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BOOK SUMMARY

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Drug Policy and the Public Good: a summary of the second edition

Thomas F. Babor[1], Jonathan Caulkins[2], Benedikt Fischer[3], David Foxcroft[4], María Elena Medina-Mora[5], Isidore Obot[6], Jürgen Rehm[7], Peter Reuter[8], Robin Room[9], Ingeborg Rossow[10] & John Strang[11]

ABSTRACT

The second edition of *Drug Policy and the Public Good* presents up-to-date evidence relating to the development of drug policy at local, national and international levels. The book explores both illicit drug use and non-medical use of prescription medications from a public health perspective. The core of the book is a critical review of the scientific evidence in five areas of drug policy: (1) primary prevention programs in schools and other settings; (2) treatment interventions and harm reduction approaches; (3) attempts to control the supply of illicit drugs, including drug interdiction and law enforcement; (4) penal approaches, decriminalization and other alternatives; and (5) control of the legal market through prescription drug regimens. It also discusses the trend towards legalization of some psychoactive substances in some countries and the need for a new approach to drug policy that is evidence-based, realistic and coordinated. The accumulated evidence provides important information about effective and ineffective policies. Shifting the emphasis towards a public health approach should reduce the extent of illicit drug use, prevent the escalation of new epidemics and avoid the unintended consequences arising from the marginalization of drug users through severe criminal penalties.

Keywords Drugs, demand reduction, illicit drug use, policy, supply control, prevention, treatment.

Correspondence to: Thomas F. Babor, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, 263 Farmington Avenue, MC6325, USA. E-mail: babor@uchc.edu

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INTRODUCTION: FRAMING THE ISSUES

The use of psychoactive substances is commonplace in many parts of the world, despite the best efforts of policymakers, government officials, public health advocates and concerned citizens to prevent, eliminate or control it. If the last century's experience can serve as a guide, in the future many countries will face periodic drug use epidemics followed by aggressive policy responses to suppress them. These policy responses or, more specifically, the scientific evidence on the impact of policy, constitute the core interest of the second edition of the book, *Drug Policy and the Public Good* [1]. In this article, we summarize the main themes of the book, and at the same time put our review of the global drug situation into context by reflecting on areas that the book may not have covered because the science base was inadequate or the topics were too speculative.

MATTERS OF SUBSTANCE

Psychoactive substances vary tremendously in their pharmacological properties, cultural symbolism and reinforcing effects. Advances in neuroscience and other disciplines have improved our understanding of how drugs affect neurotransmitters, behavior and the adverse consequences of acute as well as chronic use. Whether a particular drug is natural or synthetic, for example, affects its portability and abuse potential. Another important distinction is related to the way in which it is ingested. Substances that can be smoked, inhaled or snorted reach the brain rapidly and tend to have strong reinforcing effects. Drugs that can be diluted and then injected into the bloodstream provide more rapid delivery, which greatly increases their abuse potential.

Implicit in the development of intervention programs and prevention strategies is the notion that some drugs are more risky or harmful than others, and as such may merit more control, resources and monitoring. Legal substances such as tobacco and alcohol have always generated aggregate harm at least as great as illicit substances such as heroin and cocaine, in part because legal availability facilitates widespread use, but more recent trends have shown the complicated interplay between the black, gray and legal markets for opioids [2]. Even substances with lower risk for dependence, such as cannabis, can cause

