



BIG DATA INNOVATION FOR SUSTAINABLE DEVELOPMENT AND HUMANITARIAN ACTION

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Global Pulse

An innovation initiative of the UN Secretary-General

Vision:
public good

Big data harnessed responsibly as a

Mission:

Accelerate discovery and adoption of big data
innovation for sustainable development and
humanitarian action

Pulse Lab New York
Est. 2010

Pulse Lab Kampala
Est. 2013

Pulse Lab Jakarta
Est. 2012

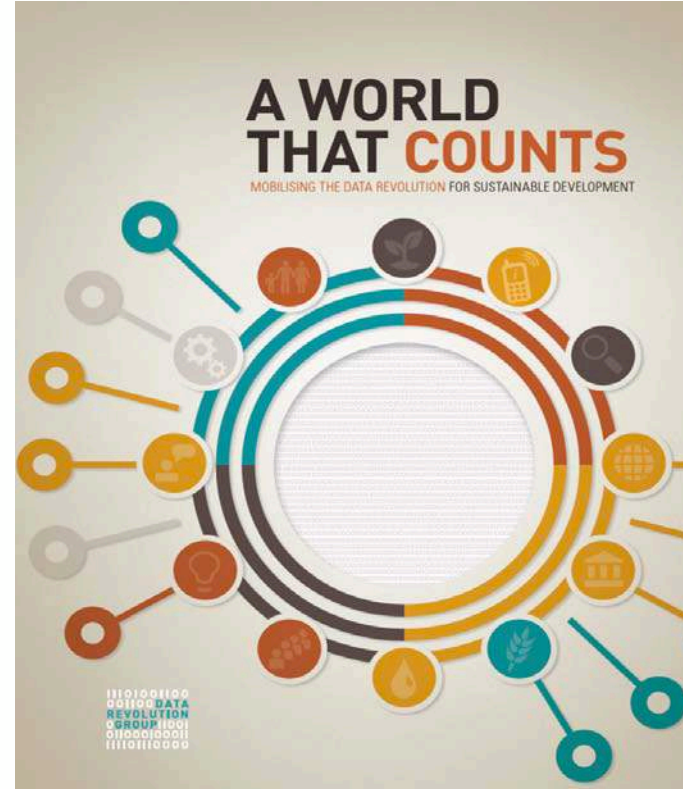


What is Global Pulse?

1. **Data Innovation Lab:** We help public sector institutions discover, develop, and test high-potential applications of real-time digital information to improve decision-making.
2. **Data Policy Think Tank:** We catalyze development and adoption of standards and policy frameworks for risk management and responsible use of big data for for the public good.
3. **Public Engagement Platform:** We advocate for private sector data philanthropy and promote public awareness of the vital role of big data in the achievement of the SDGs.



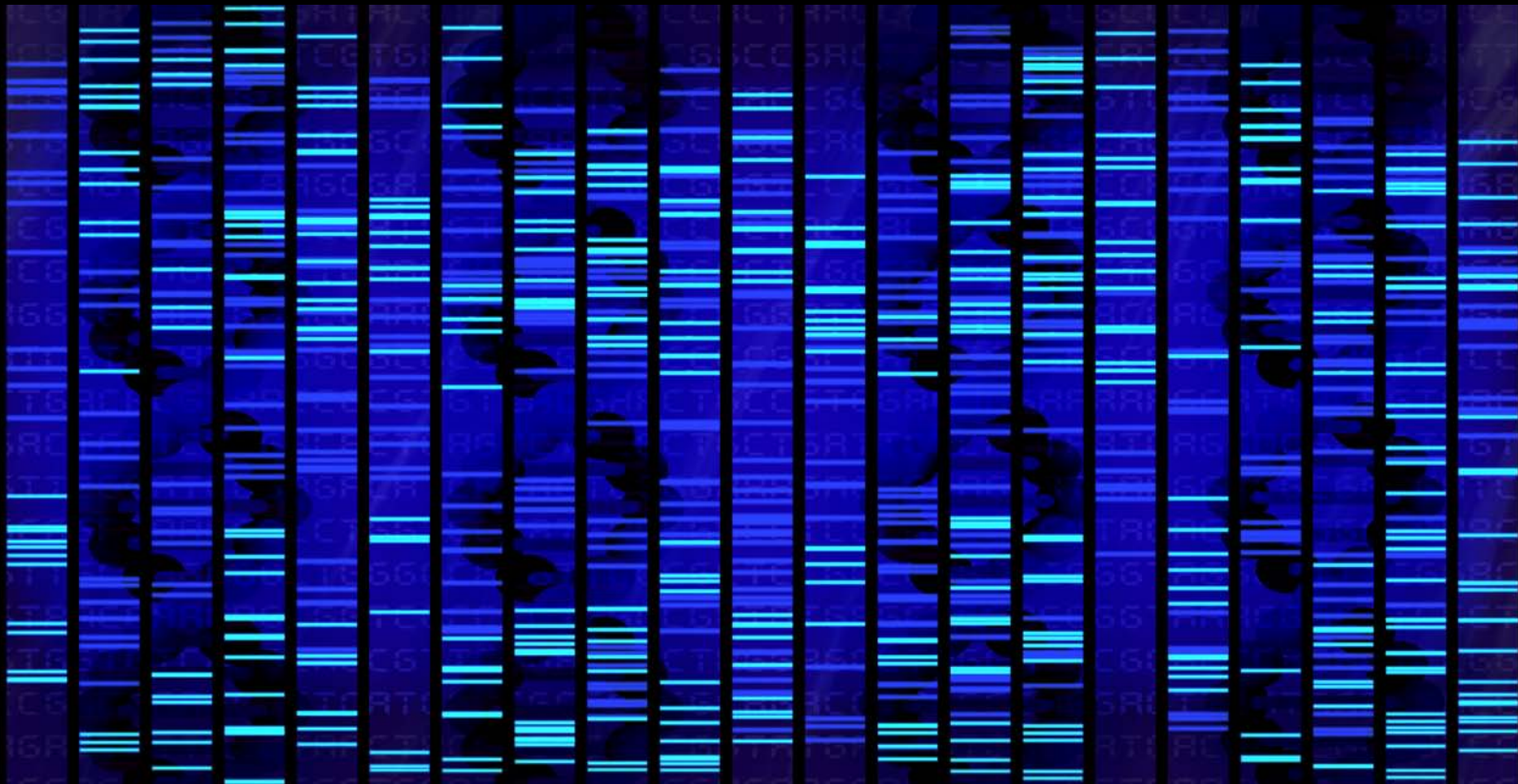
“WE NEED A DATA REVOLUTION FOR SUSTAINABLE DEVELOPMENT”

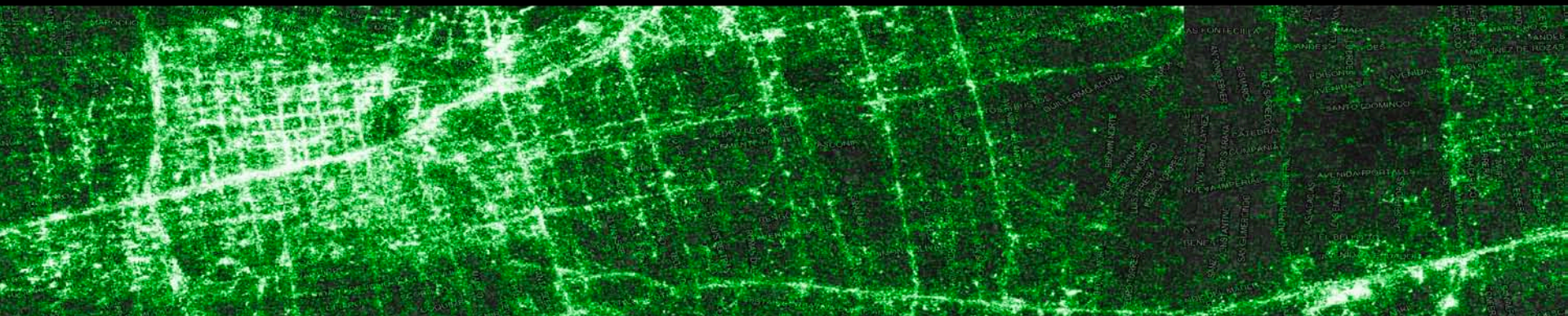


What is a data revolution?



