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”
Hypothesis: digital services are sensor networks for human wellbeing.
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.

3. 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.
2011 Tohoku Earthquake, Japan
BIG (BEHAVIORAL) DATA

“What People Say”
- Online news
- Social media
- Retail advertising
- Radio & TV

“What People Do”
- Online search
- Mobile phone usage
- Credit card purchases
- Money transfers
- Ecommerce/Retail POS
- Postal traffic
- Sensors of all sorts...
Why is big data different?

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
HIV RISK AWARENESS AT THE WORLD CUP
"There are some autism cases after MMR vaccine"

"A baby suddenly died after vaccine"

"Is it dangerous to have fever, swelling, pain, after vaccine?"

"China is investigating death cases of babies"

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<th>2012-06-20</th>
<th>2012-10-08</th>
<th>2013-04-28</th>
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<tr>
<td>1</td>
<td>Autism (213)</td>
<td>Death (1030)</td>
<td>Fever (1498)</td>
<td>Death (224)</td>
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<td>2</td>
<td>Death (5)</td>
<td>Fever (14)</td>
<td>Swelling (1494)</td>
<td>Fever (3)</td>
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<td>3</td>
<td>Sick (4)</td>
<td>Sick (4)</td>
<td>Pain (1491)</td>
<td>Crying (1)</td>
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<tr>
<td>4</td>
<td>Fever (2)</td>
<td>Crying (3)</td>
<td>Autism (1011)</td>
<td>Autism (1)</td>
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<tr>
<td>5</td>
<td>Crying (1)</td>
<td>Fever (3)</td>
<td>Fever (4)</td>
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</tbody>
</table>
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 weeks

Rain and landslides peak a month after earthquake
HUMAN BEHAVIOURS IN FLOODS USING MOBILE PHONE DATA

POPULATION DISPLACEMENT

TYPICAL NIGHT IN TABASCO

NIGHT OF FLOODS:

Lower mobility

Higher mobility

Min. 10 displacements

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
Prediction of expenditure, phone-owning households ($\rho = 0.75$)
2a| Expenditure difference to prediction (on the selected day)

Actual spending as compared to prediction:
- red: less
- blue: as expected
- green: more

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

Real-Time Rural Talk Radio Analytics
"hailstorm triggered floods which washed away crop gardens"
THANK YOU!
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