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"If Supply-Oriented Drug Policy is Broken, Can Harm Reduction Help Fix It?— Melding Disciplines and Methods to Advance International Drug Control Policy"

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Abstract

Critics of the international drug control regime contend that supply-oriented policy interventions are not just ineffective, but they also produce unintended adverse consequences. Research suggests their claims have merit. Lasting local reductions in opium production are possible, albeit rare; but, unless global demand shrinks, production will shift elsewhere, with little or no effect on the aggregate supply of heroin and, potentially, at some expense to exiting and newly emerging suppliers. The net consequences of the international drug control regime and related national policies are as yet unknown. In this paper, we consider whether "harm reduction," a subject of intense debate in the demand-oriented drug policy community, can provide a unifying foundation for supply-oriented drug policy, one capable of speaking more directly to policy goals. Despite substantial conceptual and technical challenges, we find that harm reduction can provide a basis for assessing the net consequences of supply-oriented drug policy, choosing more rigorously among policy options, and identifying new policy options. In addition, we outline a practical path forward for assessing harms and policy options.

Key words: Drug policy, drug supply, harm reduction, risk management, cost-benefit analysis.

I. Introduction

Critics of the international drug control regime contend that supply-oriented policy interventions are not just ineffective, but they also produce unintended adverse consequences. Research suggests their claims have merit. Paoli, Greenfield, and Reuter (2009), for example, find that lasting local reductions in opium production are possible, albeit rare; but, unless global demand shrinks, the production will shift elsewhere, with little or no effect on the aggregate supply of heroin and, potentially, at some economic, political, and social expense to exiting and newly emerging suppliers (see also, Dorn, 1992; Friesendorf, 2007; Nadelmann, 1989; and Seccombe, 1995). Thailand, which exited the industry with the help of a decades-long, well-funded development strategy, would almost certainly argue that it is better off without opium production than with, even if that production migrated elsewhere. But a country that is forced to abandon production rapidly might feel differently as might the newly emerging source country. The net consequences of the international drug control regime and related national policies are as yet unknown. In this paper, we consider whether "harm reduction," a subject of intense debate in the demand-oriented drug policy community, can provide a unifying foundation for supply-oriented policy, one capable of speaking more directly to policy goals. In short, we ask:

If supply-oriented drug policy is broken, can "harm reduction" help fix it?

The naïve response is "yes!" To the naïve policy analyst (i.e., one not yet aware of—let alone drawn into—the debate on harm reduction), this term of art holds intuitive appeal. It is hard to argue with a call to reduce damages or, even more simplistically, make things better. But "harm reduction" isn't just the reduction of harm—whatever that might mean—and, even if it were, the transfer of this vocabulary from demand-oriented to supply-oriented drug policy would present real conceptual and technical challenges.

The less naïve response is "maybe." Whether harm reduction can help "fix" supply-oriented drug policy will depend partly on the nature of the policy's brokenness, the weaknesses and strengths of a harm-based approach, and the specific terms of that approach. Our evaluation unfolds as follows. First, we explore the paradoxes of supply-oriented drug policy that motivated our

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interest in harm reduction. Second, we delve into the sources of discord in the debate on harm reduction. Why has this policy debate been more intense—and at times less collegial—than others? The literature suggests that conceptual and technical challenges, some more relevant to supply-oriented policy than others, have contributed to the discord. Third, we examine a number of responses to those challenges. Various tools—taxonomies, models, and measurement strategies—have emerged from the literature to identify, categorize, and assess harms. Casting a wide net, we also examine a handful of tools from other disciplines. Though none fits perfectly, each suggests a means to address one or more of the apparent challenges of a supply-oriented application. Fourth, armed with a better understanding of the brokenness of supply-oriented policy, the sources of discord in the debate on harm reduction, and possible means of invoking a harm-based approach, we consider reasons for "forging ahead."

Seeking to move from thought-piece to application, we also outline a practical path forward. This path harnesses the intuitive appeal of harm reduction, drawing insight from each of the aforementioned policy tools, and provides a foundation for evaluating the net consequences of supply-oriented drug policy and choosing among policy options. Ultimately, we find support not just for taking a harm-based approach, but for the re-introduction of a clear distinction between "supply-oriented policy" and "supply-reduction policy."

II. Supply-Oriented Drug Policy Paradoxes

As recently as the early 20th century, the terms "supply-oriented policy" and "supply-reduction policy" would have meant two different things. Supply reduction measures constituted a subset of a larger package of supply-oriented controls; initially, these controls were more regulatory than prohibitive (see McAllister, 2000; Senate of Canada, 2002; and Paoli, Greenfield, & Reuter, in press). In the late 20th and early 21st centuries, supply-oriented and supply-reduction policy have become virtually indistinguishable. The latter has consumed the former. One might now use the two phrases interchangeably, simply to avoid repetition. When Paoli et al. (2009) ask whether the world supply of heroin can be cut, they are really asking whether contemporary supply-oriented policy can succeed, globally. They answer "no." They identify opportunities for local improvements, as in the case of Thailand's reduction in opium production, but find no

global remedy. The illegal drug industry is like a balloon: when it is "squeezed" or curbed in one location, it tends to "bulge" or re-emerge in another location.

What makes this finding noteworthy is not the affirmation of a so-called "balloon effect"—the authors make no claim to originality (see Dorn, 1992; Friesendorf, 2007; Nadelmann, 1989; Seccombe, 1995; and many others for related discussions)—but a subsequent analysis of implications. Judged only on its own terms, supply reduction might be deemed unlikely to succeed, a possible waste of resources; judged on broader terms, it might be guilty of less or more. Thailand, which chose to exit the industry with the help of a decades-long, well-funded development strategy, would almost certainly argue that it is better off without opium production than with, even if that production has migrated elsewhere. But a country that is forced to abandon production rapidly, without a viable development strategy in place, might feel differently, as might the newly emerging source country.

Paoli et al. (2009, pp. 252-254) consider the balance of effects if half or all of Afghanistan's opium growing were to shift to another country, such as Turkmenistan. They acknowledge that the balance might differ for a different pair of nations, but their analysis points to a wide range of possible effects, unfolding over time, and the complexity of the issues. We draw from their discussion and focus on the effects of a rapid transfer of production on incomes, corruption, and violence in the exiting and recipient countries.

