

FROM HARM TO HOPE



Immunization improves injection practices
in the countries of the Mekong



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UNSAFE INJECTIONS: A GLOBAL PROBLEM



Chan Tha is 12 years old. Every day she helps support her family by scavenging for used syringes in mountains of refuse that make up the city's dump. She is small for her age and, like so many children who make their living digging through the stinking heaps of flyblown garbage, her legs and arms are covered with infected sores and partially healed scabs – the hazardous result of a hazardous and difficult occupation. The bruises, painful swellings and oozing wounds that cover her bare feet, legs, arms and hands are the result of needle-stick injuries from used syringes and 'sharps' – needles whose points deliver not only pain but also potentially deadly pathogens such as hepatitis B, hepatitis C and HIV/AIDS.

For children such as Chan Tha, used syringes provide the only income in an otherwise hopeless and meagre existence. In order to find a ready market for her scavenged goods, Chan Tha must break off the needles with her bare hands – further increasing the likelihood of injury and infection. "My fingers are wounded often," she says. "And my friends have the same problem".

Every day, in developing countries all over the world, poor children scavenge for used injection equipment. Every year, all over the world, traditional healers, health care workers and other medical personnel administer the 16 billion injections that feed an insatiable demand for what many mistakenly believe to be a quick cure for a staggering variety of medical ills. Some vital injections are delivered during routine immunization, but the overwhelming majority – an estimated 90 - 95% – are administered for 'therapeutic' or 'curative' purposes

In layperson's terms, these injections are used to deliver everything from common antibiotics such as penicillin and ciprofloxacin to vitamins such as B12.

Moreover, in certain regions – primarily in developing and transitional nations – most of the injections administered are not based on rational medical practice. Indeed, up to 96% of patients who present themselves to medical clinics will receive a jab containing some kind of medicinal or non-medicinal ingredient.¹ Of these, more than 70% will be given injections that are either wholly unnecessary or, in many cases, could have been administered via an oral formulation.²

And the results can be deadly.

The 'cure' that kills

Every year, all over the world, millions of men, women and children are needlessly infected as a result of unsafe injection practices. Unskilled personnel working in unhygienic settings too often unwittingly pass on infectious bloodborne diseases through the re-use of insufficiently sterilized needles and/or syringes.

In many cases, health care workers will merely rinse equipment in a pot of soapy water between injections or dispense with such measures altogether. According to the Safe Injection Global Network (SIGN), the proportion of injections administered with unsterilized equipment range from between 1.2% in industrialized nations to an alarming 75% in transitional or developing countries.

The things they carry: the global burden of unsafe injections

According to the World Health Organization, unsafe injection practices are responsible for transmitting an estimated 20 million cases of hepatitis B (HBV), two million cases of hepatitis C (HCV) and approximately 260 000 cases of HIV

¹ Simonsen L et al. Unsafe injections in the developing world and the transmission of blood borne pathogens: a review. *Bulletin of the World Health Organization*, 1999, 77 (10): 789–800.

² "First, do no harm" *Introducing auto-disable syringes and ensuring injection safety in immunization systems in developing countries*. Geneva, World Health Organization, 2002.

each year. In developing and transitional nations, unsafe injections account for 32% of new HBV infections. That translates into a total of 21 million people infected needlessly through a combination of carelessness, poverty, greed, ignorance or a simple lack of resources for



safe injection equipment and education. Unsafe injection practices also account for the majority of new HCV infections in developing and transitional countries – adding up to a total of 40% of new cases each year. Although HIV is less readily transmissible than HBV and HCV, fully 5% of new HIV infections worldwide can be attributed to unsafe injections.³ In the Middle East and South Asia, where unsafe practices verge on the epidemic, those figures are likely to be far higher.

HBV, HCV and HIV are chronic conditions that lead to disease, disability and even death a number of years following initial infection. Many of those infected with HBV in early childhood will go on to develop

chronic liver disease by the time they turn 30. Needless to say, this can have a dramatic effect on struggling national economies.

