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ESA - PhiWeek
12th Nov 2018

@unicefinnovate

UNICEF Innovation

UNICEF: 70 years
to every child



Some people think of innovation as a new idea or a new product. But innovation is a process. It's the process of taking an idea and turning it into a reality. It's the process of taking a problem and finding a solution. It's the process of taking a challenge and meeting it head-on. It's the process of taking a risk and making it pay off.

UNICEF Innovation is a team of people who are passionate about finding new ways to solve the world's most pressing problems. We are a team of people who are committed to making a difference in the lives of children and young people.

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The challenge for change is not to create a new idea, but to create a new environment and a new culture of the mind to share, build and sustain. Innovation is not a one-time event, but a continuous process. It's the process of taking a problem and finding a solution. It's the process of taking a challenge and meeting it head-on. It's the process of taking a risk and making it pay off.





UNICEF Stats



190 offices

70 years old

5.5B USD/year

12,000 staff (88% in the field)

In **337 emergencies in 2017** in 102 countries

Also:

Buyer of ~34% of the world's vaccines...

And largest single purchaser of pencils

Big + Complex Problems



pandemics

climate change

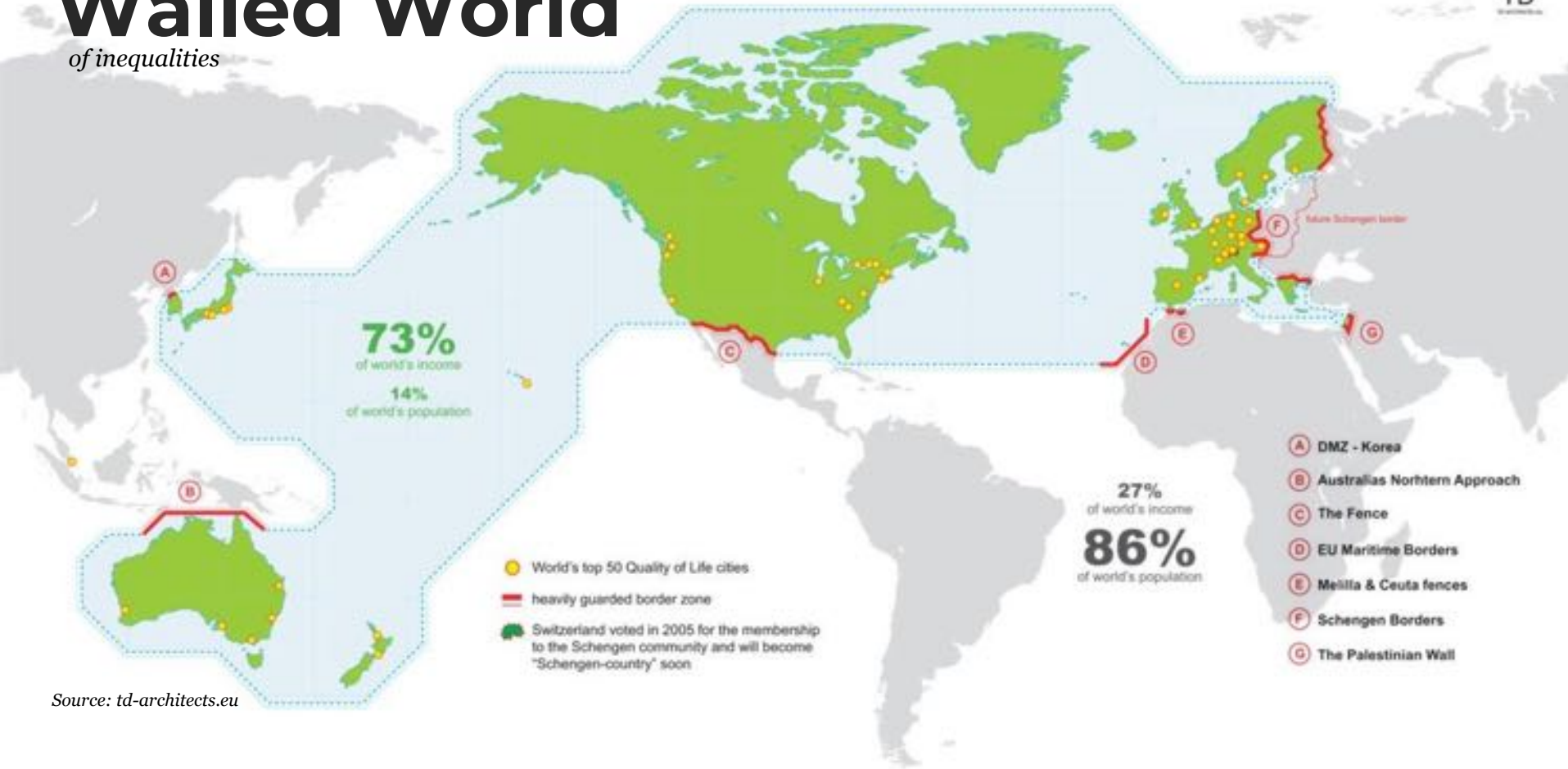
urbanization

migration

vanishing jobs

Walled World

of inequalities



Effect of a 1°C Increase in Temperature on Real per Capita Output

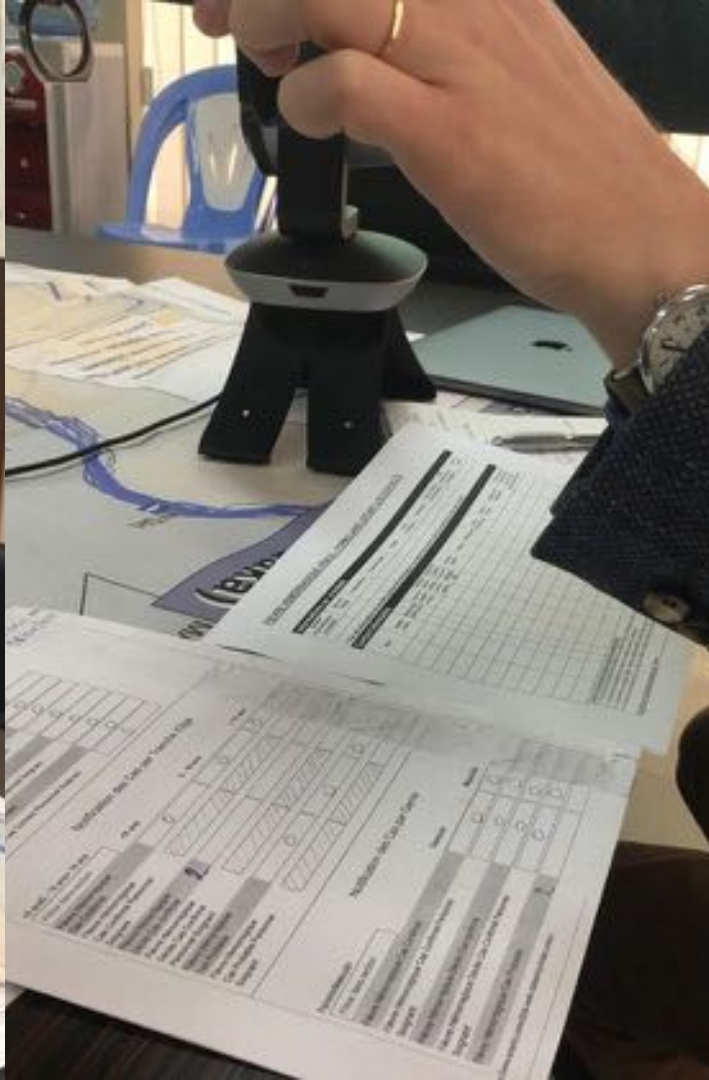












Cartographie du choléra en RDC:

Atlas provincial de prévalence
et de mortalité
du choléra en RDC

REPUBLIQUE DEMOCRATIQUE DU CONGO



Legende

- ### Identification des zones de prévalence
- Prévalence élevée (≥ 1%)
 - Prévalence moyenne (0,5% - 1%)
 - Prévalence faible (0,1% - 0,5%)
 - Prévalence très faible (< 0,1%)
 - Zone de prévalence inconnue

- ### Direction de prévalence de choléra
- Direction plus élevée
 - Direction moins élevée
 - Direction globale

