

Summary Report

Evaluation of Retractable Syringes in a Measles-Rubella Immunization Campaign in Peru

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Background

Each year more than 16 billion injections are administered worldwide.¹ Of these, 5% to 10% are administered in immunization settings. The World Health Organization (WHO) estimates that more than 50% of injections given in developing countries are unsafe.² The most common types of unsafe injection practices are reuse of syringes and needlestick injuries. To decrease the risk of disease transmission from syringe reuse, WHO guidelines recommend using autodisable (AD) syringes whenever possible. AD syringes are currently used for more than 50% of immunization injections globally. However, AD syringes have some limitations: (1) they do not provide needlestick protection; and (2) because they are single-use syringes they result in a high volume of waste and may exacerbate the problem of sharps waste handling and final disposal.

The WHO estimates that two million needlestick injuries occur among health care workers worldwide each year. Health care workers may experience a needlestick injury while administering a vaccine or a curative injection, recapping a needle, disassembling a syringe, or during the process of handling and disposal of medical waste.

In recent field evaluations retractable syringes were found to be well accepted by health workers as an alternative means of providing injections and an effective method of managing sharps waste.³ Immediately after administering an injection with a retractable syringe the vaccinator retracts the needle, disabling the device and preventing syringe reuse. Additionally, because the sharp is encased in the syringe after use, the risk of needlestick injury by waste handlers is significantly reduced, and elimination of a sharp helps to simplify the medical waste handling process.

In 2006, UNICEF and the Peruvian Ministry of Health (MOH), with assistance from PATH, performed an evaluation in Peru to assess perceptions of acceptability and safety of automatic retractable syringes in an immunization setting and their affect on waste disposal.

Prior to the evaluation Peru reported the following practices: safety boxes were not commonly used for immunization campaigns, syringes were typically recapped after use during outreach, and used syringes were deposited in plastic jerry cans filled with chlorine solution. In urban facilities, needles were removed and the waste burnt, while in rural areas syringes were burned and buried near the facility. Generally, in urban areas, syringe waste was placed in red bags labelled “contaminated waste” and turned over to public or private trash collection systems. Gloves and surgical masks were used by most waste handlers for personal protection during waste collection.

Evaluation design

This evaluation was based on operational research conducted among vaccinators, coordinators, and waste handlers in select areas of the Lima (urban) and Cuzco (rural) regions of Peru. During a nationwide (18,000,000 target population) measles-rubella (MR) immunization campaign in 2006 in Peru, 500,000 automatic retractable syringes were introduced in Lima and Cuzco. The

¹ World Health Organization’s Injection Safety Website. Available at: http://www.who.int/injection_safety/en/. Accessed June 16, 2004.

² World Health Organization (WHO). *Injection Safety, Quality of Immunization Services (QIS)*. Geneva: WHO; 1998.

³ Wells J, Folsom M, Wood S, Levin C, et al. *Evaluation of a Retractable Syringe in South Africa*. Seattle, WA: PATH; 2007.

VanishPoint™ 1-ml retractable tuberculin syringe with 5/8-inch, 26-gauge needle was donated by Retractable Technologies Incorporated for use in the evaluation. Standard 5-ml disposable syringes were used to reconstitute 10-dose vials of the MR vaccine.



Campaign injection site

The objectives of this evaluation were to assess the acceptability of retractable syringes, the perceived safety of retractable syringes, and the effect of retractable syringes on waste management practices in an immunization campaign in Peru.

Data were collected through anonymous questionnaires and focus group discussions (FGDs) with vaccinators in addition to interviews with coordinators and waste handlers upon completion of the campaign. A total of 170 vaccinators, 15 coordinators, and 25 waste handlers participated in the evaluation.

Findings

Overall, retractable syringes were seen as reliable and easy to use. All participants agreed that the greatest advantage of retractables is their increased safety for

vaccinators, waste handlers, and members of the community. Participants also identified the improved management of sharps waste as an important benefit of retractable syringes. The evaluation demonstrated their potential to reduce the use of jerry cans, especially during door-to-door campaigns. Before their widespread introduction, participants viewed training sessions as instrumental in emphasizing the proper and safe use of the device.

Acceptability of device

Speed of injection: 88% of respondents said they spent less or the same amount of time providing the injection and disposing of the syringe and needle using the retractable syringe in comparison to a standard disposable syringe. 12% said it took more time to use the retractable than to use a standard disposable syringe.

Syringe performance: 67% of vaccinators said the needle always retracted, 13% said it usually retracted, 17% said it sometimes retracted, and 3% said it never retracted. Observations revealed that occasionally health workers did not adequately push the plunger in order to trigger needle retraction.

Ease of use: 97% of vaccinators rated their experience using the retractable syringe as easy, and 84% of vaccinators thought the retractable syringe was easier to use or equal in ease of use to standard disposables they had previously used. 16% said the retractable syringe was harder to use.

Priority settings for retractable use: FGDs and vaccinator questionnaires showed that campaigns were seen as a high-priority setting for retractable syringes. In addition, more than half the coordinators who participated in the study thought retractable syringes should be used for all types of injections.

