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BACKGROUND

- Intravenous drug use (IDU) involves administering substances via a syringe and needle directly into the bloodstream. This method of drug administration is associated with various health, social, and economic consequences, making it a critical issue to address.
- IDU is closely related to the prevalence of illicit drug use, as substances like heroin, cocaine, and amphetamines are often injected. The topic of IDU is vastly complex and can be viewed from several angles including socio-political, financial, physical and mental health, crime and safety, autonomy and liberty, as well as on an international scale.
- The purpose of this project is to review the spectrum of common infections associated with IDU

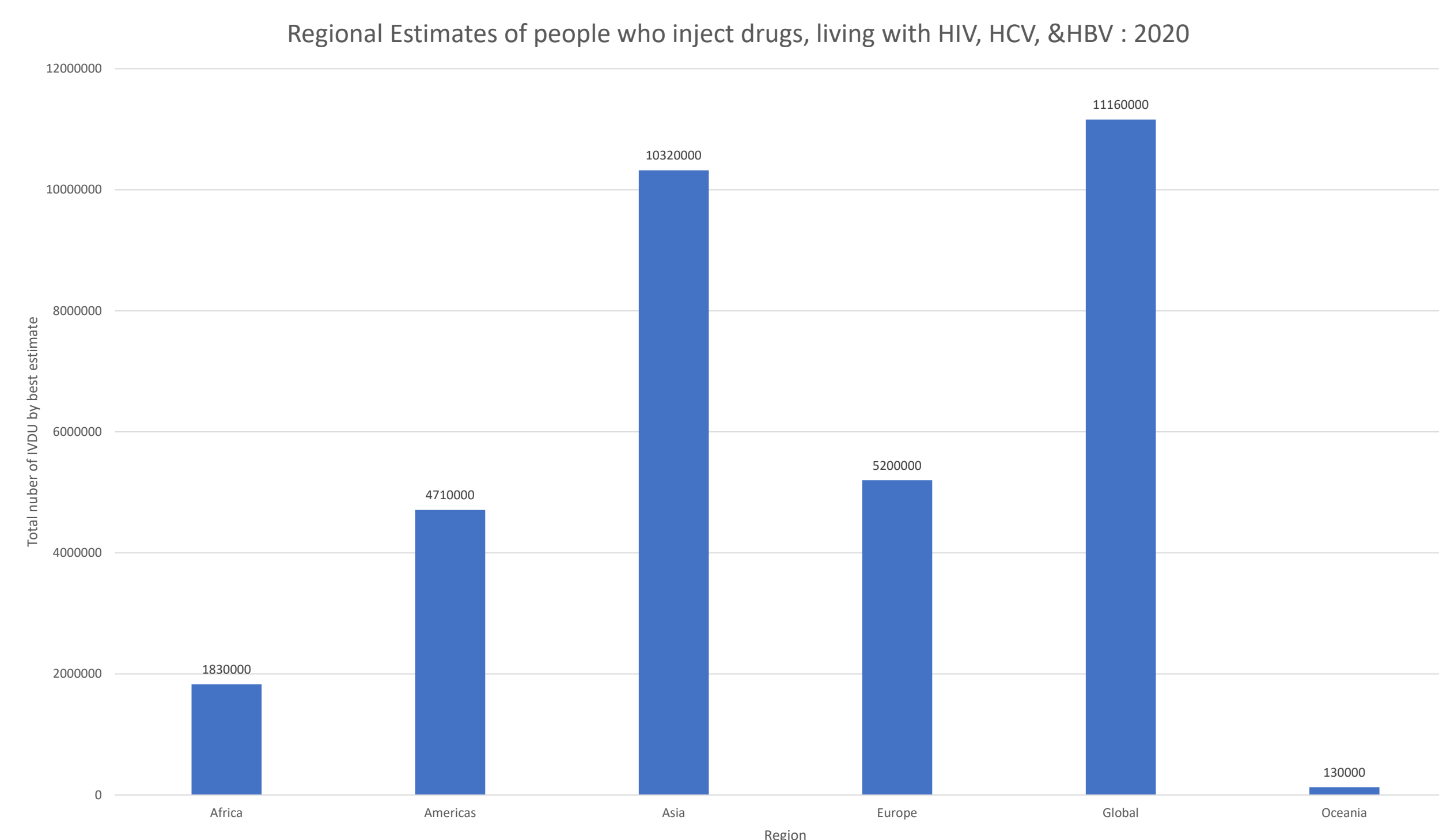


Figure 1. UNODC Regional Estimate of people who inject drugs living with HIV, HCV, & HBV : 2020

