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A tale of 2 HIV outbreaks caused by unsafe injections in Cambodia and the United States, 2014–2015

Runa H. Gokhale, MD[a,b,*], **Romeo R. Galang, MD, MPH**[a,b], **John P. Pitman, PhD**[c], and **John T. Brooks, MD**[a]

[a]Division of HIV/AIDS Prevention, Centers for Disease Control and Prevention, Atlanta, GA

[b]Epidemic Intelligence Service, Centers for Disease Control and Prevention, Atlanta, GA

[c]Division of Global HIV/AIDS and Tuberculosis, Centers for Disease Control and Prevention, Atlanta, GA

In 2014–2015, we saw 2 large outbreaks of HIV infection related to the unsafe use of injection equipment. In Cambodia, 242 persons in one rural commune (population: approximately 8,000) received a diagnosis of HIV infection over the course of 3 months. These infections were attributed to the reuse of injection equipment by an unlicensed health care provider in the informal health care sector.[1] In the U.S. State of Indiana, 181 persons in a rural southeastern town (population: approximately 4,200) received a diagnosis of HIV infection over the course of 6 months. These infections were attributed to the unsafe injection of prescription opioids[2] by people who inject drugs (PWID) for recreational uses. In Cambodia and Indiana, a large percentage of the infections were determined to have occurred recently (ie, within 6–9 months of diagnosis) (Table 1).[3,4]

In both outbreaks, HIV infection spread rapidly[3,4] in populations that were not well served by HIV screening and prevention strategies. In Cambodia, HIV testing and counseling have traditionally focused on screening in antenatal and tuberculosis clinics and targeted testing among other key populations (ie, commercial sex workers, men who have sex with men, transgender persons, PWID, prisoners). Members of the general Cambodian population who are exposed to unsafe injections fall outside of these categories and are not routinely tested. In Indiana, despite evidence that the region was experiencing a substantial increase in unsafe injection of prescription opioids,[5] access to HIV testing in the affected community was limited. Routine preventative medical care, where HIV screening and testing could otherwise have taken place, was available but not readily accessible to a large fraction of the affected community's residents, many of whom were uninsured or lacked means of transportation. Access to sterile injection equipment through a syringe service program and to medication-assisted therapy for opioid addiction was also lacking.

*Address correspondence to Runa H. Gokhale, MD, Division of HIV/AIDS Prevention, Centers for Disease Control, 1600 Clifton Rd NE, MS E46, Atlanta, GA, 30329. yet7@cdc.gov (R.H. Gokhale).

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Most persons with newly diagnosed HIV infection in each outbreak were coinfected with hepatitis C virus (HCV): 82% in Cambodia and 92% in Indiana.[6] Phylogenetic analysis of HCV strains from Roka is ongoing, but results of phylogenetic analysis on HCV strains from Indiana are consistent with multiple independent introductions of HCV into the community over a long period of time.[7] This suggests a trend in unsafe injection behavior that predates the current outbreak by several years. We have yet to see if analysis of HCV strains from Cambodia will yield similar results.

In the 1980s and 1990s, injection drug use was a leading mode of HIV transmission in the United States.[8] However by 2014, PWID accounted for only an estimated 6% of all HIV diagnoses that year.[9] This decline represents a remarkable collective success in U.S. HIV prevention efforts. HIV transmission through occupational needle exposure is even rarer in the United States today, with the last documented case reported in 1999.[10] As a result, HIV transmission by unsafe injections, whether in a medical setting or among PWID, is not a principal focus of the domestic HIV response. Although unsafe injections are recognized as a significant driver of HIV transmission in Eastern Europe and Asia, they have not factored largely in the global HIV response either, which is focused on the prevention of sexually transmitted HIV.[11] Still, as these 2 outbreaks illustrate, unsafe injections related to medical injection or injection drug use can lead to explosive HIV transmission.

