

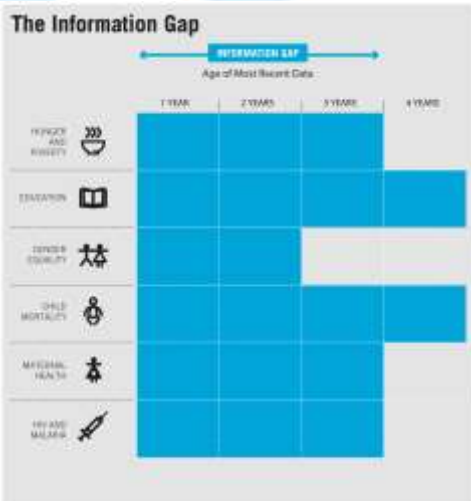


# Big Data Revolution for Sustainable Development and Humanitarian Action

Panel 3: Data from all parts of societies

Derval Usher  
Pulse Lab Jakarta





Household-level data is challenging to collect on a real-time basis, making development progress difficult to track. (Source: Millennium Development Goals Report, 2011)

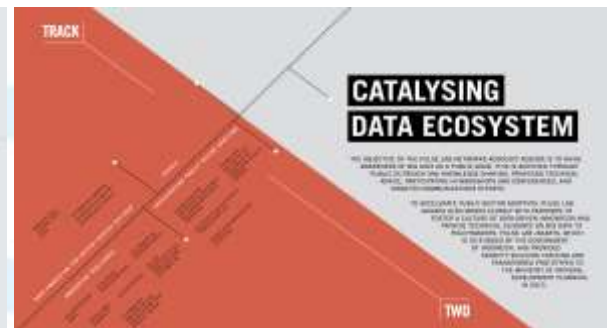


# United Nations Global Pulse

A flagship innovation initiative of the United Nations Secretary-General on the data revolution

**Vision** Big Data harnessed responsibly as a public good

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



Whether using our phones, shopping online or posting on social media, the activities that we undertake everyday generate an ocean of digital data. Once anonymised to protect privacy, this 'big data' can reveal insights on changes in human well-being, as well as real-time feedback on the efficacy of public policy, development programmes and humanitarian action.

## BIG DATA AS SOCIAL AND PUBLIC GOOD

### *What people say*

- Social media (content focus)
- Online advertisement
- Complaint system
- Radio

### *What people do*

- Social media (location focus)
- Mobile data
- Utility usage data
- Postal data
- Transportation data
- Searching keywords
- On-/ offline retail data
- Remote sensing



