Harnessing Big Data for Sustainable Development and Humanitarian Action

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www.unglobalpulse.org

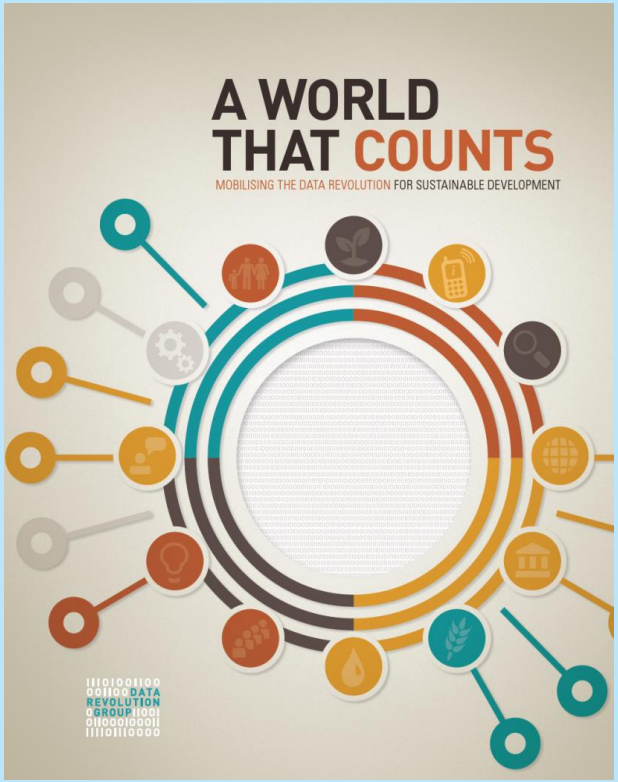
UN Global Pulse:

A flagship innovation initiative of the Secretary-General

Vision: Big Data used responsibly for the public good

Mission: Accelerate discovery, development and adoption of data science innovation for sustainable development and humanitarian action

“We need a data revolution for sustainable development”



SUSTAINABLE DEVELOPMENT GOALS

GLOBAL PULSE

Hypothesis: digital services are sensor networks for human wellbeing

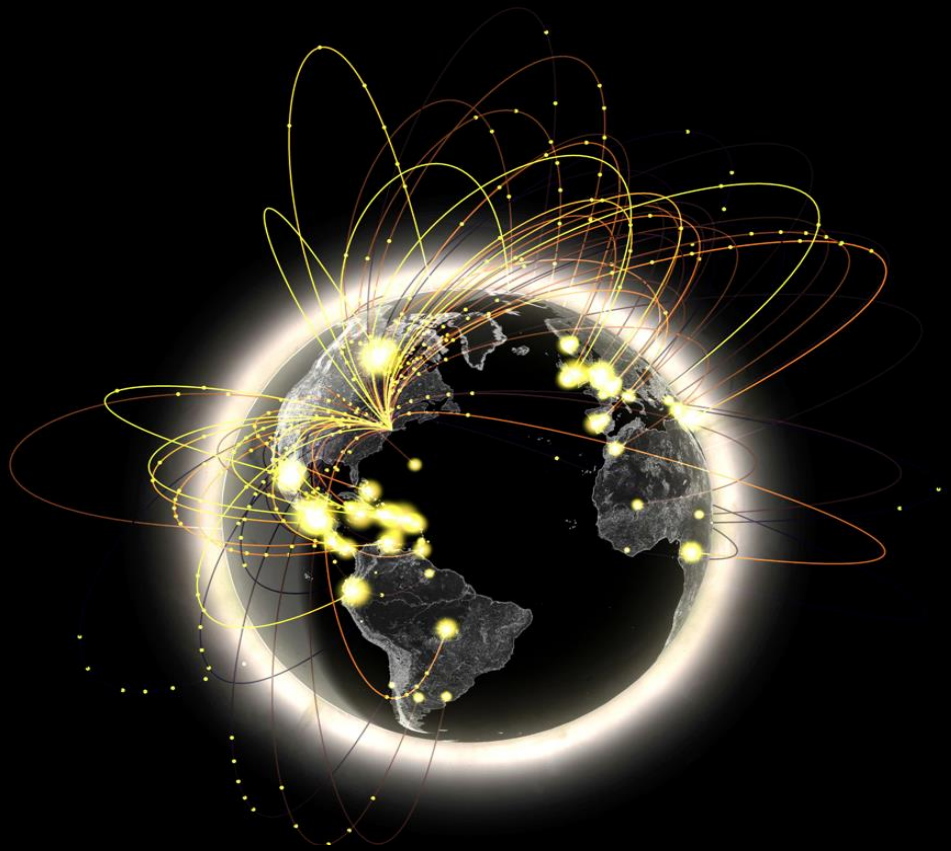


Image credit: Aaron Koblin
24 hours of global phone calls and Internet traffic flowing through New York City

There are at least three revolutions at stake for the SDGs

1. A Measurement Revolution: insights from big data allow better, faster, less-costly tracking of statistical indicators

2. A Management Revolution: broad adoption of agile, efficient, adaptive processes accelerates the organizational transformation needed to achieve the SDGs.

1. An Accountability Revolution: open access to insights from big data empower citizens to hold government accountable, because big data is produced directly by communities with no intermediary role of government.

Kamal Muara
Kapuk Muara
Pegadjungan
Jurumudi
Kapuk
Cengkareng Timur
Kamal
Tanjung Priuk
Koja
Pangkalan Jati
Duri Kepa
Gondrong
Meruya Selatan
Jelambar
Grogol Utara
Kedoya Utara
Kelapa Dua
Kebayoran Lama
Kebayoran Baru
Kebon Jeruk
Kembangan
Cengkareng
Grogol Petamburan
Tambora
Taman Sari
Penjaringan
Pademangan
Kelapa Gading
Cilincing
Tanjung Priok
Koja
Kelapa Gading Barat
Kelapa Gading Timur
Cilincing
Pademangan Barat
Pademangan Timur
Penjaringan
Tanjung Duren Utara
Tanjung Duren Selatan
Grogol
Kebon Jeruk
Kembangan Utara
Kembangan Selatan
Cengkareng
Kalideres
Pesanggrahan
Kebayoran Lama
Kebayoran Baru
Mampang Prapatan
Pancoran
Tebet
Setiabudi
Menteng
Senen
Cempaka Putih
Johar Baru
Kemayoran
Sawah Besar
Gambir
Tanah Abang
Kebon Sirih
Cempaka Putih Barat
Cempaka Putih Timur
Rawasari
Johar Baru
Kemayoran
Sawah Besar
Gambir
Tanah Abang
Kebon Sirih
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Pancoran
Tebet
Setiabudi
Mampang Prapatan
Pesanggrahan
Kebayoran Lama
Kebayoran Baru
Kalideres
Cengkareng
Kembangan
Kebon Jeruk