For the exiting country, Afghanistan, a rapid transfer would entail a loss of income.[1] Corruption and violence might diminish, but the diminution of illicit opium production is unlikely to imply a proportional diminution of those societal ills. Corruption, having taken hold in the country's nascent bureaucracy, might readily find new—and old—ways to express itself. Moreover, violence might even increase if now-impoverished producers were to fight the reduction policy or support insurgents willing to fight for them. Similarly, the traffickers who profited most from

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[1] Illegal income is still "income." It contributes positively to a country's economy if, on balance, it adds to the country's total economic activity. For Afghanistan, at least some of the illegal income is likely additional. Moreover, for a country in dire economic circumstances, the "value" of the illegal income today, even if meager, might outweigh the "value" of a promise of a legal, perhaps larger, income tomorrow.

the industry might support the producers' and insurgents' fight; they might also fight among themselves for a share of the remaining market. The corruption, violence, and ensuing support for insurgents, might further undermine efforts to improve governance and security (see also Felbab-Brown, 2009, and Mansfield, 2006). A crackdown, if needed, would entail economic, political, and social costs of its own.

Over time, Afghanistan would hope to rebuild its economy and strengthen its institutions. Incomes might grow and corruption and violence might abate, but one would need to weigh carefully the near-term costs against the longer-term benefits.

For the newly emerging source country, Turkmenistan, the transfer might entail an increase in income, if the new illicit production did not displace or impede other, more productive activities; however, it might also entail increases in drug-related corruption and violence. The effect of the increases in corruption and violence on the recipient country would depend partly on the initial condition of the state. As robust states rarely become major illicit drug producers, we might reasonably limit a more general analysis to already troubled states. If a state is systemically corrupt and violence ridden, the marginal effect of the transfer might be negligible; if a state is on the verge of collapse, the transfer could bring it down.

If the transfer of production from one country to another were to occur over a longer period of time, perhaps the result of improvements in economic and institutional conditions in the exiting country, which render opium growing a less appealing option, the analysis of effects, at least for that country, would be quite different; however, whether the recipient—the newly emerging source country—would fare much differently is an open question.

The analysis demonstrates that one cannot evaluate the effects of a supply reduction policy without looking beyond supply. Such a policy could result in a change in the balance—and distribution—of income, corruption, and violence within and across countries and regions. From this analysis, we identify a central paradox of contemporary supply-oriented policy. On the one hand, it seeks to improve the human condition through reductions in production and trafficking and, eventually, through reductions in consumption; on the other hand, efforts to reduce supply

might yield substantial adverse consequences, by altering the amount and distribution of income, corruption, and violence in exiting and newly emerging source countries, with little or no lasting effect on final consumption.[2] Though a central paradox of supply-oriented policy, this is by no means the only paradox. Other tensions between the intended and actual effects of drug policy reside along the continuum of supply-side activities, spanning illicit drug production, transnational smuggling, and wholesaling and retailing.[3]

Even the United Nations, which administers the international drug control regime, has had difficulty finding evidence of the regime's achievements. For example, the United Nations has tried to make the case for the current control system by comparing recent levels of opium production with levels 100 years ago (United Nations Office on Drugs and Crime [UNODC], 2006, p. 7). Although the pre-regime levels were substantially higher, the world has changed dramatically and to credit one change, i.e., the implementation of the international drug control regime, with the effects of so many changes strains the agency's credibility. Perhaps matters would be worse without the controls, but analyses of the past decade are discouraging (e.g., Reuter et al., 2009). As a simple indicator of market trends, the production of illegal opium has risen by more than 50 percent from peak to peak (UNODC, 2009a, p. 34).

Having explored some of the tensions and deficiencies in contemporary supply-oriented drug policy, we return to our research question: If supply-oriented drug policy is broken, can "harm reduction" help fix it? To answer, we next delve into the sources of discord in the debate on harm reduction and their relevance to supply-oriented drug policy.

III. Sources of Discord

The debate on harm reduction has been less collegial than many others:

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[2] Seccombe (1995) argues the case more strenuously and finds that the consumption effects of supply-reduction policies could be worse than minimal in that they might inadvertently promote the use of more dangerous forms of drugs and exacerbate health problems in source countries.

[3] The United Nations identifies various unintended consequences of the international drug control regime, calling attention to crime, corruption, and violence along the supply chain (UNODC, 2009a, pp. 163-184).

Few terms in the world of drug policy evoke such extremes of emotion as 'harm reduction'. Drug policy conservatives shudder, believing that traditional values and drug control will be undermined. Drug legalizers see opportunities for radical law reform. Somewhere in between, service providers and community advocates hold to a hope for more pragmatic, evidence-based interventions. These emotions are stirred by the lack of a clear definition, complicated further by a dynamic discourse that has often generated more heat than light.[4] (Ball, 2007, p. 684)

Kleinig (2008, p. 2) recalls a U.S. researcher's claim that she "can neither use the phrase nor employ the concept of harm reduction" in her federal grant proposals. Hall (2007, p. 692) considers whether "a term that means so many different things to different people and that provokes such strongly opposed views" has "reached its use-by date." The authors allude to major points of contention in the debate. We categorize and address these points as separate but interrelated problems of vocabulary, methodology, and politicization.

A. Problems of vocabulary

Wodak and Saunders (1995) aptly summarize the problem of vocabulary in titling their paper, "Harm reduction means what I choose it to mean." As innumerable authors have noted previously (e.g., Ball, 2007; Hunt et al., 2003; Jourdan, 2009; Kleinig, 2008; Riley et al., 1999; Riley & O'Hare, 2000; Weatherburn, 2009; Wodak, 1999; etc.) and despite the many papers seeking clarity (e.g., Erickson, 1995; Heather, 1995; Hunt, 2001; Obot, 2007; and Wodak, 1999), the drug policy community—policy makers, practitioners, and analysts—has not reached agreement on a definition of harm reduction and continues to argue about its meaning. Wodak (p. 169) concludes that "[t]he bewildering variety of interpretations of this term adds to the confusion of an area already complicated by lack of terminological clarity and excessive emotional fervour." Jourdan (p. 516) describes a "cacophonic plethora of definitions."

