Update on Harm-Reduction Policy and Intervention Research

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Key Words

policy, intervention, needle exchange, HIV, alcohol, drugs

Abstract

Harm reduction is a pragmatic approach to reduce the harmful consequences of alcohol and drug use or other high-risk activities by incorporating several strategies that cut across the spectrum from safer use to managed use to abstinence. The primary goal of most harm-reduction approaches is to meet individuals "where they are at" and not to ignore or condemn the harmful behaviors but rather to work with the individual or community to minimize the harmful effects of a given behavior. The current review addresses some of the newest developments with respect to harm-reduction policy, prevention, and treatment. In particular, this review highlights policies and programs that have been evaluated in peer-reviewed journals and shown to be effective at reducing the harms associated with alcohol and drug use. The overall goal of this review is to present some of the most recent developments in the field of harm reduction.

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INTRODUCTION

Harm reduction: public health policies or intervention programs designed to reduce the harmful consequences associated with substance use and high-risk activities

Most people with active alcohol or other drug problems do not seek treatment on a voluntary basis. Those who do end up in treatment are often mandated to attend by courts or other legal requirements or have suffered from severe medical problems associated with excessive use that leads to harmful health consequences. For other active users who are considering a change in their harmful habits, the choice appears to be a dichotomous one: abstain or keep using. It's as though on their life journeys, users approach an intersection marked by a traffic light: either the light is red (stop using) or green (keep using). But traffic lights also have a yellow light that signals the driver to slow down, take caution, and notice the potential harms associated with crossing that intersection. Harm reduction is a yellow-light alternative that may appeal to many users who are unwilling or unable to completely stop at the red light of abstinence. As we discuss in this review, harm reduction is indeed a user-friendly approach that tries to meet users where they're at rather than insist that they follow the rules of the interventionist who tells them to stop using altogether as the first requirement of treatment. Unlike the moral model of addiction, which is associated with the War on Drugs and tends to enhance the user's shame, guilt, and feelings of stigma, the harm-reduction approach is humanistic and based on principles of acceptance and the willingness of the therapist or provider to collaborate with clients in the course of reducing the harmful consequences of drug use.

Where does harm reduction fit in terms of other models of addiction treatment? In the early 1980s, psychologist Phillip Brickman and colleagues (Brickman et al. 1982) described four models of helping and coping that match different interventions to treat addictive behavior problems. The moral model, described above, focuses on punishment, usually in the form of incarceration, as the method of trying to force the addict to give up drugs altogether. The disease model, on the other hand, does not blame or attempt to coerce the user but instead focuses on factors beyond the control of the addict (i.e., family history, genetics, and biological vulnerability). Addiction is defined as a progressive disorder with no known cure, and abstinence is dictated as the only known method to arrest the course of development of the disease. Brickman also described what he called the "spiritual model," with a focus on 12-step interventions (such as Alcoholics Anonymous and Narcotics Anonymous): This approach adopts the disease model of etiology, but it relies on social support and on a "higher power" as the major vehicle

of change, with abstinence as the only acceptable goal. The fourth model is what Brickman called the "compensatory model": From this perspective, addictive behavior is caused by a variety of biopsychosocial risk factors that differ from person to person. Treatment consists of teaching clients how to cope more effectively with these risk factors and is consistent with many cognitive-behavioral skills-training interventions based on behavioral learning theory, wherein the goal depends on what might be the most effective for the client, including abstinence or moderation. As such, harm reduction is best considered an option in the compensatory model. Anne Fletcher, author of *Sober for Good* (Fletcher 2001), pointed out that people tend to recover best by following a treatment method that appeals to them as a promising approach, including pharmacotherapy (as prescribed by the disease model), 12-step programs (as in the spiritual model), or learning more effective coping skills (as in the compensatory model), or some combination of these interventions. We are hopeful that the moral model will be replaced by more humanistic and pragmatic programs, including harm reduction.

WHAT IS HARM REDUCTION?

Key Concepts

Harm reduction is a pragmatic approach to reduce the harmful consequences of drug use and other high-risk activities by incorporating several strategies that cut across the spectrum from safer use to managed use to abstinence. The primary goal of most harm-reduction approaches is to meet individuals where they are at and not to ignore or condemn the harmful behaviors, but rather to work with the individual or community to minimize the harmful effects of a given behavior. Harm-reduction interventions and policies are most often individualized to the specific needs and wants of the individual or community; thus, a universal harm-reduction program is not possible and would not be useful. Harm-reduction efforts, in general, are rarely one size fits all.

The principles of harm-reduction efforts are often firmly rooted in the ideals of pragmatism, humanism, immediate and attainable goals, and the recognition that harmful drugs and risky behaviors have always been and always will be a part of society (Ritter & Cameron 2006); yet alternative definitions of harm-reduction practices and polices have been the focus of ongoing debate (Lenton & Single 1998). "Harm minimization" has often been used interchangeably with harm reduction; however, Weatherburn (2009) recently offered distinct definitions for harm reducing, harm reduction, and harm minimization. According to Weatherburn (2009), any intervention program or policy that is intended to reduce harm associated with drug use and problem behavior can be considered harm reducing, whereas harm reduction is defined as a measure that is "designed to reduce the harms associated with drug use by means other than reducing drug use" (e.g., needle and syringe exchange programs; p. 335). The term harm minimization is intended to reflect an overall goal of policies to minimize harm (Weatherburn 2009). Some have recommended that the field would receive less resistance if the terms harm reduction or harm minimization were no longer used and were replaced by the terms health promotion and public health (e.g., Hall 2007). Ideally, harm reduction will be construed as a strategy within a larger public health framework (MacCoun 1998, 2009). Regardless of how researchers define harm reduction, it is important to keep in mind that after 20-plus years of fighting against abstinence-only policies, the term harm reduction is now embraced by the World Health Organization, the Joint United Nations (U.N.) Programme on HIV/AIDS, the U.N. Office on Drugs and Crime, the U.N. Children's Fund, the Red Cross, and the World Bank (Wodak 2009). In addition, at the most recent summit of the Group of Eight (G8), which is a forum for the political leaders of the governments of Canada, France, Germany, Italy, Japan, Russia, United Kingdom, United States, and the European Union, there was a focus on "Promoting Global Health" and increasing prevention programs to reduce harmful

U.N.: United Nations

behaviors (G8 Health Experts 2009). The group's report specifically stated, "Supportive legislation should improve legal and regulatory frameworks in countries. . . it is essential to focus on prevention of the main risk factors such as harmful use of alcohol and tobacco, physical inactivity, unhealthy diets, as well as harmful environmental conditions." (G8 Health Experts 2009, p. 12).