The problem, however, does not stop there. Every day, health care workers and the community at large are exposed to infection through the unsafe disposal of dirty injection

³ Ibid

equipment. Needle-stick injuries and the resale of contaminated waste for re-use on the black market further amplifies the risk. In many developing nations, health care clinics dispose of injection waste in nearby open pits, thereby providing the perfect opportunity for would-be entrepreneurs to resell syringes and needles intended for one-time use only.

Furthermore, although the prevalence of injection overuse is global, unsafe injection practices are more prevalent in some regions than others. While injections are administered most frequently in Eastern Europe and Central Asia, research indicates that the majority of unsafe injections are dispensed in the Middle East and South Asia.⁴

A template for success: immunization and the nations of the Mekong

There is one sector that can boast some real progress when it comes to stamping out hazardous practices associated with injection overuse and abuse. The Expanded Programme on Immunization (EPI) has, in the last five years, made huge strides in the fight against unsafe injections. And it has done so through what SIGN Project Leader Yvan Hutin characterizes as a “planetary realignment” between progressive international policies, funding mechanisms, policy guidance and technical support. “These four elements together are the reason why there has been so much progress,” he says.

How this came about perhaps ranks as one of the more notable public health success stories of the last two decades and highlights what can be achieved when international agencies, donors and national governments work together to initiate change. Says Basil Rodriques, Regional Immunization Officer for UNICEF East Asia and Pacific Regional office, “There has been a partnership and consultative relationship at the agency level that really enabled us to move forward.”

⁴ Hauri AM, Armstrong GL, Hutin YF. The global burden of disease attributable to contaminated injections given in health care settings. *International Journal of STD & AIDS*, 2004, 15: 7-16.



AUTO-DISABLE SYRINGES

An auto-disable syringe is a special type of syringe that inactivates itself after one use. This device, increasingly used in immunization services, is an effective tool to prevent reuse and has been the norm in immunization since 2003.



It all began in the mid-1990s, when a core of safe injection advocates, United Nations agencies and key stakeholders became aware that basic standards of hygiene governing the reuse, sterilization and disposal of injection equipment were not being followed – and on a massive scale.

Mindful of the danger posed by the transmission of bloodborne pathogens, WHO's Western Pacific Regional Office initially introduced auto-disable (AD) syringes along with safety boxes during measles immunization campaigns. The more they used safety boxes and AD syringes, the more demand grew. Recognizing the extent of the global need, in 1999, UNICEF, WHO and the UNFPA formulated a new policy that would 'bundle' vaccines with AD syringes and safety box equipment before introducing them into routine immunization services. In 2001, the first batch of bundled vaccines made it into the Expanded Programme on Immunization.

That same year, Cambodia and the Lao People's Democratic Republic applied to the Global Alliance for Vaccines and Immunization (GAVI) for funding to introduce safe injection equipment into their routine immunization services. In 2002, Viet Nam followed suit. With advocacy and policy support from UNICEF and technological and logistical assistance from the WHO Western Pacific Regional Office, 2002-2003 saw the phased-in introduction of safe injection equipment into routine immunization throughout the countries of the Mekong. Waste disposal and incineration were provided in the form of Sicim incinerators funded by donors, including the Japanese Government and the Australian Agency for International Development (AusAID). These were installed in key provincial centres prior to the introduction of safe injection equipment in anticipation of greater amounts of used injection waste.

What follows is a short description of how each country met their safe injection goals.

From tragedy to action: Cambodia, HIV/AIDS and the move to safe injections

After decades of political unrest, genocide and war, Cambodia is steadily rebuilding its shattered infrastructure, society and economy. Given the destruction – wrought by years of terrible conflict – recovery has been slow. Cambodia is still one of the poorest countries in Asia, with a third of its people living on less than one dollar a day.

SYRINGES, SUPERSTITION AND SOCIAL CHANGE: how belief systems fuel supply and demand

If unnecessary injections can lead to perilous practices that spread infectious disease, why then is there such a demand? The answers, say investigators, are complex and based in deeply rooted belief systems.

In a 2000 anthropological review of injection practices published in the *Bulletin of the World Health Organization*, author Anne V. Reeler identified three reasons why injections are so often requested and freely administered: ignorance regarding the actual origins of disease; perceptions of efficacy; and rapid social change.