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[4] For evidence of this emotion, see Weatherburn (2009) and commentaries on Weatherburn (i.e., MacCoun, 2009; Strathdee & Patterson, 2009; van Beek, 2009; and Wodak, 2009).

Ball (2007, pp. 684-685) notes that "[t]he term 'harm reduction' has been used variously to describe a principle, concept, ideology, policy, strategy, set of interventions, target and movement." Representing one distinct use, Lenton and Single (1998: 216) define harm reduction as a category encompassing policies, programs, and interventions—or policy measures—that are intended primarily to reduce the harms of drugs, but not drug use *per se*. Representing another use, MacCoun, Caulkins, and Reuter treat harm reduction as a criterion for judging a policy, program, or intervention, regardless of its aim. MacCoun (2009, p. 342), asserts that "[a]ll our interventions affect harms… whether or not the effects are intended and are beneficial or not."[5,6] Caulkins and Reuter (1997, p. 1149) recommend "that the overall objective be to minimize the harm associated with the production, distribution, consumption, and control of illicit substances."[7] They identify reducing drug use as one potential means of reducing harms.

Weatherburn (2009, pp. 335-336) suggests differentiating among "harm reducing," "harm reduction," and "harm minimization." He uses harm reducing "to describe any intervention, programme, or policy intended to reduce the harm associated with drug use, including measures designed to reduce drug use"; he reserves harm reduction "for measures that are designed to reduce the harms associated with drug use by means other than reducing drug use"; he uses harm minimization "to refer to the view that the overall goal of drug policy should be to minimize drug-related harm, in all its manifold forms."[8] Ball (2007, p. 686) suggests that alternative phrases, such as "harm minimization," "risk reduction" etc., are often used by those trying to avoid "taboo" vocabulary, but that the alternatives have added to the confusion.

Taking a different tack, Jourdan (2009, p. 516) suggests that the policy community treat harm reduction as a "big tent" and the lack of precision as presenting more opportunity than challenge.

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[5] In effect, MacCoun acknowledges not just the externalities of drug use, but of policy.

[6] MacCoun's approach, like that of Caulkins and Reuter is a close relative of the more widely-practiced—and accepted—"cost-benefit analysis." (See Hunt et al., 2003; Hawks & Lenton, 1998; Lenton & Single, 1998; and others for cost-benefit analogies and discussions.) We address this point in detail in later sections.

[7] See Caulkins (2002) on the conflation of goals and interventions.

[8] See also Hamilton & Rumbold (2004, pp. 135-136); Ritter & Cameron (2005, p. 6); and Strang (1993, p. 7).

He contends that "[t]he multiple attempts at capturing in short form the essence of or common traits of harm reduction resemble a wild goose chase after unobtainable precision."

Ultimately, the importance of an agreed definition might be a question of intent. For those seeking to label a particular policy, program, or intervention as "harm reduction," the definition bears great importance; for those seeking to assess the harms associated with an activity or the policies, programs, and interventions surrounding that activity, the definition bears less importance. Given our interest in fixing a broken policy, we can more closely align ourselves with the latter contingent. For us, a collective agreement is not essential.

B. Problems of methodology

Problems of methodology are well-documented in the literature. They include a high degree of subjectivity, a lack of data with which to support policy making, implementation, and evaluation, and an inability to aggregate or compare outcomes. For our purposes, these problems are more concerning than those of vocabulary.

1. Subjectivity

Notwithstanding assertions that harm reduction is a pragmatic and "ethically and even value-neutral approach" (see Kleinig, 2008, pp. 4-7, for an analysis of these assertions), it is, like most approaches to policy, steeped in subjectivity. Policymakers, practitioners, and analysts must make inherently subjective of decisions about the identification, attribution, measurement, and prioritization of harms, thus introducing the influence of professional if not personal values. Newcombe (1992, p. 2) describes the process of deciding which harms to reduce as unavoidably "based on a complex mixture of organizational goals, moral beliefs, and rational analysis." What constitutes a harm and from whose perspective? Should self-inflicted harms be deemed "harms"? Who are legitimate claimants of harm? (See Caulkins & Reuter, 1997; Hawks & Lenton, 1998; and Riley et al., 1999; and others for discussions of these and related questions.)

2. Quantification

The literature describes both data deficiencies—the lack of adequate and appropriate data—and measurement problems, some of which are normative (e.g., Caulkins & Reuter, 1997, pp. 1147-1148; Hawks & Lenton, 1998, pp. 158-161; Lenton & Single, 1998, pp. 215-216; MacCoun &

Reuter, 2001, pp. 102-105; and Weatherburn, 2009, p. 337). Should drug-related harms be calculated as gross figures or net of possible benefits? (In the context of cannabis use, Hawks and Lenton cite appetite stimulation and nausea reduction for cancer patients as potential benefits; in the context of drug supply, we might consider income from opium, coca, or cannabis production.) Should the value of life be measured on the basis of income earning potential and what would that mean for a drug addict with low earnings who engages in petty crime to support his or her habit? Should harms be tallied over a year, a decade, or a lifetime?

3. Incommensurability

Lastly, even if quantification were straightforward, the policy community would still face the problem of incommensurability. Some or many harms cannot be compared or combined. "Even if perfect data existed on individual harms, there is no way to aggregate them. With what common unit can one denominate both battered children and burglaries? It is simply not possible to report a scalar, aggregate measure of drug-related harm" (Caulkins & Reuter, 1997, p. 1148). Weatherburn (2009, p. 337) and others offer similar assessments. Still, efforts have been made to develop scalars (see the discussion below), but they are, by definition, reductionist. Commensurability comes at a price, specifically the loss of information.

C. Problems of politicization

Problems of politicization have arisen especially, but not only in the United States and relate primarily to issues of drug law reform and legalization (see Ball, 2007; Hall, 2007; Kleinig, 2008; Weatherburn, 2009). Views on the relationships among harm reduction, drug law reform, and drug legalization vary greatly. Some in the policy community describe harm reduction as an implicit call for drug law reform; others equate it with advocacy for legalization; still others argue that harm reduction must remain neutral on matters of legality. (For examples and analysis, see Dorn, 1992; Hunt et al., 2003, no page number; Lenton & Single, 1998, p. 218; Riley & O'Hare, 2000, pp. 9-10; Strang, 1993, pp. 14-16; and Wodak & Saunders, 1995, p. 270.)