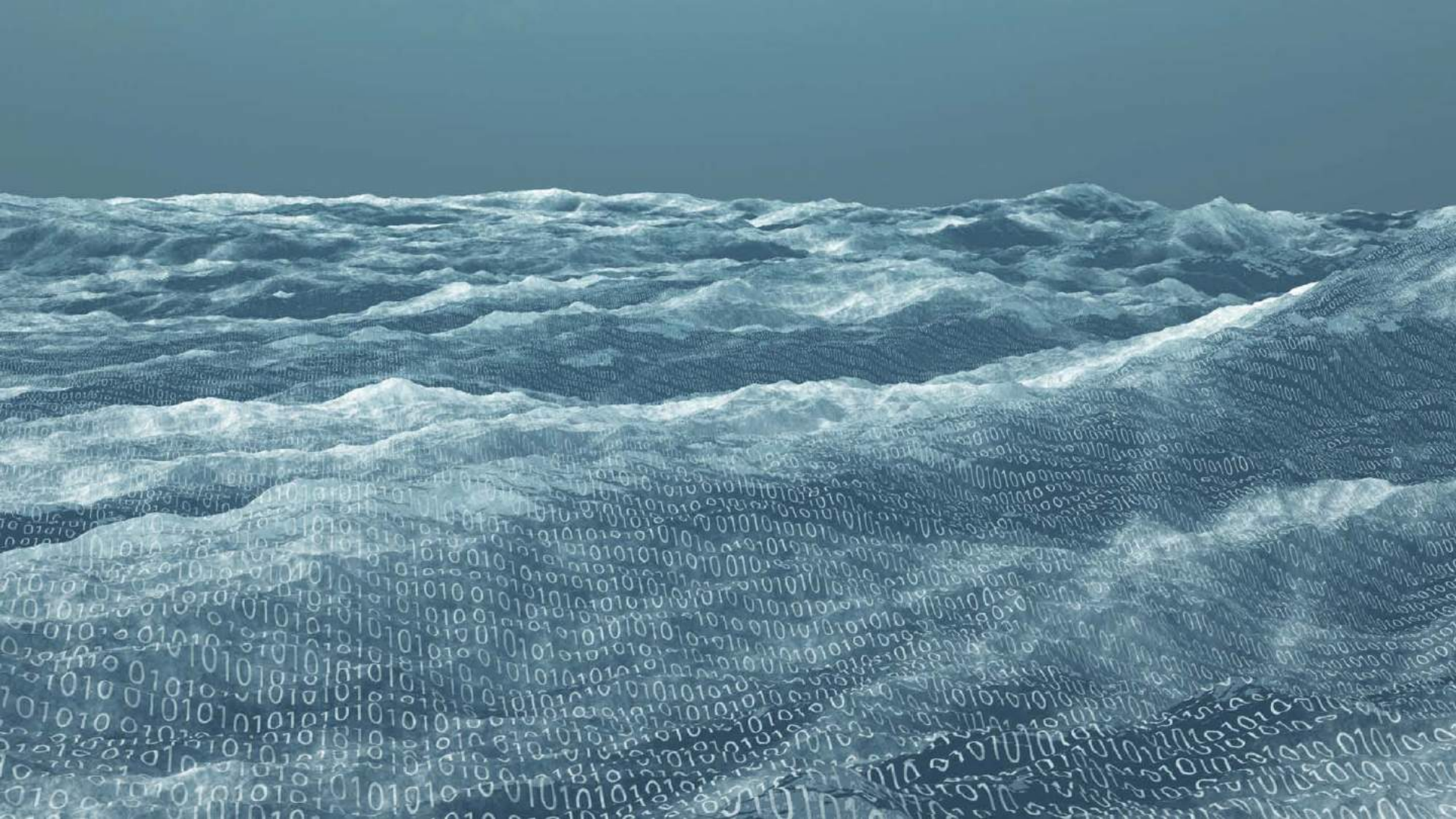
What is a data revolution?





hypothesis:

**digital services are sensor networks
for human wellbeing**



Why they call this a data revolution



survey data



big data

Real-time, continuous observation of human behavior on a massive scale



Production

Collection

Control

Use



Citizens



Machines



Corporations



Govt



Production

Collection

Control

Use

New, Digital Data Sources which Reveal Behavior Change

What people say

Online news

Social media

Retail advertising

Radio & Television

What people do

Online search

Web traffic

Mobile communications

Financial transactions

Postal traffic

Utility consumption

Emissions

BIG DATA FOR SDGs: OPPORTUNITIES

1. **Enhanced Early Warning:** Earlier detection of anomalies and events allows rapid response to crises.
1. **Improved Planning:** Real-time proxies of statistical indicators support better planning at reduced cost.
1. **Managing Operations:** Real-time trend analysis of population activities and dynamics can inform the implementation of programmes and policies.
1. **Monitoring and Evaluation:** Real-time feedback from citizens, and measurement of behavior change, allows for adaptive course corrections in programmes and policies.

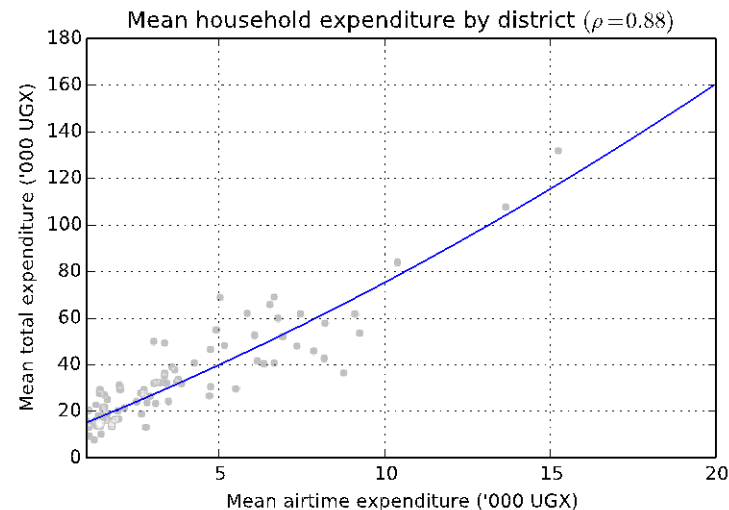
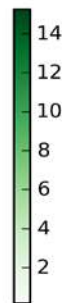
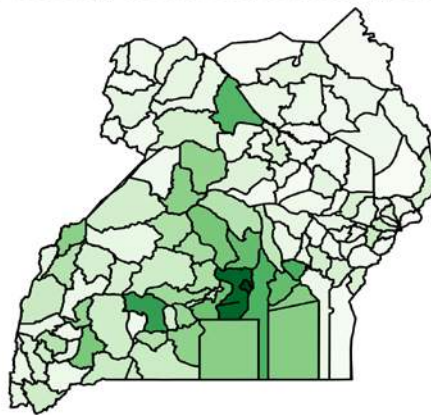
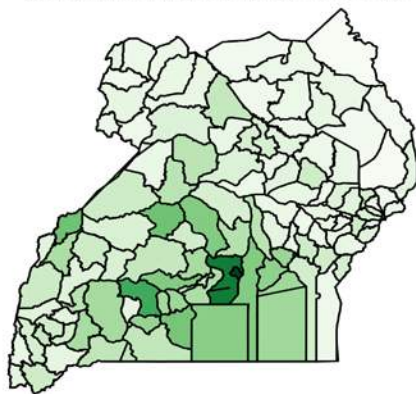
DATA INNOVATION FOR THE SDGs



POVERTY MAPPING WITH DATA DERIVED FROM MOBILE PHONE ACTIVITY



Mean monthly household consumption per adult equivalent ('000 UGX) Mean monthly airtime expenditure ('000 UGX)



**Household consumption
based on surveys**

Airtime expenditures



AUTOMATED ROOF COUNTING: PROXY FOR POVERTY MAPPING

Photo



Satellite image











Thatch



Metal



Metal



Thatch



Thatch



Metal



Metal

Metal



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Thatch



Metal



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Metal



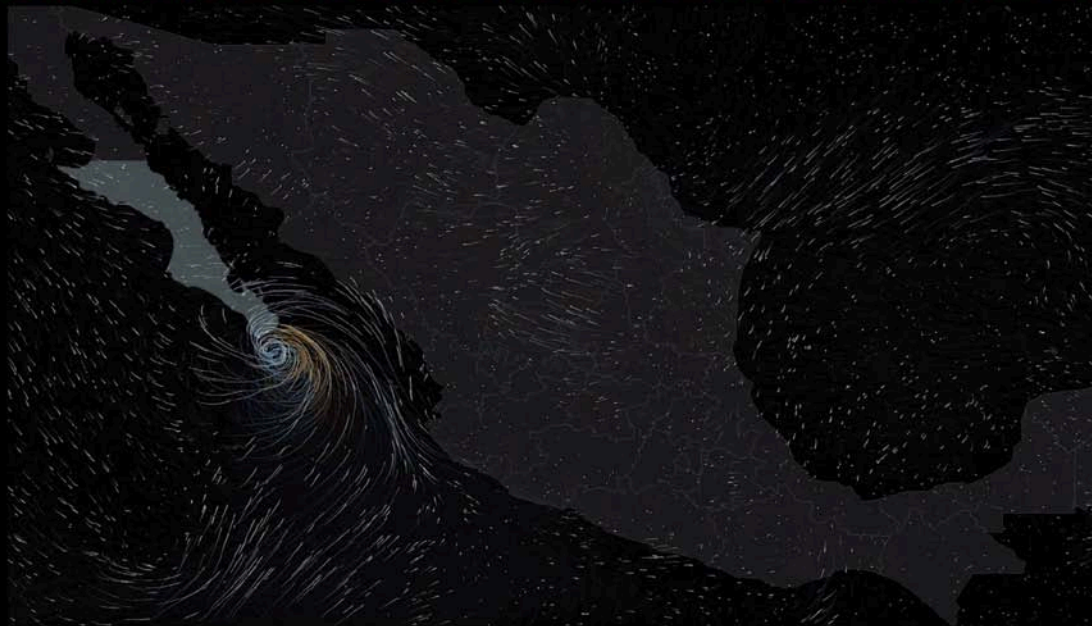


Measuring disaster resilience through financial transactions: Global Pulse and BBVA Data and Analytics



HURRICANE ODILE

The first major, and most destructive, hurricane to hit Baja California Sur in 25 years.



Wind speed

Odile made landfall in September 2014 near Cabo San Lucas as a large **category 3** hurricane, with a windspeed of approximately **110kt** (> 200km/h).



