



Challenges for ISNTD Festival Feb 23rd, 2017

About Break Dengue

Spread by the same mosquito responsible for the Zika outbreak, dengue is the fastest-growing mosquito-borne viral infection in the world today, resulting in around 390 million infections every year, [half a million hospitalizations](#) and an estimated 22,000 deaths each year. Dr. Margaret Chan, Director General of the WHO, has said that “today, dengue ranks as the most important mosquito-borne viral disease in the world.”¹

The socio-economic toll of diseases transmitted by mosquitoes is severe; the total annual [cost of dengue](#) alone has been put at \$8 billion. What’s more, outbreaks adversely affect other health service users. Health system capacity can adapt to meet predictable demand for illnesses like malaria or diabetes, but these virulent outbreaks are sporadic, unpredictable and highly disruptive, putting enormous pressure on clinics, health workers and laboratories. Getting diseases like dengue under control would have a vast [positive impact](#) across the whole of the public health system.

Despite this, dengue gets little attention on the global public health agenda. Most cases of dengue and Zika still remain undiagnosed. The social impacts of dengue fever transcends the perceived (low) severity of the disease. In dengue-affected zones, where it is more than a norm for one in the family to support the rest, dengue fever can have tragic repercussions to the whole family and their ability to get by.

This is further complicated by the fact that efforts to combat dengue tend to be isolated, short-lived and piecemeal, limited to only certain sectors or geographies.

Break Dengue is a non-profit organization that seeks to address these issues by connecting different initiatives around the world that are addressing the issue of dengue so that together they can have a bigger impact.

¹ Global Strategy for Dengue Prevention and Control, 2012 – 2020, World Health Organization

Let's break the silence and make dengue a priority.

Challenges

Break Dengue is committed to implementing the most scalable and sustainable idea on how to communicate the dengue risk, develop the prediction tool and build a strong scientific community. We will carefully analyse all submissions per each challenge and offer a symbolic prize (200€ in the form of gift vouchers per winning team) to the best ideas.

1. Communication and increasing awareness of dengue burden and risks

Issue today: A key target audience of Break Dengue are the general public living in dengue-endemic areas. However, a challenge we face is that many people from these areas do not consider dengue to be as serious as other diseases; either as they are not fully aware of the risks of dengue, or do not fully comprehend the impact and burden of dengue from a health and economic standpoint. Additionally, many of those at risk of dengue may have limited or no internet access, making them hard to reach.

Solution sought:

A solution that will help general public in endemic areas realize the reality of the dengue burden and risks, and will mobilize them to take action in some way to show that we have growing and widespread grassroots support to fight dengue. Solutions should anticipate how to communicate to those who do not have ready internet access.

2. Generating better data about dengue, dengue surveillance and creation of a Dengue Barometer

Issue today: According to Margaret Chan of the World Health Organization, dengue is the most important mosquito-borne viral disease in the world. A key strategic priority identified by the WHO to tackle dengue morbidity is to implement improved outbreak prediction and detection (Global Strategy for Dengue Prevention and Control, 2012 – 2020, World Health Organization).

Better diagnostics and disease surveillance data are required if we are to understand and measure the true scale of the challenge. When they work in parallel, mosquito control, vaccination, faster diagnostics and effective treatment can combine to turn the tide against diseases like these. There are existing efforts to try and track the spread of dengue, but they are being addressed in a piecemeal, siloed way. We need a unified and coherent approach to generate one solution to accurately predict and detect dengue cases.

In 2016 Break Dengue has launched [Dengue Track \(beta\)](#), the first step in building the ultimate dengue barometer. Dengue Track today is a crowd surveillance tool that tells users via a simple, interactive chat when they may be at risk of contracting dengue (based on official data sources), and allows users to verify this information by confirming if they or someone close to them have had dengue recently, creating a positive feedback loop. If users sign up to be Dengue Trackers, they are reminded to update their dengue status regularly and will be alerted to any outbreaks near them. [The Dengue Track map](#) plots all the different data points in one map so it's easy to see when there is dengue near you.

Dengue Track today is still in beta and does not yet represent our vision of what it could become. We need your help to define a fully integrated solution that will allow it to reach its full potential.

Solution sought:

The long term vision is to build a much more sophisticated dengue barometer that brings diverse sources together to generate a highly accurate dengue prediction tool. However, we need a solution to make this happen, bring these all together on Dengue Track as the central portal, and in a way that would bring the most value to people

using it (e.g. local health authorities and NGOs). Besides the crowdsourced surveillance capability offered by Dengue Track, existing sources of information include official sources, a very promising joint research project between Break Dengue and HealthMap which looks at Google search behavior to predict dengue cases, [DengueMap](#) by HealthMap which plots recent reports of local or imported dengue cases from official, newspaper and other media sources, and rapid diagnostic tests for dengue (tests which can be performed on the ground, and results geo-localized). In addition, there is also the potential in the near future to use social media mentions to predict and plot dengue cases. There may be other sources to integrate that we have not yet explored fully, such as tracking information about vector populations (in this case mosquitos), flight paths and human travel patterns, [human phone call behavior](#), etc.

This variety of sources would offer a more 360° view of the disease, and this multi-layered approach would deliver greater veracity. The model is more accurate because the volume and variety of data sources helps to correct errors that may arise in any individual source.

There are many exciting possibilities offered by Dengue Track and it isn't limited to dengue. In the longer term, we see potential to extend this technology to other diseases, including Zika, yellow fever and chikungunya, carried by the same mosquito as for dengue, and indeed other important diseases such as malaria. Therefore solutions could also consider how to integrate with these other diseases.

Besides the question of how to integrate these different sources, another issue we would like taken into account is how the crowd surveillance aspect of Dengue Track can be enabled in situations where the target audience do not have easy access to computers and/or smartphones.

3. Building ambassadors and mobilizing the scientific community

Issue today: Break Dengue has an expert community on Global Health Network called [Global Dengue Lab](#). With around 1250 members today, Dengue Lab is open to professionals researching or working on dengue fever and related topics. Dengue Lab aims to:

- build a comprehensive, integrated and dynamic knowledge base from which to build more effective models and methods for dengue prevention and control
- inspire concrete activities and initiatives that address the common objective of reducing the public health burden of dengue fever.

Solution sought:

A solution that will 1) attract and increase the number of experts we work with, on Dengue Lab or otherwise, and 2) maximize this resource by finding a way to engage with these key opinion leaders more often and in a way that will result in greater value generated on either side, online using Dengue Lab, or offline.

Ideally Break Dengue will foster a robust panel of experts that will act as an expert advisory group, with which to test ideas and approaches, and increase the number of expert "ambassadors" that will communicate about Break Dengue on our behalf and allow us to make an even greater impact on the ground.