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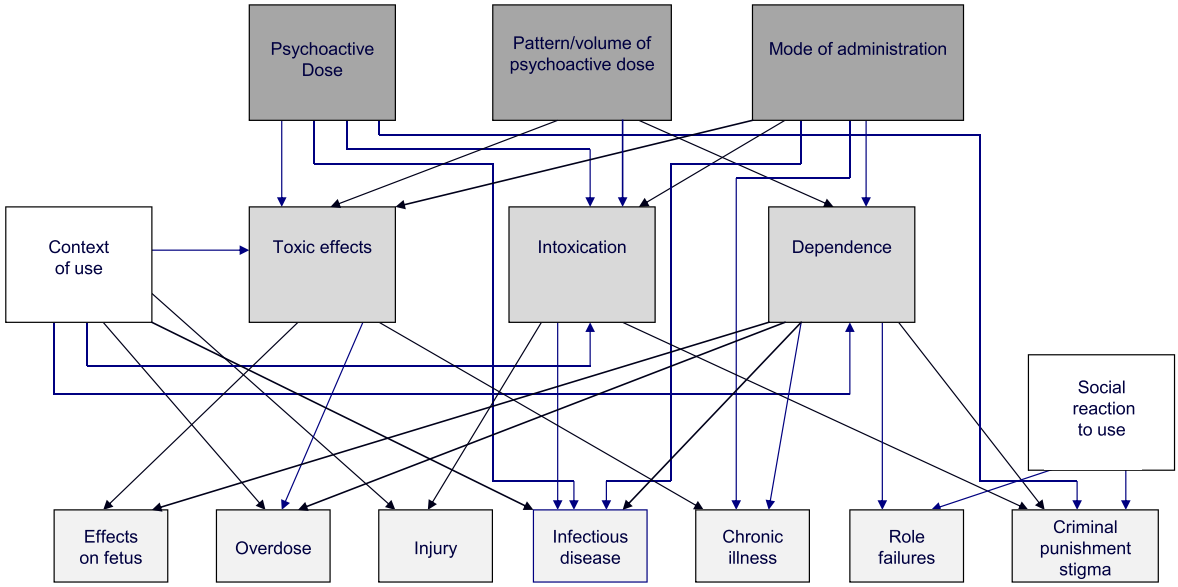

Figure 1 How toxic effects, intoxication and dependence are related to drug dose, use patterns and mode of drug administration, and in turn mediate the consequences of drug use for the individual drug user. Source: Babor *et al.* [1]. [Colour figure can be viewed at wileyonlinelibrary.com]

considerable harm if they are used with high frequency, intensity and prevalence [3,4].

Any consideration of the public health impact of psychoactive substances therefore needs to take into account three important mechanisms of harm: the physical toxicity of the substance, the intoxicating effects it produces and its potential for creating drug dependence. Figure 1 illustrates how the risks associated with psychoactive substances vary according to the drug's mode of administration, drug dose and use patterns. These mechanisms mediate the consequences of drug use and suggest that the chemical substance itself, in its pure form, is only one among many factors that determine whether and how much harm occurs.

DRUG USE IN GLOBAL PERSPECTIVE

The United Nations estimates that 5% of the world population, or a quarter of a billion people between the ages of 15 and 64 years, used an illicit drug at least once in 2014 [5]. Cannabis in its various forms is the most widely used illicit substance. Surveys suggest that the proportion of the population who report ever having used an illicit drug (in the range of 10 to 50%) is six to 15 times higher than the proportion who report symptoms of current drug dependence [6], in part because most people who try a drug never proceed to regular use. The risk of dependence is considerably higher for those who use on an ongoing basis. Of the 247 million people who report using drugs in the past year, an estimated 29 million (11.5%) had drug use disorders [5]. From 2006 to 2014 the global annual prevalence of illicit drug use remained fairly stable at around 5%, and a similar trend is observed for problem drug use, at approximately 0.6% [5].

There are significant differences in the extent of drug use and associated problems across countries and regions of the world. These differences at the population level reflect variations in drug markets, drug availability and legislation as well as political, economic and social conditions. Cultural and historical conditions can also play an important role.

Increases in drug use and in problems related to production and trafficking have been particularly marked in regions undergoing major political and societal changes. Another trend in a few countries (e.g. the United States, Canada and Australia) has been for increased non-medical use of psychopharmaceutical drugs [7,8], particularly opioid analgesics. Excessive prescribing of prescription opioids and subsequent attempts to restrict that prescribing are thought to have triggered an increase in the use of illicit heroin in North America, especially heroin that is adulterated with fentanyl or other synthetic opioids. This is reflected in sharp increases in deaths related to these drugs during the past decade [9].

There is overwhelming evidence from epidemiological research conducted during the past 50 years that youth is the period of greatest risk for the initiation of drug use [10,11]. Problem drug users are more often males and are likely to have a family history of substance dependence, delinquent behavior and mental health problems. To the extent that drug use is most often interwoven in a complex network of other social problems, both at the individual

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level and at the societal level, strategies to prevent drug use or drug-related harms need to be informed of this complexity.