1 NO POVERTY



Photo



Thatched roof

Satellite image

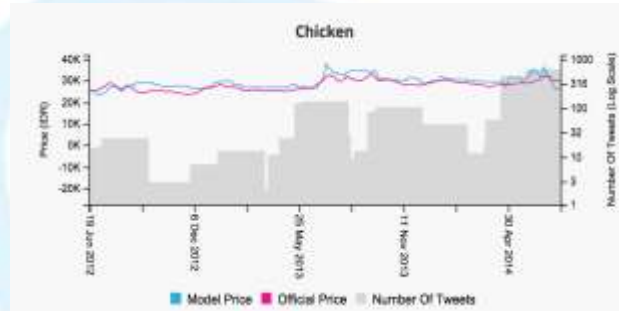


Metal roof





## Social Media

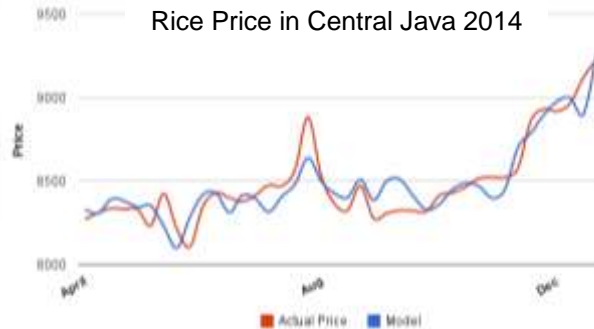


$$P_{i+1} = \frac{\alpha P_i + \beta P_{i+1}^{tweet}}{\alpha + \beta}$$

$$P_{i+1}^{tweet} = \frac{\sum_{j=1}^{|T_{i+1}|} w_{i+1}^j \cdot T_{i+1}^j}{\sum_j w_{i+1}^j} \quad w_{i+1}^j = \begin{cases} 1 - \frac{|T_{i+1}^j - \bar{T}|}{\delta} & \text{if } |T_{i+1}^j - \bar{T}| \leq \delta \\ 0 & \text{otherwise} \end{cases}$$

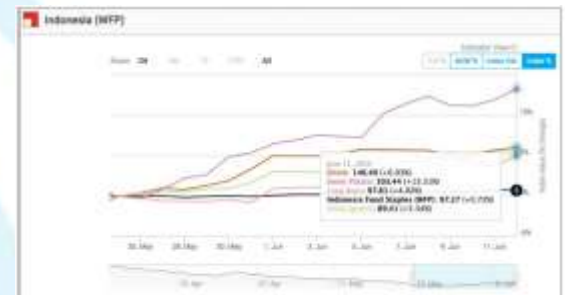
$$P_i = \frac{\sum_{j=i-k}^{i-1} P_j}{k} \text{ where no tweets over } n \text{ days}$$

## Google Search



$$P_i = \alpha + \beta_1 MoT_{i-2} + \beta_2 MoT_{i-4} + \beta_3 GT_i + \beta_4 GT_{i-1} + \beta_5 GT_{i-3}$$