6h
12h
18h
24h
senseable city lab::: BBVA
1000€ 500€ 100€
APRIL 2011 TRANSACTIONS IN
GAS STATIONS

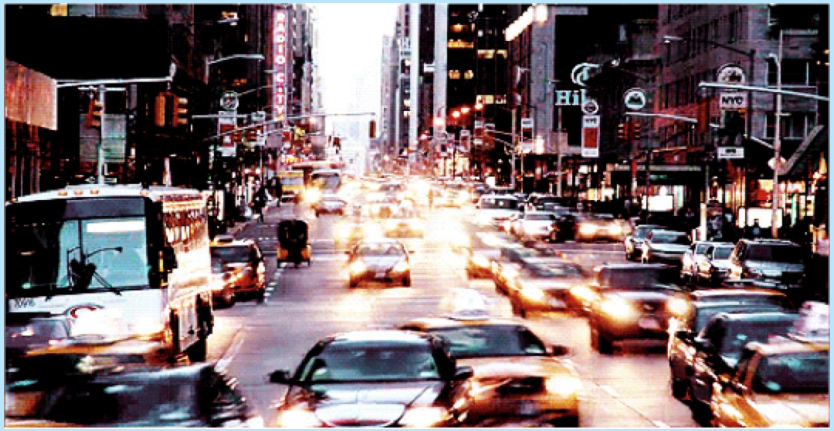
2011 Tohoku Earthquake, Japan

BIG (BEHAVIORAL) DATA

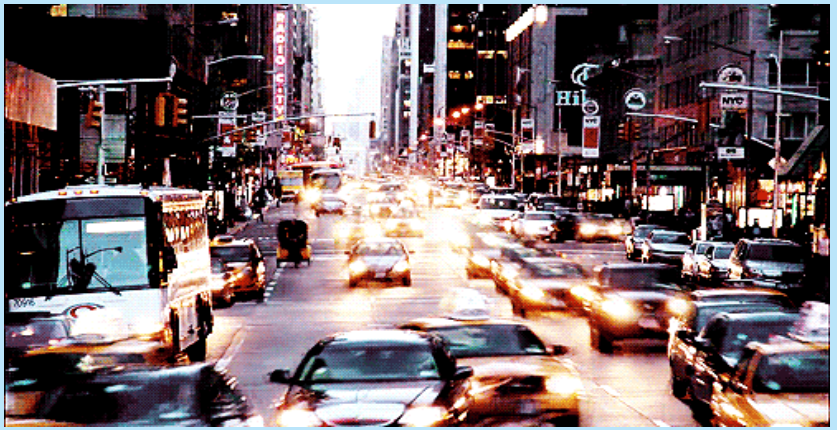
GLOBAL PULSE

“What People Say”	“What People Do”
Online news	Online search
Social media	Mobile phone usage
Retail advertising	Credit card purchases
Radio & TV	Money transfers
	Ecommerce/Retail POS
	Postal traffic
	Sensors of all sorts...

Why is big data different?

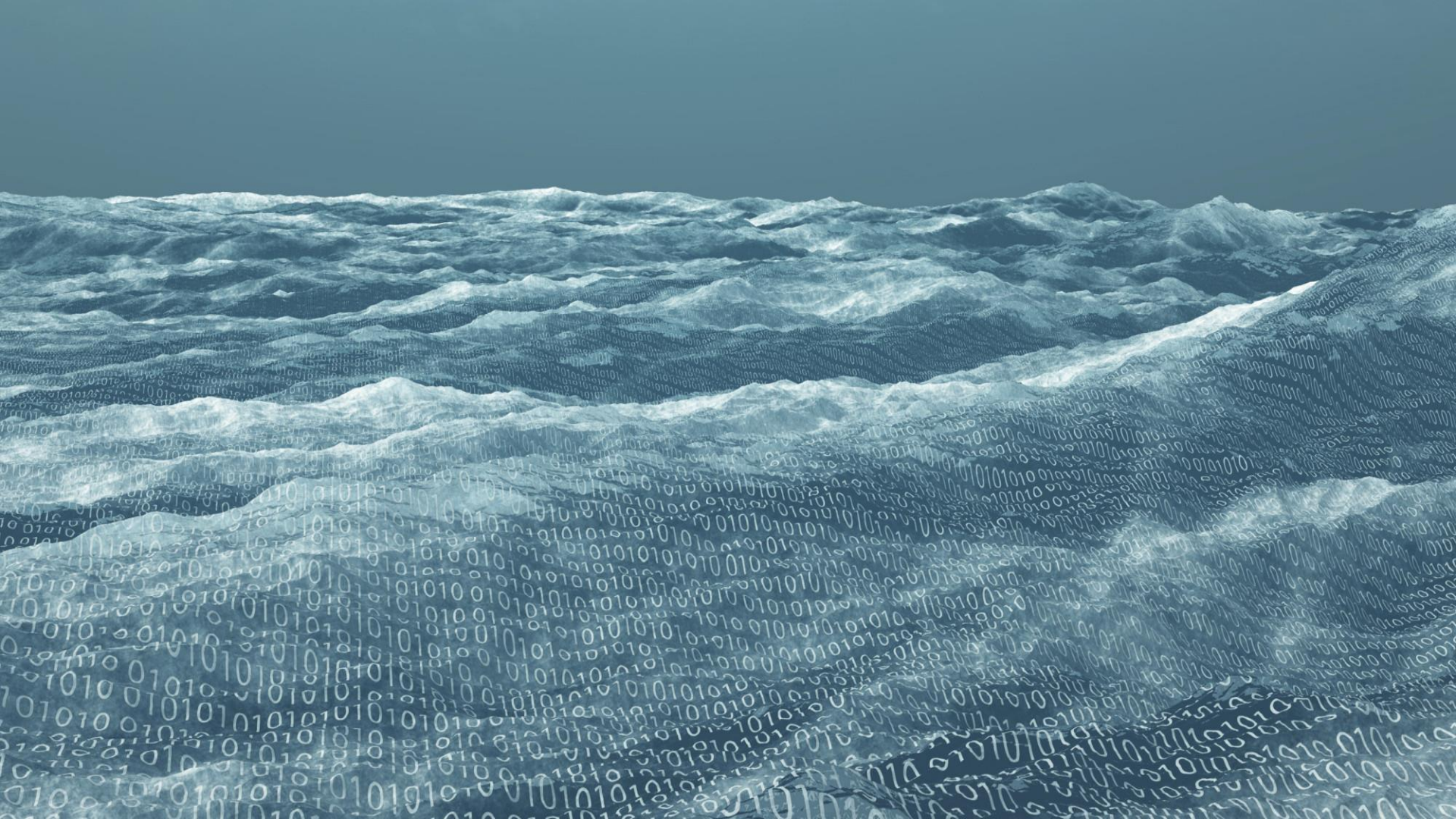


survey data



big data

It allows continuous, real-time observation of dynamics of human behavior



OUR PRIVACY & DATA PROTECTION PRINCIPLES

We access, analyze, store, transmit or otherwise use only data that has been obtained by lawful and fair means, including, where appropriate, with the knowledge or consent of the data subject