Expected vs. Actual number of transactions



 **Click on** the regions below to see the difference.

Baja California Sur

San José del Cabo

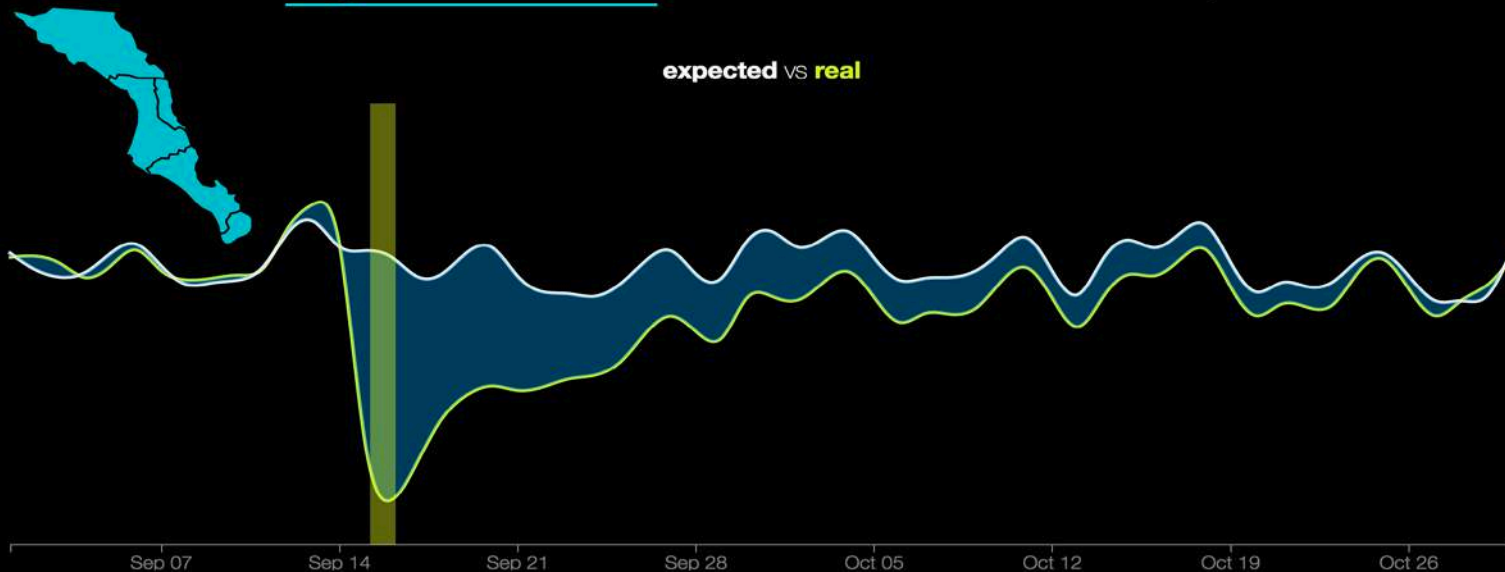
Todos Santos

La Paz

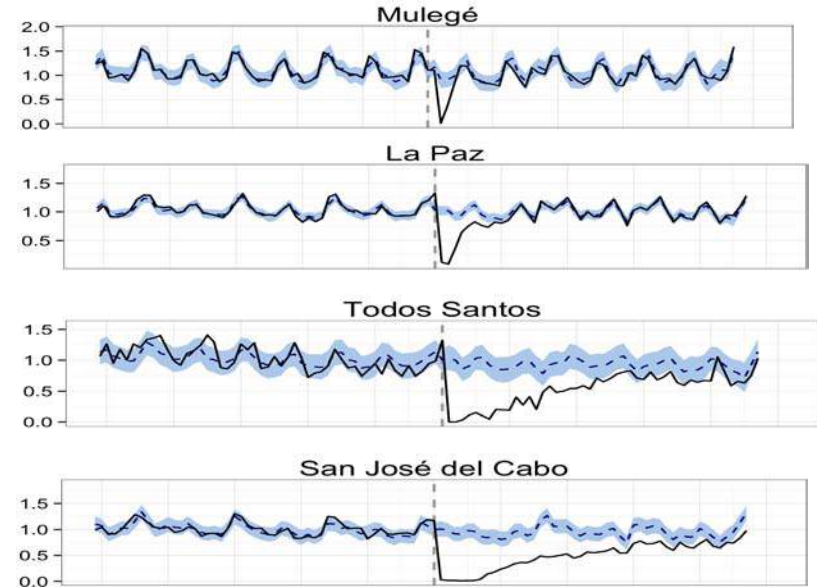
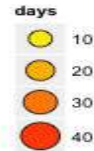
Mulegé