Supply reduction: programs and policies designed to reduce the availability of illicit drugs

Demand reduction: programs and policies designed to reduce the demand of illicit drugs

From Prevention to Treatment Programs

As described in more detail below, a plethora of interventions, from prevention to treatment programs, incorporate harm-reduction strategies. In fact, consistent with a definition of harm reduction as a goal or strategy, any program that does not require abstinence and seeks to reduce harm could be considered a harm-reduction intervention. Tatarsky (2003) relates that "the essence of harm reduction is the recognition that treatment must start from the client's needs and personal goals and that all change that reduces the harms associated with substance use can be regarded as valuable" (p. 249). It is important to maximize the efforts of individuals by recognizing that people do have the ability to change their own behavior and that even with continued drug use, many associated harms (e.g., infectious disease transmission) can be reduced or avoided. Harm-reduction efforts seek to maximize the range of intervention options that are available and to identify, measure, and assess the relative importance of drug-related harms while balancing the costs and benefits in trying to reduce them.

Policy Issues

Accepting harm reduction as a goal or strategy to be implemented across society requires acceptance of a more humanistic perspective rather than a medical or legal solution to a grievous social problem. During the twentieth century, the United States drug control policies dominated the international view and were adopted by most other countries worldwide. The use of policy to control drug use has a controversial past and is still heavily debated by policy makers. Policies have been developed to reduce supply of drugs (supply reduction and enforcement), restrict their use (demand reduction), and indict tens of thousands of individuals each year for illicit drug use. In the United States, which has the highest incarceration worldwide (Walmsley 2007), more than half of those held in federal and state prisons are indicted on drug offenses, and three out of every four convicted jail inmates were involved with alcohol and/or drugs at the time of their arrest (Bureau Justice Stat. 2009). Internationally, incarceration for drug offenses is increasing: 62% of countries that report to the U.N. Office on Drugs and Crime showed an increase in drug possession offenses, and 56% of countries reported an increase in drug trafficking offenses from 2005 to 2007 (U.N. Off. Drug Crime 2009). Over the past 100 years, policies have been imposed that address both the demand and supply of drugs as well as policies to mitigate the harms of drug abuse. The ultimate goal of both supply-reduction and demand-reduction policies is to minimize or eliminate the use and abuse of illicit drugs, which is not the primary goal of those policies that are specifically designed to reduce the harms related to illicit drug use.

Supply-reduction strategies. The goal of supply-side reduction is to reduce the availability of illicit drugs, which involves measures such as enacting foreign policy aimed at eradicating the international cultivation of plants used to make drugs and interception of drug trafficking. To maximize the efficiency of supply-reduction programs, most of the supply-side efforts have focused on drug sources, including illicit crops, drug laboratories, drug-trafficking organizations, and street dealers. Given that the international drug trade system is a global problem, the United Nations held a Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances in 1988 to create a global agreement that was designed to target drug trafficking, which included

measures to facilitate tracing, freezing, and confiscating proceeds from international drug trade and to provide the necessary provisions for extradition of major drug traffickers (U.N. Off. Drug Crime 2009). In 1998, the U.N. General Assembly adopted the Political Declaration, which consisted of the following measures to counter the world drug problem: (*a*) "Action plan against manufacture, trafficking and abuse of amphetamine-type stimulants and their precursors," (*b*) "control of precursors," (*c*) "measures to promote judicial cooperation," (*d*) "countering money laundering," and (*e*) "action plan on international cooperation on the eradication of illicit drug crops and on alternative development" (U.N. Gen. Assembly 1998). Unfortunately, their efforts failed, and in many areas of the world drug production, drug use, drug trafficking, and drug-use-related HIV injections increased markedly (Reuter & Trautmann 2009). The committee of the United Nations reconvened in 2009 to set forth a new Political Declaration, and the zero tolerance approach of the United States, Russia, Japan, and Italy prevailed, even with the European Union endorsing a harm-reduction approach.

Importantly, supply control efforts can also be harmful. Law enforcement practices associated with supply reduction result in the loss of civil liberties, increased risk of overdose and disease, and higher rates of imprisonment (Weatherburn 2009). In addition, when the price of one drug increases due to supply reduction, the use of other drugs that are less expensive tends to increase (Strathdee & Patterson 2009). For example, supply reduction resulted in price increases for powder cocaine, which inspired the rampant use of a cheaper and more potent form of cocaine (crack cocaine). Despite these potential harms, the U.S. Office of National Drug Control Policy spent 64% of its 2008 budget on supply reduction, 23% on treatment, and only 12% on prevention efforts (Cent. Subst. Abuse Res. 2008).

Demand reduction. Demand-reduction measures include prohibition, treatment, awareness campaigns, preventive interventions, community social services, and support for families. Demand-reduction strategies include preventing people from starting to use drugs, preventing experimental use from becoming regular use, providing early intervention for risky consumption patterns, providing treatment and rehabilitation programs, and reducing drug-related health consequences. In general, demand-reduction practices have been viewed as successful (Wodak 2009). For example, a study by the RAND Corporation (Rydell & Everingham 1994) identified that every dollar invested in drug treatment saves taxpayers more than seven dollars in societal costs. In contrast, taxpayers lose 85 cents for every dollar spent on source-country control and 68 cents for every dollar spent on interdiction. Thus, providing drug treatment not only is more humane but also is more efficient and cost effective.

Harm-reduction policies. As outlined below, policies have also been imposed that may help mitigate the effects of drug abuse, including needle exchange and drug substitution programs. In the next section, we provide an overview of several accomplishments of the harm-reduction movement with respect to successful harm-reduction policies.

HARM-REDUCTION PROGRAMS

In general, a harm-reduction policy seeks to meet individuals where they are and provide assistance with helping individuals and communities reduce the harms associated with drug use and other risky behaviors.

Needle Syringe Programs

Syringe and needle programs have been implemented to reduce the spread of blood-borne diseases (including HIV and hepatitis) among injection drug users. The first government-approved initiative for a syringe and needle exchange program occurred in Amsterdam in 1984, when a drug advocacy group began

exchanging needles and syringes with support from the Municipal Health Service (Buning et al. 1986). Following this initiative, a study evaluating trends in risk behaviors and outcomes associated with injection drug use found the rates of borrowing, lending, and reusing needles/syringes in an Amsterdam cohort study of 616 drug users decreased by 30% between 1986 and 1992 (van Ameigden et al. 1994). Since the late 1980s to 1990s, additional government-funded syringe and needle exchange programs have become available in the United States, Canada, many parts of Europe, and Australia. In addition, many syringe and needle exchange programs provide drug treatment referrals, peer education, and HIV prevention programs to the recipients of the clean needles.