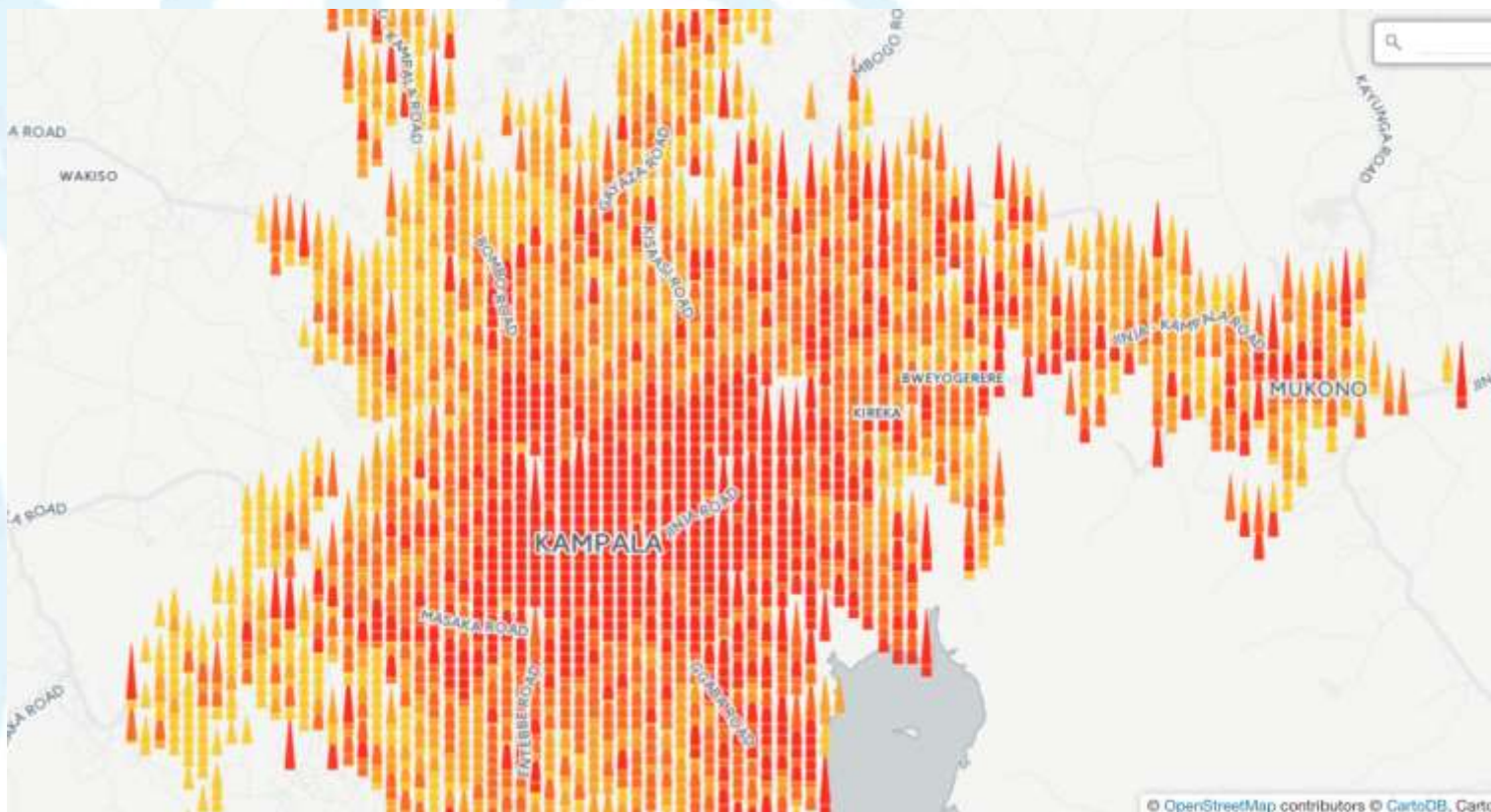
## Crowdsourcing



6 CLEAN WATER AND SANITATION



7 AFFORDABLE AND CLEAN ENERGY



© OpenStreetMap contributors © CartoDB, Carto





Item was posted by customer 'CY1224'

Country of origin

Country of destination

Date and time

Item was posted at office '75-243'

Type of event reported

International tracking ID #

Corresponding domestic tracking ID #

EMA+CP012374226IN::::21200015891152+ES+1410241030+75-243  
 +CY1224+274702+UTTAR PRADESH+28052+MADRID:SHP:DAVID AVENIDA:PISO  
 112:CLIENT\_NUM:PACKSTATION\_NUM:SIG+(55) 55 555 555:NAME1&AMP;DOMAIN  
 +(66) 66 666 666:MIGUEL@UN.ORG: MR.LUENGO:28100+1+3+A+LP+R+  
 0.055:0.051:0.00358+127.43:INR+DDU+0:EUR:BIC NUMBER:IBAN  
 NUMBER+301+MONS::43:CALLE CANALETAS