We do not access data containing personal information on any individual, without the knowledge or proper consent of the data subject

We never access the content of private communications, without the knowledge or proper consent of the data subject

We never attempt to re-identify anonymised data, without the knowledge or proper consent of the data subject

We will only access, analyse, store, transmit or otherwise use data in accordance with the purposes for which the data has been properly and lawfully obtained

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

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

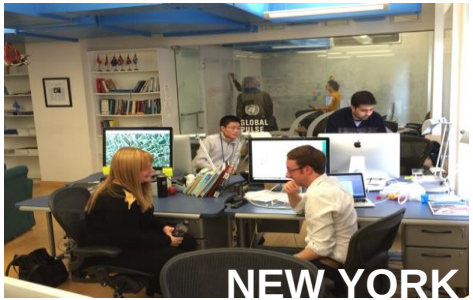
We employ even stricter standards of care while conducting research among vulnerable populations and persons at risk, children and young people, and any other sensitive data

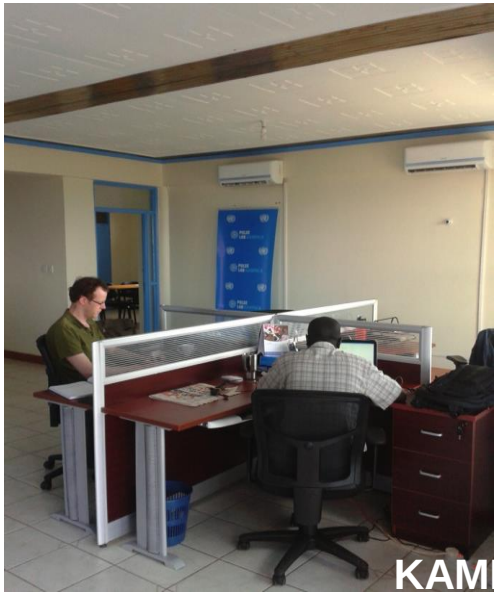
We perform due diligence when selecting data or service provider partners and ensure their activities comply with the United Nations' global mandate

We ensure that our research partners are acting in compliance with relevant law, privacy and data protection standards

