

Human immunodeficiency virus (HIV) infection rates and heroin trafficking: fearful symmetries

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ABSTRACT

There is mounting evidence that the spread of the human immunodeficiency virus (HIV) is associated with heroin trafficking routes. The relationship between the two is best illustrated by the routes leading from the two primary regions for the illicit opium poppy cultivation and heroin manufacture: the Golden Triangle of South-East Asia and the Golden Crescent of Central Asia. The producers in the Golden Triangle are the Lao People's Democratic Republic and Myanmar, and those in the Golden Crescent are Afghanistan and Pakistan. Together, those States accounted for perhaps 80-90 per cent of the world heroin supplies in 2002. HIV outbreaks resulting from unsafe injection practices among injecting drug users (IDU) in trafficking zones have been documented in Myanmar itself, in Belarus, China, India, Indonesia, the Islamic Republic of Iran, Malaysia, Pakistan, the Russian Federation, Tajikistan, Thailand, Ukraine, Uzbekistan, Viet Nam and in several States in Eastern Europe. Heroin trafficking in those States has led to serial epidemics: first of heroin use, then of injection, then of blood-borne pathogens, including hepatitis C and HIV. Ethnic and trade relationships in heroin trafficking zones appear to facilitate such epidemics, as does drug testing by petty traders in market nodes. Policy responses, or the lack thereof, have increased the vulnerability of users and their communities, as have the limited drug treatment options available in those zones. While "supply-side" approaches, including interdiction and policing, are likely to continue, those HIV epidemics will require improved drug treatment, access to HIV prevention services, including harm reduction, and new approaches to the prevention of HIV in areas where heroin trafficking occurs.

Keywords: heroin; trafficking; HIV infection; IDUs; Afghanistan; Burma; Lao People's Democratic Republic.

Introduction

There is growing evidence that the epidemic spread of human immunodeficiency virus (HIV) infection occurs in tight and complex relationship to heroin-trafficking

routes [1-3]. The relationship is most clearly illustrated by the routes leading from the two primary regions for illicit opium poppy cultivation and heroin manufacture: the Golden Triangle of South-East Asia and the Golden Crescent of Central Asia. The mechanisms that lead to those HIV outbreaks are just beginning to be understood, as are the special vulnerabilities of communities in trafficking zones. The principal heroin producers in the Golden Triangle are the Lao People's Democratic Republic and Myanmar and those in the Golden Crescent are Afghanistan and Pakistan. Together, those States accounted for perhaps 80-90 per cent of the world heroin supplies in 2002 [4]. While those four countries generate most of the world's heroin, the HIV epidemics resulting from unsafe heroin injection practices have largely been seen in the neighbouring countries or in countries of destination further afield. The spread of HIV is well documented in countries in and around the Golden Triangle, such as in Myanmar itself, in China, India, Malaysia, Thailand, Viet Nam and, more recently, in Indonesia [5-10]. For countries in and around the Golden Crescent, the data are only now emerging and the HIV epidemics are much newer: the epidemic spread of HIV, hepatitis C or both appears to be under way in Belarus, India, the Islamic Republic of Iran, Pakistan, the Russian Federation, Tajikistan, Ukraine, Uzbekistan and several States in Eastern Europe [7 and 11-15]. In virtually all the studies that have investigated HIV and hepatitis C virus infection among injecting drug users (IDU) in those regions, hepatitis C virus has been shown to be far commoner. The prevalence of hepatitis C virus among IDU generally reaches 90 per cent or higher, which is a function of the very high transmissibility of this agent through parenteral exposure. However, it is the subtyping of HIV that has proven more useful, thus far, as an investigative tool to understand trafficking.

The third important area for illicit poppy cultivation is the New World, in Colombia, Mexico and Peru. While significant for the markets of North and South America, it will not be discussed in the present article as it is less well understood in terms of interactions between trafficking and HIV spread in the production zones.