According to Reeler, more and more people are requesting injections in the absence of meaningful healing rituals and relationships. In regions where people blame spirits for a variety of medical ills and remain bound by traditional belief systems, injections are often seen as a powerful and technologically advanced intervention – no matter how irrational their administration is from a biomedical point of view.

Reeler writes, “The action of filling a syringe and penetrating the body with a needle may be perceived as an elaborate ritual and a sign of powerful medicine.” She adds that, “in many countries body piercing rituals are seen as a way of manipulating the body and intervening in its processes.” Countries cited include Bhutan, China and Thailand (acupuncture), Indonesia (inserting objects under the skin) and parts of Africa (scarification). Reeler contends that in such settings, injections fit well into the local “explanatory” framework.

In the Mekong countries of Cambodia, the Lao People’s Democratic Republic and Viet Nam, some investigators believe that superstition surrounding the use of injections can be traced back to the early days of the antibiotic revolution. During the late 1940s and 1950s, the world was still in awe over the miraculous benefits conferred by antibiotics. At that time, most antibiotics were provided by missionaries and administered via injection. To see a family member at death’s door one day and then walking around in apparently perfect health three days later bespoke some ‘powerful medicine’. Such startling cures strengthened the belief that the needle was a potent symbol of modern medical prowess.

Once established as an intervention of immense efficacy, injections became *de rigueur*. Forty years of overuse and abuse – particularly in Asia – has, however, robbed antimicrobials of their previous capacity to work medical miracles. Despite this, antibiotics (and the injections used to administer them) remain the intervention of choice in many developing countries.

⁵ Reeler A. V. Anthropological perspectives on injections: a review. *Bulletin of the World Health Organization*, 78 (1): 135-143.

Nearly half of all Cambodian children are malnourished and one in eight dies before his or her first birthday. Despite high infant and child mortality rates, Cambodia is making progress. Although the country still



has one of the highest HIV/AIDS prevalence rates in Asia at 2.6%, this rate has fallen by nearly one third since 1997. High HIV rates were the original impetus behind Cambodia's push for safer injections, and within a few short years the country has become a good example of how a confluence of political will, technical support and funding can reverse what once amounted to a veritable epidemic of unsafe injection practices.

Cambodia is unique in that strong government commitment and leadership led to the establishment of a safe injection committee focusing, not only on immunization, but also on health services as a whole. Although hepatitis B and C are easier to

transmit through unsafe injection practices, it was the fear of HIV and its rapid spread that prompted the Cambodian Ministry of Health to take action. They set up an inter agency committee comprised of international organizations, non governmental organizations (NGOs) and various governmental ministries to examine how best to tackle the problem.

According to Angus Pringle, WHO Intercountry Technical Officer for Cambodia, the Lao People's Democratic Republic and Viet Nam, unsafe injection practices were rife throughout the country. Health practitioners were using injection equipment that wasn't properly sterilized, disposable syringes were being widely reused, and contaminated injection equipment was being left to moulder in open dumps where children could scavenge them.

"It was terrible," says Pringle. "The whole purpose of immunization is to protect children. The very fact that someone could be immunized with a vaccine but then be infected with something else was scary."

Today, Cambodia's routine immunization services have moved from what Pringle describes as "highly dubious injection practices" to the widespread use of AD syringes, safety boxes, safe incineration and waste disposal. Although some problems remain – transferring safety boxes to incineration sites safely and efficiently for example – in six years Cambodia has successfully made the transition from unsafe immunization practices to a system that could be the envy of wealthier nations.

Remote access and ingenuity: the Lao People's Democratic Republic

In 2003, the Lao People's Democratic Republic scored a low 135 out of 175 on the UNDP's Human Development Index. With an adult life expectancy of only 53 years and a child and infant mortality rate of 222 per 1 000 people, the landlocked country clearly has a long way to go in raising the quality of health care for its nearly six million inhabitants.