A recent comprehensive review of 45 studies dating from 1989 to 2002 (Wodak & Cooney 2006) concluded that needle exchange programs are effective, safe, and cost-effective. Furthermore, extensive research has found no evidence that needle exchange programs cause any deleterious effects (Strathdee & Vlahov 2001). The United States maintained a ban on federal funding to support needle exchange programs from 1988 (Strathdee & Pollini 2007) until July 24, 2009, when the House of Representatives voted in support of the 2010 Labor-Health and Human Services-Education appropriations bill, which included language to lift the ban on federal funding for needle exchange programs. As stated by Speaker of the House Nancy Pelosi, "Sound science is an essential component of good public health policy, and the scientific support for needle exchange could not be more clear... These initiatives are an effective public health intervention that reduces the number of new HIV infections without increasing the use of illegal drugs" (available at **http://www.speaker.gov/blog/?p=1885**).

Safe Injection Facilities

Taking needle exchange programs one step further, several governments (including Spain, Norway, Germany, Switzerland, the Netherlands, Luxembourg, Canada, and Australia) operate safe injection facilities where injection drug users can inject their own drugs using clean equipment with the supervision of medically trained personnel (Elliot 2002). At least 28 studies have been published that indicate safe injection facilities are associated with significant reductions in needle sharing and reuse, overdoses, and injecting/discarding needles in public places (Strathdee & Pollini 2007). Supervised safe injection facilities also result in fewer fatalities due to overdose (Kerr et al. 2006). Furthermore, Wood and colleagues (2007) reported that the recently opened supervised injection facility in Vancouver, British Columbia has been associated with a 30% increase in detoxification service use and increased enrollment in other addiction treatment. Thus, safe injection facilities appear to save lives by reducing overdose, reducing morbidity and mortality associated with overdose, and increasing a person's readiness to engage in detoxification and drug treatment services.

Opioid Substitution

Opioids, including heroin, oxycodone, methadone, and morphine, are among the most powerful known painkillers and can have high abuse potential. The rise of heroin addiction in the early 1900s led several countries across the world to ban opium and to make the manufacture and possession of heroin illegal (e.g., United States Heroin Act of 1924). Opioid dependency is associated with severe psychological, neurobiological, health, and societal consequences, including increased criminal activity, unemployment, comorbid psychological and physical health problems, and mortality due to overdose. The opioids are associated with rapid onset of physical dependency, and severe symptoms of withdrawal can occur within a few hours after last drug administration. In some cases, withdrawal can be fatal. Opioid substitution therapy (i.e., agonist pharmacotherapy, methadone maintenance) has been widely employed around the world

to provide administration of a less harmful opioid (e.g., methadone, levo alpha acetyl methadol) or an opioid-receptor agonist (e.g., buprenorphine) under medical supervision to reduce the harms associated with opioid dependency (World Health Org./U.N. Off. Drug Crime 2004). Opioid substitution therapy has typically been administered in specialty clinics; however, primary care and outpatient settings may also be used for successful implementation of opioid substitution (Krantz & Mehler 2004, Merrill et al. 2005).

Several reviews have concluded that opioid substitution therapy is effective in reducing illicit opiate use, HIV risk behaviors, criminal activity, and opioid-related death (Connock et al. 2007, World Health Org. 2005) and provides cost savings of up to $12 per dollar invested in opioid dependency treatment (U.N. Off. Drug Crime 2004). Yet, opioid substitution therapies are still considered controversial, and government regulation of opioid substitution programs greatly limits the accessibility of these effective treatments for opioid dependency (Kleber 2008).

Overdose-Prevention Programs

Heroin and prescription opioid overdose deaths have increased in the United States and internationally over the past 20 years. Importantly, the mortality associated with heroin use has not been consistently linked to higher heroin levels in comparison with levels of those who survive, and mortality is more often attributable to the presence of other drugs (primarily central nervous system depressants) in the system when taking heroin (Darke & Zador 1996). In addition, death from a heroin overdose rarely occurs immediately after injection, and most commonly occurs one to three hours following injection of heroin (Sporer 2003). Most deaths from heroin overdose occur in the company of other people, who could have prevented mortality by accessing emergency medical care. In particular, the administration of naloxone (μ-opioid receptor competitive antagonist) can rapidly block and counteract the life-threatening suppression of the central nervous and respiratory systems (Strang et al. 2006). Naloxone is inexpensive, can be prescribed by a doctor, and has no abuse potential (Chamberlain & Klein 1994). Indeed, programs that supply prescription naloxone have already provided reversals of potential overdose deaths (Sporer & Kral 2007). Prescription of naloxone is often accompanied by an educational component that teaches injection drug users and their cohabitants how and when to administer naloxone. The first prospective study of naloxone prescription in combination with cardiopulmonary resuscitation training (CPR) for 12 injection drug–using partners showed that participants in the study witnessed 20 heroin overdose events and either administered naloxone (75% of events) and/or provided CPR (80% of events). None of the 20 potentially lethal overdose events resulted in mortality (Seal et al. 2005).

School-Based Substance Use–Prevention Programs

Preventing the initiation of substance use is the most cost-effective and efficient method for reducing the harm related to substance use. Initiation of substance use most commonly occurs during adolescence, and age of first use is inversely related to later problems with substance abuse and dependency (Johnston et al. 2000, Warner & White 2003). According to the most recent U.S. National Survey of Drug Use and Health (Subst. Abuse Mental Health Serv. Admin. 2007), more than 40% of youths in the United States have used an illicit drug by the age of 17, with marijuana being the most commonly used illicit drug, and nearly half of adolescents have used alcohol prior to age 17. Based on data from the Monitoring the Future study, 1.3% of adolescents report lifetime heroin use by eighth grade (approximately age 14). In an opioid treatment–seeking sample of 15- to 17-year-olds, approximately half of the sample reported sharing needles. Preventing the initiation of substance use and teaching adolescents about

the harms associated with substance use needs to happen at an early age. Several substance abuse prevention programs are available, and it has been estimated that the return on investment in youth prevention programs ranges from $5 to $102 per dollar of cost (Aos et al. 2004; available at **http://www.wsipp.wa.gov/rptfiles/04–07-3901.pdf**). Several prevention programs have been shown to be effective, and the interested reader is referred to the National Institute on Drug Abuse for a free download of the booklet *Preventing Drug Use Among Children and Adolescents: A Research-Based Guide for Parents, Educators, and Community Leaders, Second Edition* (Natl. Inst. Drug Abuse 2003; accessible from **http://www.drugabuse.gov/drugpages/prevention.html**).