expected vs **real**

Transactions



Transaction volume by district

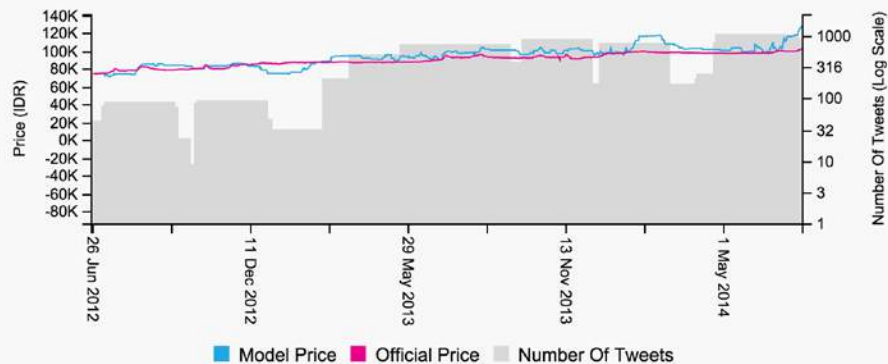




REAL-TIME TWITTER FOOD INDEX



Beef

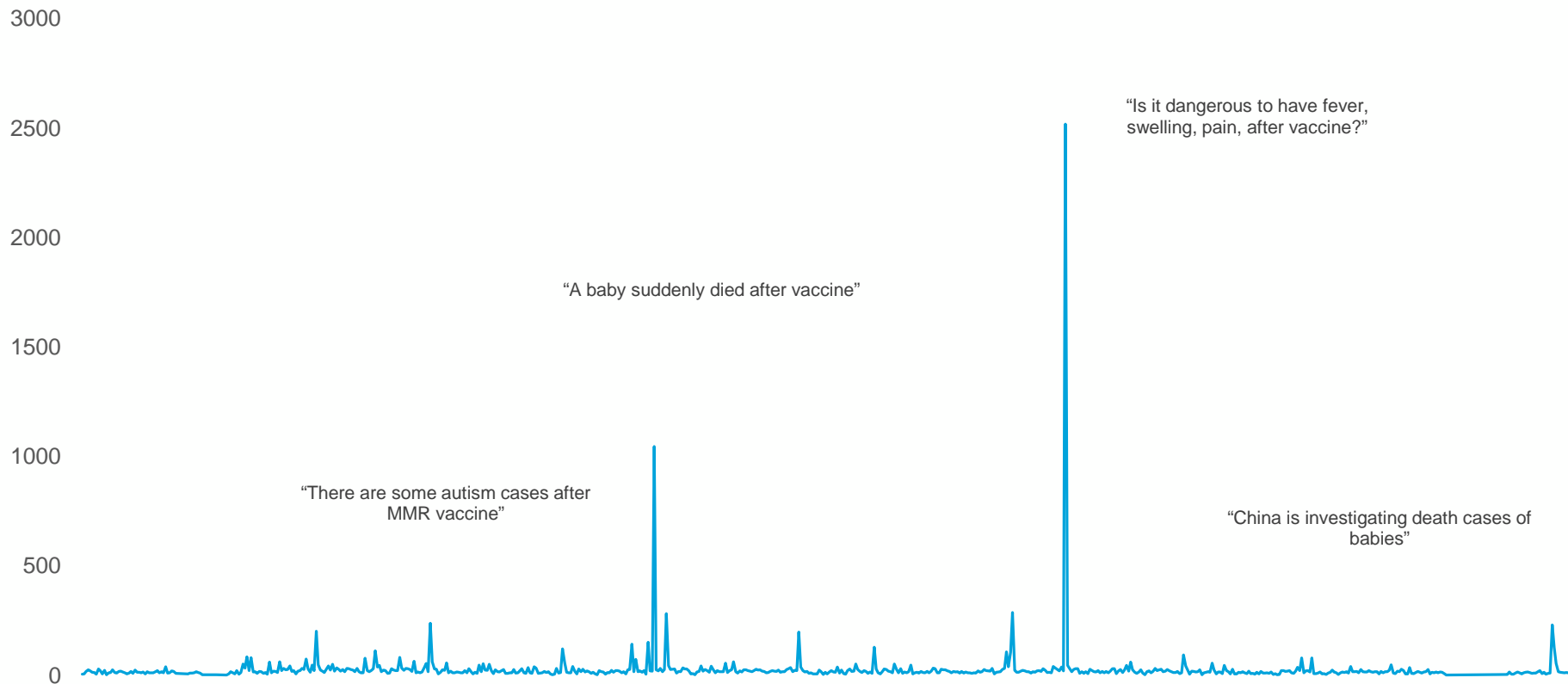


Chicken



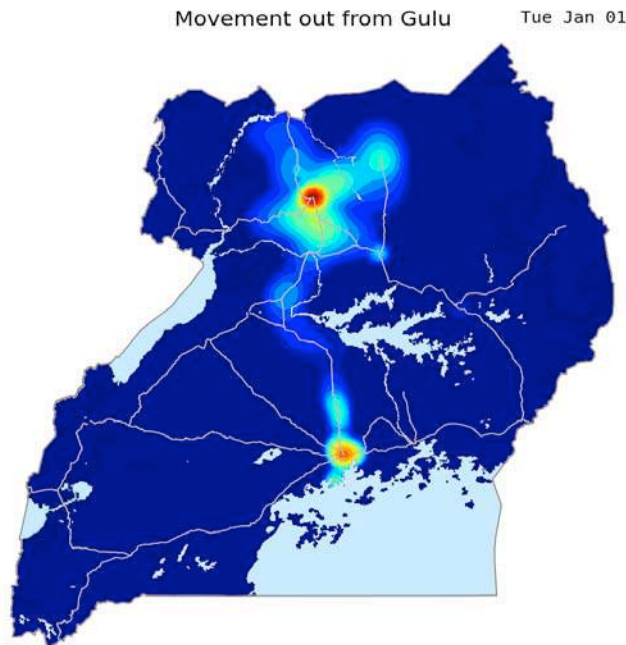
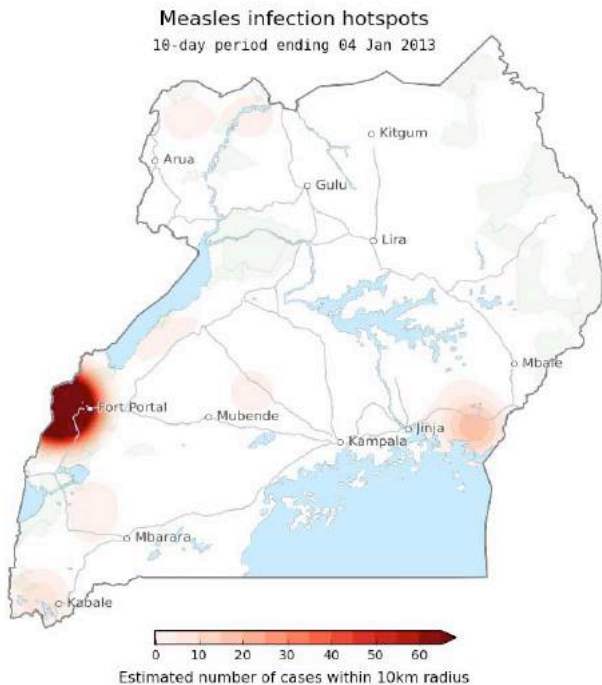


TRACKING PERCEPTION OF VACCINATION IN INDONESIAN TWITTER





Combining case data and population mobility to predict the spread of infectious disease





Project: HIV Risk Awareness at the World Cup

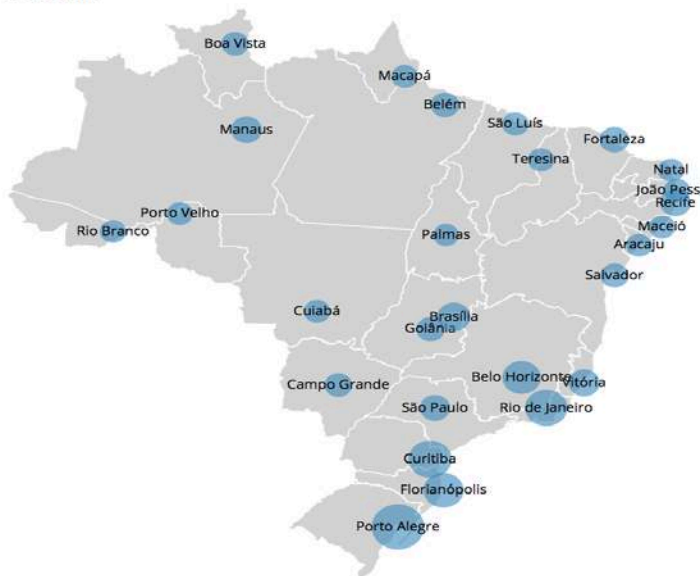
Partner:  **UNAIDS**



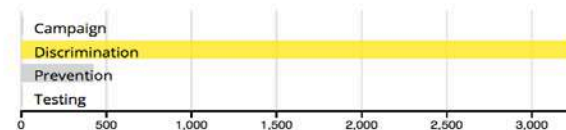
Tweets About Discrimination and HIV/AIDS

The interactive dashboard makes it possible to explore the volumes of tweets about HIV risk behavior generated each day during the 2014 World Cup. With simple mouse hover and clicks on charts, the data can be simultaneously viewed by multiple dimensions; time, host city, and the four selected categories, 'Discrimination', 'Prevention', 'Testing', and 'Campaign'.

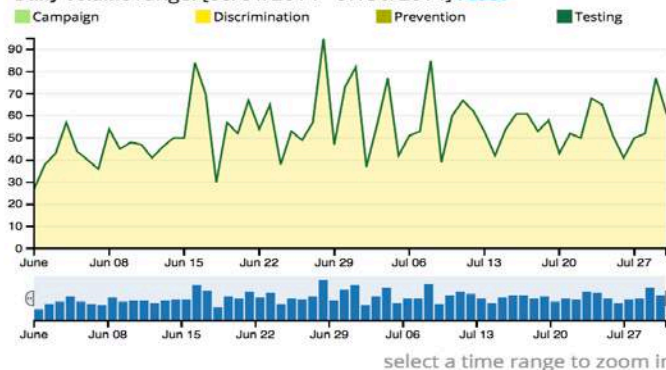
Brazil Map



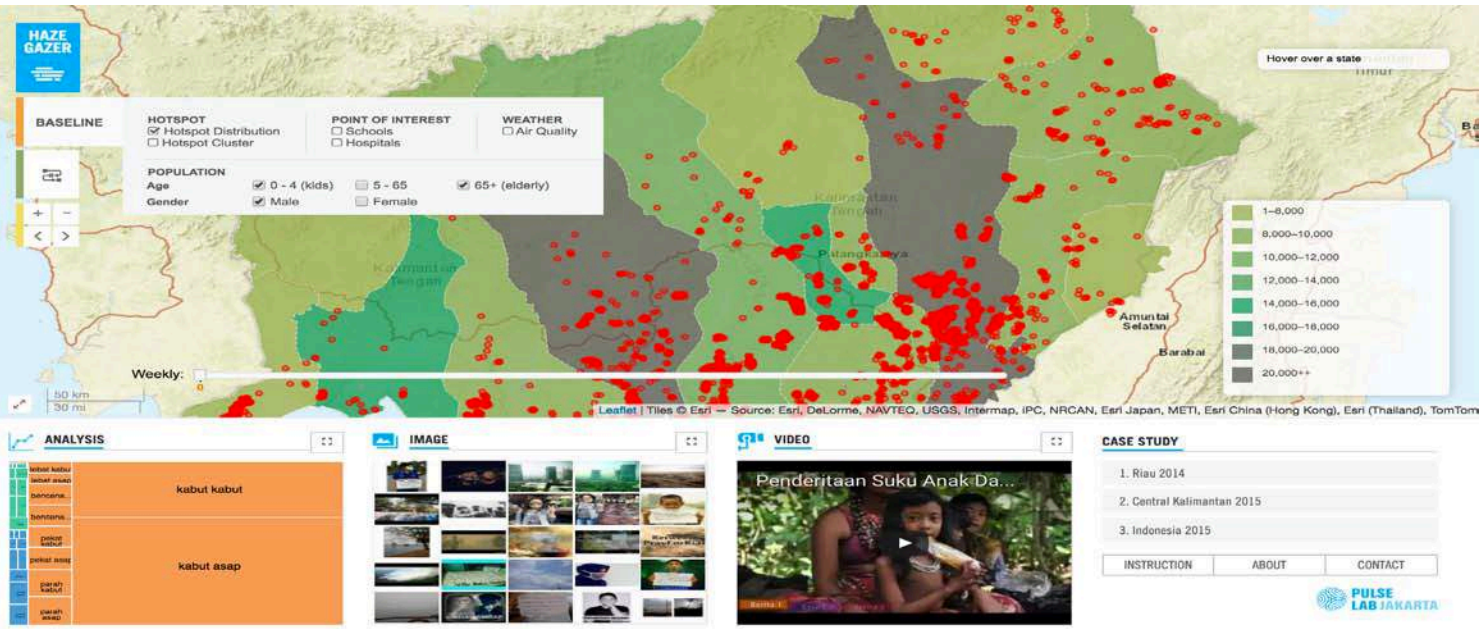
Category [reset](#)



Daily Volume range: [06/01/2014 - 07/30/2014] [reset](#)

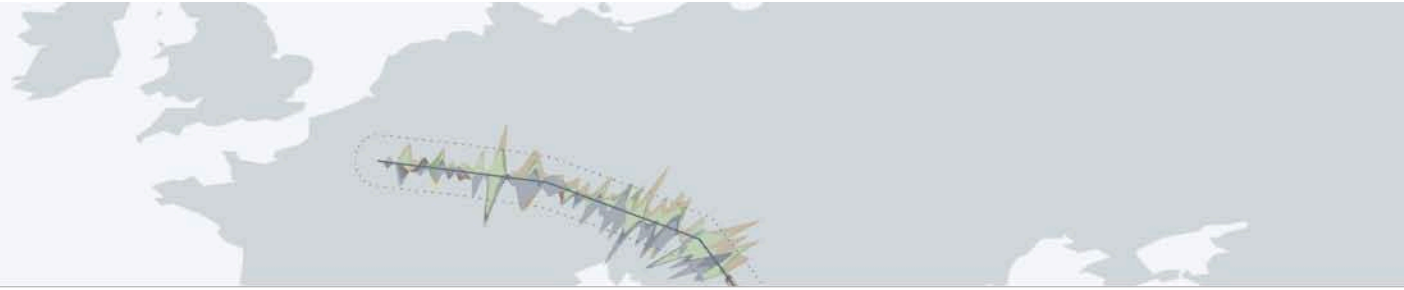
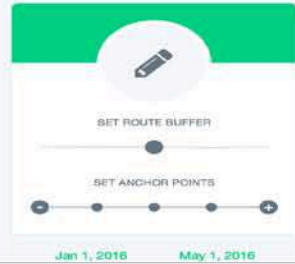