Postcode of sender

Gross and net weight of item

Amount paid for postage and currency

Place of sender





9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



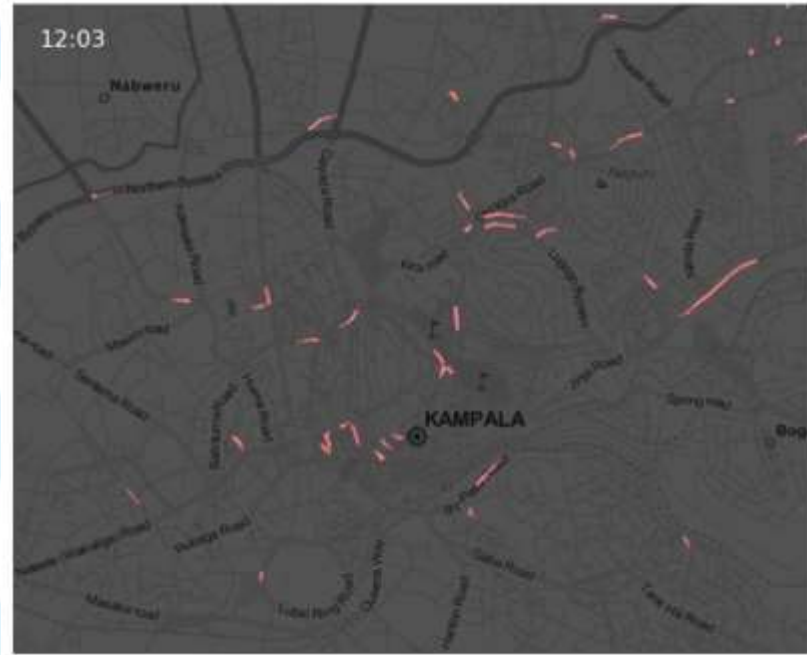
Jakarta

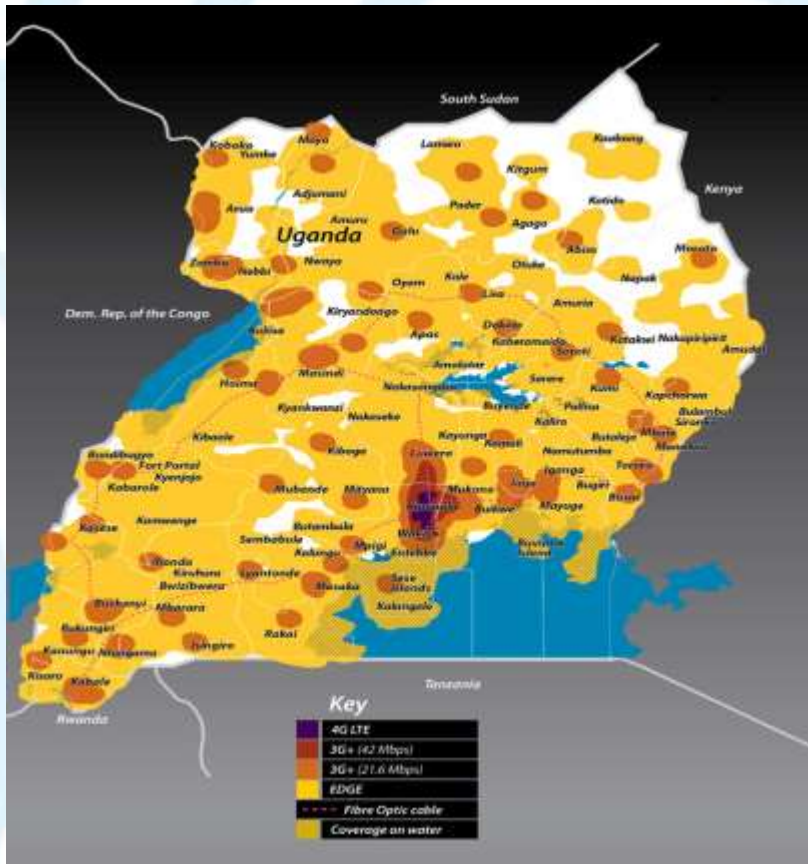


Tengah Malam 0-4      Pagi 4-8      Siang 8-12      Tengah Hari 12-16      Sore 16-20      Malam 20-24