The core elements of effective programs that are most consistent with a harm-reduction approach include social skills and resistance skills training and normative education (Bosworth 1997). Two school-based prevention programs also have explicit harm-reduction goals: the Integrated School- and Community-Based Demonstration Intervention Addressing Drug Use Among Adolescents (Poulin & Nicholson 2005) and School Health and Alcohol Harm Reduction Project (McBride et al. 2004). Both programs resulted in significant reductions in harmful alcohol use, even though neither intervention resulted in significant changes in drinking prevalence over time (Poulin & Nicholson 2005) or in comparison to a no-treatment control group (McBride et al. 2004).

Brief Alcohol Screening and Intervention for College Students

More than 80% of college students report consuming alcohol annually, with 44% reporting heavy episodic drinking (5/4 drinks per occasion for men/women) at least once in the past two weeks (Wechsler et al. 2002). Alcohol prevention and treatment interventions for college students that incorporate motivational interviewing, cognitive-behavioral skills (e.g., alcohol-related skills training), and personalized normative feedback have received considerable empirical support for efficacy among college students and are more efficacious than purely educational interventions or no intervention (Larimer & Cronce 2007). Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff et al. 1999, Marlatt et al. 1998), a widely implemented and empirically supported intervention for college student heavy episodic drinking, is a brief intervention incorporating personalized feedback about drinking behavior with components of cognitive behavioral treatment, including education regarding the effects of alcohol on the brain and behavior, skills training, risk awareness, expectancy information, and suggestions for less risky drinking habits, as well as brainstorming alternatives to heavy drinking (Marlatt et al. 1998). The BASICS program has been shown to reduce alcohol consumption and negative consequences associated with drinking (Baer et al. 2001, Larimer et al. 2001, Marlatt et al. 1998). Longitudinal analyses, two- and four-years post intervention, have shown that BASICS may accelerate the maturing out process, with significantly less drinking and fewer alcohol-related problems over the course of a student's college career (Baer et al. 2001, Marlatt et al. 1998).

Web-Based or Computer-Administered Interventions

Recent research has evaluated extensions of harm-reduction approaches to be delivered via Web-based or computer-mediated interventions. Importantly, Web- or computer-based methods provide complete anonymity; they also allow individuals to pace themselves and use the program when it is needed most. Web- or computer-based interventions have been developed for alcohol use, tobacco use, other drug use, physical activity, nutrition and healthy eating, weight loss, eating disorders, stress and coping, and violence. At least seven Web-based controlled trials with alcohol or substance abuse have been conducted and published

(e.g., Chiauzzi et al. 2005; Kypri & McAnally 2005; Kypri et al. 2004; Neighbors et al. 2004, 2006; Walters et al. 2007), with promising findings, such as reductions in alcohol use (Kypri et al. 2004; Neighbors et al. 2004, 2006; Walters et al. 2007) and alcohol-related problems (Kypri et al. 2004, Neighbors et al. 2004, Walters et al. 2007) relative to controls, and prevention of escalating use in adolescent samples. Several of these Web-based studies (Neighbors et al. 2004, 2006; Walters et al. 2007) find that reductions in perceived drinking norms mediate changes in alcohol use. The validity of Web-based research might be called into question by some; however, many have applauded the use of the Internet for psychological research (Birnbaum 2004) and have found few differences between Web and laboratory data (Krantz & Dalal 2000).

HARM-REDUCTION INTERVENTIONS AT THE POINT-OF-NEED

Housing First

Individuals who are homeless and have severe alcohol dependency and comorbid mental health or other substance use problems (often referred to as chronic public inebriates) place an incredible strain on the public health system (Thornquist et al. 2002). In the United States, it has been estimated that publicly funded programs accrue more than $80,000 in costs per person per year; with most costs related to Medicaid expenses and emergency room visits (Larimer et al. 2009). Providing stable housing to individuals can result in some cost savings; however, because such programs often require that housing be contingent upon sobriety, clients who relapse may be evicted (Tsemberis et al. 2004). In recognition that these programs might not be helpful for the most severely dependent and sick individuals, alternatives have been developed to provide stable housing that is not contingent on sobriety (e.g., Housing First). Tsemberis and colleagues (2004) conducted a randomized controlled trial comparing a control group for whom provision of housing was contingent on treatment and sobriety and an experimental group that was provided immediate housing without contingencies. Results indicated that the experimental group had significantly more stability in housing and less time spent homeless. There were no differences in substance use or psychiatric symptoms across groups. Larimer and colleagues (2009) evaluated one-year outcomes following assignment to a noncontingent housing facility as compared with a wait-list control group. The Housing First participants reported significantly less alcohol use and a lower likelihood of drinking to intoxication over time. In addition, the Housing First group averaged a cost reduction, compared to wait-list control participants, of $2449 per person per month in health and social service costs.

Trauma Centers

In 2006, more than 1.7 million of the trauma center and emergency department visits in the United States were associated with alcohol or drug misuse or abuse prior to admission (Subst. Abuse Mental Health Serv. Admin. 2008); in one study, 22.7% of all trauma patients screened positive for substance use risky behavior, abuse, or dependency at the time of admission (Madras et al. 2009). These patients may have not sought treatment for their substance use in the past, might not recognize their substance use as a problem, and are not likely to be ready to change their substance use behavior (Daeppen et al. 2007); however, they might be more able to acknowledge problematic substance use during times of crisis (O'Toole et al. 2008). The World Health Organization and others recognized that these "teachable moments" were occurring in emergency departments and trauma centers and developed a series of screening measures and recommendations for conducting brief interventions in medical settings (see Babor & Higgins-Biddle 2001). The preponderance of evidence suggesting that even a brief intervention in a medical setting can result in significant reductions in alcohol use, reinjury, and other adverse

Dual diagnosis: individuals with concurrent psychiatric and substance use diagnoses

consequences (Gentilello et al. 1999, Schermer et al. 2006) led the World Health Organization, American College of Emergency Physicians, Emergency Nurses Association, American College of Surgeons Committee on Trauma, American Public Health Association, and National Highway Traffic Safety Administration to identify Alcohol Screening, Brief Intervention and Referral to Treatment (SBIRT) as a critical injury- and substance use–prevention strategy (Babor et al. 2007). The United States, Brazil, South Africa, and the European Union have all implemented large-scale SBIRT programs. For example, in the United States, the American College of Surgeons Committee on Trauma has required, as of 2006, that all Level I and Level II trauma centers be SBIRT capable and have the capability to provide screening of alcohol and drug use problems. In addition, Level 1 trauma centers need to be able to provide a brief intervention (Am. College Surgeons Comm. Trauma 2007).

