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Injection Drug Use In Indiana

Substance abuse and addiction are major causes of preventable morbidity and mortality in the United States [1]. In 2008, an estimated 22.2 million persons, or nine percent of the U.S. population ages 12 and older, were classified with substance abuse or dependence, based on criteria specified in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) [2].

Drugs can be taken in a variety of ways. The route of administration includes drinking, smoking, snorting, swallowing pills, and injecting. All drug abuse has been proven detrimental; however, harmful outcomes are especially associated with injection drug use (IDU), a method of delivering a substance, for example heroin or cocaine, into the body using a needle and syringe.

IDU contributes to multiple health, social, and legal problems for injection drug users. It also poses a public health threat because of the increased risk of acquiring and transmitting blood-borne infections such as the human immunodeficiency virus (HIV) and hepatitis B and C viruses (HBV and HCV) through sharing non-sterile drug injection equipment [3]. Transmission of the viruses can lead to asymptomatic infections that may eventually result in severe illness, possibly years after the initial infection. Hence, former injection drug users remain at high risk for carrying and spreading these diseases, even long after they quit abusing drugs [4].

Based on the most recent data, an estimated 425,000 Americans injected drugs in the past year. The substances most frequently used for injecting include heroin, cocaine, methamphetamine, and other stimulants [5]. However, injection of prescription opioid analgesics (pain relievers) for nonmedical reasons seems to have become more prevalent as well [6-7].

Prevalence of IDU

The use of injectable drugs varies by demographic group and area. Based on pooled data from the 2006 through 2008 National Survey on Drug Use and Health (NSDUH), an annual average of 0.17 percent of the U.S. population ages 12 and older (an estimated 425,000 persons annually) injected heroin, cocaine, methamphetamine, or other stimulants in the past year. IDU rates were significantly higher for men (0.24 percent) than women (0.11 percent) and were most prevalent among adults ages 18 to 25 (0.28 percent) and ages 26 to 34 (0.26 percent). Furthermore, past-year injection rates also varied by race with Asians and Native Hawaiians or other Pacific Islanders having lower rates than other groups [5].

One of the major problems associated with IDU is the potential transmission of HIV and HBV or HCV because of non-sterile drug injection equipment. According to 2006-2008 NSDUH data, more than half (51.0 percent) of past-year injection drug users in the United States indicated that the last time they injected drugs, they reused a needle they had used before; 13.0 percent reported that they used a needle they knew or suspected someone else had used before them; and 17.7 percent stated that they used a needle someone used after them. Less than one-third (29.0 percent) of past-year injection drug users cleaned the needle with bleach the last time they used a needle to inject drugs [5].

Indiana—Availability of IDU data is limited. IDU prevalence estimates from NSDUH are not available at the state level, because low prevalence rates in the general population (U.S.: 0.17 percent) render state-level estimates unreliable. However, if we assume that Indiana's IDU patterns are similar to the nation's, we can estimate that nearly 10,800 Hoosiers injected drugs in the past year.

According to the Youth Risk Behavior Surveillance System, lifetime prevalence of IDU among Indiana high school students (grades 9 through 12) remained statistically stable from 1.6 percent in 2003 to 2.7 percent in 2007; also, rates were similar between Indiana and the nation [8].

Based on results from the Alcohol, Tobacco, and Other Drug Use by Indiana Children and Adolescents Survey[1], past-month prevalence of IDU among Hoosier students in grades 6 through 12 remained fairly stable from 2001 through 2009. Rates seemed to rise as children progressed in age; i.e., the percentage of students reporting past-month IDU increased with grade level (see Table 1). Heroin was reported to be the most frequently injected drug among youth in grades 7 through 12. However, 6th grade students reported injecting steroids most frequently [9].