DATA PHILANTHROPY

A NETWORK OF “PULSE LABS”: A SAFE SPACE FOR BIG DATA INNOVATION



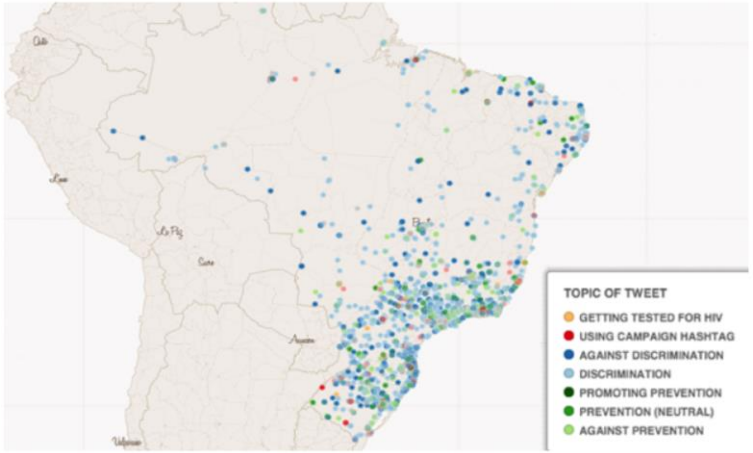


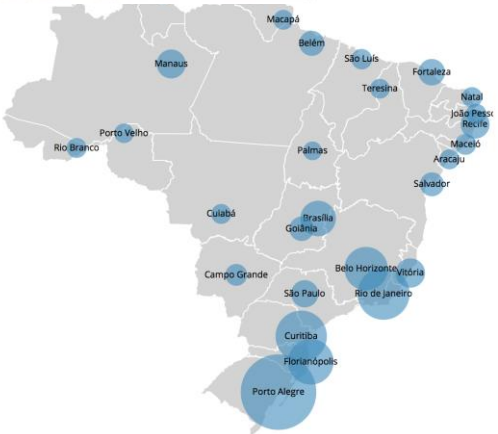
Applications

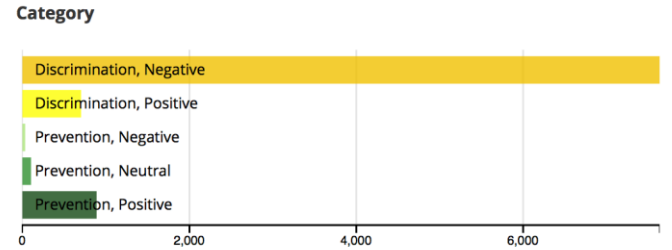
3 GOOD HEALTH AND WELL-BEING

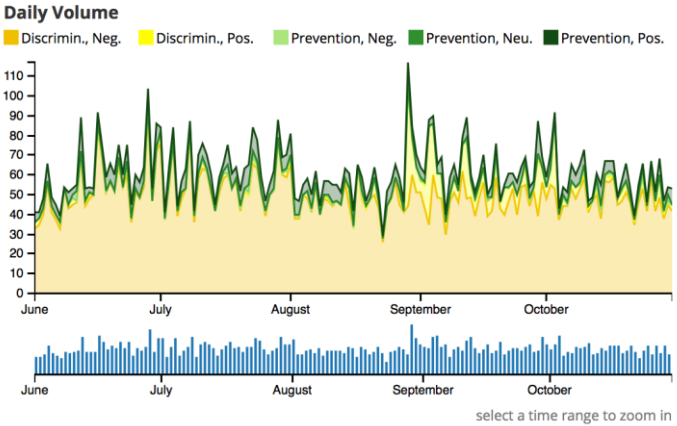
HIV RISK AWARENESS AT THE WORLD CUP

GLOBAL PULSE



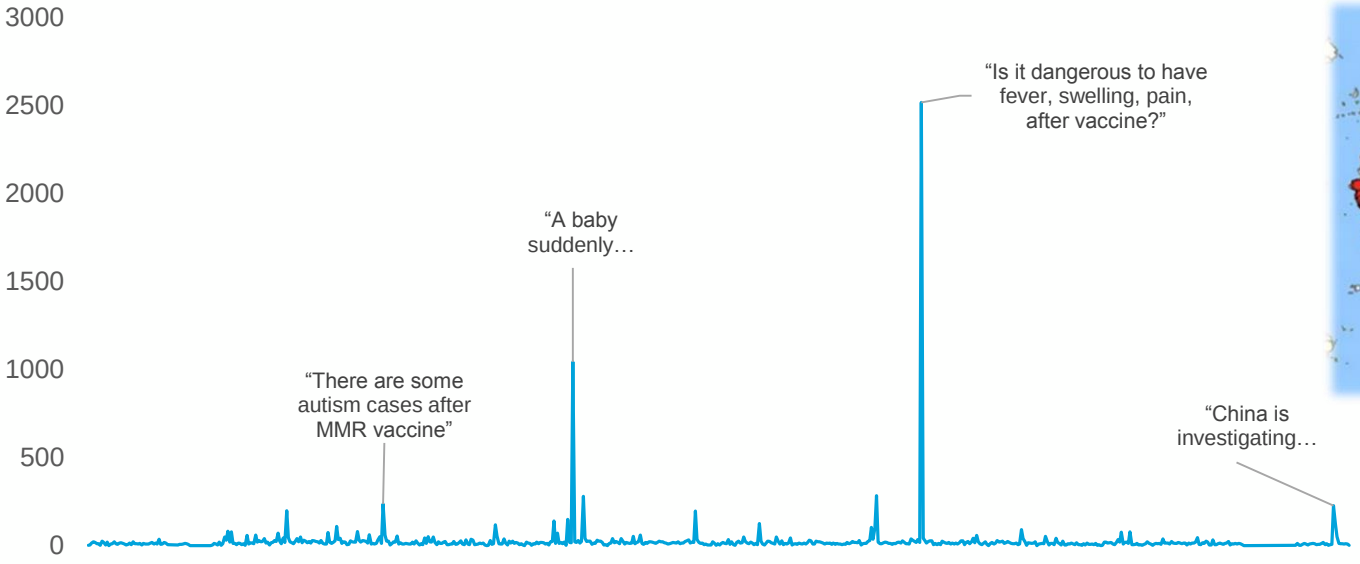


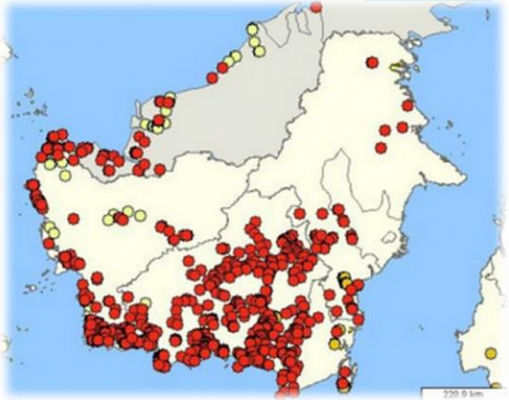




UNAIDS

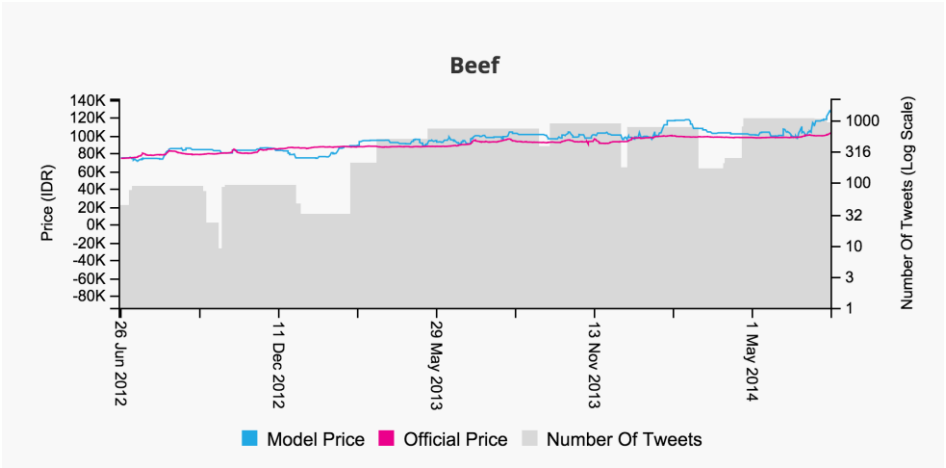
TRACKING PERCEPTION OF VACCINATION IN INDONESIAN TWITTER

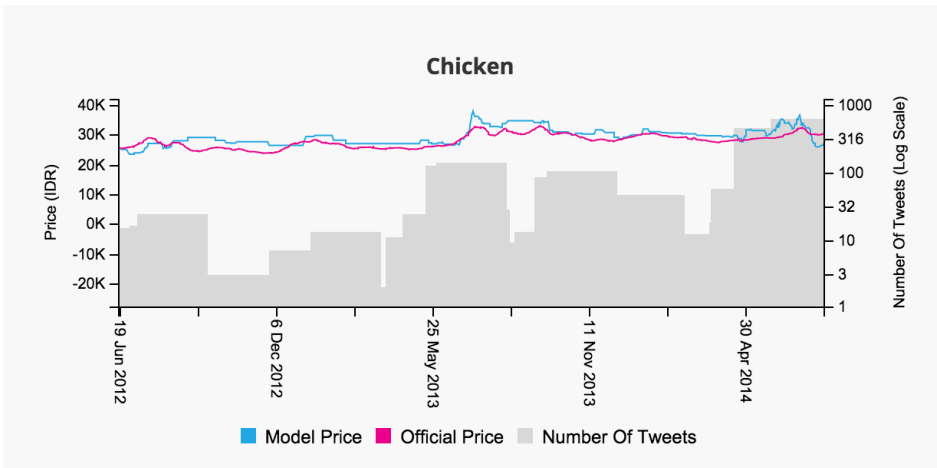




Rank	2012-06-20	2012-10-08	2013-04-28	2013-12-23
1	Autism (213)	Death(1030)	Fever (1498)	Death (224)
2	Death (5)	Fever (14)	Swelling (1494)	Fever (3)
3	Sick (4)	Sick (4)	Pain (1491)	Crying (1)
4	Fever (2)	Crying (3)	Autism (1011)	Autism (1)
5	Crying (1)	Fever (3)	Fever (4)	-