Licit poppy cultivation for pharmaceutical opiate derivatives such as morphine, codeine and demerol is centred in Tasmania, Australia, which accounts for about 50 per cent of licit world production, and in India and Turkey and has not been associated with heroin manufacture or trafficking, or with the spread of blood-borne infections. Opiate derivatives remain an important class of analgesics and are widely and generally safely used, with minimal public health effects. It is the illicit nature of criminal production and distribution and the rapid uptake of heroin use, injection and the unsafe use of equipment by young people in vulnerable communities along the trafficking routes and in destination markets further afield that has led to the fearful symmetry of heroin trafficking and the spread of HIV.

The present article seeks to clarify the degree to which the existing data demonstrate the relationship between heroin trafficking and HIV and to establish how much is known about the mechanisms that spread HIV. It also seeks to describe the tools for understanding and responding to that relationship that are

available to researchers, policy makers, clinicians and others. Finally, the article attempts to explain why societies from Ukraine to Viet Nam have been so vulnerable to the interactions between heroin trafficking and the spread of HIV and to examine what can be done to reduce the harm resulting from them.

Injection drug use and the spread of HIV

In 2000, an international research team published the findings of its investigations of the causes of HIV infections along the four heroin trafficking routes leading from the Lao People's Democratic Republic and Myanmar to China, India, Thailand and Viet Nam [2, 16]. The findings had been obtained through the use of molecular epidemiology, Land Remote Sensing Satellite (Landsat) technology, qualitative research methods and epidemiologic review. By using deoxyribonucleic acid (DNA) fingerprinting technology, the team was able to show that HIV viruses from the blood of infected IDU could help trace heroin routes. Heroin users and petty traders helped the research team to understand how heroin use spreads in communities and pinpointed the key roads, villages, towns and cities through which heroin from the Golden Triangle was moving, leaving the legacies of addiction and acquired immunodeficiency syndrome (AIDS). Since the publication of those findings, several other groups have independently investigated those zones, confirming the general hypotheses made by the team and documenting the further spread of infections and their impact on communities in China, Myanmar and Viet Nam [3, 6, 17]. The fearful symmetry of heroin trafficking and the spread of HIV can perhaps best be illustrated by the HIV epidemic in Yunnan Province of China, which is east of Myanmar and the first destination for overland exports of heroin from Myanmar to the rest of China. The farthest province from China's booming coastal cities, Yunnan has the highest HIV infection rate in China [9]. The outbreak began in ethnic minority communities in three mountain districts along the China-Myanmar border in the early 1990s, notably among the Kachin and Wa ethnic groups [18]. As heroin spread among the young people of Yunnan and a rapid transition to injecting took place, there was a predictable rise in HIV infection. Equally predictable was the subsequent spread of infection to the non-IDU sexual partners, wives and children of the largely young adult male IDU population. Yunnan now has the most mature HIV epidemic in China. Intense security and interdiction activities (supported partly by the United States of America) have failed to control the heroin trade. But it could be argued that at the current stage of the spread of the HIV epidemic in Yunnan, the virus has moved well beyond the IDU population. A similar situation obtains in Manipur State, north-east India, on the western border of Myanmar: the early outbreak of HIV infection among IDU there has led to a disseminated HIV epidemic and the highest HIV prevalence by province in India [19]. The present article will attempt to establish whether or not such situations are typical.

Observation of the rate of HIV and AIDS infections in Belarus, China, Kazakhstan, the Russian Federation, Tajikistan and Ukraine or further east in Indonesia, the Islamic Republic of Iran, Malaysia and Viet Nam reveals an

epidemiologic picture of HIV in 2002 that is striking. What these diverse States have in common is that in each, the majority of reported HIV infections and AIDS cases in 2001 were attributed not to sexual transmission, which is the predominant mode in Africa, but to parenteral infection, exposure through needle-sharing behaviours among IDU [10]. While the numbers of IDU in any one of those States may not be large on a population basis, those States represent enormous young populations, many of which have rapidly rising substance abuse rates. One example is Viet Nam, a country with a population of over 78 million, where IDU accounted for 88 per cent of all reported HIV infections in 2000 and where heroin trafficking from the growth zones of the Lao People's Democratic Republic has led to a dramatic increase in use among young people [3].

