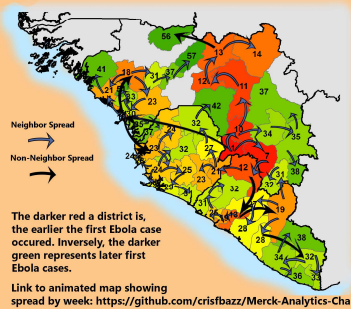


WILL AN EBOLA VACCINE CHANGE WORLD HEALTH?

The Ebola outbreak that ravaged the West African region over the course of the last two years was the worst the world has ever seen. In response to the devastation, world health leaders including Merck are designing vaccines to combat the virus and change world health. To aid in the effective deployment of a vaccine, we have researched the spread rate, areas of high concentration, strategy risks, and patient income.

HOW FAST DOES EBOLA SPREAD

Week Of First Ebola Case in each District of West Africa



87% of West Africa districts contracted their first case from bordering districts.

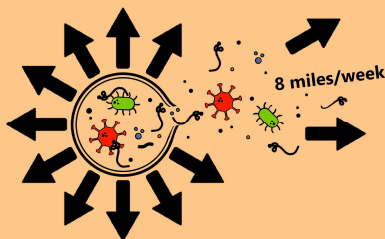
The lack of transportation infrastructure means Ebola spreads to neighboring districts most easily.

First Direct Spreads From Beginning Case

Using the first districts that contracted Ebola from the source case allowed us to calculate the distance that the virus traveled and calculate an average spread rate.



Ebola's Spread Rate

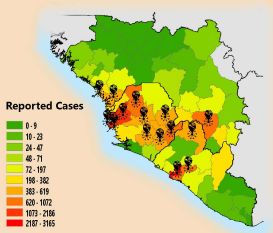


HOW TO DEPLOY THE VACCINE

RIGHT NOW

AFTER THE OUTBREAK

Hotspots Of Reported Cases in West Africa

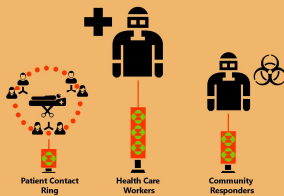


Hotspots indicate areas that are highly susceptible to rapid transmission of Ebola. Deploying a vaccine in these districts can prevent them from becoming hotspots again.

Remaining vaccines can be given to districts surrounding the hotspots moving outwards.

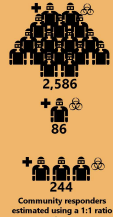


Priority Groups of Vaccination



When deploying the vaccines in the districts, the priority group should receive the vaccine first, then the remaining vaccines can be used to try to achieve at least 80% of the rest of the population (community immunity).

Total Health Care Workers & Community Responders



Guinea
2,586
86
Liberia
244
Sierra Leone

Community responders estimated using a 1:1 ratio of HCW

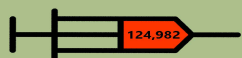
Average Household Size



7
5.1
5.9

Number of Vaccines

Priority Group Vaccines



Household Size

X

Number of Cases in Each Country (contact ring)

+

Number of Health Care Workers and Community Responders in Each Country

The Rest of The Population Vaccines (Herd Immunity)



80% of the Rest of the Population immunization means most members of the community are protected

IN THE FUTURE

IN CASE OF A NEW OUTBREAK

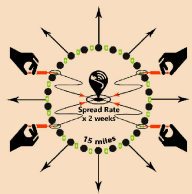
Time for a Vaccine to be Effective



Containing the spread

Start the vaccination in a radius distance of 15 miles (spread rate x 2 weeks) from the new reported cases, then move inside and outside this range.

When the spread reaches the radius areas everyone there will already be immunized.



STRATEGY RISKS

Access to Vaccines & Informed Consent

The majority of the West African population lives in rural villages. This means limited income, access to education, transportation and health care.

As a result, few patients will understand the risk of receiving a vaccine.



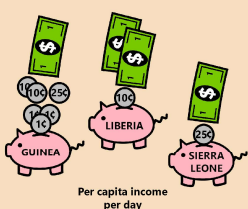
Basic education of vaccination risks should be provided by Merck as a courtesy to patients receiving the vaccine.

This information can be provided via a mobile vaccination vehicle, reducing the need for patients to travel to health care center.

Patient Income

An average poverty rate of over 65% in the 3 most affected countries means patients will not be able to afford a vaccine by themselves.

Vaccines must be funded by world health organizations, donated by developed nations, or subsidized by local governments.



MERCK ANALYTICS CHALLENGE

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