Because the majority of the population lives in remote mountainous locations that cannot easily be reached, investigators were not able to ascertain to what degree unsafe injections were practised throughout the country. Anecdotal

DEFINITIONS

Injections are skin-piercing procedures performed with a syringe and needle to introduce either a curative substance or a vaccine into a patient. This can be achieved through one of three routes:

- intramuscular – into a muscle
- intravenous – into a vein
- subcutaneous – beneath the skin

This excludes all other skin-piercing procedures such as blood transfusions, surgery, tattoos and body piercing.

An **unsafe** injection is one that causes harm to the patient (e.g. caused by unsterilized equipment), the provider (e.g. a needle-stick accident during disposal) or the community (e.g. scavenging through rubbish).

An **unnecessary** injection is one where oral alternatives are available, where the injected substance is inappropriate or harmful or where the symptoms of diagnosis do not warrant treatment by injection.



evidence, however, suggested that poor injection practices were rife – especially when it came to the sterilization of used injection equipment.

Although hampered by issues of accessibility, the Lao People's Democratic Republic is making significant strides when it comes to providing safe immunization services. With the technical and funding support of agencies such as UNICEF and WHO, the Lao People's Democratic Republic has now phased in AD syringes, safety boxes and auto-combustion incinerators into its entire immunization programme.

For routine immunization services, however, the real challenge lies in transporting full safety boxes to incineration sites. Bad roads mean that health care workers must travel by bicycle or on foot. Poor management of logistics and transportation from district to provincial level, as well as a lack of financial incentives, also hampers progress.

In response, WHO collaborated with the immunization programme to design a backpack that can hold one full safety box, injection supplies, clothes and the other necessities required for immunization outreach activities. A pilot project using the safety box backpack will be implemented in the near future.

In addition, national EPI vehicles delivering vaccine and medical supplies are being used to collect full safety boxes and return them to the provincial incineration site for destruction. So far as financial incentives for transporting safety boxes in the field go, such a scheme could only work with a reliable source of sustainable funding. None has thus far been found.

Self-sufficiency and political will: Viet Nam

Viet Nam is still grappling with the environmental, social and economic fallout from decades of war. It remains a developing country struggling to improve the lot of its 80 million people. However, despite health expenditures of only US\$ 21

per person, the country is scoring some noticeable public health successes. One of these has been made possible largely by the current economic boom and move to closer public-private collaboration.

In contrast to Cambodia and the Lao People's Democratic Republic, Viet Nam's application to GAVI in late 2002 included a request to purchase locally manufactured AD syringes and safety boxes. The strategy worked. Viet Nam successfully convinced GAVI and its partners that they were capable of producing the same technology in country – and had the potential to become a regional model of self-sufficiency and sustainability.

Four years earlier, with the help of Japanese technology, the Government of Viet Nam invested US\$4.5 million to provide its people with locally made disposable injection equipment. In September 2001, the Vietnamese Ministry of Health signed an agreement with the United Kingdom-based company Star Syringe, to allow the Vietnamese company, Mediplast, to expand their operations to include local production of AD syringes and safety boxes. In January 2003, GAVI approved Viet Nam's application and agreed to provide the cash equivalent of safe injection equipment to purchase of AD syringes and safety boxes locally. Later that same year, Viet Nam introduced locally made safe injection supplies into routine immunization services nationwide.

Today, Mediplast is manufacturing products based on updated international standards and is now considering extending its operations to include the manufacture of AD syringes for the curative sector as well.

Viet Nam went one step further when its Government came up with a national plan for waste management, something that Rodriques characterizes as a 'model' for other countries to follow: "When it comes to waste management, Viet Nam is also a leader with the integration of immunization into an overall medical waste disposal system." Viet Nam shows how a combination of effective health



policies, international assistance and technology transfer can be used to improve the quality of national health care.

The examples from Cambodia, the Lao People's Democratic Republic and Viet Nam show that injection safety is achievable. But these successes beg the question: if so much progress can be made in so little time in nations struggling with poverty and want, why then do unsafe injections continue to threaten the lives and livelihoods of so many people all over the globe? The answers have to do with two key issues: injection waste and unsafe practices within the curative sector.

Dangerous debris: the challenge of injection waste management

Disposing of injection waste in a manner that is both safe and environmentally friendly is a serious challenge that continues to hamper global injection safety efforts.