In other regions and countries, the majority of HIV infections is not among IDU, but IDU spread has played an important role in HIV epidemics. HIV infections among IDU were reported to the World Health Organization by 52 countries in 1992; the number of reporting countries grew to 114 by the year 2000, underscoring the global nature of IDU risk and spread [20]. IDU-related outbreaks have also played a key role in the dynamics of the spread of HIV, notably in introducing HIV into populations, as shown by the early epidemiology of HIV in Thailand and Viet Nam, where IDU were the first group in which HIV outbreaks occurred [3, 21]. Such outbreaks have also played an important role in the dissemination and dispersion of novel HIV-1 subtypes. One example is the recent explosive spread of the HIV-1 subtype A virus in the Russian Federation and Ukraine and the outbreak of a B/C recombinant HIV strain that has been documented among IDU in southern and western China [1, 22].

HIV infection rates in South and South-East Asia

IDU played a crucial role in the spread of HIV in South and South-East Asia in every country with a significant HIV epidemic except, perhaps, Cambodia [2]. States experiencing epidemics that were initially IDU-related or are predominantly IDU-related include China, India, Malaysia, Myanmar, Thailand and Viet Nam [2]. IDU were the first group in which the epidemic spread of HIV was detected in China, Indonesia, Malaysia, and Myanmar [10] and in all those outbreaks trafficking in heroin from the Lao People's Democratic Republic or Myanmar, or both, was involved [2].

The HIV epidemic in Thailand is among the best documented in Asia. The epidemic spread of HIV in that country was first detected among IDU in Bangkok in 1988 [21]. It was an explosive outbreak with clear links to incarcerated IDU and occurred initially among low-income, ethnic Thai, male urban residents. However, HIV spread rapidly among Thai IDU nationwide and within a year HIV rates of 20-40 per cent were the norm. The IDU-related HIV epidemic was followed by a heterosexual outbreak of HIV that was larger and involved many more people. However, while the rate of infection of heterosexuals and other groups at risk declined after the period 1995-1996, that of IDU did not [23].

Similarly, in Malaysia and Viet Nam, IDU were the first group in which the epidemic spread of HIV was detected. However, unlike in Thailand, IDU have remained the predominant risk group affected by HIV in Malaysia and Viet Nam, accounting for roughly 60-70 per cent of cumulative infections in those two countries by 2000 [20]. The heroin in Malaysia appears to be transported by sea along that country's long coast on the Andaman Sea [4]. The Lao People's Democratic Republic was identified as the likely source of this heroin and molecular-typing data confirm that HIV infections have spread north from this zone in Viet Nam into the neighbouring Guangxi Province of China [5]. China's emerging epidemic remains overwhelmingly due to needle-sharing among IDU and the three most HIV-affected provinces of China (in order of prevalence, Yunnan, Xinjiang and Guangxi) have all experienced IDU-related outbreaks along the major heroin routes [1, 9].

Myanmar is a somewhat different case. It is the region's major producer and a major consumer of heroin [8]. Trafficking within Myanmar from the heroin manufacturing areas in the Shan and Wa hills in the far north-east of Myanmar has led to a national outbreak of HIV. The United Nations International Drug Control Programme (UNDCP) and the Ministry of Health of Myanmar identified drug use rates among township adults of 2-25 per cent in 1995, one of the highest rates worldwide [24]. IDU were the first group in which HIV was identified, in 1989, and remain at extraordinary risk, with HIV prevalence rates of 60 to 95 per cent nationwide [25]. It is unclear how heroin is moved within Myanmar, but it is known that a major city in the trade is Mandalay, the largest city in northern Myanmar. Petty traders from Manipur State in India travel inland across Myanmar from India to buy high-grade No. 4 heroin in Mandalay and trucks carrying heroin to India leave from Mandalay as well [2]. HIV rates among IDU in Mandalay have been consistently in the 60-80 per cent range since at least 1995. Mandalay is in a region that is too hot and at too low an altitude for poppy cultivation.

The outbreaks of HIV infection among IDU in South-East Asia have several features in common. First, they have been explosive: HIV prevalence among Bangkok IDU went from 2 to 40 per cent in six months in 1989. Second, they have been transnational: both China and India have had their highest prevalence zones along their borders with Myanmar (Yunnan Province and Manipur State, respectively). Third, they have led to further spread among non-injecting populations, initially the sexual partners of IDU, as has been documented in China, India and Thailand. Fourth, they have proven difficult to control owing to government policies on injection drug use, the status of drug treatment in the affected States and the limited HIV prevention measures targeting IDU.