Table 1: Percentage of Indiana Students, Grades 6 through 12, Reporting Injection Drug Use in the Past Month (Alcohol, Tobacco, and Other Drug Use by Indiana Children and Adolescents Survey, 2001-2009)

Grade	2001	2002	2003	2004	2005	2006	2007	2008	2009
6	0.4	0.3	0.4	0.4	0.5	0.3	0.3	0.3	0.3
7	0.5	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
8	0.7	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.9
9	0.6	0.6	0.8	0.8	0.8	0.8	0.9	1.0	1.0
10	0.8	0.7	0.7	0.8	0.9	0.9	1.0	1.2	1.1
11	0.7	0.6	0.7	0.8	0.8	0.8	1.1	1.1	1.3
12	0.6	0.6	0.6	0.7	0.6	0.9	0.9	1.2	1.2

Source: Indiana Prevention Resource Center, 2009

When asked about their main sources for obtaining needles and syringes, most students reported receiving them from friends. They also commonly reported taking or buying these items from a store or pharmacy and giving somebody else money to buy for them [9].

Approximately half of the students who reported IDU stated that they do not reuse needles and syringes; however, roughly one in five students stated that they clean and reuse the injection equipment [9].

Consequences

IDU is a high-risk behavior that can result in multiple negative outcomes, including addiction and dependence, morbidity and mortality, and legal and social problems.

Addiction and Dependence

Drug addiction (dependence[2]) is defined as a chronic, relapsing brain disease characterized by compulsive drug seeking and use, despite harmful consequences [10]. From a neurobiological perspective, repeated exposure to a drug causes adaptations in specific brain neurons. This phenomenon in turn alters the functioning of neural circuits and eventually leads to drug addiction [11]. From a psychiatric perspective, drug addiction is a disorder that progresses from impulsivity to compulsivity in a cycle of addiction [12].

Nine percent of the U.S. population ages 12 and older were classified with substance abuse or dependence in 2008 [2].

Indiana—An estimated 453,000 Hoosiers were classified with substance abuse or dependence in 2007, amounting to 8.73 percent of Indiana's population ages 12 and older [2].

In 2007, over 29,000 treatment episodes[3] were recorded in Indiana. In 926 episodes, or 3.2 percent, IDU was reported as the usual route of administration for the primary substance of abuse. Among the IDU treatment episodes, heroin was by far the most frequently injected drug (46.5 percent), followed by methamphetamine (21.8 percent) and opiates/synthetics other than heroin and methadone (17.4 percent) [13].

Morbidity and Mortality

Health consequences can be defined as either technique-specific or substance-specific [14]. Technique-specific complications are a direct result of the injecting practice itself. For example, using non-sterile equipment can lead to injection site infections and transmission of communicable diseases, including HIV, HBV and HCV [15]. Substance-specific complications can occur because of a drug's effect on mind and body. Complications from cocaine use can include heart attacks, cardiac dysrhythmia, subdural hemorrhage, and stroke [16]. Complications from opioid use can include hypotension, respiratory depression, and coma. [16]

Overall, the high morbidity associated with IDU is well-recognized [17-18]. Among the multiple health risks faced by injection drug users, the most commonly known are bloodborne and sexually transmitted diseases, spread through use of non-sterile drug injection equipment and unsafe sex practices. In the United States, approximately one-fifth of all new HIV infections, one-third of acquired immunodeficiency syndrome (AIDS)

[1]The Indiana Prevention Resource Center annually conducts the Alcohol, Tobacco, and Other Drug Use by Indiana Children and Adolescents Survey. Statewide and regional prevalence rates are computed for Hoosier students, grades 6 through 12. Even though rates are not necessarily representative, they provide a good estimate of substance use within the state.

[2]The terms "addiction" and "dependence" are used interchangeably in this report.