Haze Gazer: Real-Time Hotspot Detection and Impact Assessment



Humanitarian Action

UNHCR & Global Pulse developed taxonomies for monitoring interactions in English, Greek, Arabic, and Farsi, as refugees travel along specific routes



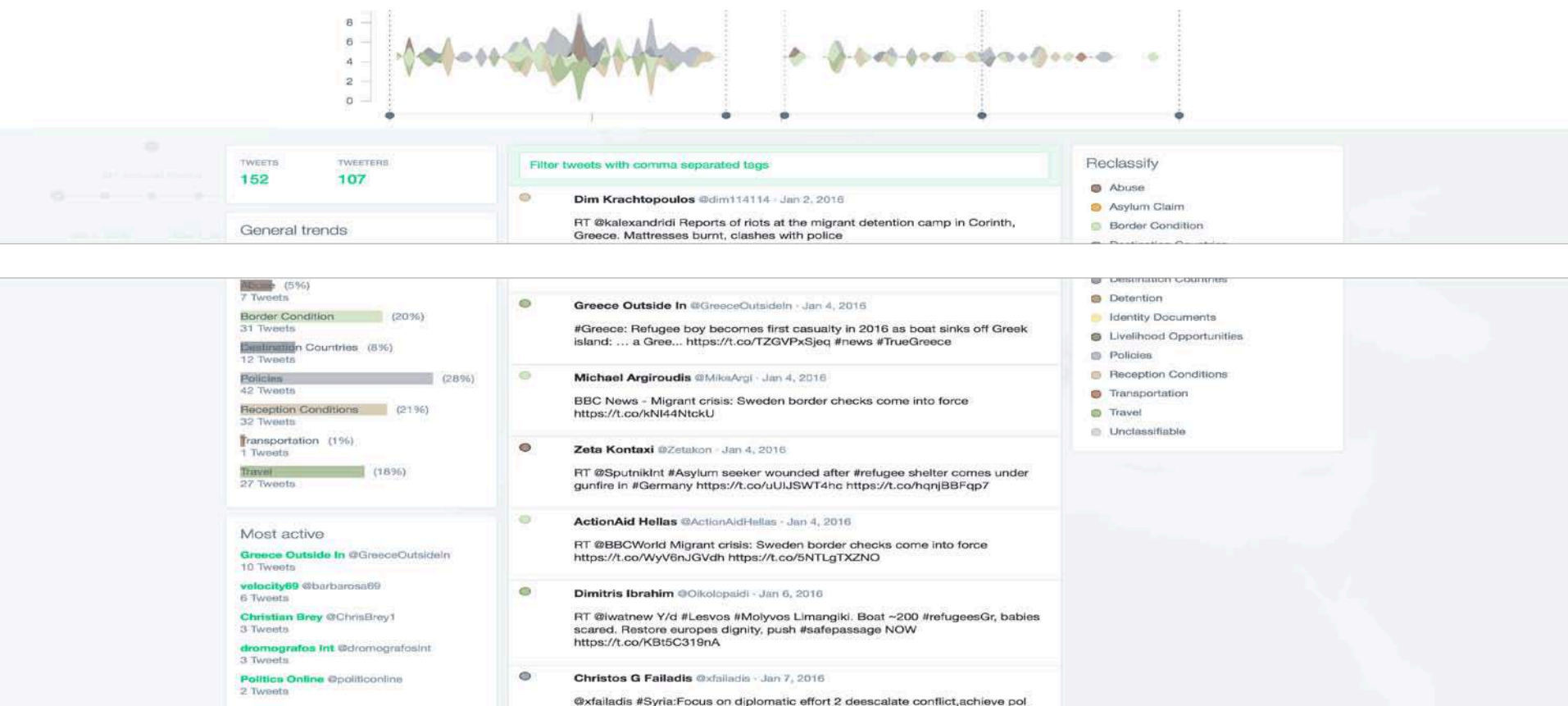
Aggregate time by: Month Day Hour

- Stream
- Stack
- Area
- Bars



- Abuse
- Asylum Claim
- Border Condition
- Destination Countries
- Detention
- Identity Documents
- Livelihood Opportunities
- Policies
- Reception Conditions
- Transportation
- Travel
- Healthcare Access

Sample of the Tweets found along a route. This proof-of-concept analytic tool will be extended to real-time monitoring in 2017.



Example rescue: April 18, 2015



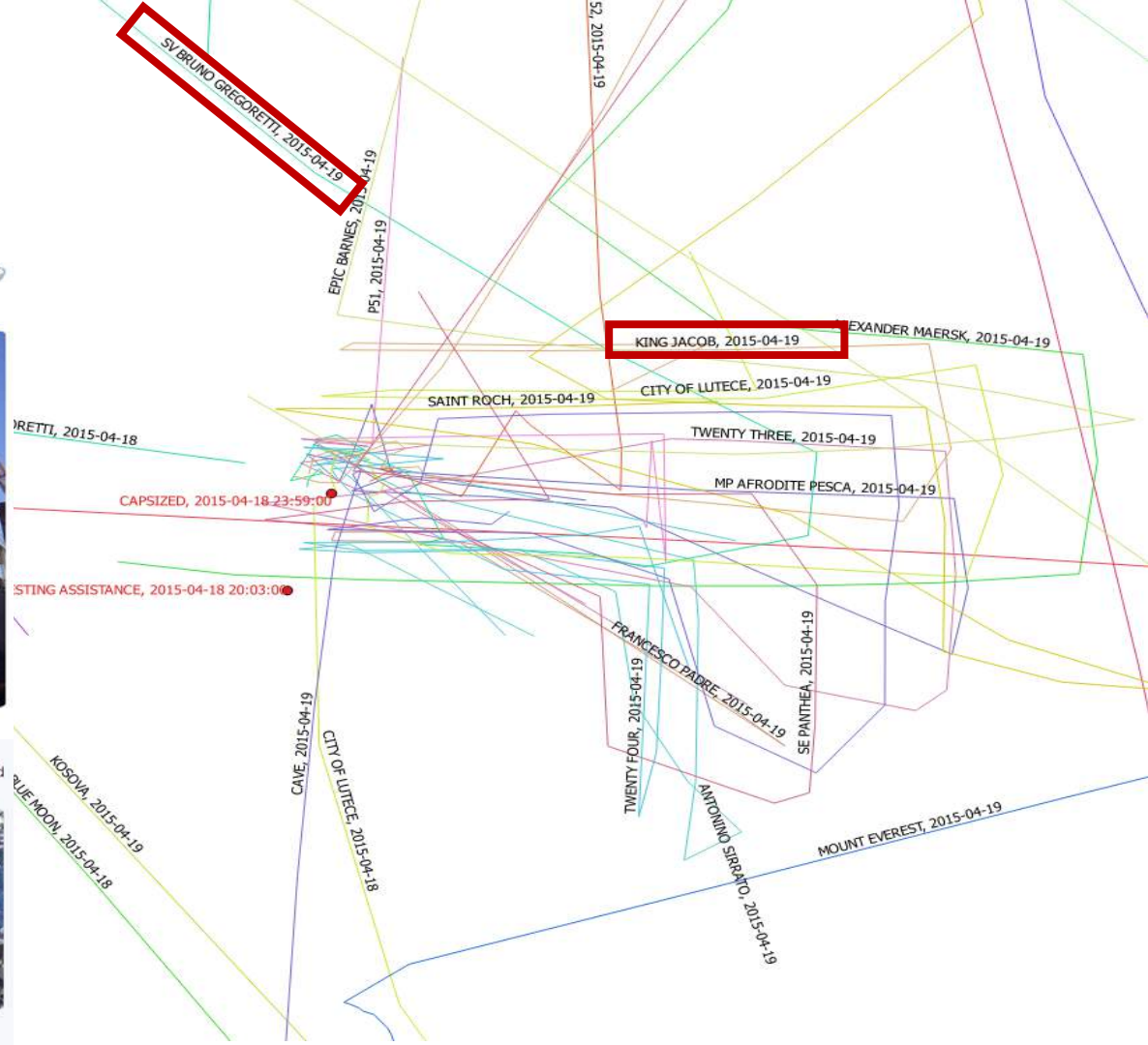
Barbie Latza Nadeau @BLNadeau · 24 Apr 2015

King Jacob ship that collided with migrant ship that sank last weekend with hundreds onboard.



