Improving immunization in developing countries

Mark Thomas

Year Founded: 2009
Organization type: nonprofit/ngo/citizen sector
Project Stage: Start-Up
Budget: $100,000 - $250,000
Website: http://vaxtrac.com

Health care
Infant health
Maternal health
Sustainable development
Vulnerable populations
Technology
Social enterprise

Project Summary

Elevator Pitch

Concise Summary: Help us pitch this solution! Provide an explanation within 3-4 short sentences.

VaxTrac deploys mobile biometric-based vaccination registries in developing countries to reduce vaccine wastage and to prevent millions of avoidable deaths

WHAT IF - Inspiration: Write one sentence that describes a way that your project dares to ask, "WHAT IF?"

What if all the money we as the international community spend on vaccines is actually applied toward saving the lives of children in need?

About Project

Problem: What problem is this project trying to address?

While the immunization rates in developing countries have progressed considerably in the past half-century, they have recently reached a plateau and are unlikely to improve much due to unaddressed obstacles in the vaccine delivery system. As a result, 2.5 million children die every year from vaccine-preventable diseases. The issue that is most directly responsible for stagnant performance is a lack of data. Healthworkers often do not know which vaccines a child has received and which they still need. Officials do not know where vaccines have been administered or where they should be redirected. All of this results in up to 50% of vaccines being wasted and millions of avoidable deaths.

Solution: What is the proposed solution? Please be specific!

The basis of the VaxTrac solution is the ability to link a patient to a vaccination record. From this capability alone comes a slew of benefits. Since we work in the most remote and poverty-stricken geographies, identifying a patient and accessing their vaccine history is a major challenge. Paper vaccine cards—the standard mechanism—are inherently flawed; they get lost, damaged, populated with misinformation and burden the patient with the responsibility of retention. We have alleviated these issues through the use of biometrics, specifically the child’s fingerprints. VaxTrac has built a mobile, biometric-based vaccination registry that healthworkers bring into the field as they administer vaccines. The primary benefit is children receiving the appropriate vaccines. However, there are myriad ancillary benefits that come from having detailed data about where and when vaccines were administered, including supply chain management, demand forecasting and the elimination of overvaccination.
Impact: How does it Work

Example: Walk us through a specific example(s) of how this solution makes a difference; include its primary activities.

Imagine a health worker in a rural clinic that is about to travel to a remote village for the day to administer vaccines, carrying little more than a cold box for the vaccines and a VaxTrac field immunization unit (FIT). The unit is comprised of a netbook, fingerprint scanner and GPS receiver packed into a case for durability and portability. Before leaving the clinic, the worker physically loads a number of vaccines into the cold box for transportation; in parallel, the worker will record in the FIT the number and type of vaccines going out. As the worker sees a child, he will ask the caretaker for the child's gender and approximate date of birth before scanning both of the child's thumbs. If the child has been seen before, the system will display which vaccines the child has received, which vaccines they are eligible for (based on time since last dose), and which vaccines should be administered that day (based on which vaccines the worker has on-hand). If a child is not in the system, a new entry is created and the worker is allowed to input past vaccination information, e.g. a vaccine card is present. As all of these FITs return to a clinic or hospital, the data is aggregated; the aggregation continues up the chain—district to sub-national, sub-national to national. With the amassed data, health policy makers can get real-time reports and see hyperlocal coverage maps. They can better project where and when vaccine demand will occur; they can re-allocate resources to regions more in need; they can respond to outbreaks deliberately and effectively.

Impact: What is the impact of the work to date? Also describe the projected future impact for the coming years.

VaxTrac has accurately tracked and made recommendations on over 100,000 immunization visits for the population of Benin. Health worker job satisfaction has increased substantially and their administrative burden has been reduced; this allows them to focus on their primary responsibility of providing health care to the people.

In the next phase, we will be able to quantify the network effects of a scaled project. As more clinics are brought into the fold and the population served increases, we will be able to show a magnified impact not only to the local vaccine delivery system but to the national healthcare system.

Sustainability

Financial Sustainability Plan: What is this solution’s plan to ensure financial sustainability?

Health worker buy-in is critical to long term success. We have centered the design of our system—from day one—around the health worker. At every step, we have solicited feedback and incorporated their suggestions. The VaxTrac system is stronger for the support and advice given by the hundreds of health workers involved.

Marketplace: Who else is addressing the problem outlined here? How does the proposed project differ from these approaches?

VaxTrac lives firmly in the center of the burgeoning mHealth sector, where the power of mobile technology is leveraged to improve the quality of and access to health care for those in developing countries. There are other organizations—Medic Mobile, OpenMRS—working on aspects of the health records system, but no one is using biometrics as the patient identifier. Without a robust mechanism for identification, any new system will be inherently flawed as the root cause will go unaddressed. Also, no other organization is focusing on the vaccine delivery system as a whole, from manufacturer to rural health clinic, in the same manner as us. A concern going forward will be the interoperability of these various systems being deployed.

Team

Founding Story

Our founder, and now Chairman of the Board, was engaged in a project on behalf of a major vaccine manufacturer to evaluate the case for production of a certain vaccine targeted at developing countries. A key component of that project was observing the vaccine delivery system from end to end. As he got closer to the “last mile” of the system (i.e. rural clinics, mobile vaccination teams) he saw that there were a large number of vaccines being wasted—up to 50% in some areas. There was an obvious disconnect in his thinking: “We spend billions of dollars every year to procure and distribute vaccines, and yet we're wasting a large number of these and children are dying as a result.” In conversations with frontline health workers and government officials, the inability to link a patient and record became the key obstacle to further improvement. He suggested the use of the only identification mechanism that a child always carried with them—fingerprints—and a technology familiar in the West.