Despite recommendations that health facilities carefully control injection waste, some clinics still deposit hazardous waste into open pits or hand dug holes. Needless to say, this poses a risk to the community – and particularly to those children forced to scavenge through dumps to help support themselves and their families.

Hanoi-based UNICEF health and nutrition project officer Pham Ngoc Len says that even in Viet Nam, which has some of the more stringent waste management policies region-wide, clinics still engage in hazardous practices. “They don't always burn before they bury,” he says. “There is a real risk. In some places animals and children can easily access or uncover infectious waste.”

According to Len, the situation in the curative sector is even worse. “They still use ordinary disposable syringes that have no built-in protection against re-use

– particularly among injecting drug users or unscrupulous or ignorant health providers. Fortunately, following ‘high-profile’ educational campaigns about the dangers of HIV/AIDS, we do see an increase in the number of patients requesting new syringes”. While this is good from the safety perspective, increased demand for new syringes inevitably means increased waste – a problem that the introduction of AD syringes only serves to make worse.

While some progress has been made regionally – largely owing to the support and technological expertise of the Japan International Cooperation Agency – insufficient numbers of incinerators at the community level continue to pose a significant health care threat. Moreover, health care authorities, UN agencies and some NGOs all agree that incineration is an interim solution to be used only until more advanced, appropriate and environmentally friendly solutions, such as safe recycling of plastic syringes, can be found.

No room for complacency: ignorance and greed in the ‘curative’ sector

Despite remarkable success within the immunization sector, it is within the curative sector that unsafe injection practices need to be addressed most urgently. According to Pringle, the primary difficulty is neither technological nor economic, but political. Donors, ever mindful of the appeal of easily demonstrable-outcomes, are well aware of the dangers posed by unsafe injection practices both within and outside the formal health care sectors. In Viet Nam, both the Ministry of Health and SIGN are trying to get their safe injection message across by specifically targeting nursing associations and raising awareness through seminars and publications.

Governments, on the other hand, prefer to base their responses on hard numbers before embarking on potentially costly safe injection campaigns. “They



need to see the figures,” says Pringle. “They need to understand that injection safety is needed right across the health sector.”

As with immunization, the push for safe injections throughout the entire range of medical practice will involve cooperation from international organizations, donors, ministries of health and traditional and non-traditional medical practitioners alike. To date, Pringle maintains that so many countries are dealing with so many health emergencies – malaria, tuberculosis, dengue fever, etc. – that they tend to view injection safety as a marginal issue. “What people fail to understand,” he says, “is that injection safety spans all of medical practice. People need to feel confident that the injections being given are safe. If they believe otherwise, they are far less likely to have their children immunized.”

Another serious obstacle is that many so-called ‘curative’ injections are administered outside the formal medical system. In many developing nations – including Cambodia, the Lao People’s Democratic Republic and Viet Nam – many physicians finish a day of work at the office only to return home to open private after-hour clinics. Unlike regular government-run clinics and hospitals, these are unregulated for-profit enterprises. Practitioners can charge more for an injection than for prescribing medications that are taken orally. More troubling still is that a combination of poverty and entrepreneurialism often persuade less scrupulous practitioners to



the safety of patients and staff, but also on local and national economies through lost productivity and higher health care costs. The experience of immunization in Cambodia, the Lao People’s Democratic Republic and Viet Nam has important political, economic and medical implications for countries facing similar dilemmas all over the world. Safe injection practices are achievable. What works for immunization can work for the curative sector as well. ❧

re-use injection equipment and charge subsequent patients accordingly – without taking into account that they are exposing their clients to substantial medical risk.

Public awareness campaigns and legislation backed up by legal and monetary sanctions are the only way to put a halt to such dangerous practices.

A call to action

Today, unsafe injections still constitute a serious threat to the lives and well-being of millions of people worldwide. To date, only 5-10% of injections fall under the scope of immunization. The majority are therapeutic – otherwise known as ‘curative’ – injections delivered both within and outside the formal health care sector. These types of injections are responsible for the bulk of infectious diseases transmitted via unsafe injections each year, and the majority could be avoided. Far from being a marginal issue, unsafe injections and unsafe waste management exert a profound toll, not only on



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