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

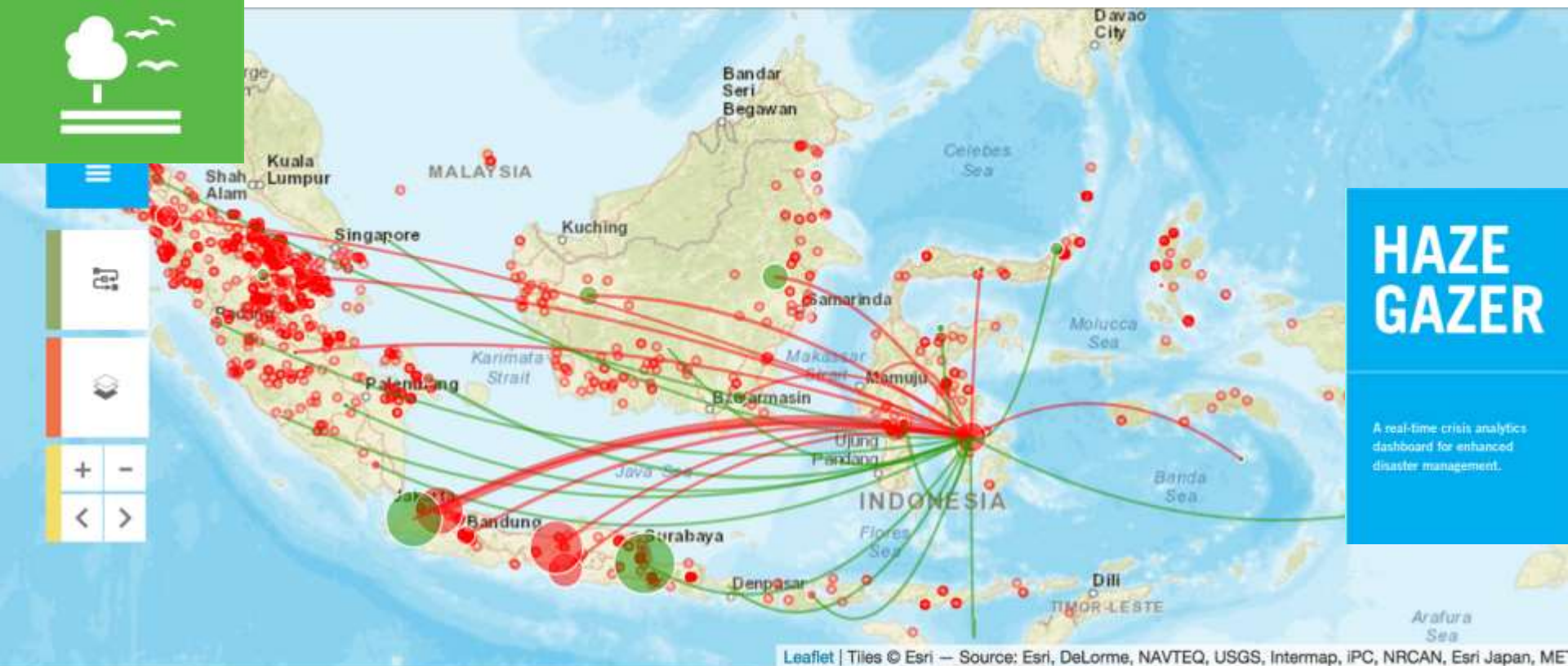
Data from GPS devices can be used for traffic control and to improve public transport







UI controls for the Haze Gazer dashboard, including a menu icon, a search icon, a refresh icon, and zoom controls (+, -, <, >).

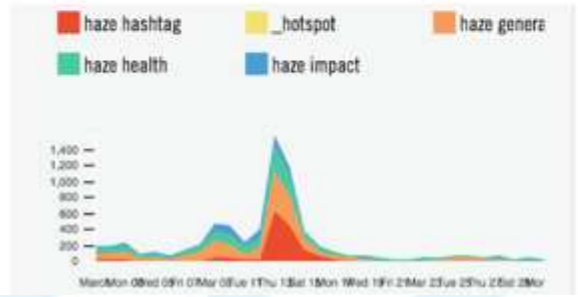


# HAZE GAZER

A real-time crisis analytics dashboard for enhanced disaster management.