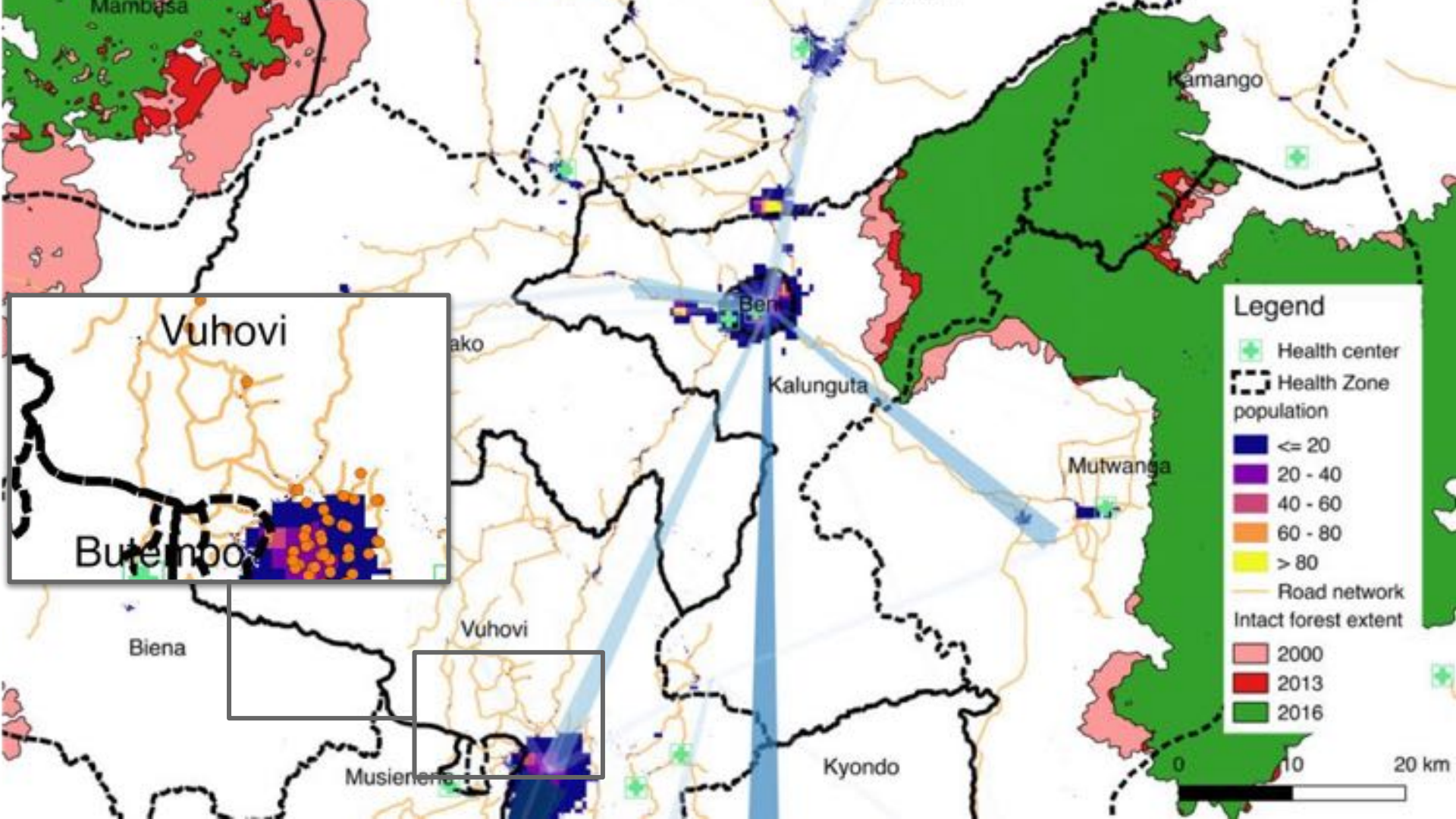
- ### Facteurs influençant la répartition géographique du choléra
- ▲ Eau courante
 - ▲ Qualité de l'eau (indice de qualité de l'eau - IQE)

- ### Facteurs socio-économiques
- ▲ Densité de la population
 - ▲ Niveau de vie
 - ▲ Niveau d'éducation
 - ▲ Niveau de santé
 - ▲ Niveau de mortalité
 - ▲ Niveau de mortalité infantile
 - ▲ Niveau de mortalité maternelle
 - ▲ Niveau de mortalité néonatale

- ### Facteurs géographiques
- ▲ Altitude
 - ▲ Climat
 - ▲ Relief
 - ▲ Type de terrain
 - ▲ Type de climat
 - ▲ Type de végétation
 - ▲ Type de sol
 - ▲ Type de roches
 - ▲ Type de végétation
 - ▲ Type de sol
 - ▲ Type de roches







First Situational Reports with Mobility and Sat Image Intelligence to Country Office

Sep 4th 2018

Mobility patterns in Ebola

The report summarizes the situation in Nord Kivu and Ituri in between areas, as observed by aggregated phone records, estimate the likelihood of Ebola spreading to other areas where are observed to travel to other places.

Data sources

- Phone Data:** Provided by Airtel
- 212 different locations in Nord Kivu and Ituri
 - Movements observed between these locations over August
- Population Data:** Provided by UNICEF DRC (original data).
- Health Zones map:** Provided by the Ministry of Health (M

Movements from Ebola affected:

Human movements are an important proxy for disease spread computed from phone data. All movements plotted are real, what other flows of movement we might be missing because

As observed in the map below, the most noteworthy flows of **affected zones** are (see red circles in the map of Figure 1):

1. Biggest number of travels from West Matoko to Beni
2. Second biggest number of travels is from Beni to Matoko
3. Significant amount of travels to Mambasa/Mandera from Matoko, at its border with Oicha, and from Beni
4. Significant amount of travels from the center of Oicha/Butembo through Musenyene to Northwest of Lubero
5. Many small flows that amount to a significant total amount, mainly coming from the center and north of Oicha at

Prepared by:
UNICEF - Office of Innovation

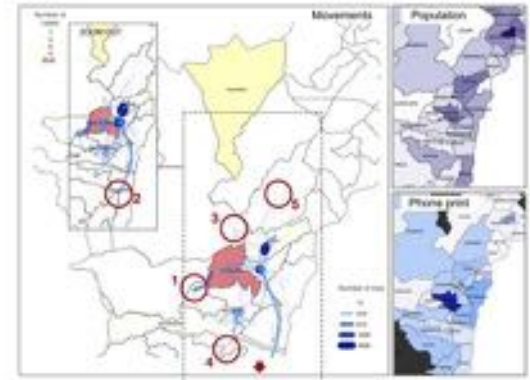


Fig 1. Flows of movement originating in Ebola affected zones in the Nord Kivu and Ituri provinces. Note: movements are computed as the sum of all the changes of location from one day to the next, considering the location of a phone the place from which it did the last invocation of the city call, SMS or data.