REAL-TIME TWITTER FOOD INDEX



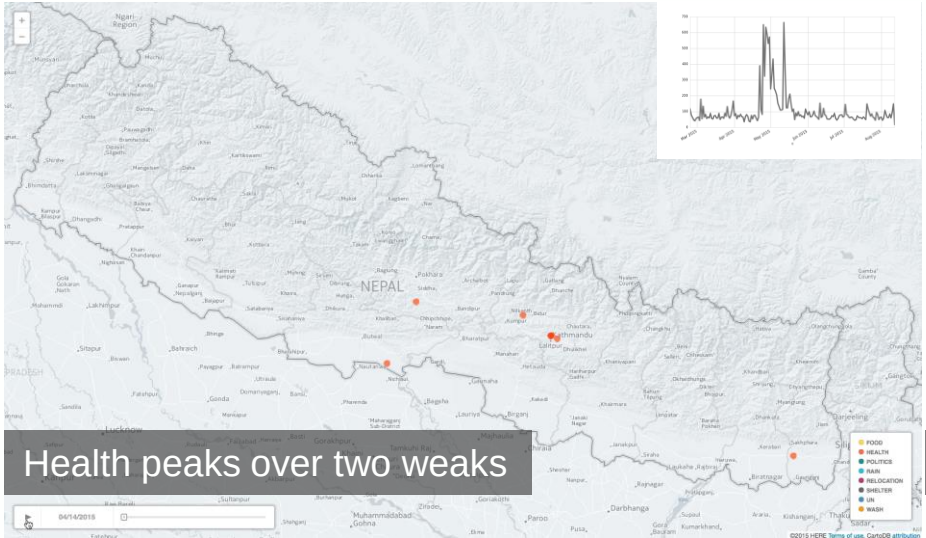


COMMODITY	PEARSON CORRELATION COEFFICIENT
Beef	0.87
Chicken	0.81
Onion	0.85

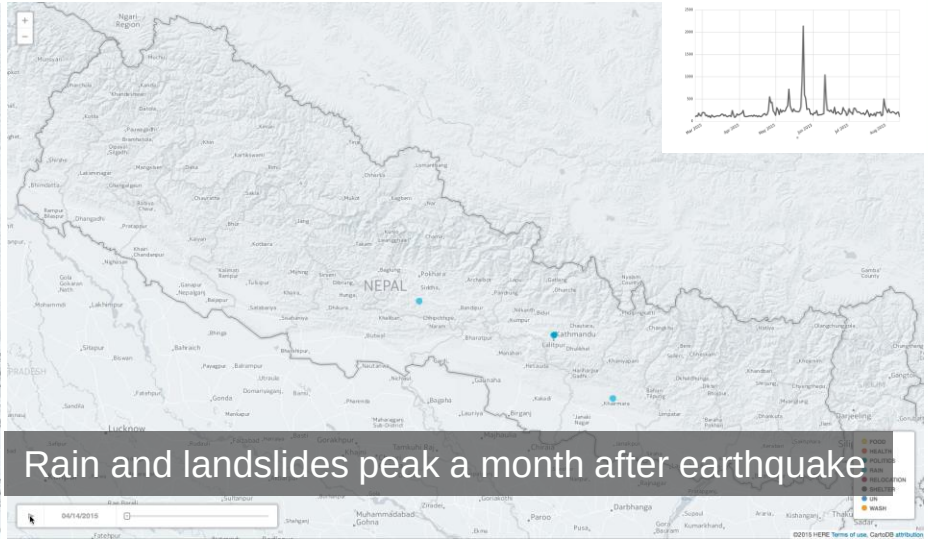
Nepal Earthquake

WASH peaks during the first week

Shelter peaks over two weeks



Health peaks over two weaks



Rain and landslides peak a month after earthquake

HUMAN BEHAVIOURS IN FLOODS USING MOBILE PHONE DATA

WFP World Food Programme wfp.org

GLOBAL PULSE

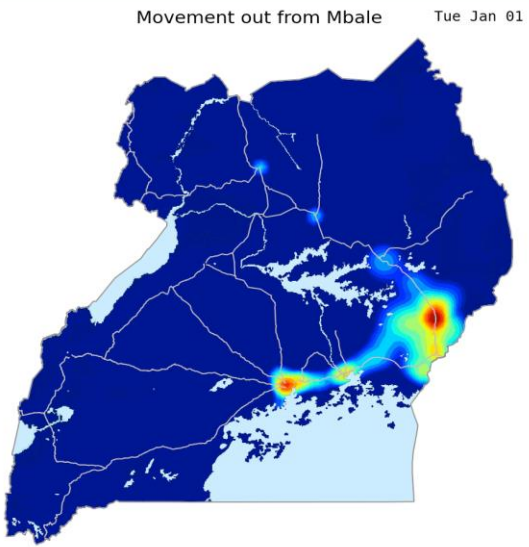
POPULATION DISPLACEMENT

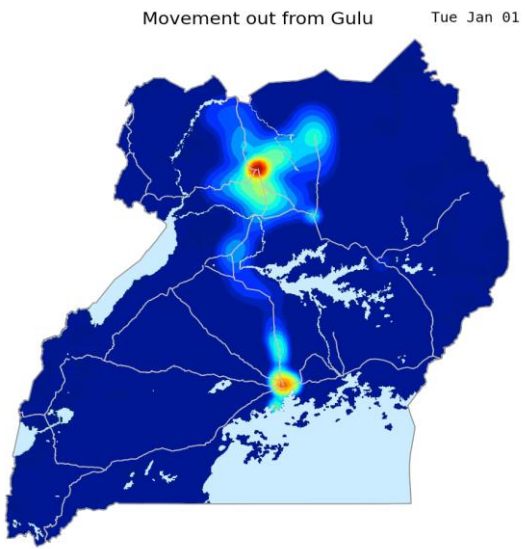
TYPICAL NIGHT IN TABASCO

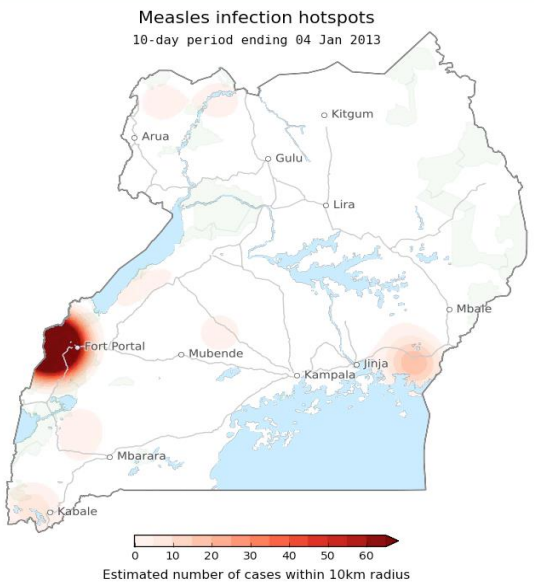
NIGHT OF FLOODS:

PARTNERS: Global Pulse, WFP, Technical University of Madrid, Telefonica Research

PREDICTING THE SPREAD OF DISEASE USING MOBILE PHONE DATA

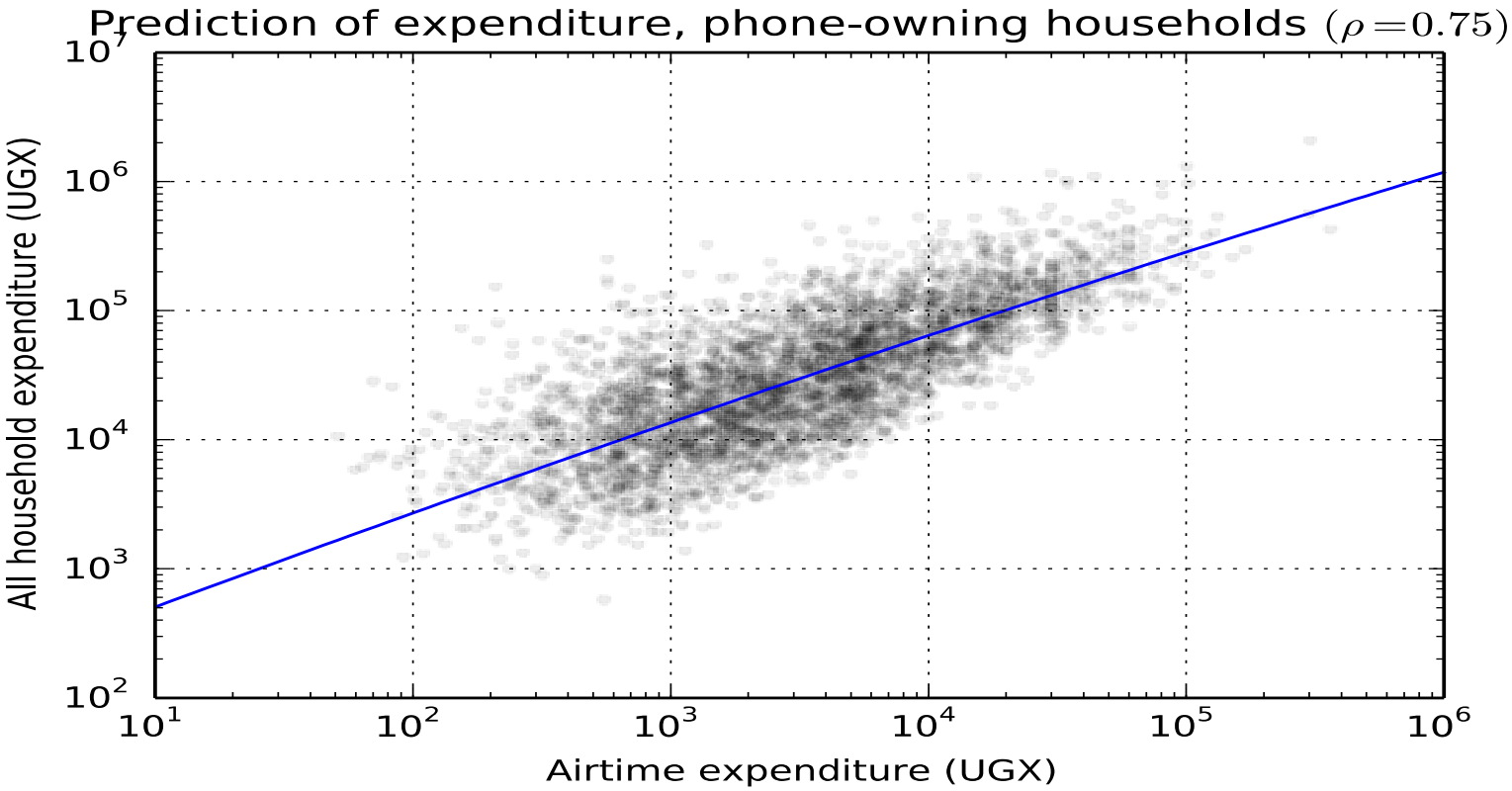






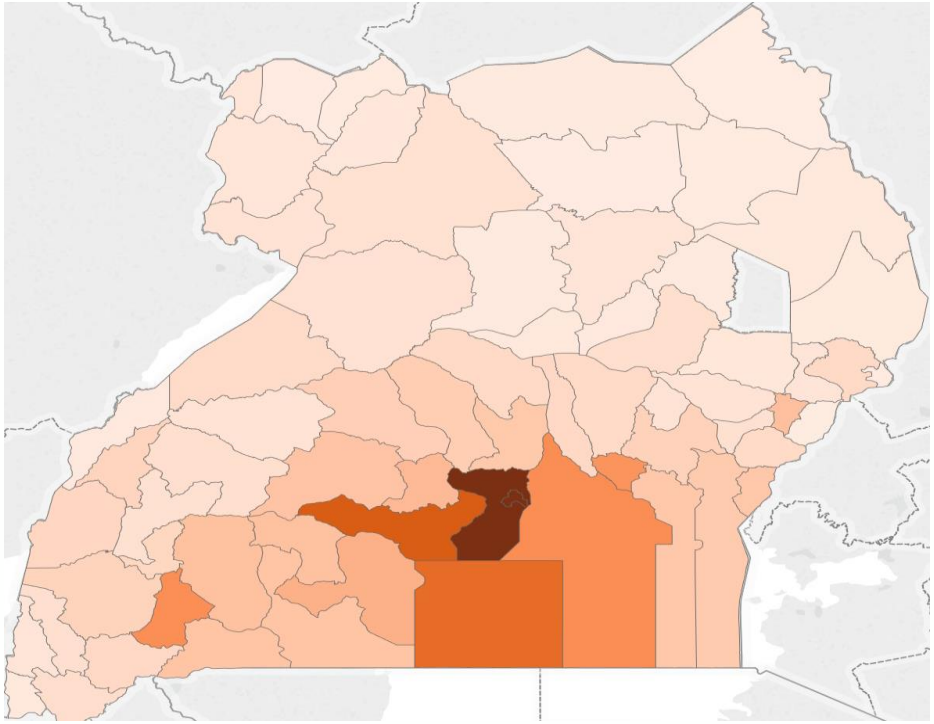
http://unglobalpulse.org/mapping-infectious-diseases