[3]This information is based on the 2007 Treatment Episode Data Set (TEDS), a national database maintained by the Substance Abuse and Mental Health Services Administration. In Indiana, TEDS data are limited to information on individuals entering substance abuse treatment who are 200 percent below the poverty level and receive state-funded treatment; therefore, the data are not representative of all individuals in drug and alcohol treatment.

cases, and at least half of new HCV cases are associated with IDU [19-21]. The Centers for Disease Control and Prevention (CDC) estimate that 60 percent of HCV cases and 17 percent of HBV cases in 2000 were among injection drug users; in other words, 17,000 of new HCV and 13,000 of new HBV cases occurred in the IDU population [22]. According to the National Institutes of Health, between 15 and 20 percent of injection drug users have HIV and 70 to 90 percent have HCV [23].

Co-infection is yet another factor contributing to compromised health conditions among the IDU population [24]. A high proportion of HIV-infected injection drug users are also co-infected with HCV. According to estimates, 20 to 30 percent of the U.S. IDU populations have both HIV and HCV [15, 24-25].

In addition, some diseases associated with IDU affect children of drug-injecting mothers: The risks of perinatal (mother-to-child) transmission of HIV and HCV are higher among women who inject drugs during pregnancy [26-28]. In general, maternal substance abuse is associated with increased risks of infant morbidity [29-30] and mortality, including sudden infant death syndrome (SIDS), during the first year of life [31-33].

IDU is clearly linked to increased risk of mortality [34-36]. Injection drug users are 6 to 20 times more likely to die prematurely than their peers [37].

Overdoses, fatal and nonfatal, are highly prevalent among injection drug users [38], and those who report a nonfatal overdose in the past are more likely to experience another, potentially fatal overdose in the future [39]. Overdoses that do not result in death contribute to significant physical morbidity that often requires expensive treatment [40].

IDU is well-known risk factor for overdose fatality [35-36]. According to the CDC, fatal drug overdoses contribute to a significant number of deaths among injection drug users. The CDC estimates that 5,000 to 10,000 injection drug users die of drug overdoses every year [41-42]. Public health researchers assert that overdose is the single leading cause of death among injection drug users in the United States [43-44]. In a recent study by Britton et al. (2010), injection drug use increased the risk of future overdose 2.5 times [40], and Frischer et al. (1993) found that over 90 percent of deaths among injection drug users were attributed to overdose or suicide [45].

Indiana—In 2008, a total of 9,253 individuals were living with HIV disease[4] in Indiana; 8.44 percent of transmissions, or 781 cases, occurred through IDU alone. Another 5.94 percent, or 550 cases, can be linked to individuals being both injection drug users and men who have sex with men (MSM)[46]. In 2006 (the most recent year of published mortality data), 141 Hoosiers died of HIV disease; this figure represents an age-adjusted mortality rate of 2.3 per 100,000 population [47].

Additionally, 29 cases of acute HBV and 7,066 cases of HCV were reported in 2008 [46]. In 2006, 98 Indiana residents died from HBV and HCV (6 from HBV and 92 from HCV), representing an age-adjusted mortality rate of 1.4 per 100,000 population in Indiana [47].

In 2006, 728 Hoosiers died from fatal drug overdoses. Due to the nature of the data, we cannot deduce how many of these overdose fatalities were attributable to IDU [48].

Legal Issues

Injection drug users are often in a position that requires the intervention of both law enforcement and public health authorities. Most injected drugs, such as heroin, cocaine, and other substances, are illegal and regulated by the Controlled Substances Act, 21 U.S.C. 812 [49].

In 2007, almost 1.7 million arrests were made in the United States for drug offenses, including possession and sale/manufacture of controlled substances, representing an arrest rate of 5.59 per 1,000 population [50].

Table 2: Risk and Protective Factors for Drug Abuse

Risk	Protective
Chaotic home environment, particularly when parents abuse drugs or suffer from mental illness	Strong and positive family bonds
Ineffective parenting, especially with children with difficult temperament or disorders	Parental monitoring of children's activities and peers
Lack of parent-child attachments and nurturing	Clear rules of conduct that are consistently enforced within the family
Failure in school performance	Success in school performance
Inappropriately shy or aggressive behavior in the classroom	Strong bonds with institutions such as schools and religious organizations
Perceptions of approval of drug-using behaviors in family, work, school, peer, and community environments	Adoption of conventional norms about drugs
Poor social skills	
Affiliations with peers displaying deviant behaviors	

Source: National Institute on Drug Abuse, 2002

[4]HIV disease refers to all HIV and AIDS cases combined.

