

Expert Opinion – Injection Safety



*Dr. Edward Hoekstra
Senior Health Advisor
UNICEF Health Section*

Q: What are the problems associated with injections?

Hoekstra: The first risk for children is exposure to blood-borne diseases, particularly hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV.) The only way to be completely safe is to use one sterile needle, one sterile syringe for each child. A second risk is to the person administering the vaccine. When they cap the syringe they may be accidentally jabbed. In the past recapping was done to protect the environment and anyone who might handle the waste. Research has shown that more than 80 per cent of those administering injections had at least one needle-stick injury during recapping. This has major consequences for health workers, particularly with Hepatitis B, Hepatitis C and HIV. Lastly, if the needles and syringes are not

disposed of properly, children may play with or step on infected devices and be exposed to blood-borne diseases.

Q: How can children be exposed to blood-borne disease during immunization?

Hoekstra: One of the problems we've had over the years with injections is that vaccines were given to children using syringes that had already been used for others. These were glass syringes that could be dismantled and the parts reused. Sometimes they would be sterilized, other times not. This was especially problematic in rural areas where they were often cleaned with lukewarm water or with contaminated substances. Thus children were exposed to blood borne diseases such as Hepatitis B, Hepatitis C and also HIV.

Disposable syringes were also reused; the steel needles could be reused as many as 100 times. Often the syringes would just be cleaned and repackaged. Another further risk to children was in circumstances where the same syringe was filled with inoculations for several children and then used for a series of injections. The problem is that once the needle is pulled out of a child's arm, a vacuum is created and a small amount of blood goes into the syringe. This then exposes the next child in line to whatever diseases the previous children may have.

Q: How widespread is the problem of unsafe injections?

Hoekstra: The issue of unsafe injections is larger than immunization. Only 5 to 10 per cent of injections are for immunization, while 90 to 95 per cent are for curative purposes. It really is surprising how many doctors administer injections in an unsafe way. Why do doctors reuse syringes? It is partly ignorance, but it also has to do with the price. If physicians work in a country where the cost of syringes is a significant percentage of their salaries, they often may rationalize using a syringe more than once. For example, they may say, I can use the same syringe on two brothers or with a married couple, as they are all in the same family. Generally safety becomes a problem if the price of the syringe is close to the income – that is when you move into a grey area. For UNICEF, injection safety is a critical concern. After all, it would certainly defeat the purpose of protecting children against the disease if we can't guarantee that they won't be infected with something else during vaccination.

Q: How is UNICEF working to guarantee the safety of immunization injections?

Hoekstra: Basically, we looked at the problem and asked, “What can we do about it?” Make sure doctors get paid more? Not going to happen. Make the syringe device cheaper? Not necessarily as easy as it sounds. Instead, we believe the answer is to perform injections with an auto-disabling device that is impossible to reuse. In the auto-disable syringes, the needle is stuck to the syringe – you can't break it off. Once you pull out the plunger and push in fluid once, this triggers a mechanism that makes it impossible to pull the plunger out again.

Q: How can poor countries afford the new devices?

Hoekstra: The price of these syringes is coming down. At first, the price for traditional syringes was about US3 cents and the auto-disable syringe (AD syringe) US15 cents. This posed a problem for poorer countries and encouraged syringe reuse. Now the price for AD syringes is less than US6 cents, with traditional syringes at US4 cents. So, with the difference in price being so much lower, this makes our job much easier and decreased the temptation to use traditional syringes. If all countries bought AD syringes, this would force a production change.

The [Global Alliance for Vaccines and Immunization \(GAVI\)](#) has also made funds available for all 74 developing countries that wish to buy AD syringes over a three years period. Thus we hope that most of the critical countries will now have sufficient money to make the switch. At this time, UNICEF provides 44 per cent of the world's vaccines, with 138 countries using only AD syringes and safety boxes for their immunization services. This percentage is increasing monthly. The bundling of the vaccines with these materials occurs in the countries themselves.

Q: What results has UNICEF seen from the needle safety efforts?

Hoekstra: UNICEF started using auto-disable syringes in 1998. At the time, we had 50 million syringes. By 2006, that number had grown to almost 900 million. Since 2006, UNICEF has purchased fewer AD syringes as governments in the developing countries have started purchasing the AD syringes themselves. The measles campaign was where UNICEF first put the AD syringe to widespread use. Since 2000, no measles vaccines have gone out without AD syringes and safety boxes. In the past, physicians faced the risk of accidental needle jabs when they went to cap a syringe after injection. Now, they drop the syringe directly into the box, usually a plastic or cardboard container. Once the box contains 100 syringes, the boxes are incinerated and the remains buried.

As part of these campaigns, we built more efficient incinerators to accommodate the huge amount of waste produced during massive vaccination campaigns. Over a short period of seven days, we reach more than 95 per cent of the children in a population - that can mean up to 10 million children in one week. Of a total of approximately 686 million children that have been vaccinated for measles with a second opportunity for measles immunization during the last eight years, all were done with AD syringes and safety boxes. The waste management was also monitored and we helped communities build incinerators that can now be used by the health system.

###