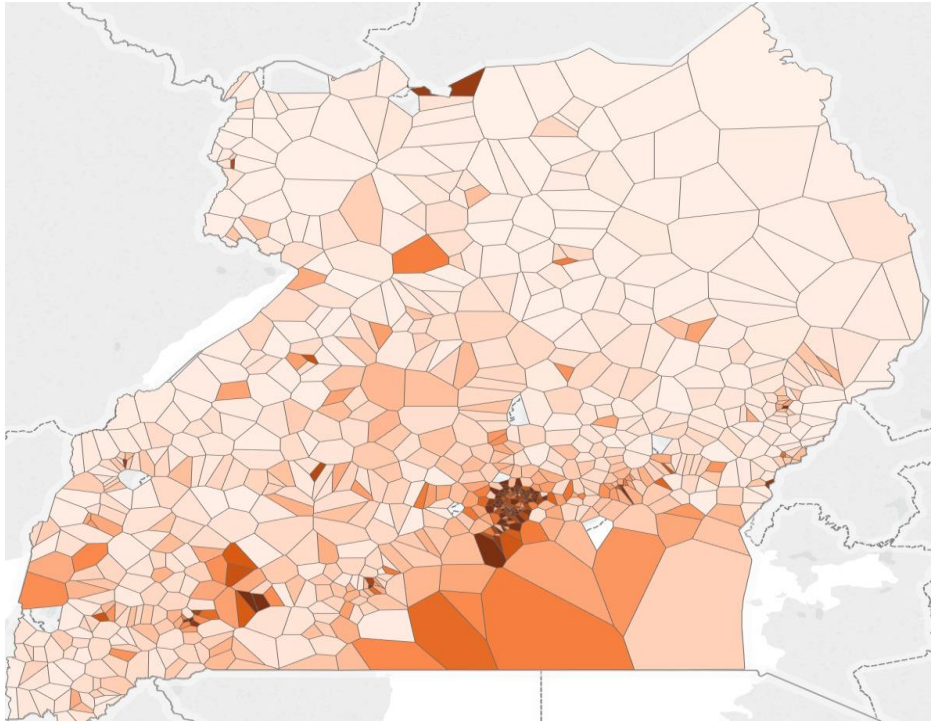
GLOBAL PULSE



1 NO POVERTY

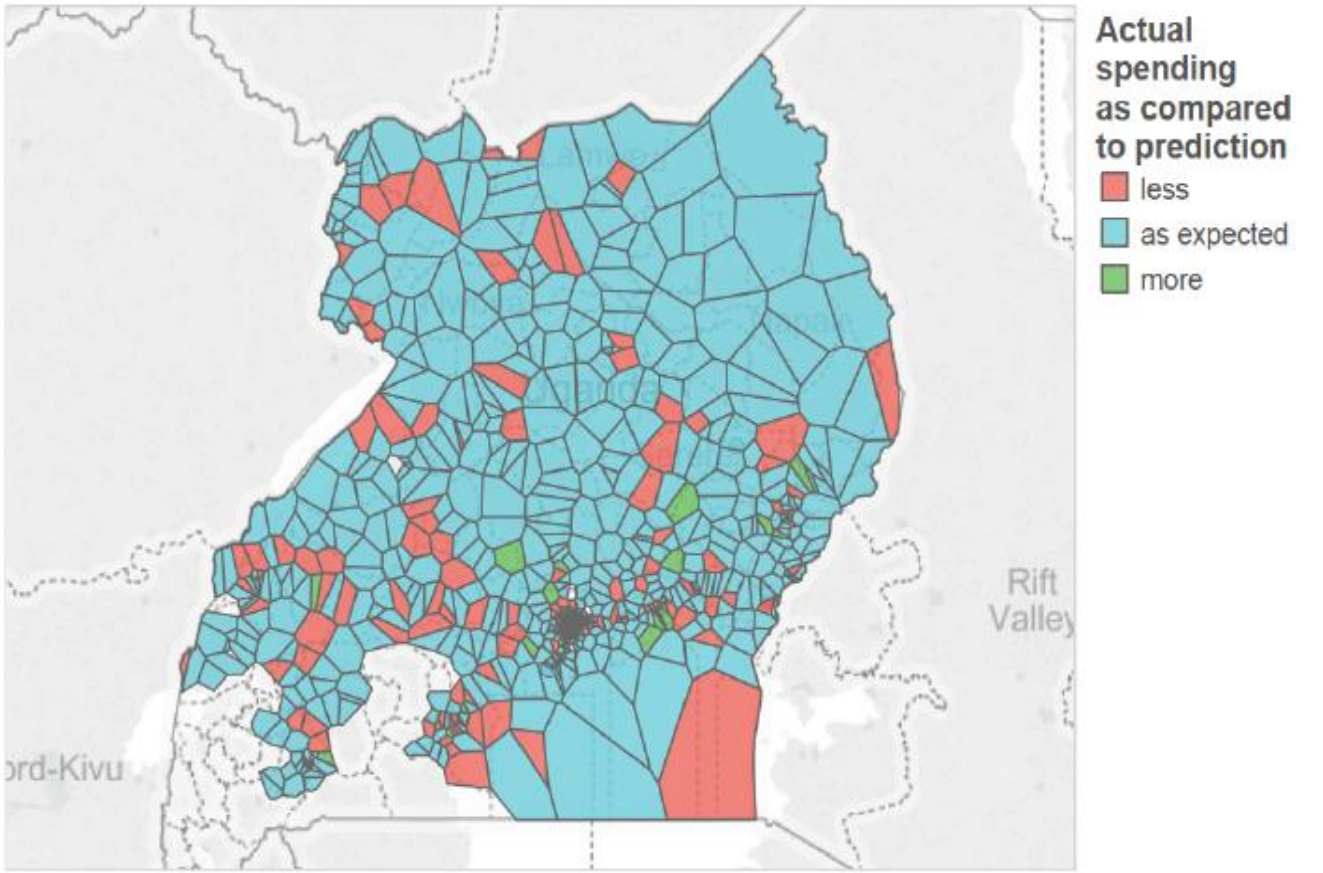
GLOBAL PULSE





1 NO POVERTY

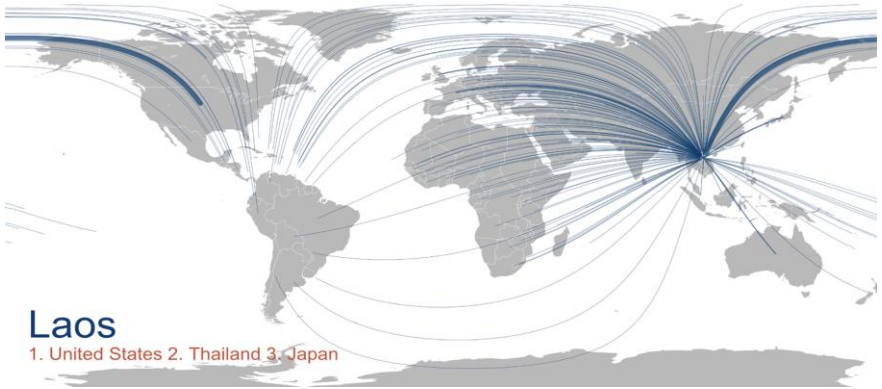
2a| Expenditure difference to prediction (on the selected day)