HARMS ASSOCIATED WITH ILLICIT DRUG USE

Five types of morbidity and mortality have been identified as primary expressions of health harm associated with illicit drug use: (1) overdose; (2) other injury; (3) non-communicable physical disease; (4) mental disorders, including drug dependence; and (5) infectious disease. In 2017, 585 000 deaths and over 41 million disability-adjusted life-years lost were estimated to have been caused by illicit drug use [12]. Both estimates show a considerable increase from 1990 and a steady increase during the past decade [12,13].

Although the burden, harm and costs attributable to illicit drug use are substantial, especially in high-income countries [12], for most nations they are markedly lower than those attributable to alcohol and tobacco. However, in certain historical situations drug-related harm may become a key factor in life expectancy reversals for countries, such as in the recent declines in life expectancy in the United States or in Mexico [14,15].

Opioids, cocaine and amphetamines entail greater risks, especially when they are injected. As suggested in Fig. 1, many harmful consequences are not necessarily intrinsic to the properties of the drug, but instead are associated with the physical and social environment in which drug use takes place. A society's drug policy will be more likely to meet its chosen goals if these epidemiological considerations concerning the distribution of harms are taken into account in the allocation of resources for prevention, treatment and social service programs [16].

ILLEGAL MARKETS: THE ECONOMICS OF DRUG DISTRIBUTION AND SOCIAL HARM

Illegal drugs are commodities that are bought and sold in markets. These markets differ in terms of their organizational form, pricing strategies, product quality and degree of associated corruption. Internet-enabled, direct-to-consumer sales are increasing for certain new psychoactive substances, and also for cannabis in some legal markets. Nevertheless, with the notable exception of fentanyl, most drug harms stem from substances with more traditional supply chains. Many farmers are engaged in small amounts of drug-growing in the producing countries, but there are comparatively small numbers of refiners, smugglers and top-level importers. Compared to most legal markets, there are many sellers relative to the number of buyers in drug markets.

Despite the belief that drug markets are dominated by a small number of cartels, syndicates and organized crime families, drugs are produced and distributed by the collective efforts of millions of individuals and small organizations that operate in a highly decentralized manner. One consequence of the network character of drug distribution is its resilience. Eliminating individual players or even entire organizations within a mature drug distribution network has little impact on the ability of the network as a whole to transport drugs from their source to the customers. This adaptability of mature drug distribution networks limits the ability of enforcement authorities to eradicate mass-market drugs.

Illegal drugs are extremely expensive relative to legal drugs and most other familiar consumer goods. High prices reduce consumption, abuse and adverse health consequences, even for users who are drug-dependent [17], but high prices tend to impoverish drug users, increase the amount of crime they commit and enrich drug distributors [18]. Regarding quality, illicit drug markets deliver low-quality goods and services because of the absence of regulation and the inability to enforce contracts through normal means. Adulteration and the lack of quality control can cause harm in many ways, including the risk of overdose. Harms are not limited to individuals. Production and trafficking are associated with corruption, political instability, violence and rates of addiction in both source and transit countries [19,20]. Most of the market-related harms are a consequence of efforts to reduce drug use, especially the laws and programs prohibiting the production, distribution and possession of illicit drugs, although the benefits of reduced use arising from prohibition may well over-ride the market harms that prohibition creates. Hence, the best response might be to reform prohibition, not end it.

THE LEGAL MARKET: PRESCRIPTION AND DIVERSION OF PSYCHOPHARMACEUTICALS

The growth of modern medicine is paralleled by substantial growth in psychopharmaceutical medications designed to treat psychiatric disorders, pain, cognitive dysfunction, mental distress and sleep disorders. These medications, many of which have high dependence potential, are primarily distributed, at least in high-income countries, through a prescription system.

Global consumption of pharmaceutical opioids has more than tripled over the past 20 years [21,22], but the consumption of opioids for pain care is highly unbalanced between richer and poorer countries. For example, approximately 90% of the world's morphine is consumed in a small number of countries (mostly the United States, Canada, Australia, New Zealand and in western Europe), whereas a large majority of the global population, mostly

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in low- and middle-income countries, have very limited access to opioid medications. These differences in psychopharmaceutical use are driven, at least in part, by a combination of relative affluence, cultural factors and the influence of pharmaceutical marketing [23–25]. The disparity is also related more to overconsumption in some countries (e.g. United States and Canada), and to limited availability of psychopharmaceutical supplies in some lower-income countries than to differences in mental distress or pain across countries.