Global estimates suggest that 95% of injections are given for therapeutic reasons (as opposed to injections given for vaccinations or family planning purposes). Most of these therapeutic injections are believed to be medically unnecessary, and the World Health Organization estimates at least 50% are unsafe (syringe, needle, or both are reused without sterilization).[12] In 2000, the last year for which data are available, it was estimated that unsafe medical injections accounted for 5% of all new HIV infections world wide.[13] In the United States, >150,000 patients have been affected by unsafe injection practices in health care settings since 2001, including 18 outbreaks of viral hepatitis infections between 2001 and 2011.[14]

The Joint United Nations Programme on HIV/AIDS estimates that there are 13 million PWID worldwide, of whom 1.7 million, or 13%, are living with HIV infection.[15,16] HIV prevalence among PWID is highest in Eastern Europe, Central Asia, East Asia, and Southeast Asia, with prevalence in some countries estimated to be as high as 54%.[11] The most commonly injected drugs are heroin and opiates.[11] In the United States, 75% of persons age ≤30 years newly infected with HCV report having abused prescription opioids,[17] the sale of which quadrupled between 1999 and 2010, leading to a significant increase in the number of opioid-associated overdoses and deaths,[18] and to a surge in the national prevalence of injection drug use.

Unsafe injections, whether by medical practitioners or PWID, do not occur in a vacuum. Interventions to reduce the incidence of unsafe injections must take into account local factors and traditions that drive the reuse of injection equipment. In the context of unsafe medical injections in Cambodia, these factors included high community demand for medical injections, limited access to safety engineered devices, lack of training, and lack of knowledge regarding appropriate indications among persons administering injections, and

the possibility that there were economic pressures or incentives on the part of medical providers to improve profit margins. In the context of reuse of injection equipment among PWID in Indiana, contributing factors included high community demand to inject prescription opioids, no access to sterile injection equipment (syringe service programs were illegal in Indiana at the time of the outbreak), and limited access to treatment for substance use disorders.

A silver lining is that each outbreak has spurred new efforts to prevent HIV infections via unsafe injecting practices. In Cambodia, an injection safety intervention is being designed that includes health care worker training in safe injection practices alongside a community-focused awareness campaign to reduce demand for unnecessary injections. In Indiana, the outbreak led to a new state law that permits syringe service programs—a policy change mirrored by new federal law that reversed a long-standing ban on the use of federal funds for such programs, and efforts are underway to address the shortage of medication-assisted substance abuse treatment resources. The outbreak also prompted U.S. federal and state public health authorities to begin assessing community vulnerability to a PWID-associated HIV outbreak and to consider establishing systems to detect and prevent them in other parts of the country.[19]

Outbreaks like those that occurred in Cambodia and Indiana may continue to occur, but they do not need to take us by surprise. Although we acknowledge that public health efforts globally operate in a resource-constrained environment, we will need to invest domestically and internationally in systems that strategically enhance limited HIV testing and prevention resources to ensure that early signals of potential problems are detected, recognized, and responded to appropriately. By coupling these efforts with efforts to reduce the drivers of unsafe injection practices, we may start to ensure that community vulnerabilities are rapidly identified before they devolve into seemingly inevitable outbreaks.

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References

1. Vun MC, Galang RR, Fujita M, Killam W, Gokhale R, Pitman J, et al. Cluster of HIV infections attributed to unsafe injection practices—Cambodia, December 1, 2014–February 28, 2015. MMWR Morb Mortal Wkly Rep. 2016; 65:142–5. [PubMed: 26890340]
2. Conrad C, Bradley HM, Broz D, Buddha S, Chapman EL, Galang RR, et al. Community outbreak of HIV infection linked to injection drug use of Oxymorphone–Indiana, 2015. MMWR Morb Mortal Wkly Rep. 2015; 64:443–4. [PubMed: 25928470]
3. Galang, RR., Gentry, J., Peters, PJ., Brooks, JT. HIV-1 and HCV molecular epidemiology of a large community outbreak of HIV-1 infection linked to injection drug use of oxymorphone – Indiana, 2015 (Abstract MOAC0304LB). Vancouver, Canada: International AIDS Society (IAS); Jul 19–22. 2015 Available from: http://pag.ias2015.org/. [Accessed November 18, 2016]
4. Rouet, F., Leoz, M., Mom, C., Vun, MC., Prak, S., Ken, S., et al. Investigation of bloodborne viruses from a nosocomial outbreak in rural Cambodia; Paris, France. International Scientific Symposium, Institut Pasteur International Network; 2015.