Workplace Substance Abuse Prevention Programs

Data from the U.S. National Household Survey on Drug Abuse (Subst. Abuse Mental Health Serv. Admin. 1999) have demonstrated that more than 70% of current illicit drug users and heavy drinkers are employed full time. Thus, the large majority of substance abusers in the United States are in the workplace. In addition, substance use can have a major negative impact on worker health and productivity as well as substantial costs to employer-provided health insurance plans (Trudeau et al. 2002), and the workplace culture often includes drinking and drug use practices (Ames et al. 2000). Yet, few prevention programs have been developed for workplace settings. Recent investigations of health promotion programs (Cook et al. 1996), stress management programs (Kline & Snow 1994), health counseling programs (Heirich & Sieck 2000), worksite wellness programs (Deitz et al. 2005), and workplace managed care (Galvin 2000) have shown all to significantly reduce substance use and risky substance use behavior and to improve attitudes about changing substance use. More work needs to be done to follow up on these initial findings, in particular because many of these studies have lacked rigorous designs, with low statistical power, nonstandardized outcome measures, and low participation rates (Cook & Schlenger 2002). One promising new prevention program is an interactive Website, CopingMatters (**http://copingmatters.com**), which was designed to help employees reduce both the quantity and the frequency of alcohol consumption (Matano et al. 2000). Pilot data have indicated significant reductions in the frequency of binge episodes over 90 days following the intervention (Matano et al. 2007).

Treatment Approaches for Co-Occurring Disorders

More than 50% of people who have serious mental health problems also suffer from substance misuse (Drake et al. 2005), and many practitioners believe that individuals with a dual diagnosis (i.e., psychiatric and a substance use diagnoses concurrently) must be abstinent from substances prior to treating the psychiatric problem. A harm-reduction approach to dual diagnosis treatment recognizes that "dual" disorders are multidetermined and are often inseparable (Denning 2000). Harm-reduction psychotherapy for co-occurring disorders includes assessment and treatment strategies that are different from standard addiction treatments. In general, harm-reduction psychotherapy (see Denning 2000, Tatarsky 2002) aims to meet clients where they are and individualizes the treatment to the current needs and desires of the client. Motivational interviewing, goal setting, coping skills training, stress reduction, and relapse prevention can all be components of harm-reduction psychotherapy for substance users. Regrettably, no randomized controlled trials of harm-reduction psychotherapy have been conducted, as described by Denning (2000) or Tatarsky (2002); however, other treatments for dual diagnosis have shown promise in reducing substance use and related

harmful behaviors without requiring abstinence prior to treating the mental health problem. Seeking Safety (Najavits 2002) has been shown to be effective at reducing drug use and symptoms of posttraumatic stress disorder as well as improving family and social functioning (Najavits et al. 2005). Mindfulness-based relapse prevention, a recently developed treatment for substance use disorders, has been shown to decrease substance use, craving, and related problems in a sample with high rates of comorbid psychiatric disorders (Bowen et al. 2009).

FUTURE RESEARCH NEEDS

Need for Policy, Public Health, and Epidemiology Research

As described above, major health organizations and funding agencies worldwide have only recently become more open to the possibilities afforded by harm-reduction policies and programs. It is critical to proactively initiate research studies to examine individual, community, and systemwide changes in behavior that follow from changes in policies and the availability of more harm-reduction programs. Multisite, multicountry and multicultural studies to compare effectiveness of harm-reduction policies and programs across different groups of people will be critical to further advance our understanding of what works, for whom, and when.

Cost-effectiveness research and program evaluation will also be necessary to demonstrate both program efficacy and relative cost offsets from implementation of a harm-reduction policy or program. Interested stakeholders, even those who do not initially support a harm-reduction approach, are likely to be swayed by generous cost savings provided by these approaches. For example, in Seattle, the police and many city government officials were not initially supportive of the Housing First program described above, but after the results came in with a cost savings of more than $3.2 million in emergency social and health services (Larimer et al. 2009), the city stakeholders rallied behind the program and have continued to fight for public dollars to keep the program going. In a press release, Seattle Mayor Greg Nickels commented, "This is a tremendous start. . . we will see more facilities like these open in the months and years ahead. With every new building, we take a big step toward ending homelessness in our community" (see **http://www.seattle.gov/mayor/news.asp**).

Cost offsets: cost savings as a result of a mental health intervention or policy

CONCLUSIONS

Harm reduction has engendered many controversies in the treatment of addiction, as reviewed above. For those who subscribe to the moral model, harm reduction is unacceptable because it "gives permission" for addicts to keep using. These opponents see harm reduction as equal to the green light at the driving intersection choice point mentioned at the beginning of this review. It is also opposed by proponents of the disease model, who typically define addiction as a progressive disease with no cure—only abstinence is accepted as a means of stemming the course of the disease, and even a single occasion of drug use is equated with a relapse. These critics have denounced harm reduction as an "enabling" strategy that fosters the continuation of the addictive disease. From a public health perspective, however, harm reductionists see their goal as helping their clients stay alive, healthy, and more motivated to make further habit changes. Harm reductionists state that if total abstinence is the exclusive goal, users who are unable to initiate abstinence will refuse to attend treatment or drop out because they will see total abstinence as a "disabling" strategy.