Diversion of psychopharmaceuticals from the prescription system for the purpose of non-medical use constitutes a substantial part of the illicit drug market in a growing number of countries. While there is criminal or organized diversion from the prescription system as well as counterfeit products, most of the diversion happens informally, often at the consumer/patient end of the distribution chain. There is substantial evidence that 'informal sourcing' of prescription drugs from peers, friends or family members constitutes the main pathway for a great part of non-medical use [26].

A large amount of psychopharmaceuticals in unregulated markets are there as 'diverted' medications from legitimate production or from dispensing at different points of the health-care system. This includes large amounts of prescriptions written and dispensed at the retail level, whether based on deviant procurement practices such as 'doctor-shopping' or as legitimate prescriptions that are diverted within a legitimate care system. It is therefore no surprise that nations that dispense the largest amounts of these medications experience the most severe problems with regard to diversion and misuse [2,27]. Although 'medical use' and 'non-medical use' of psychoactive medications are often assumed to be mutually exclusive categories, the pathways of availability and distribution for both types of substances are increasingly converging.

STRATEGIES AND INTERVENTIONS TO REDUCE DRUG USE AND RELATED HARM

Within the global prohibition framework, a variety of strategies and interventions have been developed to reduce illicit drug use and related harm. The scientific evidence for these policy options is derived from a variety of research methods and measurement techniques, ranging from randomized clinical trials of prevention programs to 'natural experiments' that evaluate the impact of new policies. Contemporary drug policy is concentrated in three broad areas: programs to prevent drug use, services that help heavy drug users change their behavior or the consequences of that behavior and supply control programs. In recent years, addiction science has matured as an aid to policy formation and evaluation. Drawing upon an extensive literature of both original research and integrative literature reviews, the remainder of this article summarizes the book's critical evaluation of the scientific evidence relevant to each of these areas.

PREVENTING ILLICIT DRUG USE BY YOUNG PEOPLE

There is a broad array of options available within the ambit of youth-focused prevention, comprising both distinct strategies (e.g. mass media campaigns, community-based family strengthening programs) and many forms of school-based drug prevention. Among the plethora of school-, education- and community-based prevention programs, there is evidence that some approaches can delay the initiation of drug and alcohol use [28], particularly curricula that take a developmental and social skills approach by combining social competence and social influence components.

A small number of high-quality studies find evidence supporting specific family-based or classroom management programs in preventing drug or alcohol use. It is notable that these programs do not focus exclusively or specifically on drug or alcohol use *per se* [28,29]. Rather, their aim is to improve behavior and social skills more generally, within the family or classroom environment. These programs also show evidence of wider effect beyond drugs or alcohol. In contrast, purely didactic prevention programs have no evidence of effectiveness, whether delivered through the mass media, in the community or in the classroom. And other forms of primary prevention such as drug testing in schools [30,31] and mass media campaigns on their own are not effective in preventing or reducing drug use by young people [32,33].

HEALTH AND SOCIAL SERVICES FOR DRUG USERS

Health and social services attempt to reduce drug-related harm by promoting abstinence, by reducing the frequency of drug use and by changing behaviors that are harmful to drug users and society at large, such as injection drug use, drug overdose and criminal activity. Among the most carefully evaluated programs are interventions focused on users of heroin and other opioids. Overall, opioid substitution therapy (OST) has stronger evidence of effectiveness than any other intervention for opioid use disorder [34]. The documented benefits of OST include reduced overdose mortality, less HIV infection and lower crime rates. When fixed medium or high doses are used, buprenorphine and methadone are equally effective [35]. Naltrexone implants and depot formulations circumvent the major problem of poor adherence, with positive randomized clinical trials in the United States, Russia and Norway [36–40]. Good results have also been reported for supervised heroin

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substitution treatment for patients who repeatedly fail standard treatments [41].

Therapeutic Communities (TCs) have also shown positive results in quasi-experimental studies [42,43]. Psychosocial interventions for users of cocaine, cannabis, methamphetamine, hallucinogens, benzodiazepines and club drugs have evidence of effectiveness as well, with good evidence for reducing drug use, drug-related problems and criminal activity, across a range of drugs and administration routes and in both low- and high-income countries [44,45]. One very specific approach that has shown consistent effectiveness across a range of substance use disorders, populations and settings is contingency management (e.g. 'voucher-based reinforcement') [46].

