

Low-cost diagnostics for Africa

Kisumu, Kenya
Stevenage, United Kingdom
Graham Simpson



Organization type:

for profit

Project Stage:


Start-Up

Budget:

\$50,000 - \$100,000

Website:

<http://www.gsk.com>

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Project Summary

Elevator Pitch

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

Cheap and reliable diagnosis of diseases in rural areas, with lack of electricity or water, and inadequately trained healthcare staff are widespread problems in less developed countries. GSK is helping to develop simple, cheap, paper-based devices capable of diagnosing infections and saving millions of lives.

About Project

Problem: What problem is this project trying to address?

Cheap and reliable diagnosis of diseases in remote, rural areas, with challenging weather conditions, lack of electricity or clean water, and inadequately trained healthcare staff are widespread problems in the less developed countries. In particular, poor maternal and child healthcare leads to significant mortality and morbidity with undiagnosed conditions being left untreated. With infectious diseases such as malaria and tuberculosis, point-of care diagnosis is not possible with the limitations in healthcare resources. Tens of millions of people's lives could be saved annually with a platform solution involving an open-innovation collaboration of expert partners.

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

GSK is helping to develop simple, cheap, paper-based devices capable of producing quantitative diagnostic test strips at-site. These tests can be administered by minimally trained healthcare workers in hot, humid environments common in developing countries. The ante-natal pen uses a novel design with a dropper to deliver reagents consistently with a business model generating an income for the healthcare worker. The G6PD test uses an innovative visual screen which allows quantitative assessment in difficult to detect cases. Both designs are part of a wider platform which will revolutionise healthcare diagnosis and companion treatment in developing countries.

Impact: How does it Work

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

In a developing world setting many patients cannot afford the time or money to travel to central healthcare centres for medical treatment. Unpaid, volunteer healthworkers from the community travel out to remote villages and will take with them the low-cost diagnostic tests. The tests will

screen pregnant women for ante-natal complications (including pre-gestational diabetes, pre-eclampsia and anemia). The tests cost less than 0.5 cents to administer due to the simple design - the reagents are administered using a dropper on to cheap filter paper. The test kit (~ 100 tests) is purchased by the healthworkers and the cost reimbursed with a profit when administering tests to patients. The filter strips are then tested with the patients urine or blood to give a very quick and easy reading which can be detected by untrained healthworkers. The patient is charged a small fee for the test and the healthworker makes a sufficient income to purchase another kit and provide for their families. If positive the patient is then referred to the local hospital for further testing by qualified health professionals to give effective treatments. For the G6PD diagnostic, many patients are at risk of side-effects from anti-malarial medications due to genetic mutations common in populations in the developing world. This diagnostic provides a rapid and quantitative view of the genetic deficiency, avoiding the use of expensive lab-based equipment, often not present in these settings. Both tests have been developed in partnership with Johns Hopkins University student teams with advice from Jhpiego.

Sustainability

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

The WHO supports a number of consortia who are investigating point of care diagnostics. The global expertise that GSK brings in discovery, development and distribution of novel medicines and vaccines, particularly in the developing world bring unique strengths in the industry. GSK's expertise in diseases of the developing world, including the development of malaria vaccine Mosquirix, and extensive partnerships with NGOs, governments and institutions across the world make us the ideal partner. Johns Hopkins and Jhpiego develop innovative solutions for global healthcare issues particularly around novel devices have been recognised by the award of several grants and awards (Gates, USAID). Other competitors in the field include PATH and FiND who have experience in developing diagnostics.

Team

Founding Story

Graham had a life-changing experience on his PULSE volunteer placement in Africa when the child of a close colleague in Kenya, died of anemia in the community ambulance he was driving back to the district hospital, over 20 miles away across rough back-country roads. This simple condition could so easily be diagnosed and treated in the UK and he realised that this was too common to be acceptable. He saw the opportunity to diagnose so many simple conditions in the field which could provide huge patient benefit. His passion for finding innovative healthcare solutions which could make an impact in Africa grew and led him to reach out to the head of R&D at GSK, Moncef Slaoui on his return. Moncef connected him with Jhpiego to work on these projects in collaboration with Johns Hopkins University. Graham connected with Michelle, another passionate participant from the PULSE volunteer partnership, and Dwight, an experienced diagnostic developer and got the project off the ground.

About You

About You

First Name

Graham

Tell us about yourself/your team.

We are a diverse team of intrapreneurial scientists collaborating closely with academia and an NGO, Jhpiego. The GSK team have experience of volunteering in Africa with team-leader, Graham Simpson, and Michelle Wobker spending 6-month placements in Western Kenya and Ghana in 2010. Dwight Walker is the other key member and has developed commercial diagnostics within the industry. The group is part of a wider team of micro-volunteers within GSK who have helped the project. With our academic partners in the biomedical Engineering Department at Johns Hopkins University and at healthcare NGO Jhpiego, we are working together to develop innovative solutions for healthcare in developing countries.

What makes you an intrapreneur? What are the skills, capabilities, and personality traits that make you an intrapreneur?