A critic of harm reduction and a leading expert in addictions treatment, Dr. Alan Leshner (former director of the National Institute of Drug Abuse and current director of the American Association for the Advancement of Science), published a paper advocating that the term "harm reduction" be dropped altogether owing to its controversial nature in the addictions treatment field. He lists a number of

criticisms that have been raised by opponents of various harm-reduction programs, including the provision of needle exchanges (because this approach serves only the broader community in terms of reducing HIV transmission and it encourages continued drug use), promotion of controlled drinking by chronic alcoholics (because it does not eliminate liver disease and it facilitates relapses into violence or uncontrolled drinking), the use of smokeless tobacco products (because of increased risk of negative health consequences), and the use of agonist medications for heroin addiction, including methadone and buprenorphine (because these are substitute addictive substances that go against the grain of drug-free treatment goals). Leshner (2008) criticized advocates of harm reduction, such as the Harm Reduction Coalition, as endorsing extreme ideological views about the acceptability and need for this approach. His most salient critique is that anyone associated with harm reduction supports drug legalization:

> This reflexive association of "harm reduction" with decriminalization or legalization has made it very difficult for US communities to implement other kinds of harm-reduction strategies when they are so labeled. . . . What to do? The answer seems simple. Right or wrong, the imprecise use of this term and its use as a euphemism for drug legalization have over the past decades sufficiently inflamed US drug warriors that they cannot have a rational discussion of even the underlying concept, let alone how harm-reduction strategies might be implemented. This fact alone justifies our doing away with the term. (Leshner 2008, p. 514)

Finally, harm-reduction therapy often does lead many users to the point where they are willing to give up drug use altogether. By participating in a harm-reduction program that teaches them new coping skills, users begin to notice that they are capable of making important habit changes, from attending a needle-exchange program to reducing amounts of alcohol consumed. As a result, they are likely to feel more confident about their ability to make these important habits changes, and their self-efficacy for future change is enhanced. Rather than relying on willpower or a higher power as the vehicle for change, they realize that they have their own "skill-power" to evoke change. As the old saying goes, "Where there's a will [motivation to change], there's a way." For many active users, harm reduction is the way.

SUMMARY POINTS

1. Harm reduction is a pragmatic and compassionate approach to reduce the harms associated with substance use and other risk behaviors.
2. Many individuals and government organizations are opposed to harm reduction because they want to eliminate substance use by enforcing abstinence-only policies and intervention programs, despite widespread evidence that harm-reduction programs are effective and cost-efficient.
3. Several international organizations, including the United Nations and the World Health Organization, are supportive of harm-reduction approaches because of the preponderance of evidence that many harm-reduction programs have slowed the spread of HIV and other communicable diseases.
4. Government funding for supply-reduction programs has always exceeded the funding for demand-reduction and harm-reduction programs despite the fact that many supply-reduction policies (e.g., incarceration) can lead to increased harm to individuals and increased costs to society.

5. Harm-reduction programs with the most empirical support include needle exchange programs, opioid substitution therapy, overdose prevention programs, substance use prevention programs for adolescents and young adults, emergency room screening and intervention for substance use problems, and workplace substance use prevention programs.

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LITERATURE CITED

Am. College Surgeons Comm. Trauma. 2007. **http://www.facs.org/trauma/publications/sbirtguide.pdf**

Ames GM, Grube JW, Moore RS. 2000. Social control and workplace drinking norms: a comparison of two organizational cultures. *J. Stud. Alcohol* 61:203–19

Aos S, Lieb R, Mayfield J, Miller M, Pennucci A. 2004. *Benefits and Costs of Prevention and Early Intervention Programs for Youth*. Olympia: Washington State Inst. Public Policy

Babor TF, Higgins-Biddle JC. 2001. *Brief Interventions for Hazardous and Harmful Drinking: A Manual for Use in Primary Care*. Dept. Mental Health Subst. Depend., World Health Org.

Babor TF, McRee BG, Kassebaum PA, Grimaldi PL, Ahmed K, Bray J. 2007. Screening, Brief Intervention, and Referral to Treatment (SBIRT): toward a public health approach to the management of substance abuse. *Subst. Abuse* 28:7–30

Baer JS, Kivlahan DR, Blume AW, McKnight P, Marlatt GA. 2001. Brief intervention for heavy-drinking college students: 4-year follow-up and natural history. *Am. J. Public Health* 91(8):1310–16

Birnbaum MH. 2004. Human research and data collection via the Internet. *Annu. Rev. Psychol.* 55:803–32

Bosworth K. 1997. Drug abuse prevention: school-based strategies that work. *ERIC Digest (ED409316–1997-07–00)*. Washington, DC: ERIC Clearinghouse on Teaching and Teaching Education

Bowen SW, Chawla N, Marlatt GA. 2009. *Mindfulness-Based Relapse Prevention*. New York: Guilford. In press

Brickman P, Rabinowitz VC, Coates D, Cohn E, Kidder L. 1982. Models of helping and coping. *Am. Psychol.* 37:364–84

Buning EC, Coutinho RA, van Brussel GH, van Santen GW, van Zadelhoff AW. 1986. Preventing AIDS in drug addicts in Amsterdam. *Lancet* 1(8495):1435

Bureau Justice Stat. 2009. *Criminal Offender Statistics*. **http://www.ojp.usdoj.gov/bjs/crimoff.htm#data**

Cent. Subst. Abuse Res. (CESAR). 2008. FY2009 Federal drug control budget released; prevention continues to receive dwindling proportion of funding. *CESAR FAX* 17(10):March 10. College Park: Univ. Maryland

Chamberlain JM, Klein BL. 1994. A comprehensive review of naloxone for the emergency physician. *Am. J. Emerg. Med.* 12(6):650–60

Chiauzzi E, Green TC, Lord S, Thum C, Goldstein M. 2005. My student body: a high-risk drinking prevention web site for college students. *J. Am. Coll. Health* 53(6):263–74

Connock M, Juarez-Garcia A, Jowett S, Frew E, Liu Z, et al. 2007. Methadone and buprenorphine for the management of opioid dependence: a systematic review and economic evaluation. *Health Technol. Assess.* 11(9):1–171

Cook R, Back A, Trudeau J. 1996. Preventing alcohol use problems among blue-collar workers: a field test of the Working People program. *Subst. Use Misuse* 31:255–75

Cook R, Schlenger W. 2002. Prevention of substance abuse in the workplace: review of research on the delivery of services. *J. Prim. Prev.* 23:115–42

Daeppen JB, Bertholet N, Gmel G, Gaume J. 2007. Communication during brief intervention, intention to change, and outcome. *Subst. Abuse* 28(3):43–51