Karl Stagno-Navarra @ksnavarra · 19 Apr 2015

PHOTO: The 28 survivors from capsized migrant boat in Mediterranean on board the #Gregoretti on way to #Malta



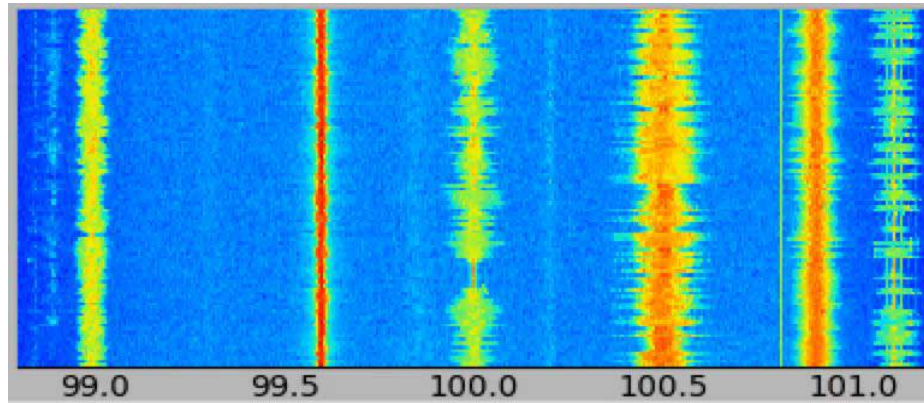
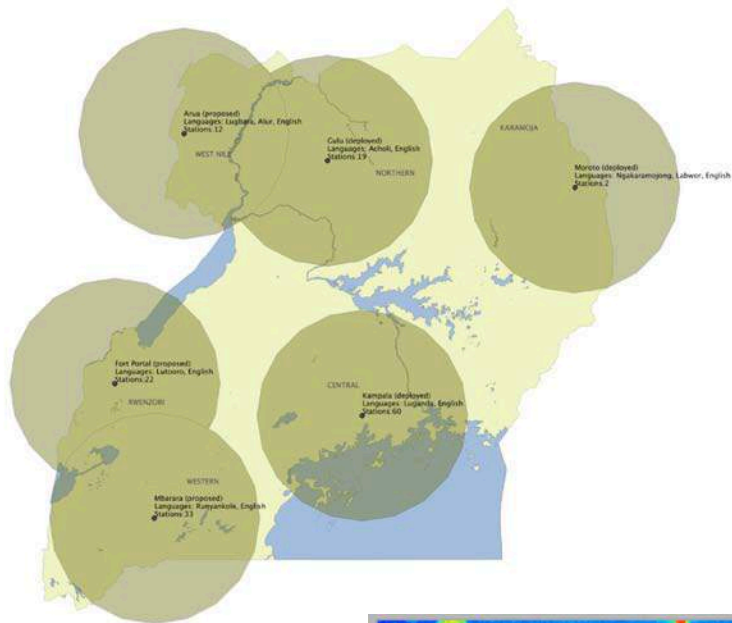
*Rescue
signatures
in the
Mediterranean*



Bridging the Digital Divide

Radio Content Analysis

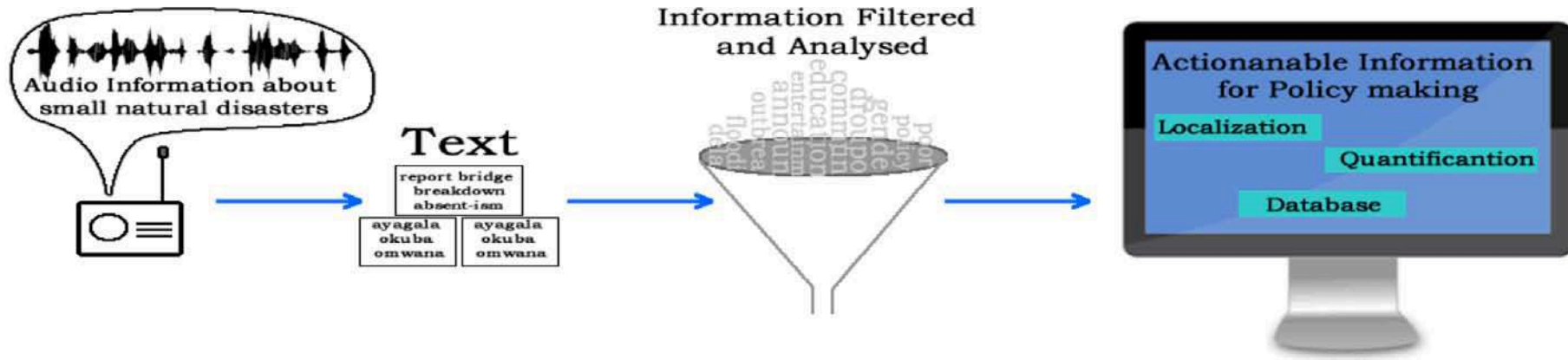




Tool provides the ability to listen to just the topics of interest...



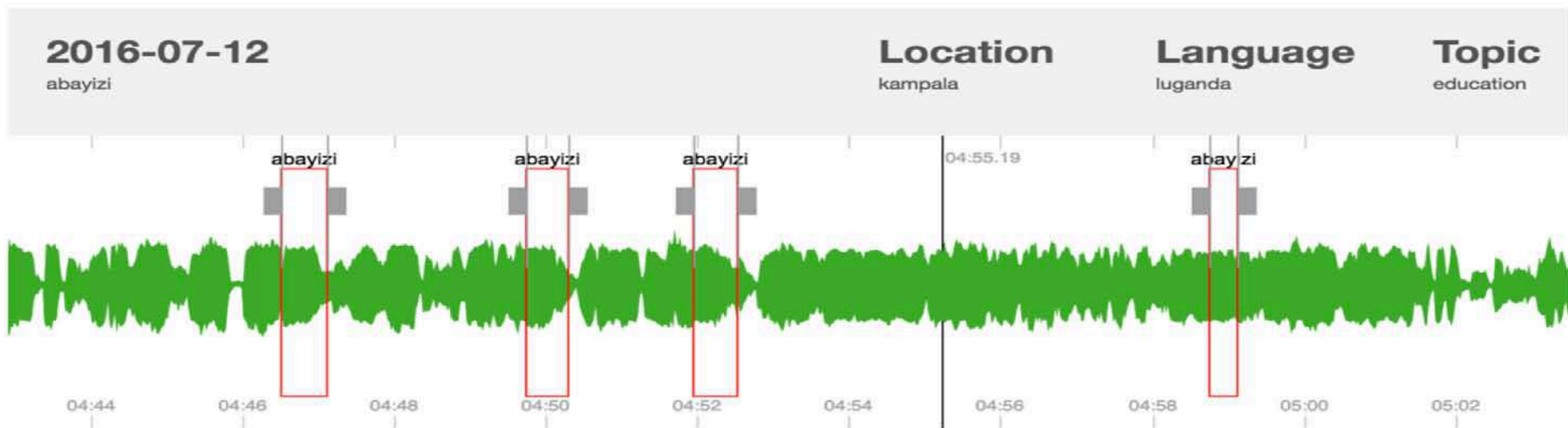
Generating real-time actionable insights from rural areas



Speech Analytics Supported Languages:

1. Ugandan English
2. Luganda (Bantu)
3. Acholi (Nilotic, also spoken in South Sudan)

Radio analysis, showing detection of education-related keywords in a Luganda radio broadcast (*abayizi* means “students”)



Dashboard allows quick review of relevant segments with keywords, or 5-minute fragments for context



3

GOOD HEALTH
AND WELL-BEING



“When you go to the hospital they tell us ‘go to the clinic of so and so’.... Most of the doctors now own clinics, and if possible the government should prohibit doctors working in government hospitals from having clinics.

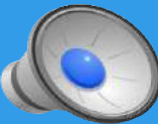
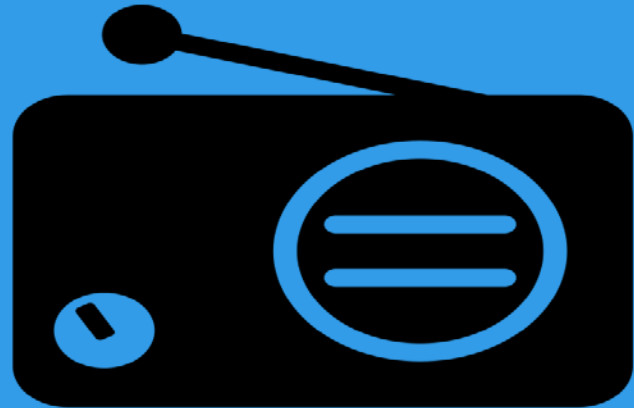
There is a lot of medicine theft by the doctors and they take the medicine to their private clinics