Note:

Close data plotted as appearing in WHO External Situational Report (August 22nd):

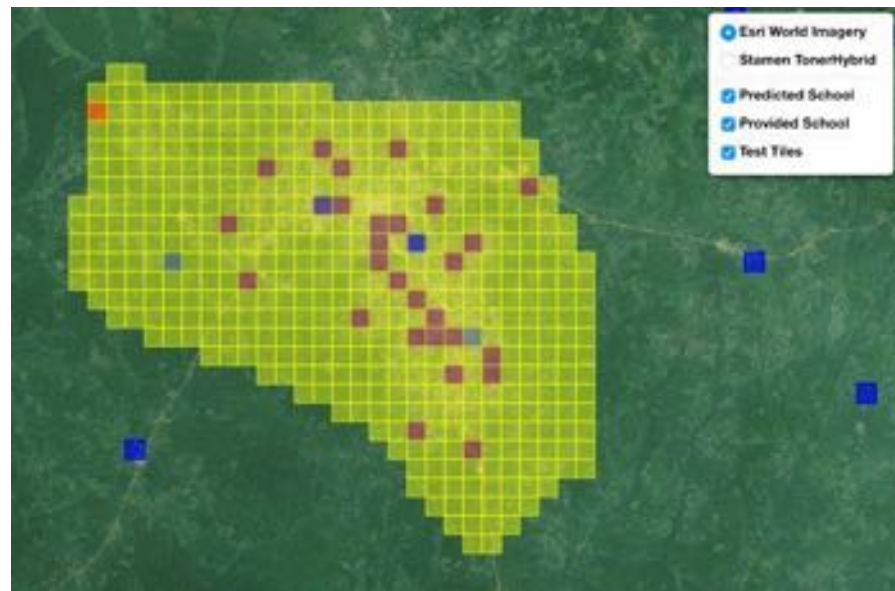
Zone	Probable	Confirmed	Deaths prob.	Deaths conf.	Total cases
Beni	0	6	0	4	6
Butembo	2	0	2	0	2
Matoko	21	61	21	27	82
Mandera	2	7	2	1	9
Musenyene	1	0	1	0	1
Oicha	1	1	1	0	2



Can we map all the schools in the world?



Deep Learning for automatic detection



Preliminary results for Liberia with more than 75 % overall accuracy.

Collaborators: Oxford University , UCSD, Development Seed, UNOSAT, PAHO



Region Mobility

Baseline Activity/Mobility Index

Monday Tuesday Wednesday

Thursday Friday Saturday

Sunday

Region Threats

Natural Disasters Index

Violence Index

Zika Risk Index

Region Vulnerabilities

Human Development Index (inverted)

HDI estimated

Population

School Capabilities

Connectivity

Internet Connectivity 4G Coverage

3G Coverage 2G Coverage

School context

Connectivity, poverty, nutrition...