The Golden Crescent: HIV infection rates and Central Asian heroin

Much less is known about heroin and HIV epidemics in the Golden Crescent than is known about those in South and South-East Asia. For most States affected by heroin from Afghanistan and Pakistan, HIV spread is a more recent event and

many have little data or research capacity. However, the little that is known suggests another region of fearful symmetry.

Several tools can be used to measure poppy production, but arguably the most accurate is Landsat satellite technology, which measures crop densities [4]. United States intelligence agencies have used Landsat to assess poppy cultivation, estimate opium base harvests and calculate heroin yields (10 kilograms of opium base gives roughly 1 kilogram of refined heroin). In 1996, after the establishment of Taliban rule, the estimated yield in Afghanistan was 200 tons [4]. By 1999, Afghanistan was manufacturing 450 tons of heroin per year and had become the world's largest single manufacturer in a multibillion-dollar industry. Poppy growing appeared to cease in 2000 after the leader at that time, Mullah Muhammed Omar, delivered an edict on the subject, but stockpiled heroin reserves held by producers and traffickers apparently ensured that the supply was maintained despite the ban on poppy cultivation. In 2002, the new Administration and its allies acknowledged that a reduction in poppy cultivation could only be achieved through a long-term process of agricultural reform and development and the extension of government control across the vast rural areas of the country. For the short to medium term at least, Afghanistan will remain a significant producer. The second largest grower in the region, Pakistan, produces about 20 tons of heroin a year, roughly equal to the production of the Lao People's Democratic Republic and mostly in the remote tribal zones along the Afghan border in the North-West Frontier Province [4]. Those areas are only marginally under federal control, very underdeveloped and likely to remain dependent on poppy cultivation for some years.

The HIV-related repercussions of heroin exports from Afghanistan and Pakistan are only now beginning to be understood, as nascent HIV epidemics take hold in a region for which data have been sparse, but that was thought to have been relatively spared from HIV. The Islamic Republic of Iran and Pakistan appear to be two of the major overland routes for the trafficking in heroin from Afghanistan [7]. While HIV prevalence is low in both States, Pakistan had an estimated 3 million heroin addicts in 2000 and has suffered great social harm as a consequence [11]. The Islamic Republic of Iran led the world in 1999 in narcotics seizures by volume [4]. The country also has an enormous epidemic of heroin use among its young people [7]. The Iranian Government is deeply concerned about this and it was a primary source of tension and border conflict while the Taliban regime was in control in Afghanistan. A nascent epidemic of HIV among Iranian IDU appears to have begun in the period 2000-2001, with recent reports of very high rates of HIV infection among incarcerated IDU in Tehran (up to 67 per cent in one facility) [7].

The countries most affected by HIV are the Russian Federation and the two former Soviet republics of Belarus and Ukraine [12, 14]. In its *Report on the Global HIV/AIDS Pandemic, 2000*, the Joint United Nations Programme on HIV/AIDS (UNAIDS) identified those three States as having the fastest-growing HIV epidemics in the world [26]. More than 75 per cent of all infections in the Russian Federation and its neighbours in 2000 were owing to injecting drug use

[12, 13, 27]. The far east of the Russian Federation has been particularly affected. The Irkutsk region of Siberia, around Lake Baikal, has the highest rate of HIV infection in the Russian Federation after Moscow and, again, more than 80 per cent of the HIV infections reported in Irkutsk have been among IDU [28]. Kazakhstan, too, has seen a recent outbreak of drug use and HIV infection, although it is unclear whether the source of the trafficking route is China to the east or Afghanistan to the south.

Poppy cultivation and politics

While the HIV epidemic is a new challenge to the Russian Federation, the trafficking connections of the Golden Crescent are not new, having existed during the long Afghanistan war with the former Union of Soviet Socialist Republics (USSR), when poppy cultivation by the Mujahidin was tolerated by the West because the anti-Soviet forces had no other exports comparable to heroin in terms of value and ease of transport [29]. The consequent high rates of heroin use and addiction among Soviet forces engaged in the Afghan conflict were a predictable outcome and helped undermine support for the war among those troops, their families and Soviet citizens.