Indiana—More than 29,000 arrests were made for drug-related offenses involving controlled substances in 2007, accounting for an arrest rate of 4.57 per 1,000 population. Almost 4,000 of these arrests were for possession of opiates and cocaine, the most frequently injected drugs, representing an arrest rate of 0.62 per 1,000 population [50].

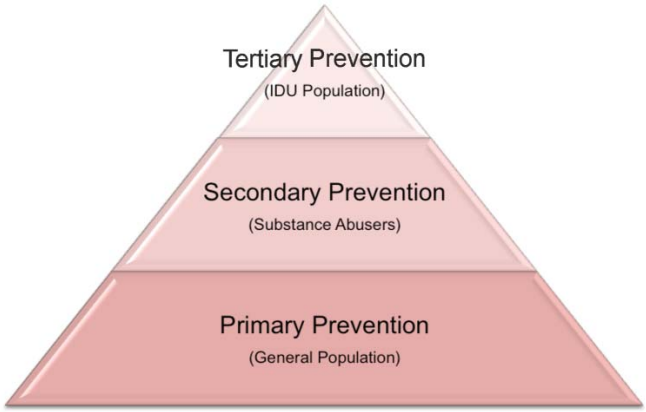
Risk and protective factors

Precursors of alcohol and drug problems have been described as risk factors for substance abuse. These factors have been shown statistically to increase the likelihood of substance abuse [51]. Conversely, protective factors are variables that reduce the probability of alcohol and drug problems. According to Swadi (1999), more than 70 identified risk factors may increase the likelihood of substance use. This wide array of risk factors can be condensed into three main domains: constitutional predisposition (individual characteristics), environmental factors (family and peers), and life events [52]. The factors influencing IDU are similar to factors linked to general drug use.

The National Institute on Drug Abuse (2002) has published a list of risk and protective factors to guide substance abuse prevention planning (see Table 2) [53]. Additional risk factors associated with IDU are:

- social disruption, including having dropping out of school, unemployment, family disruption, homelessness (especially when mental illness is present), and incarceration [54-57]
- unruliness and misbehavior early in life [58]
- recent experience of violence/victimization [59]
- early sex trading, particularly prevalent among young female drug users (sexual partners are a primary factor in the initiation of females into IDU) [59-60]

Conversely, availability of treatment services has been shown to lower the risk of substance abusers becoming injection drug users. According to one study, substance abusers in contact with treatment facilities were significantly less likely to transition to IDU [61].



Thoughts for Policymakers

IDU poses a severe health risk for users themselves but also for society, particularly because of the potential transmission of infectious diseases such as HIV and viral hepatitis. Comprehensive policy strategies are crucial and can target the at-risk population at any or all of the following stages.

Primary Prevention—Individuals who use illicit substances are more likely to transition from non-IDU routes of administration (such as smoking, snorting, etc.) to IDU than nonusers, particularly when initiation of drug use occurs at an early age [54, 63-63]. Therefore, evidence-based drug prevention efforts can help reduce or delay onset of substance use and by extension, IDU onset, in the general population.

Secondary Prevention—Secondary prevention efforts will be helpful in preventing current non-injecting drug abusers from transitioning to IDU. Since substance abusers in contact with treatment facilities are less likely to transition to IDU [61], the availability and accessibility of such services is essential in reducing IDU prevalence.

Tertiary Prevention—Tertiary prevention strategies can target injection drug users by (a) making substance abuse treatment services available and (b) providing education and intervention to reduce the transmission of infectious diseases like HIV, HBV, and HCV. These interventions may include harm reduction strategies (see textbox).