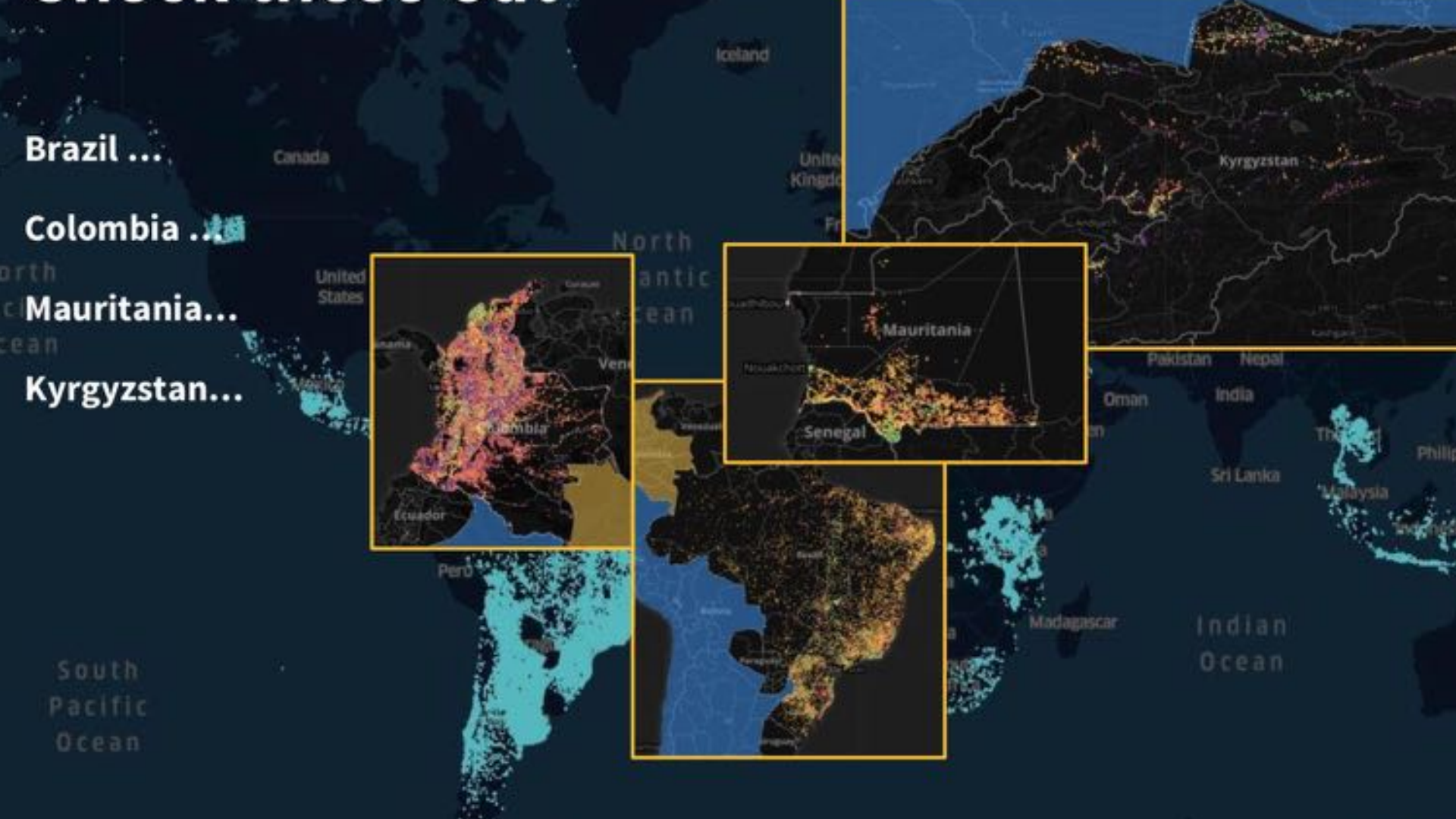


Brazil ...

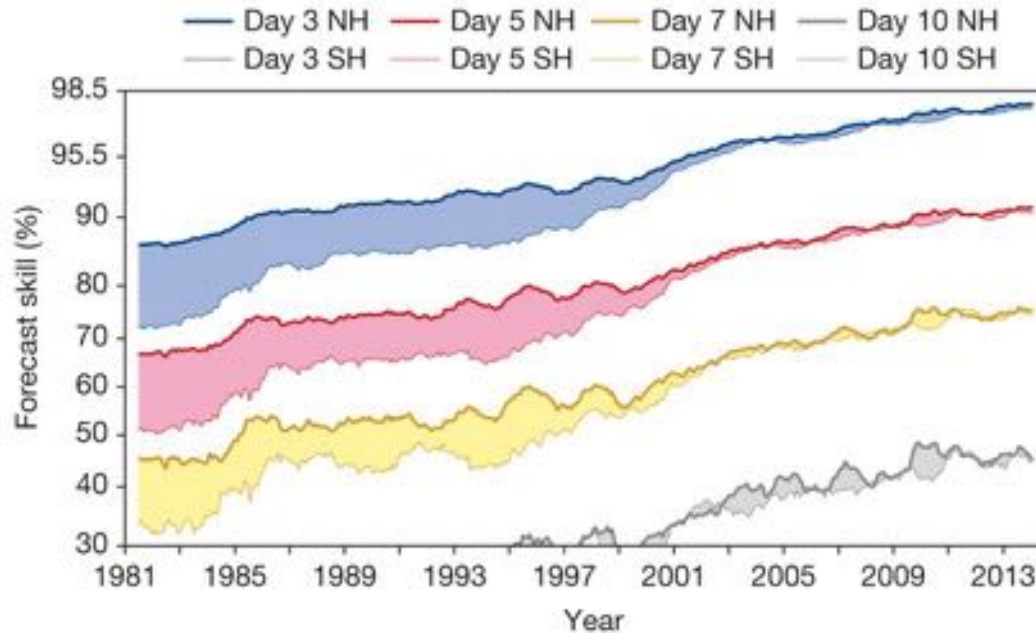
Colombia ...

Mauritania...

Kyrgyzstan...

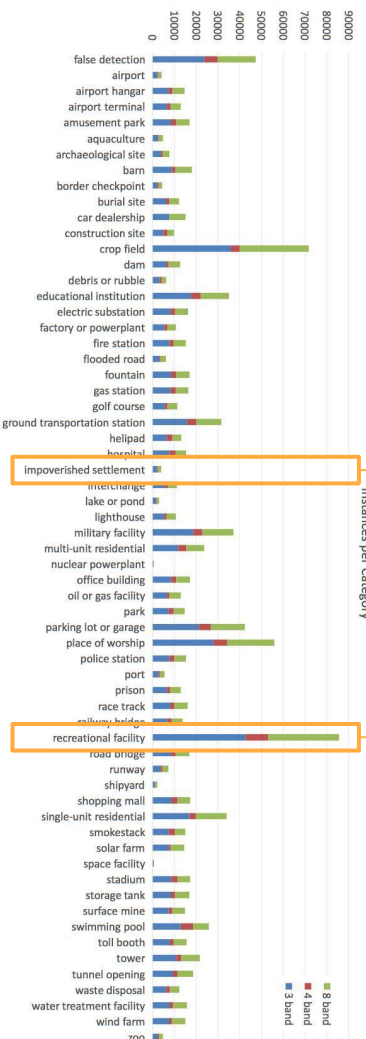


The future...