The poppy farmers of Afghanistan are largely subsistence farmers who sell opium as a cash crop to supplement minimal incomes. As in the Golden Triangle region, the real profits of heroin come not from farming, but from trafficking and it is among the trafficking networks that real revenues accrue [29]. But part of the legacy of war is the local expertise in poppy cultivation and the production and sale of narcotics. The Afghan war, which the Soviets lost, appears to have brought heroin first to the dispirited troops and then to Moscow. Trafficking links may therefore be a legacy of the long struggle of the people of Afghanistan, although that remains speculation.

Another heroin-related epidemic is currently being experienced by China. The Xinjiang Uighur Autonomous Region is the only Muslim majority region of China. Xinjiang shares borders with Afghanistan, Kazakhstan and the Russian Federation (Siberia) and is linked to the rest of China by the Silk Road. It also has China's second highest rate of HIV infection by province, after Yunnan in the far south [20]. More than 78 per cent of the HIV infections in Xinjiang are owing to injection drug use involving heroin. Tragically, more than 90 per cent of IDU in the two largest cities in Xinjiang are ethnic Uighurs, which means that the HIV infections in this large province are largely among young Muslims [9].

Belarus, China, the Islamic Republic of Iran, Kazakhstan, Pakistan, the Russian Federation and Ukraine are all experiencing outbreaks of heroin use among their young people and all now appear to have HIV epidemics related to that use. Heroin exports from the Golden Crescent are at the root of these complex new problems. These are regional challenges, but they point to a global problem that ties the Golden Crescent to the Golden Triangle: illicit heroin revenues. In 2000, Afghanistan was the world's poorest State, on paper, and Myanmar was designated a "least developed country" by the United Nations. Afghanistan was

almost entirely dependent on donor aid in 2002 and had essentially no foreign reserves, a bankrupt treasury and limited licit exports. The economics of the drug trafficking networks based in the Golden Crescent are not known, but it is known that taxes on poppy farmers and protection money from drug traffickers were among the main sources of revenue for both the Taliban and the Northern Alliance before the interim Government led by Hamid Karzai came to power. In both Afghanistan and Myanmar, heroin has enabled the purchase of weapons on the black market and funded militias, insurgencies and crime [4]. Afghanistan has the potential to grow other crops, including grain and orchard fruits, but those would require irrigation systems and access to markets, which remains a huge challenge for much of the country. In Myanmar, the poppy-growing regions have been at war with the central Government virtually since the departure of the British after the Second World War [30]. In order to achieve a reduction in the opium supply from those regions, viable alternative economies for the rural poor will need to be established, which will take time, and sustained donor investment, and the nurturing of stable, functioning civil societies will be necessary. If Afghanistan were once more to descend into civil strife and warlordism, it is likely that heroin production would revive. Indeed, as in Myanmar, it is in the interests of the narcotics cartels and the corrupt leaders that they have supported that civil society should fail; a chilling reality, given the wealth and power that heroin revenues have already generated.

Mechanisms on the ground

Before discussing policy responses to the interactions of heroin and HIV, it would be useful to consider some mechanisms of those interactions which bear on the spread of HIV and how best to curtail it. One obvious feature shared by all of the primary trafficking zones out of the Triangle and the Crescent is geographic: overland heroin is moved almost exclusively across remote border regions, generally mountain and forest zones adjacent to the hills where poppy will grow. The illegal and clandestine nature of this industry demands such remote areas. Indeed, as a former director of UNDCP has pointed out, there are very few regions remote and lawless enough to support a major heroin industry. It is surely no coincidence that it is Myanmar, secretive, closed and ruled by junta; the isolated Lao People's Democratic Republic under its Communist Party; Afghanistan with its decades of strife; and the tribal zones of Pakistan that became the world's leaders in heroin production: these are almost the only places in the world closed enough to sustain the heroin industry.