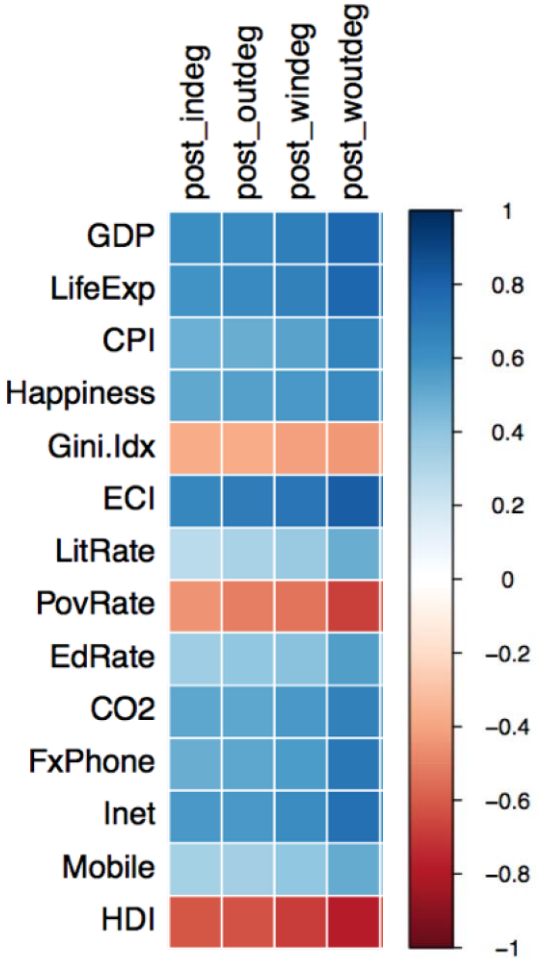


GLOBAL PULSE

http://unglobalpulse.org/mobile-CDRs-food-security

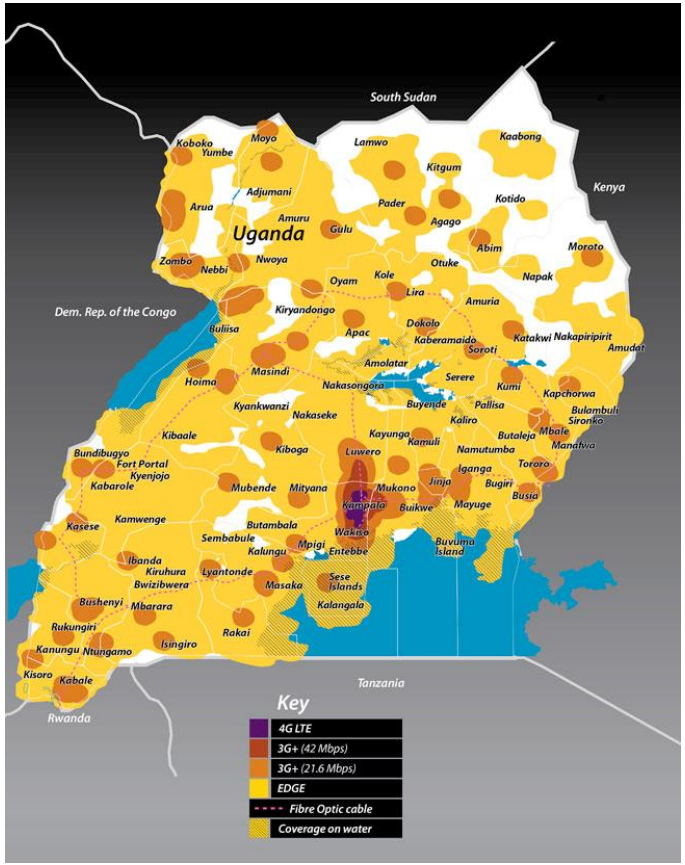
ECONOMIC INDICATORS HIDDEN IN BIG POSTAL DATA





Real-Time Rural Talk Radio Analytics

All 200 FM transmitters are in areas with mobile phone/EDGE reception, and most have 3G+ coverage.

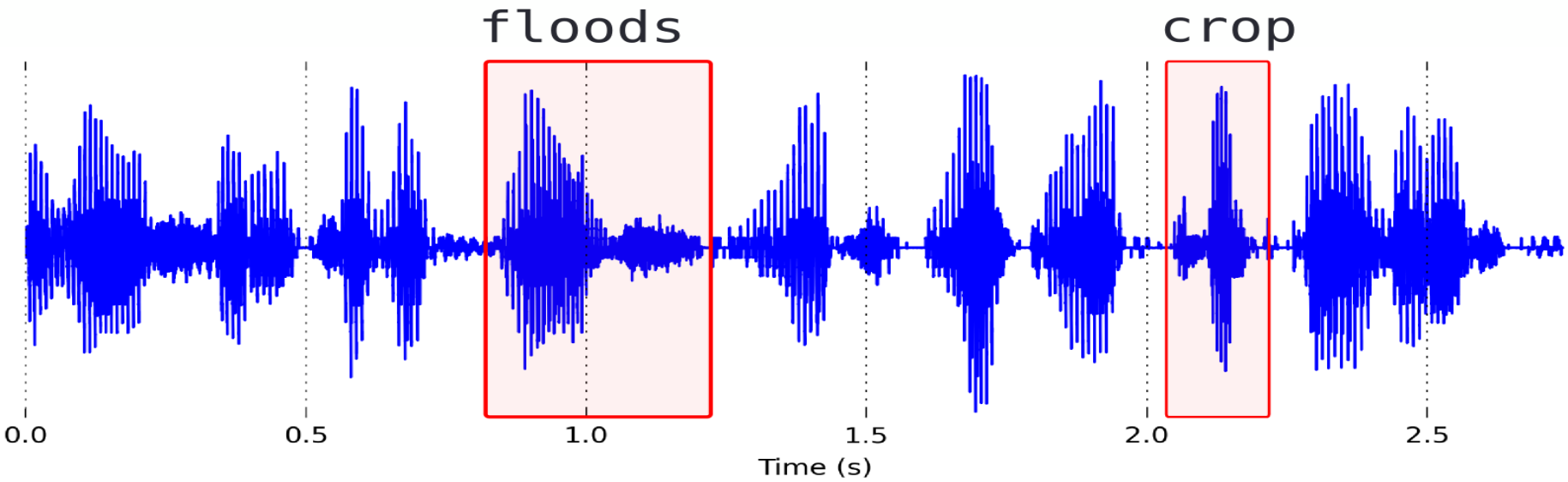


Recording Ugandan talk radio on 50 stations 24x7 in English, Luganda and Acholi.

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

GLOBAL PULSE

"hailstorm triggered floods which washed away crop gardens"



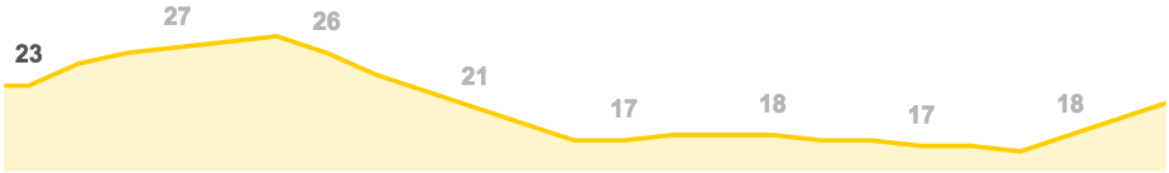
Kampala, Uganda

Wednesday 10:00 AM
Partly Cloudy

23 °F | °C

Precipitation: 10%
Humidity: 78%
Wind: 10 km/h

Temperature | Precipitation | Wind



11 AM | 2 PM | 5 PM | 8 PM | 11 PM | 2 AM | 5 AM | 8 AM

Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed
28° 16°	27° 17°	24° 17°	25° 15°	27° 16°	27° 16°	26° 16°	26° 18°

THANK YOU!

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