Harm reduction services directly target the specific risks of drug use (e.g. drug overdose deaths, infection or transmission of HIV or hepatitis B or C) without making the assumption that cessation of drug use needs to be a main therapeutic goal. There is evidence to support the effectiveness of needle exchange programs in reducing the transmission of HIV [47], and the pre-provision of take-home naloxone has been found to save lives with a very low incidence of adverse events [48]. Supervised consumption sites, where drug users can inject or otherwise consume their drugs in a safe environment with medical assistance available, have a good record of reducing overdoses and other risks from use supervised in the facility [49].

A range of treatments for addiction provide valuable contributions to the criminal justice system, often in the context of being alternatives to incarceration. Drug courts can reduce crime and promote treatment participation [50–52]. Drug treatment in prisons and after release helps prisoners to remain abstinent, prevents recidivism and facilitates continued employment, especially if OST or a TC model is used [53–55]. Evidence [56] also supports the benefits of mutual help organizations (e.g. Narcotics Anonymous and similar recovery programs).

Countries differ markedly in terms of the availability, accessibility, coordination, cost-effectiveness and coerciveness of treatment and harm reduction services [57]. However, treatment services alone, without coordination with criminal justice, health care, psychiatric services and social services, are unlikely to have an impact at the population level, as reflected in reduced rates of substance-related mortality and morbidity. However, in many low-income countries, the treatment gap is more related to availability of services and lack of a health care infrastructure than to the organization of the health system [58].

SUPPLY CONTROL

Supply control approaches to drug policy focus on constraining the production, distribution and sale of illicit psychoactive substances, and include alternative development programs in producer nations, interdiction in transit zones and at national borders, control of precursor chemicals used to produce certain drugs (e.g. methamphetamines) and the arrest and incarceration of drug dealers at all market levels. There is no evidence that promoting alternative economic and social development as part of global drug control strategy has a noticeable effect on drug use in the principal consuming countries. Other interventions higher up the distribution chain (e.g. crop eradication, interdiction, precursor controls) have produced transient market disruptions sufficient to affect drug use and related health outcomes (e.g. [59]), at least in the short term.

Figure 2 illustrates a supply-side success. Between 2006 and 2010 the quantity of cocaine consumed in the United States declined by more than 50% [59]. A wide

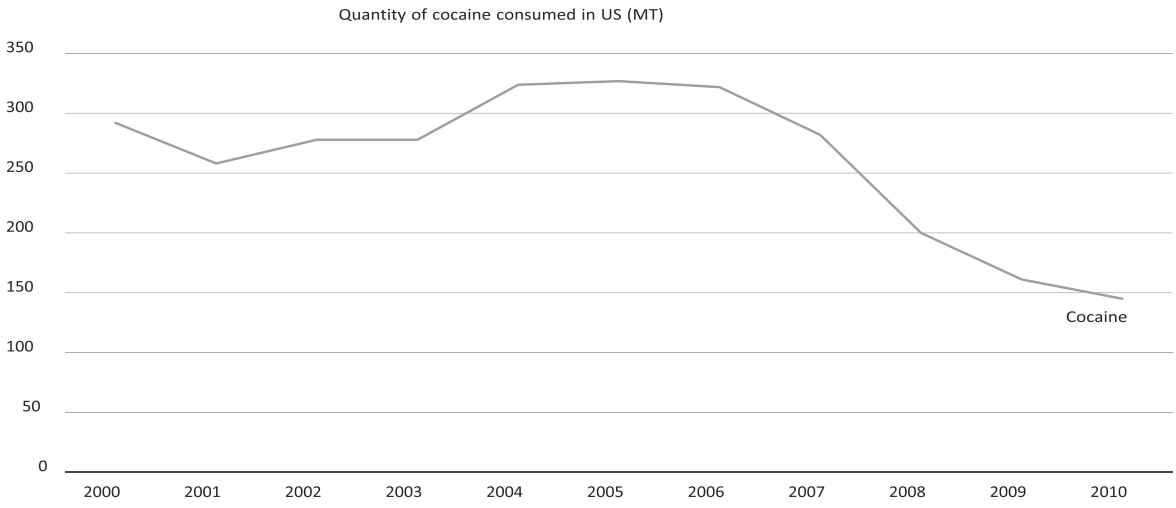

Figure 2 Quantity of cocaine consumed in the United States, 2000–10. Source: Babor *et al.* [1]

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variety of indicators (e.g. overdose deaths, treatment admissions) showed declines consistent with this trend. While the estimated number of frequent users declined by 20% during the period, it is likely that users also reduced their consumption. Both could stem from price increases whose origins are not entirely clear, but may be due to some combination of a reduction in cocaine supply in Colombia, the effects of a crackdown on violence in Mexico [60] and limits on essential precursor chemicals [61].