The foregoing problems call into question the feasibility and desirability of extending harm reduction to supply-oriented drug policy; among them, the problems of subjectivity, quantification, and incommensurability appear most relevant to our interests.

IV. Conceptual and Technical Responses

Faced with these conceptual and technical challenges, the drug policy community has stepped forward with various tools to identify, categorize, and assess drug-related harms, particularly as they pertain to drug use. Efforts to address supply-related and criminal harms, more generally, are less prevalent; however, the national security community has developed a widely used risk management process that bears relevance.

A. Drug-related and other taxonomies[9]

Newcombe (1992, pp. 2-5) offers one of the first taxonomies of drug-related harms. It is a two-dimensional—"type" and "level"—matrix that accommodates the negative and positive consequences of drug use. His intent was to develop a simple theoretical framework and provide a "springboard" for follow-on efforts to both rank harm-reduction goals and measure the effectiveness of interventions aimed at achieving them. For "type," he delineates among health (physical and psychological), social, and economic consequences; for "level," he delineates among individual (user), community (family, friends, neighbors, and colleagues) and societal (the structures and organization of society) consequences. He suggests that a better classification system would include time, duration, and scale and support quantification.

MacCoun and Reuter (2001, pp. 105-112)[10] construct a three-dimensional taxonomy of drug-related harms. They delineate among categories of harm (health, social and economic functioning, safety and public order, and criminal justice); bearers of harm (users, dealers, intimates, employers, neighborhood, and society); and primary sources of harm (use, illegal status, and enforcement). In seeking to identify the primary sources—or underlying causes—of harms, they recognize that harms might be related to drug use, but not necessarily caused by it. They initially consider four such causes, i.e., trafficking, illegality, enforcement, and use, but exclude trafficking from the final list. They argue that trafficking might be a proximate cause of harm, but it is not usually the underlying cause. The harms of trafficking, apart from the use it enables, are mostly associated with manifestations of policy, i.e., law enforcement and illegality.

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[9] See also "harm indices" below, some of which include taxonomies.

[10] MacCoun and Reuter (2001) reproduce the framework presented in MacCoun, Reuter, and Schelling (1996).

Demonstrating the broader applicability of harm reduction, von Hirsch and Jareborg (1991) enter the literature from a different disciplinary perspective and address the harmfulness of criminal conduct which injures or threatens identifiable victims.[11] They focus on the individual victims of crime and evaluate harms in terms of their effects on an average victim's standard-of-living. Their taxonomy then distinguishes among harms to physical integrity, material support and amenity, freedom from humiliation, and privacy or autonomy (pp. 19-21) and considers the severity of harms, ranging from those which impede survival to those which have only a marginal effect on the living standard (p. 17). They also discuss the possibility of extending the approach to crimes, such as drug trafficking, with wider-ranging societal effects (pp. 33-35).

B. Models and measurement strategies

MacCoun (1998, p. 1202) develops an integrative policy model that draws a deceptively simple distinction between "micro" and "macro" harm and identifies the paths through which harm- and supply-reduction policy can operate (see Figure 1). The micro harm is the "average harm per use," which is a function of two vectors of harms to users and non-users, respectively, and the macro harm or "total harm" is the product of that harmfulness and "total use" or incidence. Incidence is, in turn, a function of the number users and the quantity each user consumes. The model also acknowledges a role for the shape of the consumption distribution.

The micro-macro distinction represents an analytical breakthrough in the harm-reduction literature.[12] It accommodates interactions between harmfulness and incidence and it offers a means to contemplate if not calculate the overall effects of policy measures. A reduction in harmfulness, prevalence, or intensity, *all else constant*, results in a reduction in total harm. By implication, each component of total harm is a potential policy lever. Arithmetic suggests the

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[11] Also demonstrating broader the applicability of harm reduction, the Serious Organized Crime Agency [SOCA] (2009, p.32) offers a two-dimensional framework for serious organized crime that delineates among physical, social, environmental, economic, and structural types of harms and among individual/local, community/region, and UK/international bearers of harms. See also Maltz (1990).

[12] Others, such as Newcombe (1992, pp. 9-13), have made this distinction less formally and analytically.

potential for tradeoffs: it might be possible to reduce total harm by reducing the harmfulness of use even if prevalence or intensity increases.

Figure 1: MacCoun's Integrative Model
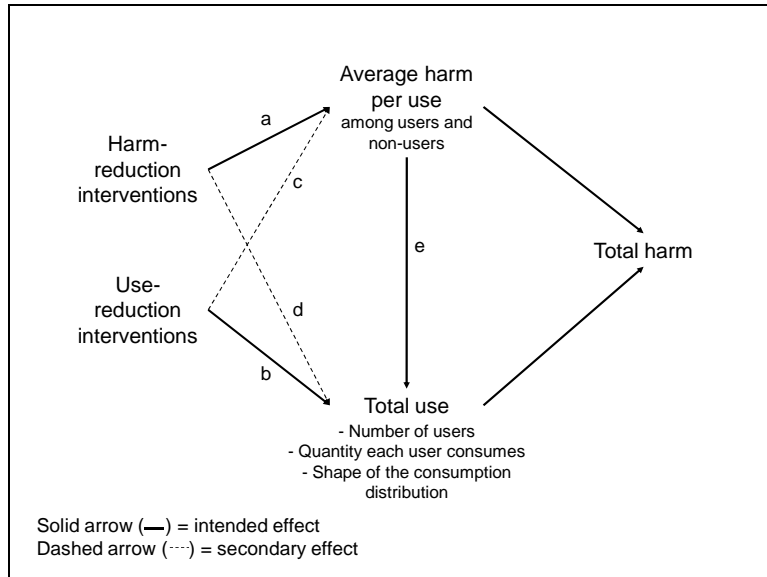
Source: Based on MacCoun's (1998, p. 1202) text and figure.