INFECTIOUS COMPLICATIONS OF IDU

- Skin and soft tissue infections, such as abscesses, are the most prevalent infectious complications related to IDU. These infections typically result from nonsterile injection techniques and are caused by gram-positive bacteria like *Staphylococcus aureus* and *Streptococcus* spp.
- Osteomyelitis and septic arthritis are significant infectious complications among people who inject drugs (PWID), often originating as bloodstream infections and spreading hematogenously to distal sites in the axial skeleton.
- Viral infections, such as HIV and viral hepatitis, are well-documented within IDU networks. PWID should receive routine HIV screening, be offered pre-exposure prophylaxis for HIV, and be immunized against hepatitis B virus (HBV).

Persons who inject drugs have higher mortality rates and are at a higher risk of developing bacterial, viral, and fungal infections. Skin and soft tissue infections are the most common while the most fatal infection is infective endocarditis. Treatment of these conditions usually requires prolonged courses of antibiotics and, in some cases, may require surgery.

Table 1. Commonly Used Drugs

Substance	Estimated number of people injecting in 2019	Prevalence	Health Risks
Opioids	5.5 million	Most commonly injected substance worldwide	Overdose, transmission of bloodborne infections like HIV and Hepatitis C, addiction, respiratory depression
Amphetamines	2.2 million	Particularly prevalent in North America, Southeast Asia, and Australia	Cardiovascular disease, overdose, addiction, psychosis
Cocaine	Unknown (lower than opioids and amphetamines)	Less common than opioids and amphetamines	Cardiovascular disease, overdose, transmission of bloodborne infections like HIV and Hepatitis C, addiction
Prescription opioids	Varies by region and availability	A concern particularly in the United States	Overdose, addiction, transmission of bloodborne infections like HIV and Hepatitis C, respiratory depression
Other substances	Relatively low percentages	Includes synthetic opioids such as fentanyl and research chemicals	Overdose, addiction, transmission of bloodborne infections like HIV and Hepatitis C, various health risks depending on the specific substance

COMMON DRUGS

- Quantifying the exact percentages of intravenous drug use by specific substances can be challenging due to variations in reporting methods, the nature of illicit drug use, and differences in regional drug preferences. However, a rough estimation of the relative prevalence of IDU drugs made by the UNDOC found that opioids, amphetamines, and cocaine were the most used drugs.