A second shared feature is ethnicity. Those areas generally have in common populations who are ethnic minorities or tribal groups, or both [30]. In South-East Asia they are virtually all hill-dwellers, whereas the majority populations of the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam are lowlanders and rice cultivators [30]. One especially important factor is that those groups tend to straddle national borders. So in Yunnan Province of China, both sides of the China-Myanmar border lands are farmed by ethnic Kachin and Wa, and family, language, and trade links long pre-date heroin trafficking. Another example is the

ethnic Manipuris of Manipur State in India, who are Tibeto-Burmans like the majority population of Myanmar, not ethnic Indians, and can move easily into Myanmar to access the heroin markets in Mandalay [31].

For HIV to spread along trafficking routes, local people have to use the drugs. Qualitative work in China, India, Myanmar and Viet Nam has suggested a direct mechanism for the “exchange” of HIV-1 subtypes (known as clades or strains). This mechanism relies on the fact that many petty traders in the region are also users, who support their own habits by purchasing and selling small amounts of heroin. In at least four States, it is known that those petty traders typically self-test heroin purity by injecting themselves. Since travelling across those zones with injecting equipment is an obvious sign of intent to use drugs, they rarely have their own equipment. On the border between China and Viet Nam, for example, traders typically cross the mountains from China, stay the night with their contacts in Viet Nam and share drugs and equipment before making purchases. The very low genetic diversity of strains in this region suggests rapid spread of only one viral subtype, a molecular feature favoured by this kind of direct spread. Major traffickers moving heroin in consignments weighing hundreds of kilograms or more have very different ways to move their product, including trucking, sea and air routes. But it is likely that the spread of HIV in overland regions occurs on a more local person-to-person basis. A recent report from Yunnan Province found that 75.9 per cent of a large series of IDU in south-eastern Yunnan were of Han Chinese ethnicity which led the authors to conclude that the epidemic in Yunnan was no longer confined to non-Han ethnic minorities [32].

A fourth mechanism is also likely to be important, though somewhat variable. Along at least some of the major trafficking routes, services for truckers have developed, which, in addition to fuel, food and lodging, often include sex services. In South-East Asia, those sex services generally consist of roadside brothels, karaoke parlours, bars and so forth. In Central Asia they may be less apparent, but still available, or may have young male sex workers, as in the trucking industry in Pakistan. Those border zone sex service venues can overlap with drug trafficking and provide another mechanism by which HIV could spread where heroin and other contraband are moved. On the borders between China and Myanmar and between Myanmar and Thailand, women and girls are trafficked on the same routes, and indeed by some of the same trafficking networks, as heroin [33].

The interaction of heroin trafficking and sex industry-related HIV risks can also be found in the special economic zone of Pingxiang on the highway and train crossing from Viet Nam to China [1]. Pingxiang was one of the first Chinese cities to experience a rapid HIV epidemic among IDU and molecular work has confirmed the cross-border nature of this epidemic [5]. But Pingxiang also has a booming sex trade on the Chinese side of the zone. As many as 19 separate brothels in a four-street radius in the trucking zone in Pingxiang were counted in 2000, each with 10-30 women and girls working in it. HIV rates had remained low among those women until 2001, though there now appears to be increasing prevalence [34]. In settings like Pingxiang, sex workers and their clients in border and trafficking zones may be key “bridge” populations from IDU to wider networks of people at sexual risk.

Policy responses

IDU outbreaks associated with heroin trafficking have proven difficult to prevent or control. In the major production zones and in the wider affected regions, treatment and prevention programmes for drug use were limited before the spread of HIV [35]. That remains largely the case: across the whole of Asia the only place where evidence-based heroin treatment and methadone maintenance therapy are available on demand to drug users is the Hong Kong Special Administrative Region of China. This is tragic, given that there is a large and growing international evidence base for success in prevention of HIV infection and other blood-borne diseases among IDU [36]. While the majority of published reports have been from the developed world, principally Australia, North America and Western Europe, there have been several reports of pilot projects and successful programmes in Asia, including reports from India, Nepal, Thailand and Viet Nam. Much of that work has focused on harm reduction and needle and syringe exchange programmes, the basic tools of most reported interventions. In 1998, the *Journal of Substance Use and Misuse* published its "Bibliography on Syringe-Exchange References", which included several hundred published reports on those interventions and the debates that they generated [37].