In this model, policy, whether aimed at harm or use, operates through multiple channels, not all intended. A harm-reduction intervention might affect both the average harm (Figure 1, causal path "a") and levels of use (path "d"), either positively or negatively. Path "a" represents an intended effect, but path "d" represents a secondary effect. Likewise, a use-reduction measure might affect both the levels of use (path "b") and average harm (path "c"). Path "e" indicates that a change in average harm might lead directly to a change in levels of use. For example, if the health consequences of drug use become less onerous, use might increase. Still, even with an increase in use, it is possible that the total harm will decrease.

The integrative model clearly demarcates the relationships among harm, use, and demand-oriented policy, but it is highly stylized. By MacCoun's own reckoning (1998, p. 1203) macro harm reduction is a "heuristic principle." The simplification of "harm per use," perhaps best suited to heroin injecting, enables a constructive thought exercise, but it offers limited insight into many possible harms. Although MacCoun (p. 1202) specifies harms to users and non-users,

including criminal victimization, the latter application seems less plausible. How, for example, would one relate drug-related crime, violence, or public nuisance to dosage?[13]

Despite claims of fundamental incalculability, others have attempted to develop quantitative estimates of total harm. Ritter (2009, pp. 478-479) describes efforts to produce single, comparable measures of drug-related harms as worthwhile.[14] She notes that those who think about details might not be satisfied, but finds merit in the efforts as "a valuable step forward." At the very least, the efforts shed light on the challenges of quantification and incommensurability. The analytical gains must be weighed against the loss of information that results from pressure to include only quantifiable and commensurable phenomena (e.g., MacDonald, et al., 2005, and UNODC, 2005). In addition, we see potential for bias in seemingly innocuous decisions about mathematical formulations (e.g., UNODC, 2005).

UNODC (2005) has developed an illicit drug index consisting of a single measure of potential health-related harm that accumulates as a composite "reference drug," moves along the supply chain. According to UNODC, the index is intended for cross country comparisons of a country's overall drug problem (p. 166). Apart from excluding non-health related harms, the index suffers from an inherent computational bias that ranks source countries—only a handful of which produce the world's illicit drugs—as those with the biggest drug problems.[15]

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[13] Caulkins (2002, p. 2) suggests an extension of the approach in which he conceptualizes total harm s as a multiple of total use and the average per unit harms from production, distribution, and consumption, but he does not address the practicality of the "per unit" specification. In his formulation, he also includes "control costs" as a component of total harm, which, as we address in a footnote below, we would not.

[14] For recent innovations, see MacDonald, Tinsley, Collingwood, Jamieson, & Pudney (2005); McFadden (2006); Moore (2007); Nutt, King, Saulsbury, & Blakemore (2007); Slack et al. (2008); and UNODC (2005).

[15] MacDonald et al. (2005) focus on a single country and take a broader view of harm—they track changes in four types of drug-related harms (health impacts, domestic crimes, commercial crimes, and community harms)—but still face the constraints of quantification and incommensurability. For example, they exclude the effects of drug use on employment, educational attainment, financial stability, and homelessness among users.

C. Five-step risk management process

We end this section with the presentation of a risk management tool that is widely-used to assess potential "bad consequences"—or harms—in U.S. military operations.[16] Notwithstanding obvious differences in perspective, the national security community faces challenges of quantification and incommensurability that are similar to those of the drug policy community. Consider, for example, the plights of the policy analyst asked to calculate the values of life, property, and civil liberties in a counter-insurgency scenario and the policy maker asked to set priorities and allocate resources on the basis of the analyst's findings.

The U.S. military characterizes risk in terms of hazards, bad consequences that can arise from hazards, and the probability and severity of those consequences.[17] It defines a hazard as a condition or activity with the potential to cause bad consequences, such as injury, illness, or death of personnel; damages to or losses of equipment and property; and mission degradation. U.S. military doctrine outlines a risk management process (see Figure 2).

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[16] This discussion draws heavily from Greenfield and Camm (2005, pp. xiv-xvi and 44-49), which in turn draws from U.S. Department of the Army (1998) and U.S. Department of the Army, Marine Corps, Navy, and Air Force (2001). U.S. Department of the Army (2006) provides an updated exposition.

[17] The U.S. Army (U.S. Department of the Army, 1998 and 2006) has adopted the term "hazard" whereas joint military doctrine (U.S. Department of the Army et al., 2001) refers to "threats."

Figure 2: Five-Step Risk Management Process

Source: Based on Greenfield & Camm (2005, p. 47).

The process begins with a military mission that entails risk, but, for our purposes, it could begin with a drug-related activity. Following Greenfield and Camm (2005, pp. 49-63), we suggest interpreting Step 1, as 'identify hazards *and* associated bad consequences'; thus, we would list the latter and their causes. However, beyond mere lists and much as MacCoun and Reuter (2001) focus on "primary sources," Greenfield and Camm (pp. 47-48) also argue for a clear distinction between proximate and underlying causes. Absent that distinction, a policy maker might choose a risk control—in the drug policy community, a policy measure—that could be ineffective or worse, either leaving risks intact or creating new ones.[18]

Ideally, Step 2 would include estimation of both the probability and severity of a potential bad consequence or harm, but quantification is not essential. U.S. military doctrine includes a ranking matrix (see Figure 3) that analysts can use to help establish policy priorities. The matrix asks for information on "probability," defined loosely, to include frequency. Quantitative data can be used to inform the evaluation, but the matrix does not fundamentally require

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[18] Greenfield and Camm (2005, pp. 53-61) provide several examples. See also McCord (2003).

quantification; rather, it requires expert opinion.[19] Incommensurability is still a problem, but the matrix offers the analyst a systematic starting point.

Figure 3: Risk Assessment Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L
E = Extremely high risk; H = High risk; M = Moderate risk; L = Low risk					

Source: Based on Greenfield & Camm (2005, p. 48), citing U.S. military doctrine.

Step 3, which calls for a determination of "residual risk," addresses the possibility that the military—or any other agency—might prefer to accept the possibility of a bad consequence and then develop a response and recovery plan to deal with it as it arises.[20] By implication, controlling risk is not the same thing as eliminating risk. Steps 4 and 5 accommodate changes in circumstances and new information. A strategy for eliminating, reducing, or coping with risk emerges from Steps 3, 4, and 5, collectively.