Darke S, Zador D. 1996. Fatal heroin "overdose": a review. *Addiction* 91(12):1765–72
Deitz D, Cook R, Hersch R. 2005. Workplace health promotion and utilization of health services: follow-up data findings. *J. Behav. Health Serv. Res.* 32:306–19
Denning P. 2000. *Practicing Harm Reduction Psychotherapy: An Alternative Approach to the Addictions*. New York: Guilford
Dimeff LA, Baer JS, Kivlahan DR, Marlatt GA. 1999. *Brief Alcohol Screening and Intervention for College Students*. New York: Guilford
Drake RE, Wallach MA, McGovern MP. 2005. Special section on relapse prevention: future directions in preventing relapse to substance abuse among clients with severe mental illnesses. *Psychiatr. Serv.* 56:1297–302
Elliott L. 2002. Con game and restorative justice: inventing the truth about Canada's prisons. *Can. J. Criminol.* 44(4):459–74
Fletcher AM. 2001. *Sober for Good*. New York: Houghton Mifflin
Galvin DM. 2000. Workplace managed care: collaboration for substance abuse prevention. *J. Behav. Health Serv. Res.* 27(2):125–30
Gentilello LM, Rivara FP, Donovan DM, Jurkovich GJ, Daranciang E, et al. 1999. Alcohol interventions in a trauma center as a means of reducing the risk of injury recurrence. *Ann. Surg.* 230:473–80
G8 Health Experts. 2009. *G8 Preliminary Accountability Report*. **http://www.reliefweb.int/rw/RWFiles2009.nsf/FilesByRWDocUnidFilename/MYAI-7TS38H-full_report.pdf/$File/full_report.pdf**
Hall W. 2007. What's in a name? *Addiction* 102(5):692
Heirich M, Sieck CJ. 2000. Worksite cardiovascular wellness programs as route to substance abuse prevention. *J. Occup. Environ. Med.* 42:47–56
Johnston LD, O'Malley PM, Bachman JG. 2000a. *National Survey Results on Drug Use from the Monitoring Future Study, 1975–1999. Volume I: Secondary School Students*. NIH Publ. No. 00-4802. Rockville, MD: Natl. Inst. Drug Abuse
Kerr T, Tyndall MW, Lai C, Montaner JS, Wood E. 2006. Drug-related overdoses within a medically supervised safer injection facility. *Int. J. Drug Policy* 17(5):436–41
Kleber HD. 2008. Methadone maintenance four decades later: thousands of lives saved but still controversial. *J. Am. Med. Assoc.* 300(19):2303–5
Kline M, Snow D. 1994. Effects of a worksite coping skills intervention on the stress, social support and health outcomes of working mothers. *J. Prim. Prev.* 15(2):105–21
Krantz JH, Dalal R. 2000. Validity of Web-based psychological research. In *Psychological Experiments on the Internet*, ed. Birnbaum, pp. 35–60. San Diego, CA: Academic
Krantz MJ, Mehler PS. 2004. Treating opioid dependence. Growing implications for primary care. *Arch. Intern. Med.* 164(3):277–88
Kypri K, McAnally HM. 2005. Randomized controlled trial of a web-based primary care intervention for multiple health risk behaviors. *Prev. Med.* 41(3–4):761–66
Kypri K, Saunders JB, Williams S, McGee R, Langley JD, et al. 2004. Web-based screening and brief intervention for hazardous drinking: a double-blind randomized controlled trial. *Addiction* 99:1410–17
Larimer ME, Cronce JM. 2007. Identification, prevention, and treatment revisited: individual-focused college drinking prevention strategies 1999–2006. *Addict. Behav.* 32(11):2439–68
Larimer ME, Malone DK, Garner MD, Atkins DC, Burlingham B, et al. 2009. Health care and public service use and costs before and after provision of housing for chronically homeless persons with severe alcohol problems. *J. Am. Med. Assoc.* 301(13):1349–57
Larimer ME, Turner AP, Anderson BK, Fader JS, Kilmer JR, et al. 2001. Evaluating a brief alcohol intervention with fraternities. *J. Stud. Alcohol* 62(3):370–80
Lenton S, Single E. 1998. The definition of harm reduction. *Drug Alcohol Rev.* 17(2):213–19
Leshner AI. 2008. By now, "harm reduction" harms both science and public health. *Clin. Pharm. Therapeut.* 83:513–14
MacCoun RJ. 1998. Toward a psychology of harm reduction. *Am. Psychol.* 53(11):1199–208
MacCoun RJ. 2009. Harm reduction is a good label for a criterion all drug programs should meet. *Addiction* 104(3):341–42; 345–46

Describes results from a landmark study demonstrating cost savings and health promotion following interventions with substance users in a trauma center.

Presents an overview of the controversies surrounding different definitions of harm reduction.

Summarizes the controversies surrounding opioid substitution programs.

Madras BK, Compton WM, Avula D, Stegbauer T, Stein JB, Clark HW. 2009. Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple healthcare sites: comparison at intake and 6 months later. *Drug Alcohol Depend.* 99:280–95

Marlatt GA, Baer JS, Kivlahan DR, Dimeff LA, Larimer ME, et al. 1998. Screening and brief intervention for high-risk college student drinkers: results from a two-year follow-up assessment. *J. Consult. Clin. Psychol.* 66:604–15

Matano RA, Futa KT, Wanat SF, Mussman LM, Leung CW. 2000. The employee stress and alcohol project: the development of a computer-based alcohol abuse prevention program for employees. *J. Behav. Health Serv. Res.* 27:152–65

Matano RA, Koopman C, Wanat SF, Winzelberg AJ, Whitsell SD, et al. 2007. A pilot study of an interactive website in the workplace for reducing alcohol consumption. *J. Subst. Abuse Treat.* 32:71–80

McBride N, Farringdon F, Midford R, Meuleners L, Phillips M. 2004. Harm minimization in school drug education: final results of the School Health and Alcohol Harm Reduction Project (SHAHRP). *Addiction* 99(3):278–91

Merrill JO, Jackson TR, Schulman BA, Saxon AJ, Awan A, et al. 2005. Methadone medical maintenance in primary care. An implementation evaluation. *J. Gen. Intern. Med.* 20(4):344–49

Najavits LM. 2002. Clinicians' views on treating posttraumatic stress disorder and substance use disorder. *J. Subst. Abuse. Treat.* 22(2):79–85

Najavits LM, Schmitz M, Gotthardt S, Weiss RD. 2005. Seeking Safety plus Exposure Therapy: an outcome study on dual diagnosis men. *J. Psychoactive Drugs* 37(4):425–35

Natl. Inst. Drug Abuse. 2003. *Preventing Drug Use Among Children and Adolescents: A Research-Based Guide for Parents, Educators, and Community Leaders*. Bethesda, MD: U.S. Dept. Health Human Serv. 2nd ed.