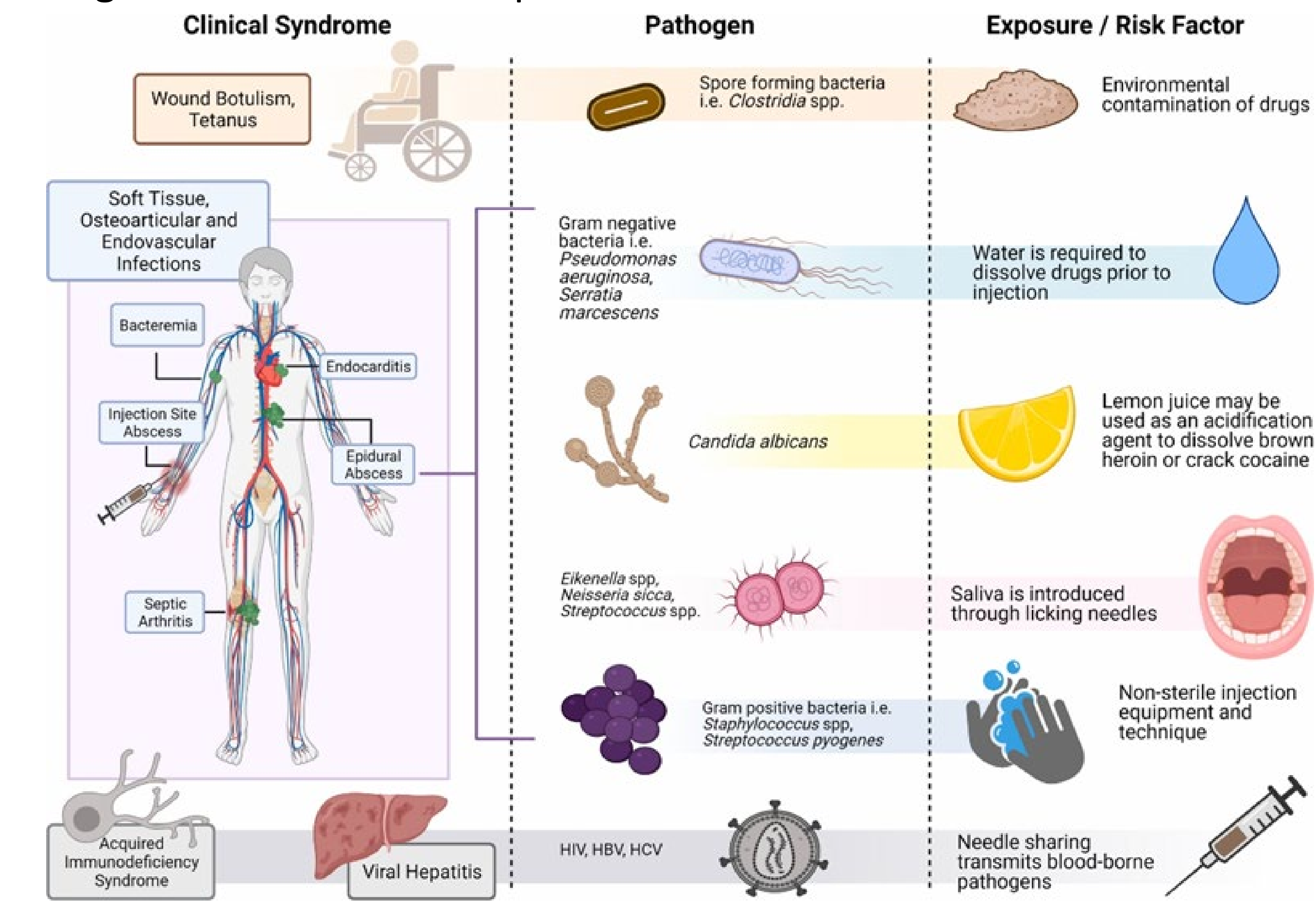
Table 2. Common Infections with IDU

Clinical Syndrome	Infection	Common Pathogens	Treatment / Prevention
Skin and Soft Tissue Infections	Abscess, cellulitis, necrotizing fasciitis, toxic-shock syndrome	<i>S. aureus</i> , <i>Streptococcus</i> spp., <i>Bacillus</i> spp., <i>Clostridium</i> spp.	Empiric first-line antimicrobial therapy; surgical debridement; wound irrigation; antitoxin administration for severe cases; vaccination (tetanus)
Osteoarticular Infections	Osteomyelitis, septic arthritis, spinal epidural abscess	<i>S. aureus</i> , <i>P. aeruginosa</i> , <i>Serratia marcescens</i> , <i>E. coli</i>	Prolonged courses of antibiotics; surgical debridement
Endocarditis	Infective endocarditis (IE)	<i>S. aureus</i> , <i>Streptococcus</i> spp., <i>Enterococcus</i> spp.	Prolonged courses of targeted antibiotics; possible surgical intervention; addiction medicine consultation and medication for opioid use disorder (MOUD)
Viral Infections	HIV, Hepatitis B (HBV), Hepatitis C (HCV)	Human immunodeficiency virus, Hepatitis B virus, Hepatitis C virus	Routine screening; pre-exposure prophylaxis for HIV; HBV vaccination; HIV, HBV, and HCV treatment with appropriate antiviral medications; linkage to care

INFECTIOUS COMPLICATIONS OF IDU

- Infective endocarditis (IE) is a severe infectious complication of IDU, which is implicated in nearly 30% of all IE cases in the US. IDU-IE is considered a distinct clinical entity due to its unique pathogenesis, microbiology, and patient demographics. Patients with IDU-IE are younger, have fewer comorbidities, and are more likely to have viral-mediated liver disease compared to non-IDU-IE patients.

Figure 2. Infectious complications of IDU



Marks, L. R., Nolan, N. S., Liang, S. Y., Durkin, M. J., & Weimer, M. B. (2022). Infectious Complications of Injection Drug Use. *The Medical Clinics of North America*, 106(1), 187–200. <https://doi.org/10.1016/j.mcna.2021.08.006>

CONCLUSIONS

The burden of IDU and related infections has been steadily increasing over the last decade in the United States and around the world. The complexity of the issue and the intersection of public health, political, and legal aspects make tackling the issue difficult but not impossible. Preventive measures such as patient education, as well as mitigation efforts like syringe service programs have shown effectiveness in reducing risk among PWID. Management of patients who are diagnosed with infectious complications often requires an individualized approach. From a medical perspective, a multidisciplinary approach would help alleviate some of the challenges that come with IDU-related infections, particularly more fatal infections like IE that often require protracted treatment. There is no one solution to the problem, but a joined effort can produce better outcomes for patients and society at large.