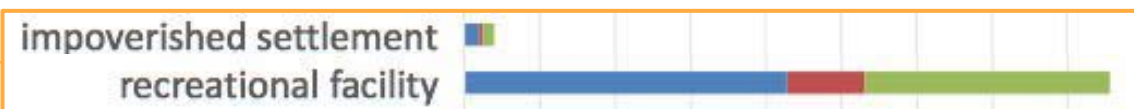
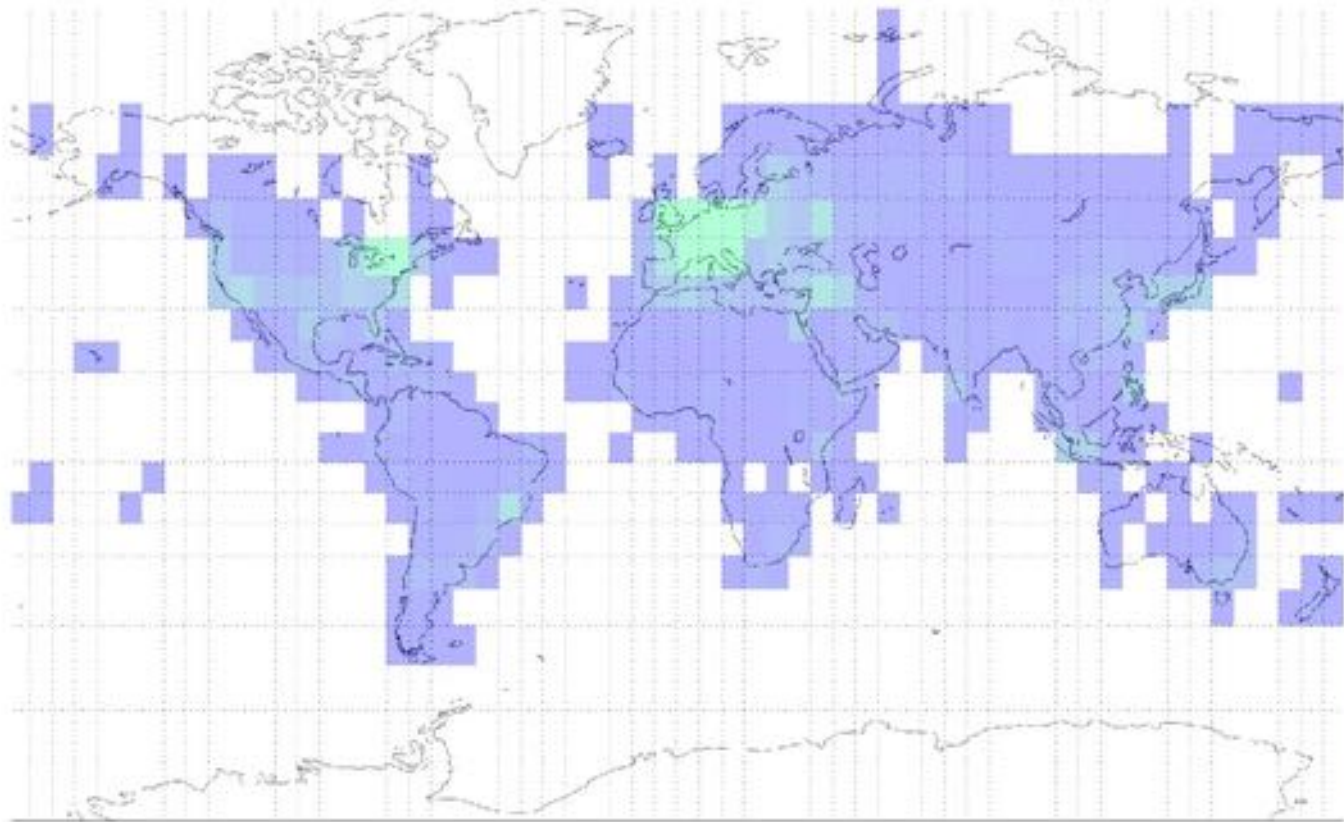


...has 2 challenges...