The national security approach offers practical guidance in the extension of principles of harm reduction to supply-oriented drug policy. Steps 1 and 2 lead to the identification of the bad

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[19] Similarly, Heather (1995, p. 333) argues for the validity of qualitative assessments and rankings.

[20] The potential for residual risk serves as a reminder that risk ratings and rankings can help establish policy priorities, but the selection of policy options requires further analysis. A likely and critical hazard might be flagged for attention, but the costs of addressing it could exceed the benefits or, in a resource constrained world, the net benefit of addressing it might be substantially lower than that of addressing another unambiguously lesser hazard. We return to the issue of cost-benefit analysis in the next two sections of this paper.

consequences or harms associated with an activity, such as drug production or trafficking, an assessment of the severity and probability or frequency of those harms, and an evaluation of their underlying causes. The results provide baseline "estimates" of harms under current policy, which the policy community can use to conduct analyses of alternative scenarios.

V. Should We Forge Ahead?

The conceptual and technical challenges might be worse in this policy arena than in others, but they are not unique to harm reduction or the drug policy community. (Recall the plights of the counter-terrorism analyst and policy maker.) Indeed, the assessment tools of the national security and other policy communities might even suggest responses to at least some of the drug policy community's challenges. The hurdles for a harm-based approach to drug policy, be it demand- or supply-oriented policy, are high, but not insurmountable.

What strengths does harm reduction bring to bear on supply-oriented policy? The answer depends on which "version" of harm reduction one invokes. We would treat harm reduction as a goal to strive for and not as a set of policies, programs, interventions, or measures. We would address the harms associated with particular activities and account for the positive and negative consequences that might arise from alternative policy measures

Harm reduction, so framed, offers the advantage of breadth. As Sparrow (2008) notes, the reduction of harm is a valuable goal across many policy fields, from poverty alleviation and counter-terrorism to pollution and disease control.[21] Relating to supply-oriented drug policy, a harm-based approach would allow us to look beyond "supply reduction" and encourage explicit consideration of the positive and negative consequences of policy measures across a broad spectrum of concerns. Rather than assessing drug policies with a handful of standard indicators, such as eradicated area, seizures, and arrests, we might consider the effects of drug policy on income, corruption, violence, the environment, human health, and a host of other concerns

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[21] For evidence of harm reduction's potential in supply-oriented applications, see Caulkins (2002); Caulkins & Reuter (2009); Dorn (1992, pp. 115-119); Strang (1993, p. 17); the UK Drug Policy Commission (2009); and UNODC (2009a, pp. 163-184); for concerns about interdisciplinary "identity theft," see Elvins (2008).

spanning multiple policy communities.[22] Thus, we can link concerns about drug policy to those of other fields that are touched—and sometimes pummeled—by supply-oriented strategies. In less abstract terms, harm reduction might enable a more comprehensive analysis of a policy that would shift opium production from one country, such as Afghanistan, to another.

A harm-based approach might also promote rigor. For example, in choosing among policy options—faced with many possible policies, programs, or interventions—an assessment of harms could yield the necessary information for a notional cost-benefit analysis. First, one would need to establish whether a policy, after accounting for its positive and negative consequences, reduces harms on balance. In this context, the question of gross versus net harms gains importance, even more so for a source country that is dependent on illegal income. To illustrate, consider again the case of Afghanistan. Opium currently generates a substantial share of that country's income (UNODC, 2009a, p. 187). Any policy measure that rapidly reduces Afghan opium production without generating new economic opportunities would also reduce Afghan income. In this example, excluding the benefits of the illegal activity, all else constant, would increase the apparent attractiveness of production-reducing policies. Second, if a policy measure passes this initial admissibility test, one must still assess the overall effect of the measure relative to the implementation cost.[23] After accounting for those costs, does the measure still make sense? How does the reduction in harm "measure up" against the implementation costs? Third, in the presence of multiple policy options and limited resources, one would compare results across options. Much of the analysis would be qualitative, but it would nevertheless provide a systematic basis for policy evaluation.

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[22] Hamilton and Rumbold (2004, p. 139) note that harm reduction, in the context of drug use, can provide a basis for bringing together legal, social, and health approaches in a coordinated and coherent manner.

[23] Note that we do not include the costs of implementing policy measures, e.g., enforcement, as among the harms of an activity. Instead, we view policy measures and hence the accumulation of implementation costs, as decision variables. Funding is not itself a measure of harm; rather, it can be set in relation to society's perception of and concern about the harm. The policy implications of the inclusion of law enforcement costs can be paradoxical: "if one includes the costs of responses to crime as part of the 'costs of crime', the less that is done about them, the lower are the 'costs of crime'" (Levi & Burrows, 2008, p. 294). See also Dorn & van de Bunt (2010, pp. 8-9).

Lastly, through the lens of harm reduction, we might uncover opportunities to address supply more constructively. An Afghan development strategy might, for example, encourage shifts away from poppy mono-cropping, which has increased in the southern regions of Afghanistan, and toward multi-cropping and crop rotation, both to reduce farmers' dependence on opium income and to discourage environmentally damaging agricultural practices. Perhaps more surprisingly, Caulkins and Reuter (2009, p. 16) suggest leveraging the balloon effect: "[f]or enforcement to suppress a particularly noxious part of the market… it is only necessary to make it uncompetitive relative to other, less noxious forms of selling." Similarly we might compare modes of production or trafficking and seek to discourage the most damaging modes. For example, a change in policy that makes "body packing," which can lead to overdose and death, relatively unattractive could be harm reducing, depending on the alternatives.[24]

A harm-reduction approach might also allow us to anticipate and take precautions against or prepare for the unintended consequences of new policy measures. Intensified, uneven enforcement of prohibitions against opium production in Afghanistan has fueled widespread corruption, which is endangering the state-building process (see Felbab-Brown, 2009, and Mansfield, 2006). With forethought, it might have been possible to take additional steps to enhance the integrity of the civil service, the Afghan National Police, and their respective overseers—or, perhaps more realistically, to postpone the intensification of enforcement until the net consequences would have been positive. Likewise, on the basis of harm reduction, one might have guessed that the intensification of enforcement in Mexico would lead to an increase in drug-related corruption and violence. If acknowledged early on, the negative side-effects of this policy choice could have been targeted with programs to reform the Mexican police forces and prison system and to reduce the influx of weapons along the U.S-Mexican border. Admittedly, none of these tasks would have been easy; however, at the very least, a better awareness of the potential side effects could have helped prepare the Mexican public for what was to come and, possibly, to alleviate the harms produced by outbursts of violence in border areas.