5 GENDER
EQUALITY

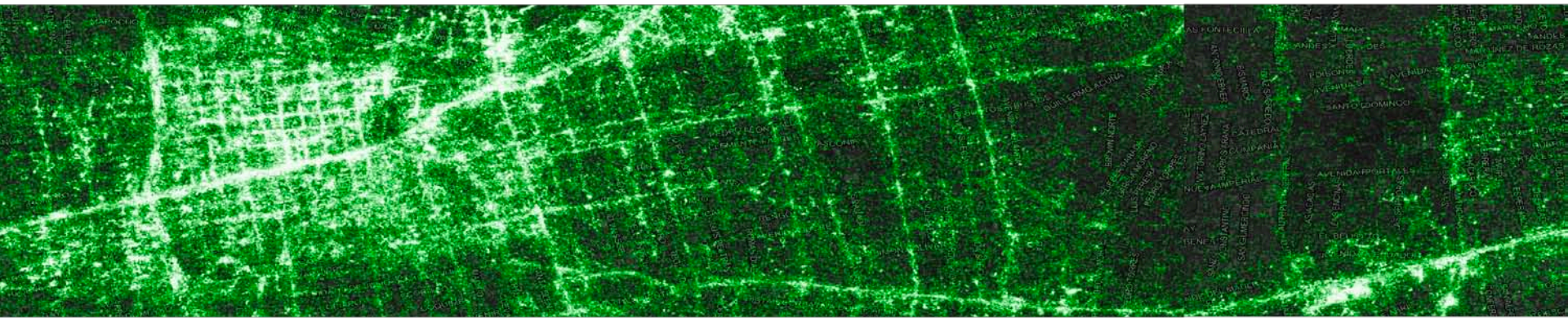
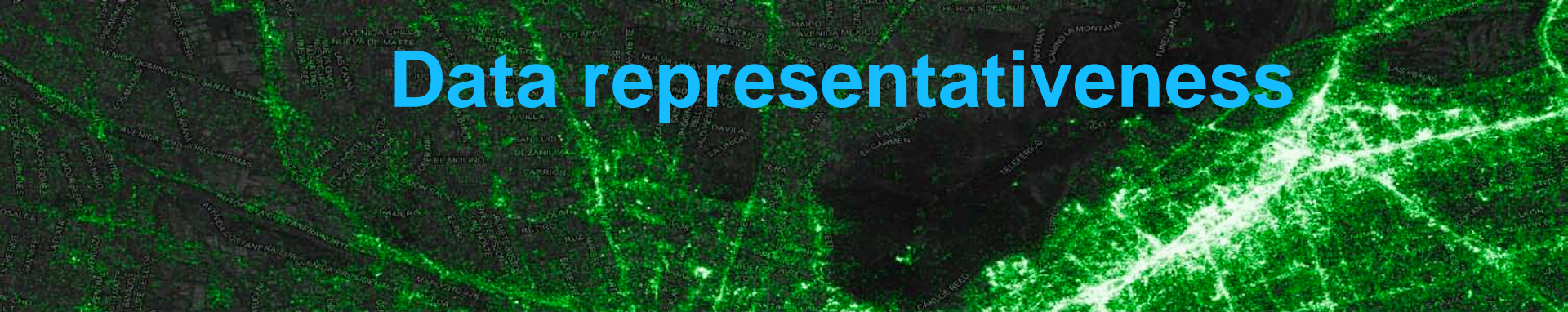


“Many people think those women who are in political leadership, they are either bad wives, they are prostitutes, they have been called names. Nobody believes you can actually get into an election and win.”



Challenges

Data representativeness



Data access



Data Philanthropy

Access Partnerships

BBVA

DATA & ANALYTICS



Telefonica



UPU

UNIVERSAL
POSTAL
UNION



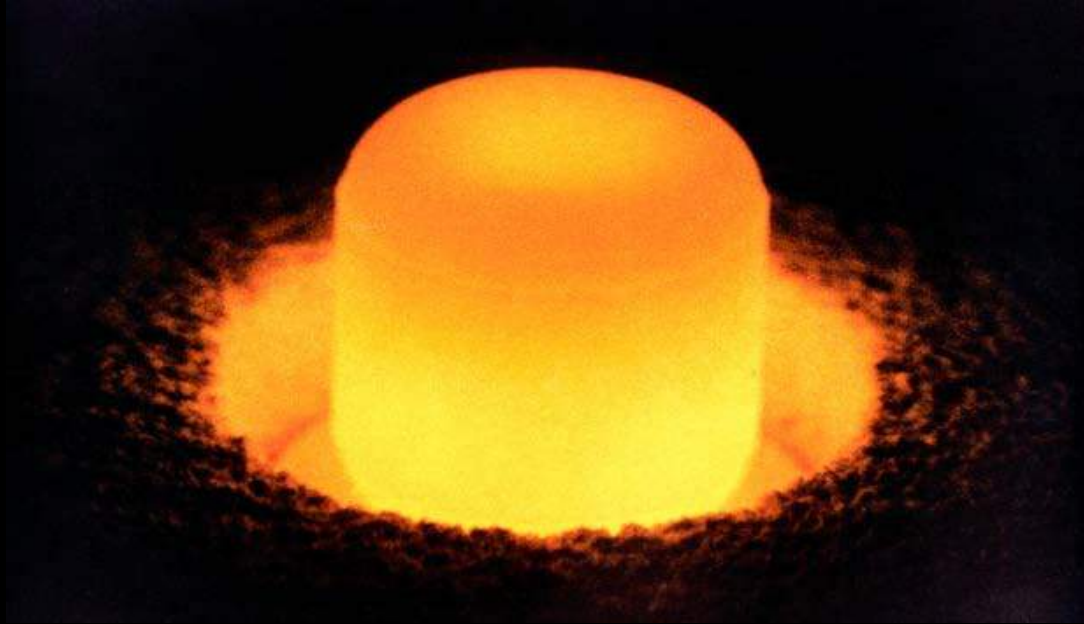
Analytics Partnerships



Crimson Hexagon

Quid®

Responsibility to protect



Misuse of data may cause harm...

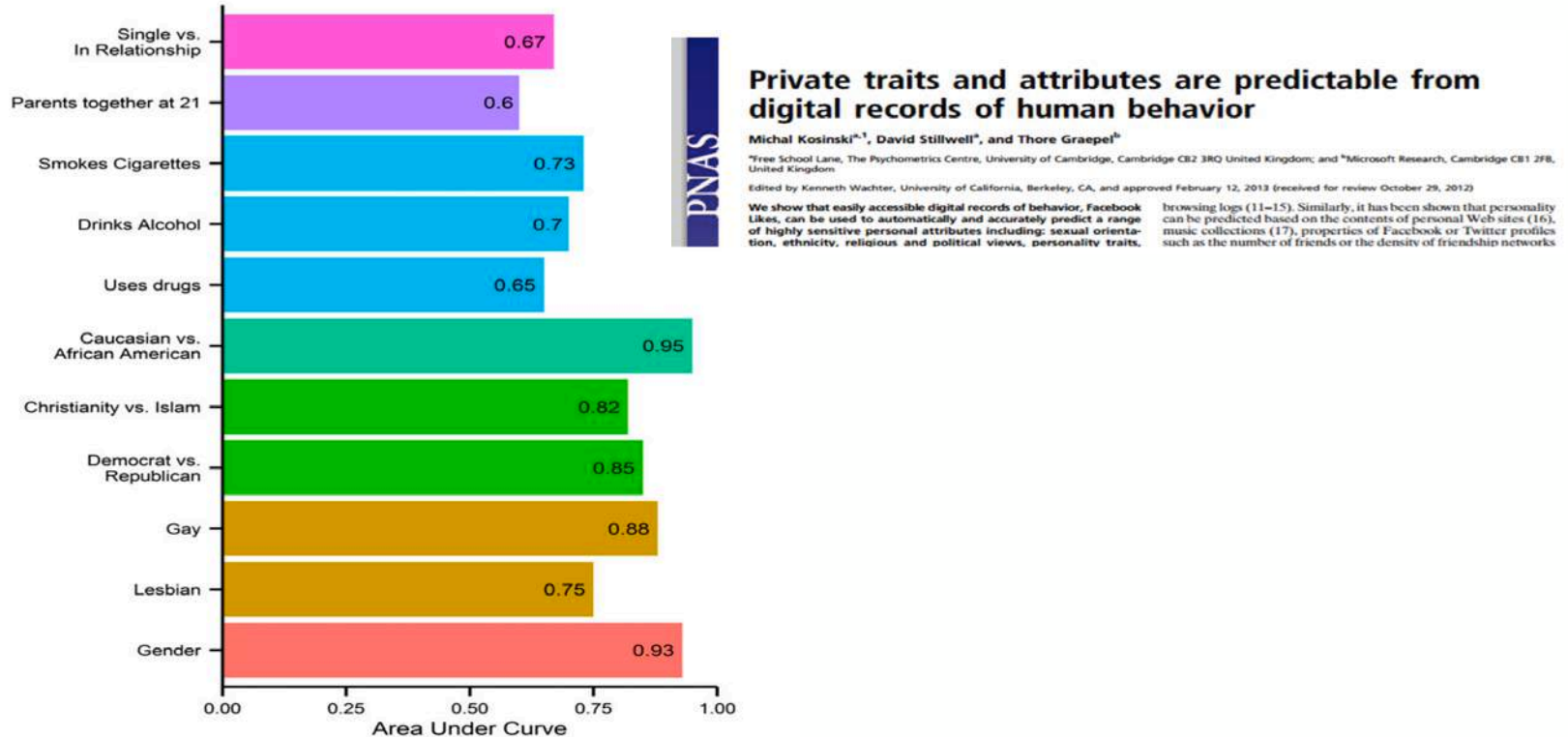
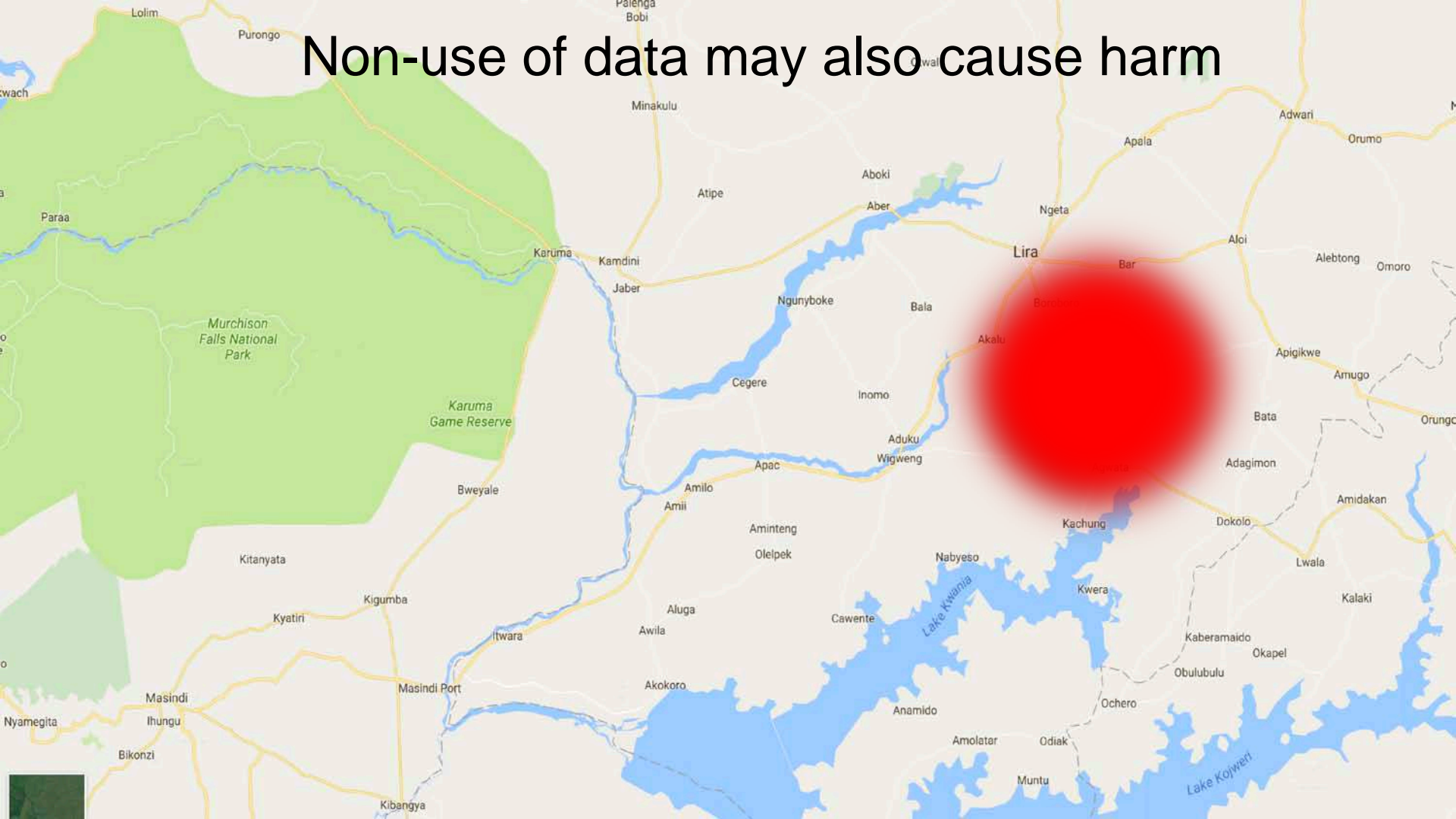