1 Algorithmic & Data Equity




Instances per Category





Some problems are **HARD**
given the **RIGHT** data and
algorithms

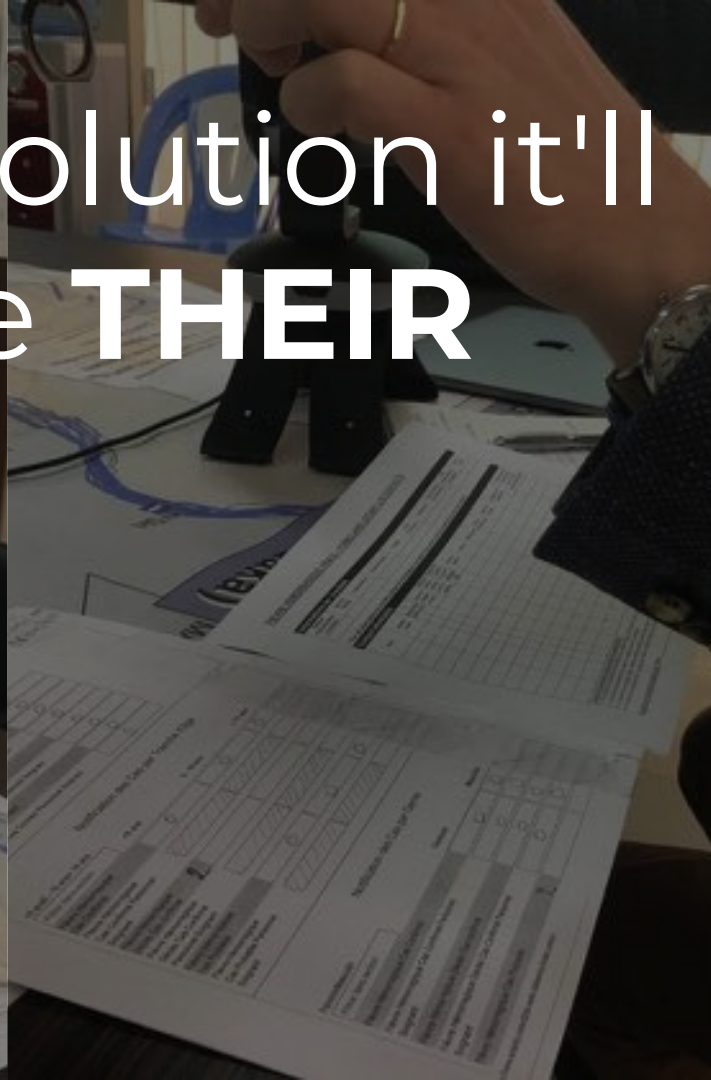
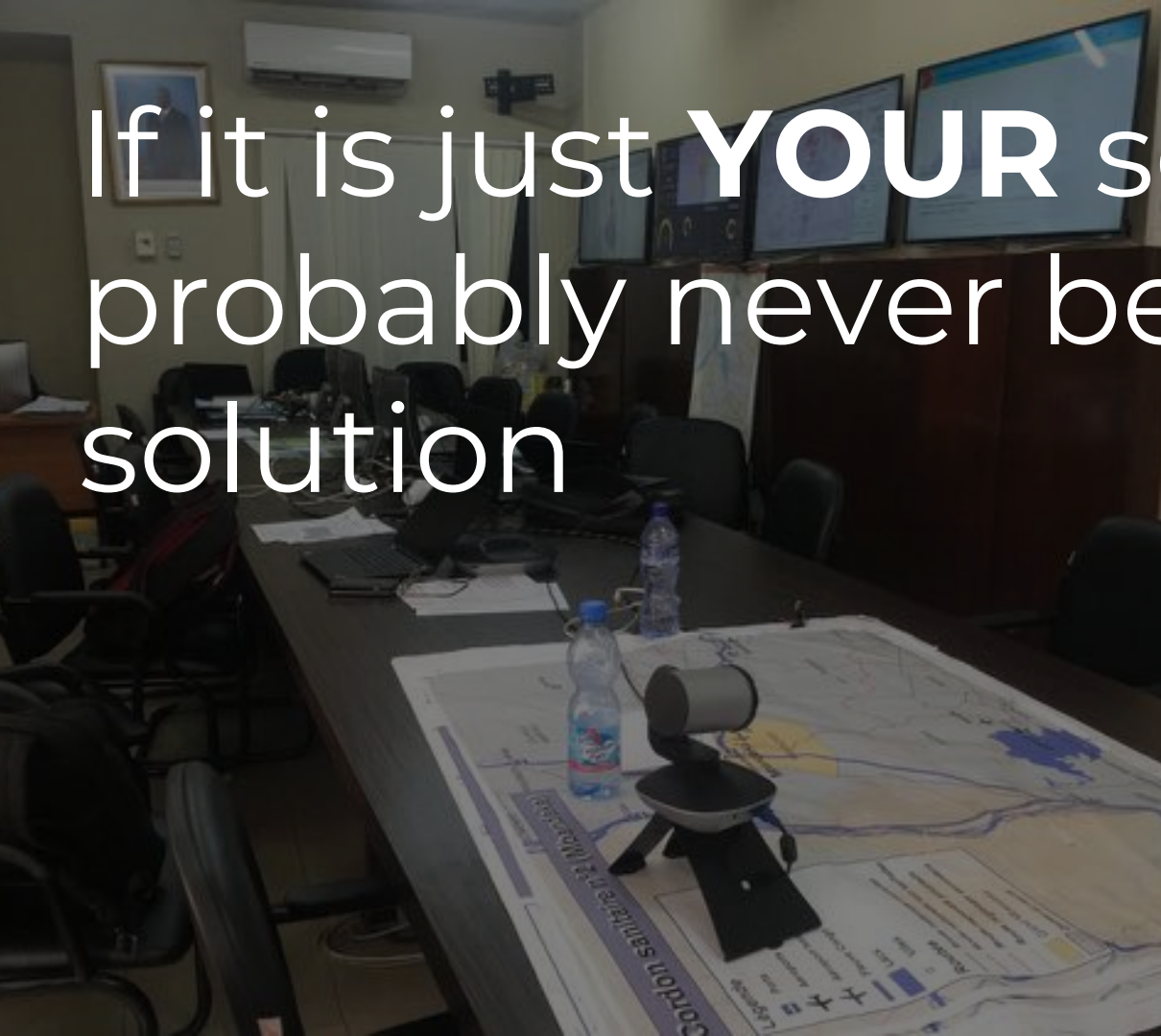
Liongwe, Malawi



