach been taken with regards to regulating already controlled substances, this would have allowed the country to wean itself off its MoD Act, and onto a system of evidence-based regulation.

Perhaps as fundamental as any of the above flaws, the New Zealand Act misunderstood how best to motivate manufacturers to reduce the risks and ensure the safety of potential regulated psychoactive substances. Setting an arbitrary bar of safety below which a product must come merely restricts manufacturers, rather than actively encouraging good practice. Recently, a report evaluating the New Zealand model by the Beckley Foundation made a first attempt to address this issue, suggesting a form of mandatory product insurance could be used to incentivise the production and testing of less risky psychoactive substances, with insurance premium linked to the safety profile of a psychoactive substance.[8] A manufacturer of a potential new legal psychoactive substance would have to quantify the degree of risk a substance poses to produce a safety profile, which would then allow an independent insurer to set the premium for a given substance. In so doing, the insurer would incentivise manufacturers to produce safer substances, and also to collect greater evidence supporting the substances' safety, meanwhile any reports of drug-related harm would increase premiums. It would require a huge amount of work to thoroughly consider the practicalities and predict the potential pitfalls

of such an approach, but it does at least point towards some refreshingly clear thinking on psychoactive substance regulation.

Such a system poses some serious questions: how does a government or a private insurance company monetarily quantify the potential of harm to human health of drugs known to have some level of risk? Is there a cut off, beyond which a drug is too dangerous to be insured, and if so where does this point lie? If there isn't, would the system be open to abuse by companies willing to invest large sums to regulate dangerous but profitable drugs? Similarly, would a government have any responsibility to allow less harmful, but still risk-containing substances to the market? For example if a less harmful amphetamine-like stimulant could displace, say, the cocaine market, would this be a desirable outcome? In the current global political climate, consideration of any such system is distant, with wholesale banning of psychoactive substances still the preferred route of governments, and acknowledgement, let alone acceptance of drug use still a rare occurrence.

One of the fundamental lessons to learn from attempting to legislate for or against psychoactive substances has been that whatever governments' best intentions, overly restrictive systems encourage more inventive approaches to circumvent them, which has led invariably to a cascade of other headaches further down the line, be they for politicians, law enforcement, legislature or public health authorities. More liberal approaches can allow for flexibility within their systems that, conversely, allow more intelligent policies to emerge based on harm reduction and the reality that we live in a drug using society. Accepting, understanding and harnessing drug markets legally, rather than attempting to quash them, is the only way our society will regain control of them.

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