

Disposable-Syringe Jet Injection

Health need

With the advent of the HIV/AIDS epidemic and knowledge of the transmission of hepatitis B and other bloodborne diseases through unsafe injection practices worldwide, safe injection technologies have become a high priority for global health. Reuse of contaminated syringes, needle-stick injuries among health workers, and threats to the community from improperly disposed of and potentially contaminated needles and syringes are serious health risks. Multiple-use nozzle jet injectors, although credited with decades of successful use in the field, are no longer used due to evidence of cross-contamination between injections. More recently, disposable-syringe jet injectors (DSJIs) have been developed to prevent cross-contamination between patients. This technology is currently the only available needle-free technology that can be used to deliver all injectable vaccines used in developing-country immunization programs, at all depths of delivery (intradermal, subcutaneous, and intramuscular).

PATH is exploring ways in which this technology could facilitate new vaccination strategies. For example, intradermal delivery offers the potential advantage of effective immunization with smaller doses, allowing for reduced costs of each vaccination and increased coverage for vaccines that are in short supply due to high cost or limited production capacity. PATH has identified potential benefits of using DSJIs for this type of vaccination.

Technology solution

DSJIs use a sterile, single-dose, needle-free syringe for each injection. New, low-cost designs that meet international public health safety standards are now becoming available. Unlike other needle-free vaccine administration technologies, these injectors require no change in vaccine formulation and can be filled from multi-dose and single-dose vials at the point of use.

PATH has worked with several developers on their respective DSJI technologies to advance designs that are affordable and adapted for routine immunization in low-infrastructure settings.

Current status and results

PATH is working with multiple device developers and has performed health care worker evaluations of device prototypes by health care workers in the field (Brazil, China, and India). PATH plans to assist developers with the necessary regulatory, clinical, economic, programmatic, and applied research that will enable such a technology to be introduced and used in developing-country immunization programs.



Scott Areman

Disposable-syringe jet injector.

“Needle-free delivery systems offer an answer to the problem of sharps in the vaccination programs. That is why WHO is so interested in this technology. In addition, the intradermal administration of fractional doses of IPV [inactivated polio vaccine] could make this vaccine affordable for developing country use.”

Dr. Roland Sutter of the World Health Organization and the Global Polio Eradication Initiative.

Availability

For more information regarding this project, please contact Darin Zehrung at dzehrung@path.org.

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