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[24] Body packing refers to the practice of ingesting drugs to conceal them during transport. Note that Caulkins (2002, p. 9) argues on other grounds for the societal preferability of small-scale courier-based trafficking.

The recent history of cocaine flows from South America to Europe offers a final example. As those flows have increased, Western Africa has gained prominence as a transshipment venue and taken "market share" from the Caribbean. UNODC (2007, p. 6) attributes some of that prominence to law enforcement efforts in the Caribbean and Europe that could have discouraged traffickers from shipping cocaine through the Caribbean, a common practice, and encouraged the development of alternative routes. Had harm reduction been a guiding principle in those efforts, policy analysts might have expected a change in trafficking patterns and set out to determine whether the amount and distribution of harms would be altered for the better under a plausible set of scenarios, including the shift to Western Africa. On the one hand, the law enforcement efforts targeted body packing and related overdoses; on the other hand, Western Africa is already unstable and the corruption and violence that accompany cocaine trafficking could be the straw breaking the camel's back for some nations (UNODC, 2009b).

We do not dispute the challenges of applying a harm-based approach to drug use, production, or trafficking, but still see value in systematic thinking even if it requires subjectivity and cannot be quantified fully or in fully commensurate terms.

VI. Practical Path Forward

Having made the decision to consider harm reduction as a goal, rather than as a set of specific policies, programs, interventions, or measures, the literature suggests at least three possible analytic approaches: the first focuses primarily on the harms of activities (e.g., von Hirsch & Jareborg, 1991); the second concerns itself with the harms of policies (e.g., McCord, 2003); the third considers both (e.g., MacCoun & Reuter, 2001). We prefer the third and propose an approach (see Figure 4) that marries principles of harm reduction with those of national security's risk assessment and supports systematic policy evaluation.

Figure 4: Harms and Policy Assessment
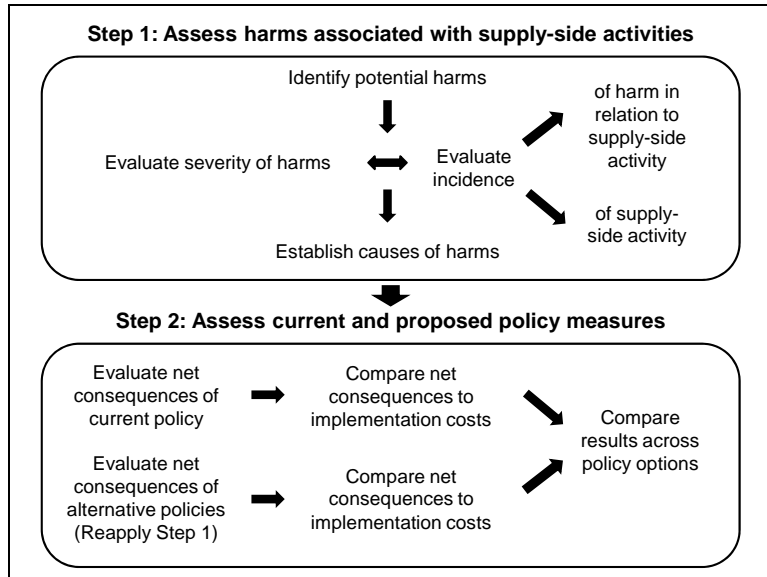
Step 1 draws together the components of the 5-Step risk management process that constitute risk assessment, with "incidence" replacing "probability" or "frequency," and provides the foundation for policy assessment in Step 2. To assess the overall incidence of a harm, one would assess both the incidence of the harm in relation to the supply-side activity and the incidence of that activity. For example, to assess the harms of body packing, one would assess both the rates of overdose and death among packers and the incidence of packing.

The evaluation of causality in Step 1 explicitly incorporates MacCoun and Reuter's (2001) primary source dimension and satisfies the national security community's call for a thorough understanding of causality. The analysis of harms, their incidence, and their causality, provides baseline "estimates" against which the drug policy community—and other affected policy communities—can assess the effects of policy changes, be they large or small, rapid or slow, forced or voluntary. In conjunction with a comparison of net consequences and policy implementation costs, it provides a means to select among policy options.

To conduct a comprehensive, albeit largely qualitative, cost-benefit analysis of the current international drug policy regime, one might compare the baseline estimates of all harms under current policy to a no-policy scenario and then compare the notional "difference" to the

implementation cost. Adding another layer of complexity, one might seek to establish not just the balance of effects in relation to those costs but the distribution within or among countries. Alternatively, to conduct a less daunting but still useful analytical exercise, one might compare the incremental effects of discrete changes in policy against the baselines.

To better inform the policy assessment, we also propose a supply-side version of MacCoun's (1998) integrative model (see Figure 5). In the spirit of that model, we distinguish between micro and macro harms and articulate the direct and indirect channels through which policy might affect harms; however, there are important differences in our specifications. MacCoun normalizes harms on the basis of dosing, in itself a highly stylized and limiting approximation for drug use; we consider many possible supply-side activities and consequences and so work with the relevant denominators for each. In our model, the total harm would be a function of the average harmfulness or severity of a bad consequence associated with a supply-side activity, the incidence of that bad consequence in relation to the activity, and the incidence of the activity, assessed for all the bad consequences associated with an activity.