About You

Organization:
VaxTrac

First Name
Mark

Last Name
Thomas

Twitter URL
http://www.twitter.com/vaxtrac

Facebook URL
http://www.facebook.com/pages/VaxTrac/89849616115
VaxTrac

Organization Country
United States, KY, Jefferson County

Country where this project is creating social impact
Benin, LI

How long has your organization been operating?
1-5 years

The information you provide here will be used to fill in any parts of your profile that have been left blank, such as interests, organization information, and website. No contact information will be made public. Please uncheck here if you do not want this to happen.

Innovation

How long have you been in operation?
Operating for 1-5 years

Which of the following best describes the barrier(s) your innovation addresses? Choose up to two
Cost, Quality.

Social Impact

Please describe the goal of your initiative; outline what you are trying to achieve

We envision a world where every child, regardless of background, has equal access to lifesaving vaccines. Every year, more than 24 million children will not receive the most basic vaccines, and 2.5 million of which will die from vaccine-preventable disease. Ambitious as it may seem, we intend to drive that number to zero. It is encouraging that there is so much international focus and funding to bring vaccination to the forefront of development efforts. However, it is unacceptable that we do not make every available effort to ensure we do not waste a single dollar or a single dose. The goal of our initiative is to reduce vaccine wastage making more doses available and to strengthen the entire delivery system with actionable data.

What has been the impact of your solution to date?

We have completed the design of our system as well as prototype testing in rural India. To date, we have proven the biometrics work at a high reliability rate and that the technology can stand up to the harsh environments for which it was specifically designed. The currently ongoing pilot project has the system deployed in two regions in southern Benin. Collectively, we are covering a total population of roughly 400,000 people. Upon successful completion of the pilot project, we expect to be prove that we reduced vaccine wastage, increased the coverage rate and reduced the total vaccination system cost per fully immunized child.

What is your projected impact over the next five years?

In the next five years, we expect to have the system deployed at a national scale in at least several medium-size countries. We also expect to have sub-national projects in another dozen countries, with plans to scale those up to national coverage. In total, we expect that our systems will be covering a total population of 50-100 million people. One key benefit will be a reduction of the vaccine wastage rate, the implication of which is that a country can immunize more people with the same number of vaccines. Coverage level goes up (more children get immunized) and the cost efficiency goes up (higher coverage at the same cost).

What barriers might hinder the success of your project? How do you plan to overcome them?

Scalability is the single largest hurdle we have to overcome. We require a physical unit at every vaccination outlet, which generally translates to one unit per every 10,000-40,000 people. One step that we are taking is to reduce the cost of each unit; we already use cheap, easily-replaceable off-the-shelf hardware. We have also working to use low-end mobile phones as a field unit. Another step we are taking is to build comprehensive cost-benefit models. So if units are (relatively) expensive and we require many of them, we will at least show that the cost of the system is more than offset by the value of the improvement. Lastly, healthworker buy-in is critical to the widespread adoption so we have worked with end users every step throughout our design and testing process.

Winning entries present a strong plan for how they will achieve and track growth. Identify your six-month milestone for growing your impact

Demonstrate success on a small scale and build foundation for continued growth

- Identify three major tasks you will have to complete to reach your six-month milestone

  Task 1
  Complete pilot project in Benin and publish results

  Task 2
  Begin larger deployments in two new countries

  Task 3
  Initiate partnerships with at least six organizations that have operations in new countries
Now think bigger! Identify your 12-month impact milestone

Identify and resolve issues faced as projects are brought to national scales

<table>
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<tr>
<th>Task 1</th>
<th>Work with partners to draft and approve a plan for ramp-up from pilot project to national scale</th>
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<tr>
<td>Task 2</td>
<td>Build a detailed cost model for what is required to scale (hardware, training, logistics, etc.)</td>
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<td>Task 3</td>
<td>Drive down unit costs at least 50% by completing another design iteration and initiating new procurement strategies</td>
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Sustainability

**Tell us about your partnerships**

Our most fruitful partnerships are with the managers and implementers of frontline health service delivery. We work closely with the WHO and UNICEF at both the country level as well as at international and programmatic levels. Within each country, we also work directly with representatives from the Ministry of Health and other NGOs that operate health facilities. We are also leveraging the network of some of our funders (e.g. Gates Foundation) to forge new relationships with other organizations merging innovation and health care in developing countries.

**Are you currently targeting other specific populations, locations, or markets for your innovation? If so, where and why?**

In the long term, we target the 73 GAVI-eligible countries, which are all of the countries with a per capita GNI of under $1,500. In the short term, we are ensuring that we validate the impact of our system across a broad range of environments, geographies, and levels of infrastructure. We have plans for projects in three different countries, each of which presents unique challenges. We have a pilot project in Benin and will be initiating new projects in the next few months in Nepal and Ecuador.

**What type of operating environment and internal organizational factors make your innovation successful?**

We give our team significant freedom and empower them to make decisions and plans. Clearly this only works because we have been very selective as to who we bring on board; this is not an environment in which most will thrive, or even survive. We also embrace both lean and flat organizational principles. No one has to report to an office; we all work remotely and at our own pace and in our own preferred style. We also do not burden the organization with strict reporting structures. Everyone involved knows what the end goal is and they have been given the power to make that happen.

**Please elaborate on any needs or offers you have mentioned above and/or suggest categories of support that aren’t specified within the list**

Funding is an issue for every organization, non-profit and corporate alike. I think it goes without saying that it is a constant stressor and one that too often takes time away from our people making a real impact. In addition to funding, a major need is building relationships with other NGOs or government agencies that have boots on the ground in these countries providing the vaccinations.

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