Regarding the pursuit and punishment of high-level dealers, what little evidence exists suggests that there may be diminishing returns to drug policy goals from extended periods of incarceration. Finally, local or street-level enforcement is probably not an efficient strategy for reducing drug use, simply because the number of current and potential sellers is so large as to overwhelm the capacity of the criminal justice system to deliver punishment. Supply-control interventions absorb the bulk of drug control spending in most nations, yet the evidence which would support these interventions is weak, in part because the existing evaluations fail to demonstrate effects on either the supply or the price of drugs in the marketplace.

CRIMINALIZATION AND DECRIMINALIZATION OF DRUG USE OR POSSESSION

Research suggests that punishing drug users has limitations as a major component of drug policy [62]. An increasing number of countries and jurisdictions have therefore been reducing or eliminating criminal penalties for possession of small amounts of drugs for personal use, on grounds both of proportionality and effectiveness-oriented policy. Most decriminalization or depenalization programs involve the substitution of civil penalties for criminal penalties for possession offenses, while retaining full formal prohibition. The balance of the available evidence is that removing or reducing criminal penalties on possession does not lead to substantial increases in use [63]. For cannabis, in particular, there are a number of cases where there was no measurable change in consumption from such a policy change [64,65].

PRESCRIPTION REGIMENS AND OTHER MEASURES TO CONTROL MISUSE OF PSYCHOPHARMACEUTICALS

There is extraordinary global variation in the availability of prescription psychoactive drugs, with most prescription drug use being concentrated in developed countries. A variety of measures aim to prevent abuses such as 'doctor-shopping' and diversion of psychopharmaceuticals from the medical and pharmacy systems. The evidence [66,67] suggests that prescription regimens affect the prescribing practices of doctors, although restrictions often result in substitution of other medications which are sometimes equally or even more harmful. Price can be used to channel demand between two drugs that are substitutes for each other, moving demand from a drug with more adverse consequences to a less risky alternative [27,68]. Advice to physicians on prescribing, in the absence of regulatory enforcement, has limited effect unless the advice concerns a new and serious side-effect and alternative medicines can be prescribed [69]. Shifting a prescribed drug onto a special prescription register, in conjunction with guidelines that limit prescriptions, reduces prescriptions of that drug [70]. In summary, the development of a strong pharmacy system can limit illicit misuse of prescription medications, but in countries with a very high demand for psychopharmaceuticals, such systems have not been able to prevent periodic epidemics of prescription drug misuse.

DRUG POLICY AND CONTROL AT THE INTERNATIONAL LEVEL

International drug control efforts are designed to coordinate domestic laws with international activities that regulate or limit the supply of psychoactive substances. At the heart of international drug policies are three United Nations (UN) drug control treaties adopted in 1961, 1971 and 1988 which, along with several UN bodies [e.g. Commission on Narcotic Drugs (CND), the International Narcotics Control Board (INCB) and the World Health Organization (WHO)], attempt to protect public health by insuring the availability of useful drugs for medical and scientific purposes while criminalizing illegal production and trade in order to prevent diversion and drug abuse. The gross imbalance in world consumption of legal opiates is a pointer to the limited availability of effective pain medications in many low-income countries, with 80% of the world's population having either no or inadequate access to treatment for moderate or severe pain [71]. Regarding the ability of the international drug control system to restrict illicit markets and supply, reports from the international agencies indicate that the drug problem continues to constitute a serious threat to the health, safety and wellbeing of humanity [72,73]. With the proliferation of new psychoactive substances and the move by some countries to reconsider the prohibition of cannabis, there are several options which may be taken to modify the system, including amendments to the conventions and re-scheduling of cannabis. Nevertheless, drug policy and control at the international level remains a work in progress limited by the lack of consensus regarding effective methods and the challenges of emerging drug epidemics.

