Crowd Sourcing for Public Health Emergencies

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Global polio eradication progress 1988 - 2019
Global cVDPV cases and environmental positive isolates reported post switch

Data in WHO HQ as of 26 Jun. 2018

1. Excludes viruses detected from environmental surveillance

Onset of paralysis 27 June 2017 – 26 June 2018

Papua new Guinea

Dot represents cVDPV1,2 & 3 cases randomly distributed within the second administrative level and the time period is based on the date of onset of the cases. The environmental sites are represented to the closest location of the sample collection and the time period based on the collection date of the sample.

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

Map Scale (A3): 1:20,000,000

1 cm = 200 km

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.
Children who are affected by polio may be:
- Unreachable
- Inaccessible
- Hard to find
- Marginalized by society
- Escaping war
- Living in remote places
- Unaware polio is preventable
Vaccines that protect against polio have to be carefully maintained and administered. Kept between 2-8°C. Transported to places that may be remote, insecure, inaccessible. Administered by a vaccinator.
After a vaccination campaign, representative surveys are conducted to ensure all children are reached; these are conducted in conditions that are..
Where do people live?

denominator

bounding box

connectivity

key locations
Can crowd-sourcing help us to understand where children live?
Mapathons were used as a means to reach the unreachable.
What is a mapathon?
How this is done?
How this is done?
How this is done?
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Mapathon results

Friday 19 - Mon 21 Jan, 2018
over 72 hrs
338,953 structures mapped.
Mapping of DFA and team areas
Cross validation
Fixed
post
Case study 2

Total StructuresMapped (Somalia & DRC)

1,334,992

Last update: 12 hours ago

Structures created during Mapathon

515,319

Last update: 12 hours ago
For Tanganyika we have found more than 250 settlements which was never included in the normal microplan. New settlements keep overflowing into the micro-plans for DRC.

Example of microplan map
Lovoi
1910 Population
200 Building structure
10 person per structure
Bukama, Katobwe
5989 Population
265 Building structure
23 person per structure
Supporting Outbreaks
The cases reported are mapped closest to the location of the village or health centre.
- Creating a 20kms. Buffer around the major roads.
- Creating a 20kms. Buffer around the existing river ways.
Overlaying the major roads and waterway buffer all the cases got covered within the buffer.
The layer on building structures would be a key component to analyse the risk at granular level.
1.5 – 1.8 million U5 children* within the buffer zone of 20kms from the major waterways and major roads.
We had an ambition of mapping entire Africa, 300 million points within a time span of 72 hours using 300,000 volunteers globally.
World of Automation
World of Automation

Mapping every building in Sub-Saharan Africa
powered by satellite imagery and artificial intelligence
by Digital Globe
World of Automation

Disease Prevention Maps

https://dataforgood.fb.com/tools/disaster-maps/
Crowd source and automation
Comparing WHO mapathon with facebook disaster maps
1. combination of both crowd sourcing and automation could be a good idea.
2. Creating training samples can be crowd sourced.
3. Automation could be used to do the feature extraction.
4. Validation of outcomes of the building foot prints can be crowd sourced.
thank you