Indiana, USA

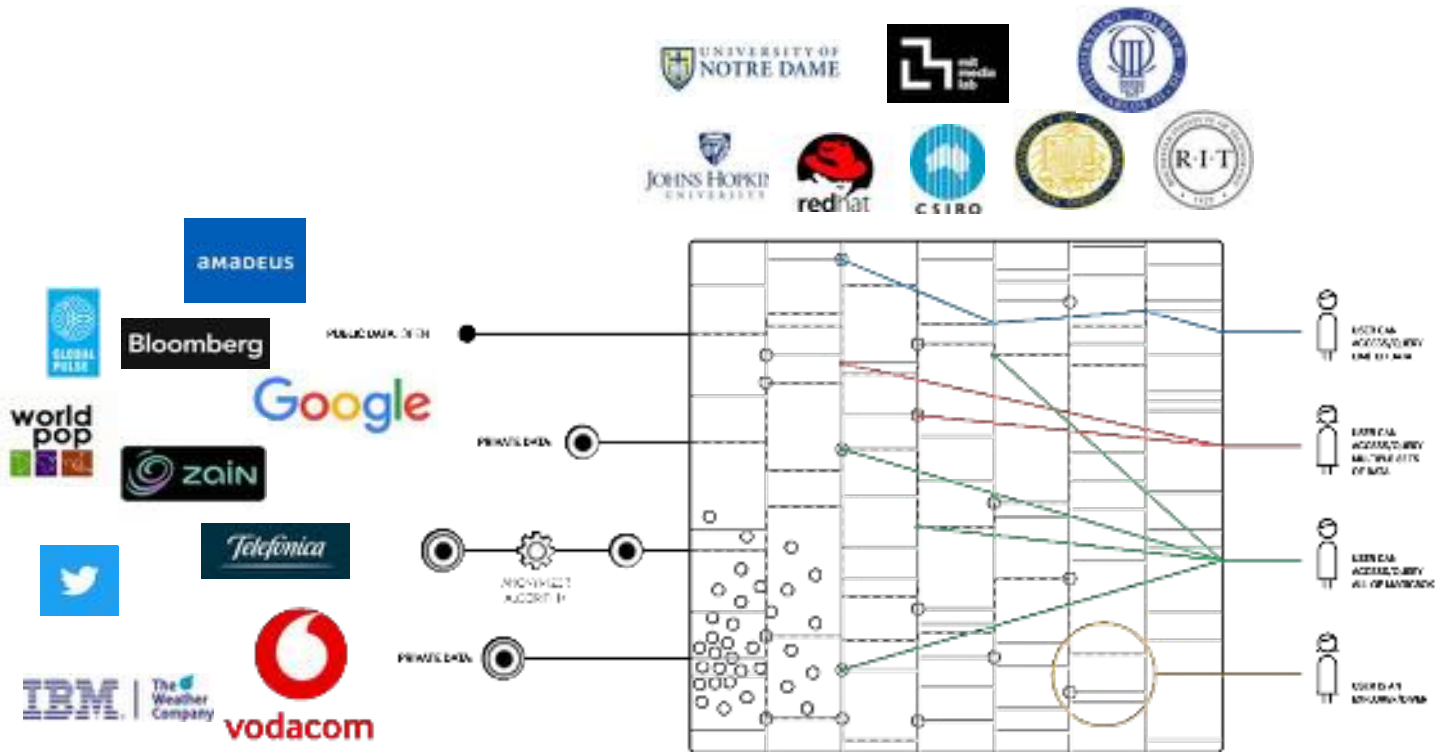
2 Closed systems, data and algorithms

If it is just **YOUR** solution it'll probably never be **THEIR** solution



Magic Box

An open Source Platform to connect
A common effort to make available data science, Big Data and AI to tackle global problems



A group of children and adults in a slum, with a soccer ball being thrown in the air. The children are smiling and making peace signs. A man in a blue suit is standing on the left. A soccer ball is in the air in the background.

Connect

<http://unicefstories.org/magicbox>

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