Figure 5: Supply-Side Integrative Model
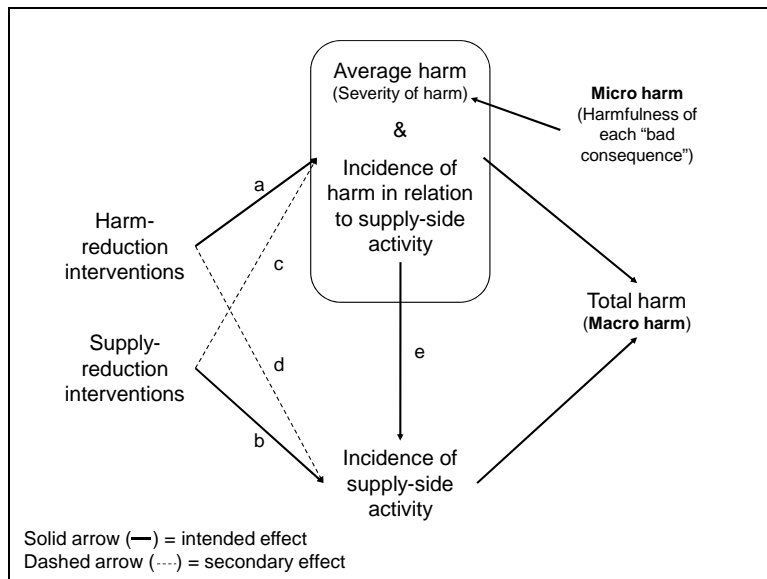
For some supply-side activities and harms the assessment would amount to a careful thought exercise; for others, it might involve estimation. An Andean coca-growing example illustrates the latter: the incidence of the supply-side activity could be the number of hectares in coca

production; the incidence of the bad consequence in relation to the activity could be the number of hectares deforested to enable production; and one dimension of harmfulness or severity might be the average environmental loss per hectare deforested. The number of hectares deforested might exceed those in production because cultivation, harvesting, processing, and transportation require land-consuming infrastructure, such as roads.

The appropriate measure of incidence might differ by activity—there might also be different measures for the same activity, depending on the object of concern—as might the type and number of possible bad consequences. For some harms it might be more helpful to consider hectares, tonnage, or household, regional, or national market participation. One might estimate environmental damage on the basis of hectares, as above, or consider income gains or losses in terms of tonnage produced and trafficked. One might also consider income in terms of the share of economic activity attributable to drug production and trafficking.

A full blown analysis of harms would be "messy" at best, entailing many of the foregoing conceptual and technical challenges, including those of subjectivity, quantification, and incommensurability. Nevertheless, one would seek to identify the set of harms associated with supply, such as environmental degradation, corruption, and violence, and to determine whether those harms occur rarely or always and are catastrophic or marginal.

Having established the underlying causes of harms, some of which could be policy itself, it is possible to begin to assess the net effects of current and proposed policies on total harms, as represented in the causal paths in Figure 5. Note that the harm associated with a supply-side activity might decline even if the incidence of that activity does not; indeed, the incidence could rise. For example, a new program to construct forest-friendly roads might lessen the average environmental loss associated with coca production, but it might also encourage production if the roads make it easier to produce or transport coca. On balance, the program might still reduce harm, but the net consequences would require careful calculation. Similarly, a policy to decrease

the incidence of an activity might have mixed effects. A coca eradication program might increase the average environmental loss, depending on the form the program takes.[25]

In a related article (Paoli, Greenfield, & Zoutendijk, 2010), we are constructing and applying a taxonomy to facilitate the assessment of harms from cocaine trafficking, human trafficking, tax fraud, and tobacco smuggling in Belgium.

We use the von Hirsch and Jareborg (1991) taxonomy as a point of departure and draw insight from Newcombe (1992) and MacCoun and Reuter (2001). We start with von Hirsch and Jareborg because, with some adaptation, they can accommodate a broad range of "criminal conducts" without disallowing drug-related harms. In contrast, Newcombe, MacCoun and Reuter, and others have tailored their approaches to drug-related harms, but with less obvious means of extension to other arenas. Our taxonomy considers harms to individuals, private-sector entities, government entities, and the environment, both physical and social. Among individuals, it delineates harms to physical integrity, material well-being, etc., as per von Hirsch and Jareborg, but it also includes psychological losses.[26] For private-sector and government entities and for the environment, the taxonomy offers analogies; for example, a drug-compromised business might suffer a loss of operational integrity.

After identifying and organizing harms, we can assess their severity and incidence. We use a modified version of von Hirsch and Jareborg's living-standard scale to guide determinations of severity, ranging from marginal to catastrophic, and we evaluate the incidence of harms within broad categories, ranging from rarely to always. The ratings are based, whenever possible, on empirical estimates, e.g., the average number of physical injuries associated with Belgian cocaine trafficking operation; however, we do not demand quantification or seek to create an

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[25] Recalling the earlier discussion of supply-reduction policies in Afghanistan, a crackdown on production might also spur violence, fuel corruption, and generate support for insurgents. For an alternative discussion of the potential for perverse policy-induced revenue effects, see Caulkins, Kleiman, & Kulick (2010).

[26] Most if not all authors other than von Hirsch and Jareborg (1991) include mental health somewhere in their taxonomies or frameworks. For different treatments, see MacCoun & Reuter (2001); MacDonald et al. (2005); and Longshore, Reuter, Derks, Grapendaal, & Ebener (1998).

aggregate measure or scalar index of harm. Lastly, we intend to evaluate the underlying causes of harms, which could then provide the foundation for a policy assessment.

VII. Policy Directions and Concluding Remarks

In this paper, we have identified a central paradox of contemporary supply-oriented drug policy, evaluated the weaknesses and strengths of a harm-based approach to policy making and analysis, and proposed a practical path forward. We suggest a two-step process, consisting of a harm assessment and a policy assessment. Having begun to test and refine elements of this process in the Belgian context, we look forward to undertaking harm and policy assessments for Afghanistan, Colombia, and other even "messier" venues.

Without seeking to either oversell the value of harm reduction or undersell the challenges it poses, our analysis suggests that a harm-based approach can provide a unifying foundation for assessing the net consequences of supply-oriented drug policy, choosing more rigorously among policy options, and identifying new policy options. Whether a harm-based approach can speak more directly to policy goals than supply reduction, will depend, ultimately, on how those goals are framed (Caulkins & Reuter, 1997). If framed simply "to reduce supply," it offers no special insight and might lead us, the policy community, in the wrong direction; if the goal is framed "to increase social welfare," then perhaps it can. Contemplating the latter and adopting a harm-based approach would, however, require the re-introduction of a clear distinction between "supply-oriented policy" and "supply-reduction policy."

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