Fig. 2. Prediction accuracy of classification for dichotomous/dichotomized attributes expressed by the AUC.

Non-use of data may also cause harm



Principles for Responsible Use of Data



Purpose of use

We access, analyse or otherwise use data for the purposes consistent with the United Nations mandate and in furtherance of the Sustainable Development Goals

Right to use

We access, analyze or otherwise use data that has been obtained by lawful and fair means, including, where appropriate, with the knowledge or consent of the individual whose data is used

Purpose compatibility

We ensure to the extent possible, that all of the data we use for project purposes is adequate, relevant, and not excessive in relation to the legitimate and fair purposes for which the data was obtained

Individual privacy

We do not access, analyse or otherwise use the content of private communications without the knowledge or proper consent of the individual

We do not knowingly or purposefully access, analyse, or otherwise use personal data, which was shared by an individual with a reasonable expectation of privacy without the knowledge or consent of the individual

We do not attempt to knowingly and purposefully re-identify de-identified data, and we make all reasonable efforts to prevent any unlawful and unjustified re-identification

Data security

We ensure reasonable and appropriate technical and organisational safeguards are in place to prevent unauthorised disclosure or breach of data

Risk and harm assessment and risk mitigation

We perform a risk assessment and implement appropriate mitigation processes before any new or substantially changed project is undertaken

We take into consideration the impact that data use can have not only on individuals but also on groups of individuals

We ensure that the risks and harms are not excessive in relation to the positive impact of the project

Data sensitivity

We employ stricter standards of care while conducting research among vulnerable populations and persons at risk, children and young people, and any other sensitive data

Data minimisation

We ensure the data use is limited to the minimum necessary

Data retention

We ensure that the data used for a project is being stored only for the necessary duration and that any retention of it is justified

Data quality and accountability

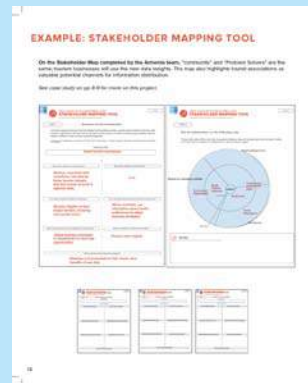
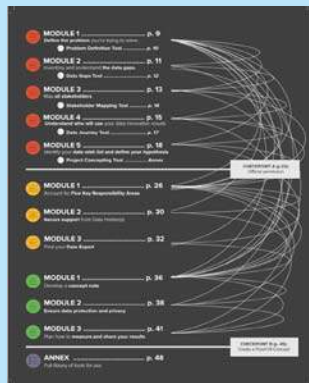
We design, carry out, report and document our activities with adequate accuracy and openness

Our collaborators

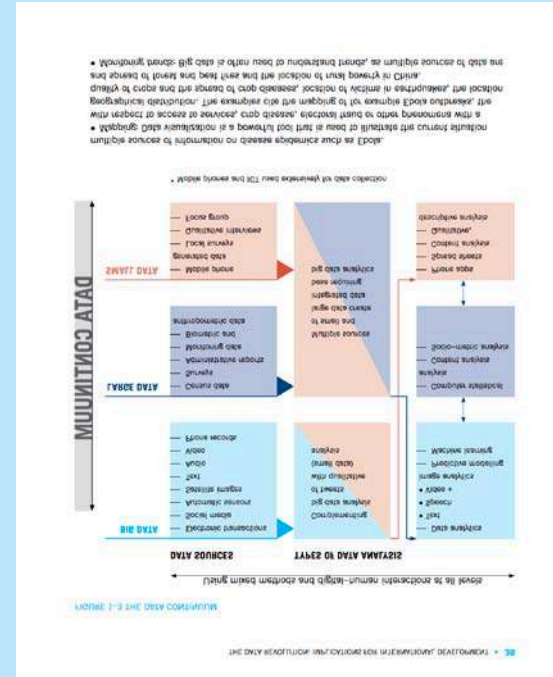
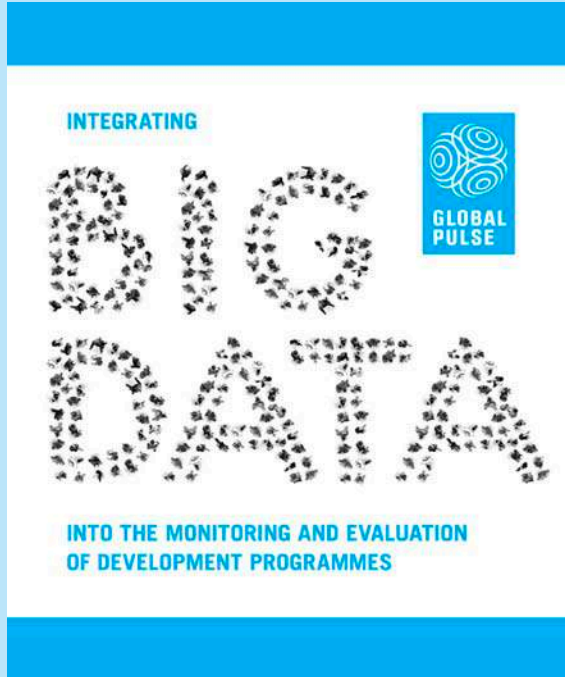
We require that our collaborators are acting in compliance with relevant law, data privacy and data protection standards and the United Nations' global mandate.

Sustainable Innovation:

Building Institutional Capacity for Data Innovation



Sustainable Innovation: Integrating Big Data into Monitoring and Evaluation





Santiago, Chile

Sunday 8:00 PM

Mostly Cloudy



25°C | °F

Precipitation: 0%

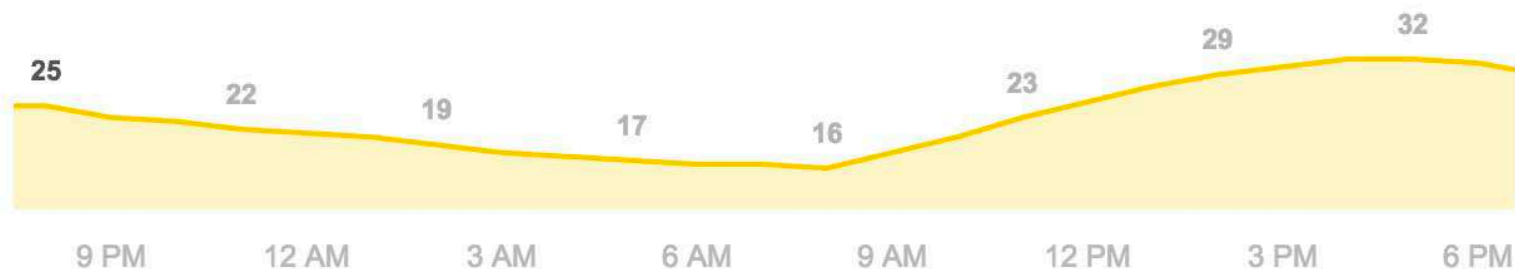
Humidity: 27%

Wind: 8 km/h

Temperature

Precipitation

Wind



Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
29° 16°	33° 18°	31° 15°	29° 14°	28° 14°	30° 13°	26° 12°	26° 13°