Successful needle exchange programmes have been conducted in Australia, the Netherlands and the United Kingdom of Great Britain and Northern Ireland. In the largest analysis published, the incidence of HIV increased by about 6 per cent per year in 52 cities without needle exchange programmes and decreased by 5.8 per cent per year in 29 cities with needle exchange programmes [38]. The New York City needle exchange programmes have been studied in prospective cohorts: lower rates of incident HIV infection were documented among IDU using needle exchange programmes (1.4-1.6 per cent per year) than among those who did not attend needle exchange programmes (5.3 per cent per year, 95 per cent confidence interval: 2.4 to 11.5) [39]. Long-term methadone maintenance therapy has been shown to reduce HIV risk behaviours, in particular needle use, and there is strong evidence that methadone maintenance therapy prevents HIV infection among IDU.

Where harm reduction and methadone maintenance therapy are available, as they were to many IDU in the United States HIV Network for Prevention vaccine preparedness studies, sero-incidence can be low [40]. In that study, HIV incidence among homosexual and bisexual men between 1995 and 1997 was measured at 1.55 per 100 person years, while among male IDU the rate was 0.38 per 100 person years.

The Thai Working Group on HIV/AIDS Projections has recently published projected scenarios for the Thai epidemic [41]. They found that a decline in needle-sharing from 20 to 10 per cent among Thai IDU would avert 21,774 new infections by 2006 and 81,761 infections by 2020. That would constitute the single largest number of infections averted for any one intervention strategy. By 2006, roughly 3,800 of the expected 22,000 infections nationwide would be averted by that intervention alone. Viet Nam has reported on the feasibility of needle

exchange programmes and on pilot needle exchange programmes in the cities of Hanoi and Ho Chi Minh [42]. While they did not measure impact, they were able to conclude that needle exchange programmes were feasible, but that they required acceptance by the community and by the police to be sustained. Needle exchange programmes have also been implemented in India, notably in New Delhi and Manipur State, where high rates of IDU behaviour are common.

Taken together, those studies all support the contention that harm reduction and needle exchange programmes are effective prevention tools, and that they might have an effect on heroin-related epidemics in trafficking zones. Yet those approaches have been little used in the fight against HIV/AIDS.

It is difficult to imagine a public health tool with reasonable evidence of efficacy that has generated as much debate as have prevention programmes for IDU. A review of the literature suggests three principal problems with the implementation of harm reduction approaches and needle exchange programmes [43, 44]. First, they have repeatedly been seen as condoning or facilitating injecting drug use, making them politically unpopular outside the prevention community. Second, they have faced legal, security and policy challenges, since they require “safe” domains of interaction with active IDU. A third challenge, where needle exchange programmes have been implemented, is the coverage rates of needle exchange programmes for IDU populations. One exception to the lack of programmes in affected areas has been the rapid implementation of needle exchange programmes in the Russian Federation and the Commonwealth of Independent States, established in partnership with the Open Society Institute of the George Soros Foundation, Médecins Sans Frontières, the ministries of health of many affected nations and the United States Agency for International Development. The Open Society Institute has supported the establishment of more than 140 needle exchange programmes in the Russian Federation alone and that effort has the potential to reach levels of coverage which might control HIV among IDU.

Conclusions

Individuals, communities and countries that have the misfortune to be on major heroin-trafficking routes faced multiple epidemics in 2002. Those epidemics began with heroin use, heroin injection and then HIV infections. While the clear long-term goal for all the States involved is to be free of drug trafficking, the realities of the current political and development situations of the major producers, most notably Afghanistan and Myanmar, suggest that narcotics-based economies will be with the world for some time to come. In the short to medium term, a public-health-based approach would be to minimize the health impacts of heroin trafficking by working with affected communities. Such approaches could include reducing heroin addiction through improved treatment and support for IDU and reducing the spread of HIV among those who continue to inject by expanding harm reduction and needle and exchange programmes. The prevention of spread beyond IDU suggests that that may be critically important to the prevention of wider epidemics of HIV/AIDS. A clear priority for further research and

programmes are the front-line Central Asian States and around the Golden Crescent: the Islamic Republic of Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkmenistan and Uzbekistan. Those must be considered States that are at very high risk of an explosive spread of HIV in the coming years and that could benefit from the programmatic and research experience that have elucidated the heroin and HIV interactions of the Golden Triangle.

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