We all possess the tenacity, passion and innovative thinking which are essential in intrapreneurs. We care deeply about the patients who will benefit from our products and regularly seek creative ways to overcome hurdles put in our way. We are comfortable leading multi-disciplinary teams, always somehow finding time (when none officially exists!) to write proposals, mentor students, read literature reviews and tap our networks to get to the next milestone in the project. We are all successful in our careers, contributing significant scientific impact to new platforms and products within the GSK business but feel strongly that we have the unique skills and energy to do more than just our day jobs to make difference. Others think we are crazy but we have a bug which means we can't let go!

About Your Organization

Company Country

, HRT, Stevenage

Primary country where this project is creating social impact

, NY, Kisumu

Additional countries or regions

Thailand, Nepal

Industry

Health Care

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

Select the stage that best applies to your solution

Growth (your pilot is up and running, and starting to expand)

The Solution: Why is this solution innovative for your company and industry?

The innovation comes in the novel technologies used to dispense, quantitate and analyse the diagnostic strips but also in the business model to support the programmes. GSK is helping to develop these diagnostics in partnership with academic and an NGO partner in an open-innovation agreement which enables sustainable solutions for developing countries.

Impact

What has been the impact of your solution to date?

The project is still being piloted by the group in studies in developing countries (Thailand, Nepal, Kenya). Already in initial tests using students as volunteer healthworkers the results can be read with minimal instruction. The potential impact would save many lives and reduce the suffering of patients in communities across the developing world. The NGO and academic partners have been assisted in redesign of the diagnostic to be more effective in challenging climates and to match strict clinical regulations.

Internally the project have helped internal groups establish contacts with groups who can develop diagnostics for non-commercial goals. The longer-term impact of the platform, developed in partnership, could bring cutting edge science to developing world healthcare and diagnose such conditions as sickle-cell anemia, HIV and TB.

What is your projected impact over the next 1 to 3 years?

The two projects will be progressed to filing with regulatory bodies over the next 1-3 years. The clinical testing schedule and distribution is currently being established and is still in the planning stages.

Will update further.

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

There are several competing commercial and cultural drivers which may hinder the success of the project. As we are all employed full-time in other roles we have been relying on pro-bono/microvolunteering resource to progress the project. Although senior management are supportive, this may become challenging with competing priorities internally. The returning PULSE volunteers are given 6 months of time to work on ongoing projects and bringing these volunteers into the project maintains its vitality and allows us to spread the workload. We will continue to apply for external funding and build convincing reasons to believe to convince internal stakeholders to progress the project further.

Sustainability

What is the benefit or value you're creating for your business?

Developing companion diagnostics helps GSK ensure that only the patients that can benefit from our medicines are taking them, which minimizes cost to patients and prevents their unnecessary exposure. GSK continues to be viewed as contributing to the improvement in welfare around the world, ensuring that our future patients can trust us. The scientific expertise, understanding of the regulatory approval framework and distribution networks with our government, institutional, commercial and NGO contacts that GSK brings will impact patients globally.

How are you leveraging internal resources (funds, time, knowledge, etc.) to support this initiative?

The team have coordinated scientific experts from across GSK clinical and research organisations to advise on the project with pro-bono resource. Using internal social networks designed to allow easier collaboration (called GSK Mingle), the team have identified interested internal and external partners quickly, by-passing the traditional, commercially driven funding cycles. Through our networks we have identified experts at Rexam, Millipore, and external packaging manufacturers to advise the team and worked closely with the academic and clinical teams at weekly meetings to reach project milestones. Funding has been leveraged from the senior leaders in R&D to allow travel and seed funding of the projects.

Expand on your answer, explaining the long-term funding and support plan.

The goal of the project is to take the diagnostics through the approval process with regulators in the US/EU over the next 1-3 years. The process will be funded with grants from external organisations (Gates, USAID) and with in-kind/pro-bono donations of resource and support from internal and external partners. The industrial/academic partnership is open and transparent offering resources which benefit the project when necessary. GSK has a clear policy that intellectual property from the project can be leveraged by the partners as long as the products can be supplied through GSK at a low enough price to allow access in least developed countries.

Tell us about your partnerships across your company and externally that are key to your project's success.

Partnerships with internal groups in R&D have allowed scientists with varying expertise to come together on a pro-bono/microvolunteering basis. From chemical stability, biological assays, device development, commercial expertise and clinical development, the experts have taken time out of their day jobs to contribute time and energy with no complaints. The same scientific rigour can be brought to global health projects leveraging the world leading manufacturers (e.g. Rexam)

What internal support have you gotten for your project? What kind of push-back have you received?

Senior leaders (including head of R&D Moncef Slaoui and head of Platforms John Baldoni) have both been instrumental in leveraging internal resource for these projects. We have mainly operated under the radar but at the times when support has been requested we have been delighted to receive it unconditionally. As our 'day-jobs' fill our time, the main push-back will come when major investment is needed, but we plan to fill these gaps by leverage through institutional funding.

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