



## Mariyeh Azizian - Iran

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Hi everyone. As you said, my name is Mariyeh Azizian, and I am a national support team leader of SDGs of AIESEC in Iran, and my solution is about vaccine delivery with Microneedle arrays to achieve Sustainable Development Goal 3, good health and well-being.

Actually, this solution is about research, development, localization and also accessibility of Microneedle Technology for vaccine delivery of Measles, Malaria, Human Papillomavirus or HPV and also Influenza vaccines, based on the prevalence rate of these diseases in each country, to eradicate these communicable diseases. To describe Microneedle in a simple word, I can say that Microneedle arrays are micron scale needles that can be used as a transdermal vaccine delivery.

But why do we need this technology to achieve SDG 3? Actually, we all know about SDG Target 3.3 and 3.b, about ending communicable diseases by 2030, and also the necessity of the research and development of vaccines for the communicable diseases. Also according to WHO data, communicable diseases need to be eliminated and eradicated by vaccination. Most vaccines are injected using hypodermic needles. Hypodermic injections cannot easily be used by patients themselves, and this is just one of the disadvantages of using hypodermic needles; but Microneedles can overcome these limitations. Beside this and other advantages of microneedle arrays, such as painless administration and improving immunological responses, one of the most important advantages of these arrays is ease of use and self-administration, which can reduce treatment cost of vaccine delivery of communicable diseases – such as influenza, measles, malaria, HPV and other communicable diseases.

How will this solution help to eradicate these communicable diseases? The first step is promoting for students to research and study about Microneedle technology at universities and academic centers. According to these studies and according to reports and articles, Microneedle for vaccination can be produced in pilot scale for clinical trials by knowledge-based companies, especially in countries with high prevalence of these diseases. Also treatment centers need to be established for clinical trials in the area of research for special communicable diseases, for example, a Measles Clinical Center in Afghanistan, or Malaria Clinical Center in Sudan.

After clinical trials are completed successfully, microneedle arrays will be manufactured in industrial scale by local companies and will be accessible to patients in high prevalence areas. At the final step, local companies can commercialize their Microneedle products, and can even export them.

The main challenge of this solution is about financial resources. The financial sources for these solutions can be provided by government sectors, universities and academic institutes, NGOs for advancing SDG 3 and global organization and partnerships. So, the treatments can be provided free of charge for volunteers and patients, and also health insurances can support and cover the cost of commercial Microneedles for patients.

But how will this solution be implemented? The first step is to promote and introduce Microneedle technology to students, professors and teachers to encourage them to research and study this field. Universities can carry out this role by holding workshops about Microneedle and vaccination and providing funds and grants for developing vaccine delivery by Microneedles. Also the global cooperation between AIESEC, UN, UNESCO, and the WHO will lead to hold international conferences about Microneedles and vaccination.

Another step to implement this solution is clinical trials; a clinical trial protocol will be provided by students, professors and academic staff. International volunteers can be provided by AIESEC to advance this solution, and WHO National Medical Equipment Department, and National Health Organization of the research country will supervise and monitor the clinical trial process. The main step of this solution is to produce, manufacture and distribute Microneedle technology and Microneedle arrays. To implement this step, knowledge base companies can be run by private sector investments, and that is how the solution will be implemented.

Thank you so much for your attention.