Transmission of communicable diseases, including HIV and viral hepatitis (HBV and HCV), is a major public health concern, and IDU is a significant contributing factor. The U.S. Department of Health and Human Services lists reduction of new AIDS cases among injection drug users as one of their primary objectives [64]. Comprehensive strategies are needed to achieve this goal. Prevention efforts and treatment services are essential for at-risk populations. Furthermore, conditions that precede IDU need to be considered: Efforts to strengthen protective factors and to reduce risk factors will be invaluable in decreasing new AIDS cases among this population.

Harm Reduction Programs: Needle and Syringe Exchange and Methadone Maintenance Programs

Harm reduction is an approach to reducing negative consequences of IDU, incorporating a spectrum of strategies from safer use to managed use to abstinence. Under this model, injection drug users are not necessarily expected to embrace a goal of abstinence in order to receive treatment; instead, the priority is reducing the risk of HIV transmission, and other public health concerns [65-66].

Risk reduction approaches include drug abuse treatment, HIV testing and counseling programs, street-based outreach by peer educators, and individual and group counseling. Proponents of harm reduction also implement community-level interventions to change IDU norms concerning safer injection and safer sex. Additionally, they advocate needle and syringe exchange programs (NSEPs) to provide sterile injection equipment [67-68]. Many studies show that NSEPs are associated with positive health outcomes, such as declines in needle sharing and injection frequency [69-75]; reductions in incidence of HIV, HBV, and HCV infections or risk behaviors related to these conditions[32, 65, 67, 71, 75-81]; decreases in syringe reuse [74-75], and increases in initiation of drug treatment programs [82-84].

Another approach to harm reduction is Methadone maintenance therapy (MMT). Methadone is a synthetic agent that is used for the treatment of opioid addiction [85]. It occupies opioid receptors in the brain that would otherwise be occupied by other opioids (e.g., heroin), relieving narcotic cravings, suppressing the abstinence syndrome*, and blocking the euphoric effects associated with IDU [41, 85-86]. MMT is an extensively researched treatment modality, and there is strong evidence that it helps reduce or stop the practice of IDU in users [41, 85, 87].

In addition to reducing or eliminating rates of illicit drug use, positive MMT outcomes include reductions in mortality and criminality associated with heroin use; reduced risk of overdose and transmission of infectious diseases associated with IDU, such as HIV, HBV, HBC, bacterial infections, endocarditis, soft tissue infections, thrombophlebitis, tuberculosis, and STDs; and improvement in injection drug users' health and social productivity [41, 86-87]. Methadone maintenance is recognized as the most effective treatment for opiate addiction, validated by the World Health Organization (WHO), Institute of Medicine, and Centers for Disease Control and Prevention, especially when coupled with social services [41, 86-88].

* Abstinence Syndrome: Individuals who have become physically dependent on a substance may experience a set of withdrawal symptoms when administration of the drug is stopped.

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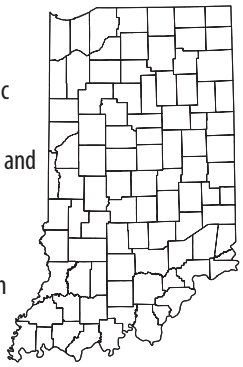

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Authors: Marion S. Greene, MPH, Program Analyst, **Ainur T. Aiypkhanova, MHA**, Graduate Assistant, **Oluyemi A. Aladejebi, MHA**, Graduate Assistant, **Eric R. Wright, PhD**, Director, Center for Health Policy; Professor and Division Director for Health Policy and Management, Department of Public Health, IU School of Medicine; Professor, Health Administration and Policy, IU School of Public and Environmental Affairs; Co-Director, Consortium for Health Policy, Law, and Bioethics, Indiana University-Purdue University Indianapolis (IUPUI)

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