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LEGALIZING THE SUPPLY OF CANNABIS

A fundamental policy question concerning any intoxicant is whether unsupervised use for recreational purposes—and production and supply of material for such use—ought to be legal or illegal. Changing the legal status of cannabis has attracted the most attention because of its widespread use and relatively favorable risk profile in comparison with several legal substances. Even as nations such as Uruguay and Canada, and several subnational jurisdictions in the United States, have legalized cannabis production and use, it is difficult to predict the effects of those actions because there is virtually no prior research on the topic. The full effects of legalization will take a generation or more to manifest, and there are many different design options for legalization that will need to be evaluated. Building on the writings of several authors [59,74–77], it is possible to consider a spectrum of legalization alternatives, including home growing, cannabis clubs and government monopolies, that contrast with the commercial licensing system used to regulate alcohol in many countries and cannabis in some US states and Canadian provinces. A major challenge in setting up a legal regimen for cannabis is to adopt an architecture for structuring the market that puts limits on availability and on promotion and marketing. It is also important for the system to be insulated from market interests, political pressures and from 'regulatory capture', which occurs when a regulatory agency, created to act in the public interest, instead pays too much attention to the commercial or political concerns of interests that dominate the industry it is charged with regulating [78].

CONCLUSIONS AND REFLECTIONS

The main message of this book summary is that scientific research is available to inform the development and implementation of drug policy, yet current drug policy in most societies takes limited account of this research. Among the 47 options reviewed in the book, most show some evidence of effectiveness in at least one country, but the evidence is less than definitive for many others, either because the interventions are ineffective or the research is inadequate. Unfortunately, policies that have shown little or no evidence of effectiveness continue to be used in many countries and recommended by international organizations.

The evidence supports two overarching conclusions that can guide future efforts to reduce the harmful effects of psychoactive substances. First, an integrated and balanced approach to evidence-informed drug policy is more likely to benefit the public good than are uncoordinated efforts to reduce drug supply and demand. Secondly, by shifting the emphasis towards a public health approach, it may be possible to reduce the extent of illicit drug use, moderate the escalation of new epidemics and avoid the unintended consequences arising from the marginalization of drug users through severe criminal penalties.

In updating the contents of this book the authors became increasingly aware of the public health challenges of illicit substances, manifested not only in the endemic nature of many drug problems, but also in the new epidemics that develop with technological innovations (e.g. new psychoactive substances, the spread of fentanyl, online markets). In the policy arena, the reciprocal connections between the illicit drug market and the legal pharmaceutical industry in some of high-income countries require new models of empirical research and better theories to guide surveillance and policy at the population level. In some respects, the disproportionate concentration of current drug research on neuroscience-derived, individual-level explanations and pharmacological interventions leaves a vacuum in funding for policy research directed at broader, population-level dynamics, such as the long-term effects, positive and negative, of decriminalization, cannabis legalization and the commercialization both of psychopharmaceutical and of recreational drug use. Drug policy remains a work in progress that will require greater investment in a range of research strategies that are relevant to public health needs at the local, national and international levels.

Declaration of interests

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Authors' affiliations

Department of Community Medicine and Health Care, University of Connecticut School of Medicine, Farmington, CT, USA,[1] Carnegie Mellon University, Heinz College, Pittsburgh, PA, USA,[2] Faculty of Medical and Health Sciences, University of Auckland, New Zealand and Department of Psychiatry, University of Toronto, Canada,[3] Oxford Brookes University, Oxford, UK,[4] National Institute of Psychiatry Ramón de la Fuente Muniz, Mexico City, Mexico,[5] University of Uyo and the Centre for Research and Information on Substance Abuse (CRISA), Uyo, Akwa Ibom State, Nigeria,[6] Centre for Addiction and Mental Health (CAMH), Toronto, Canada, Dept. of Psychiatry and the Dalla Lana School of Public Health, University of Toronto, Toronto, Canada,[7] School of Public Policy and Department of Criminology, University of Maryland, College Park, MD, USA,[8] Centre for Alcohol Policy Research, La Trobe University, Melbourne, Australia and Centre for Social Research on Alcohol and Drugs, Stockholm University, Sweden,[9] Norwegian Institute for Public Health, Oslo, Norway[10] and National Addiction Centre, (Institute of Psychiatry), London, UK[11]

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