Neighbors C, Larimer ME, Lewis MA. 2004. Targeting misperceptions of descriptive drinking norms: efficacy of a computer-delivered personalized normative feedback intervention. *J. Consult. Clin. Psychol.* 72:434–47

Neighbors C, Larimer ME, Lostutter TW, Woods BA. 2006. Harm reduction and individually focused alcohol prevention. *Int. J. Drug Policy* 17:304–9

O'Toole TP, Pollini RA, Ford DE, Bigelow G. 2008. The health encounter as a treatable moment for homeless substance-using adults: the role of homelessness, health seeking behavior, readiness for behavior change and motivation for treatment. *Addict. Behav.* 33(9):1239–43

Poulin C, Nicholson J. 2005. Should harm minimization as an approach to adolescent substance use be embraced by junior and senior high schools? Empirical evidence from an integrated school- and community-based demonstration intervention addressing drug use among adolescents. *Int. J. Drug Policy* 16:403–14

Reuter P, Trautmann F. 2009. *A Report on Global Illicit Drug Markets*. Brussels: European Commiss.

Ritter A, Cameron J. 2006. A review of the efficacy and effectiveness of harm reduction strategies for alcohol, tobacco and illicit drugs. *Drug Alcohol Rev.* 25(6):611–24

Schermer CR, Moyers TB, Miller WR, Bloomfield LA. 2006. Trauma center brief interventions for alcohol disorders decrease subsequent driving under the influence arrests. *J. Trauma* 60:29–34

Seal KH, Thawley R, Gee L, Bamberger J, Kral AH, et al. 2005. Naloxone distribution and cardiopulmonary resuscitation training for injection drug users to prevent heroin overdose death: a pilot intervention study. *J. Urban Health* 82(2):303–11

The first prospective study evaluating the effectiveness of naloxone distribution in the prevention of heroin overdose.

Sporer KA. 2003. Strategies for preventing heroin overdose. *Br. Med. J.* 326(7386):442–44

Sporer KA, Kral AH. 2007. Prescription naloxone: a novel approach to heroin overdose prevention. *Ann. Emerg. Med.* 49(2):172–77

Strang J, Kelleher M, Best D, Mayet S, Manning V. 2006. Emergency naloxone for heroin overdose. *Br. Med. J.* 333(7569):614–15

Strathdee SA, Patterson TL. 2009. Supply reduction's hidden casualties: a view from the trenches. *Addiction* 104(3):340–41; 345–46

Strathdee SA, Pollini RA. 2007. A 21st-century Lazarus: the role of safer injection sites in harm reduction and recovery. *Addiction* 102(6):848–49

Strathdee SA, Vlahov D. 2001. The effectiveness of needle exchange programs: a review of the science and policy. *AIDScience* 1:1–13

Comprehensive review of needle exchange programs.

Subst. Abuse Mental Health Serv. Admin. 1999. *Summary of Findings from the 1998 National Household Survey on Drug Abuse*. Subst. Abuse Mental Health Serv. Admin., Off. Appl. Studies, Rockville, MD

Subst. Abuse Mental Health Serv. Admin. 2007. *National Survey on Drug Use and Health*. Subst. Abuse Mental Health Serv. Admin., Off. Appl. Studies, Rockville, MD

Subst. Abuse Mental Health Serv. Admin. 2008. *Drug Abuse Warning Network, 2006: National Estimates of Drug-Related Emergency Department Visits*. DAWN Series D-30, DHHS Publication No. (SMA) 08-4339. Subst. Abuse Mental Health Serv. Admin., Off. Appl. Studies, Rockville, MD

Tatarsky A. 2002. *Harm Reduction Psychotherapy: A New Treatment for Drug and Alcohol Problems*. Northvale, NJ: Jason Aronson, Inc.

Tatarsky A. 2003. Harm reduction psychotherapy: extending the reach of traditional substance use treatment. *J. Subst. Abuse Treat.* 25(4):249–56

Thornquist L, Biros M, Olander R, Sterner S. 2002. Health care utilization of chronic inebriates. *Acad. Emerg. Med.* 9(4):300–8

Trudeau JV, Deitz DK, Cook RF. 2002. Utilization and cost of behavioral health services: employee characteristics and workplace health promotion. *J. Behav. Health Serv. Res.* 29(1):61–74

Tsemberis S, Gulcur L, Nakae M. 2004. Housing First, consumer choice, and harm reduction for homeless individuals with a dual diagnosis. *Am. J. Public Health* 94(4):651–56

U.N. Gen. Assembly. 1998. *Political Declaration on Global Drug Control*. **http://www.un.org/ga/20special/**

U.N. Off. Drugs Crime. 2009. Confronting unintended consequences: drug control and the criminal black market. In *World Drug Report*, pp. 163–86. New York: U.N. Publ.

van Ameijden EJ, Van Den Hoek AR, Coutinho RA. 1994. Injecting risk behavior among drug users in Amsterdam, 1986 to 1992, and its relationship to AIDS prevention programs. *Am. J. Public Health* 84(2):275–81

Walmsley R. 2007. *World Prison Population List*. London: Intl. Cent. Prison Stud., Kings College. 7th ed.

Walters ST, Vader AM, Harris TR. 2007. A controlled trial of Web-based feedback for heavy drinking college students. *Prev. Sci.* 8(1):83–88

Warner LA, White HR. 2003. Longitudinal effects of age at onset and first drinking situations on problem drinking. *Subst. Use Misuse* 38(14):1983–2016

Weatherburn D. 2009. Dilemmas in harm minimization. *Addiction* 104(3):335–39

Wechsler H, Lee JE, Kuo M, Seibring M, Nelson TF, Lee H. 2002. Trends in college binge drinking during a period of increased prevention efforts. Findings from 4 Harvard School of Public Health College Alcohol Study surveys: 1993–2001. *J. Am. Coll. Health* 50(5):203–17

Wodak A. 2009. Harm reduction is now the mainstream global drug policy. *Addiction* 104(3):343–45; discussion 345–46

Wodak A, Cooney A. 2006. Do needle syringe programs reduce HIV infection among injecting drug users: a comprehensive review of the international evidence. *Subst. Use Misuse* 41(6–7):777–813

Wood E, Tyndall MW, Zhang R, Montaner JS, Kerr T. 2007. Rate of detoxification service use and its impact among a cohort of supervised injecting facility users. *Addiction* 102(6):916–19

World Health Org., U.N. Off. Drugs Crime, U.N. AIDS. 2004. Substitution maintenance therapy in the management of opioid dependence and HIV/AIDS prevention. *Joint Position Paper*, pp. 11–30. Geneva, Switzerland: WHO

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