Safety

Previous needlestick injury experience: Stigma around needlestick injury is a critical issue and makes collection of data difficult—most vaccinators were initially reluctant to talk about needlestick injury. Once the topic was raised in FGDs, however, many participants acknowledged having experienced needlestick injuries.

Needlestick injury—vaccinators: In FGDs vaccinators agreed that the use of retractable syringes could reduce the risk of needlestick injuries considerably due to the automatic needle retraction mechanism of the syringe, eliminating the need to recap needles after use. In questionnaires, 93% of vaccinators said they did not get a needlestick injury while using the retractable syringe during this campaign, and 7% reported needlestick injuries while using the retractable syringe during this campaign.



Giving injections in remote areas

Table 3. Vaccinator recollection of needlestick injuries during campaigns

Vaccinator recollection of needlestick injuries	No injury (%)	Before injection (%)	During injection (%)	After injection (%)	Total (%)
Needlestick injuries with retractable syringe during October 2006 rubella campaign	158 (93%)	7 (4%)	1 (1%)	4 (2%)	170
Recollection of needlestick injuries with standard disposable syringes during previous campaigns	115 (68%)	23 (13%)	1 (1%)	30 (18%)	169

Needlestick injury—waste handlers: Waste handlers gave a wide variety of responses related to needlestick injury. Of the 25 waste handlers interviewed, 2 said they are common events for cleaning personnel, 12 said they are occasional, 5 said they are very rare events, and 5 said that no needlestick injuries occur because they have been fully trained.

Protocol for treatment of needlestick injury: Vaccinators in Lima Este were familiar with post-exposure protocol but felt the process was so bureaucratic that they did not report injuries. Therefore, there is no record of needlestick injury to health care personnel. Vaccinators in Cuzco were not familiar with the system for post-exposure treatment. Waste handlers knew treatment protocol for needlestick injury, including availability of medications for preventive treatment. However, during the campaign, insufficient medications were made available.

Reuse: When vaccinators were asked whether they had reused standard disposable syringes in the past, 88% said they had not, and 12% said they had. Correct disposal practices as well as increasing awareness in the community were identified as ways to prevent reuse.

Health care waste management

Logistical fit with existing operations: Retractable improved the syringe collection and disposal system by eliminating the need for jerry cans and simplifying the waste disposal system. The exclusive use of retractable reconstitution syringes in addition to the use of retractable syringes would be necessary in order to eliminate the disposal of exposed sharps throughout the health care system.

Syringe disposal practices: 98% of vaccinators said that disposal of retractable syringes was a simpler process than discarding standard disposables.

Training and education

Training: Most participants thought the amount of training provided was sufficient and that the retractable syringe was easy to use. However, the evaluation pointed to the need for clearer training messages on proper technique and adequate practice prior to use.

Patient education: Vaccinators agreed that it is important to provide information about the new syringe to patients prior to use, especially since the needle retracts back into the syringe.



*Improvised sharps containers
"SHARP MATERIAL"*

Conclusions

Acceptability and safety

In this evaluation retractable syringes were seen as a reliable, easy to use, and a safer and faster alternative to standard disposables in the campaign setting. Safety was seen as one of the most important benefits of using the retractable syringe. The percentage of needlestick injuries reported with the use of retractable syringes versus what was reported with the use of standard disposables was significantly lower. Although participants recommended the use of retractables in all settings, other studies have shown that fixed-needle syringes such as the retractable evaluated in this study are not suitable for hospital procedures, such as connection with IV lines or blood draws. Therefore, it is recommended to provide users with clear training messages about the advantages, limitations, and proper use of retractable syringes.

Affect on waste disposal

Retractable syringes have the potential to improve the management of sharps waste and possibly provide a cost reduction. Recommendations for the improvement of safe disposal of medical waste include enhanced training, provision of adequate protective equipment (gloves, clothing, sharps containers, and bags), installation of final disposal solutions (e.g., incinerators), and the use of retractable syringes on a permanent basis.

Training

Training is a critical component of the successful introduction of any new technology, including retractable syringes. Though the training provided during this evaluation was generally seen as sufficient and the retractable syringe as easy to use, findings pointed to the need for clearer training messages on proper technique and adequate practice prior to use in a clinical setting.



Training campaign staff on retractable syringe use

retractable syringes, pending budget approval. However, before starting introduction of the retractable syringes, the Peruvian MOH needs to modify national guidelines for the use of injection devices that include the use of retractable syringes. In many developing countries the cost of retractable syringes continues to be prohibitive in their adoption of this technology.

Patient education

It will be essential to identify and articulate key messages for vaccinators to pass on to patients as to why a new safety syringe has been introduced. Before giving the injection it is important for vaccinators to explain that the syringe will make a noise when it retracts and that the needle is pulled back into the syringe once the injection has been given to prevent reuse and potential needlestick injuries.

Plans for introduction

Based on the positive results from the evaluation, the Peruvian MOH is considering procurement and a broader introduction of