5. Rudd RA, Aleshire N, Zibbell JE, Gladden RM. Increases in drug and opioid overdose Deaths—United States, 2000–2014. MMWR Morb Mortal Wkly Rep. 2016; 64:1378–82. [PubMed: 26720857]
6. Peters PJ, Pontones P, Hoover KW, Patel MR, Galang RR, Shields J, et al. An outbreak of HIV infection linked to injection drug use of Oxymorphone—Indiana, 2014 – 2015. N Engl J Med. 2016; 357:229–39.
7. Ramachandran, S., Teshale, E., Switzer, W., Peters, P., Galang, R., Pontones, P., et al. Networks of HCV transmissions among persons who inject drugs: Indiana, 2015. Boston (MA): CROI; Feb 22–25. 2015 Available from: http://www.croiconference.org/sites/default/files/uploads/croi2016-abstract-book.pdf. [Accessed November 18, 2016]
8. Hall HI, Song R, Rhodes P, Prejean J, An Q, Lee LM, et al. Estimation of HIV incidence in the United States. JAMA. 2008; 300:520–9. [PubMed: 18677024]
9. Centers for Disease Control and Prevention (CDC). [Accessed February 29, 2016] HIV Surveillance Report, 2014. 2015. Available from: http://www.cdc.gov/hiv/library/reports/surveillance/.
10. Joyce MP, Kuhar D, Brooks JT. Notes from the field: occupationally acquired HIV infection among health care workers—United States, 1985–2013. MMWR Morb Mortal Wkly Rep. 2015; 63:1245–6. [PubMed: 25577991]
11. Harm Reduction International. [Accessed February 29, 2016] The global state of harm reduction: towards an integrated response. 2012. Available from: http://www.ihra.net/files/2012/07/24/GlobalState2012_Web.pdf.
12. Simonsen L, Kane A, Lloyd J, Zaffran M, Kane M. Unsafe injections in the developing world and transmission of bloodborne pathogens: a review. Bull World Health Organ. 1999; 77:789–800. [PubMed: 10593026]
13. Hauri AM, Armstrong GL, Hutin YJ. The global burden of disease attributable to contaminated injections given in health care settings. Int J STD AIDS. 2004; 15:7–16. [PubMed: 14769164]
14. Centers for Disease Control and Prevention. CDC grand rounds: preventing unsafe injection practices in the U.S. health-care system. MMWR Morb Mortal Wkly Rep. 2013; 62:423–5. [PubMed: 23718950]
15. United Nations Office on Drugs and Crime. [Accessed February 29, 2016] World drug report. 2014. Available from: https://www.unodc.org/documents/wdr2014/World_Drug_Report_2014_web.pdf.
16. UNAIDS. The GAP report. Atlanta (GA): Centers for Disease Control and Prevention; Dec 6–9. 2015 Available from: http://www.unaids.org/sites/default/files/media_asset/UNAIDS_Gap_report_en.pdf. [Accessed February 29, 2016]
17. Suryaprasad AG, White JZ, Xu F, Eichler BA, Hamilton J, Patel A, et al. Emerging epidemic of hepatitis C virus infections among young nonurban persons who inject drugs in the United States, 2006–2012. Clin Infect Dis. 2014; 59:1411–9. [PubMed: 25114031]
18. Centers for Disease Control and Prevention. Vital signs: overdoses of prescription opioid pain relievers–United States, 1999–2008. MMWR Morb Mortal Wkly Rep. 2011; 60:1487–92. [PubMed: 22048730]
19. Van Handel, M., Van Handel, M. US counties vulnerable to large HIV epidemics among PWID in special session: unsafe injection practices among people who inject drugs in rural communities: a new phase of the HIV epidemic?; Conference Program 2015 National HIV Prevention Conference (Special Session 13); Atlanta, GA. 2015.

Table 1

Common characteristics: Cambodia and Indiana HIV outbreaks, 2014–2015

Outbreak element	Cambodia	Indiana
Setting	Rural	Rural
Mode of HIV transmission	Unsafe injection (medical)	Unsafe injection (nonmedical)
Timing of HIV spread	Rapid (mo)	Rapid (mo)
Preoutbreak community HIV prevalence	Low (0.6%)	Low (<0.1%)
Community access to HIV testing	Minimal	Minimal
Outbreak HCV infection prevalence	High (82%)	High (92%)