Leaflet | Tiles © Esri — Source: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, ME

### ANALYSIS



### IMAGE



### VIDEO





## NATIONAL DASHBOARD

[INSTRUCTION](#) [ABOUT](#) ☰

**DATA SOURCE**

Lapor
  Twitter

**REGION**

Indonesia ▼

**CATEGORY**

Food Sufficiency

Energy

Health

Education

Health

Poverty Reduction

Poverty Reduction

Poverty Reduction

Security

**TIMELINE**

01/01/2016 - 01/01/2017

Day
  Week
  Month
  Year

Home | **Volume Analysis** | Treemap Analysis | Keyword Analysis | Topic Breakdown Analysis | Alert Analysis

**Topic**

Topic	Volume (approx.)
Automatic Reform	55
Poverty Reduction	45
Health	35
Education	15
Energy	5
Food Sufficiency	5
Industry	5
Infrastructure Transportation	5
Maritime Development	5
Urban	5

**Daily Volume**

16,855 selected out of 16,855 messages from users | [reset all](#)

Automatic Reform
  Education
  Energy
  Food Sufficiency
  Health
  Industry
  Infrastructure Transportation
  Maritime Development
  Poverty Reduction
  Urban



How data science and analytics can contribute to sustainable development

**1 NO POVERTY**

Spending patterns on mobile phone services can provide proxy indicators of income levels

**2 ZERO HUNGER**

Crowdsourcing or tracking of food prices listed online can help monitor food security in near real-time

**3 GOOD HEALTH AND WELL-BEING**

Mapping the movement of mobile phone users can help predict the spread of infectious diseases

**4 QUALITY EDUCATION**

Citizen reporting can reveal reasons for student drop-out rates

**5 GENDER EQUALITY**

Analysis of financial transactions can reveal the spending patterns and different impacts of economic shocks on men and women

**6 CLEAN WATER AND SANITATION**

Sensors connected to water pumps can track access to clean water

**7 AFFORDABLE AND CLEAN ENERGY**

Smart metering allows utility companies to increase or restrict the flow of electricity, gas or water to reduce waste and ensure adequate supply at peak periods

**8 DECENT WORK AND ECONOMIC GROWTH**

Patterns in global postal traffic can provide indicators such as economic growth, remittances, trade and GDP

**9 INDUSTRY, INNOVATION AND INFRASTRUCTURE**

Data from GPS devices can be used for traffic control and to improve public transport

**10 REDUCED INEQUALITY**

Speech-to-text analytics on local radio content can reveal discrimination concerns and support policy response

**11 SUSTAINABLE CITIES AND COMMUNITIES**

Satellite remote sensing can track encroachment on public land or spaces such as parks and forests

**12 RESPONSIBLE CONSUMPTION AND PRODUCTION**

Online search patterns or e-commerce transactions can reveal the pace of transition to energy efficient products

**13 CLIMATE ACTION**

Combining satellite imagery, crowd-sourced witness accounts and open data can help track deforestation

**14 LIFE BELOW WATER**

Maritime vessel tracking data can reveal illegal, unregulated and unreported fishing activities

**15 LIFE ON LAND**

Social media monitoring can support disaster management with real-time information on victim location, effects and strength of forest fires or haze

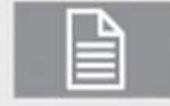
**16 PEACE, JUSTICE AND STRONG INSTITUTIONS**

Sentiment analysis of social media can reveal public opinion on effective governance, public service delivery or human rights

**17 PARTNERSHIPS FOR THE GOALS**

Partnerships to enable the combining of statistics, mobile and internet data can provide a better and real-time understanding of today's hyper-connected world





## Global Pulse Project Series

<http://unglobalpulse.org/blog/big-data-development-action-global-pulse-project-series>



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## DATA PRIVACY



DATA PRIVACY ADVISORY GROUP  
 DATA PRIVACY AND PROTECTION

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Global Pulse is a United Nations innovation initiative that explores how new, digital data sources and real-time analytics technologies can provide a better understanding of changes in human well-being and emerging vulnerabilities. However, legitimate concerns about privacy and data protection present challenges to harnessing Big Data sets for public benefit.





# UNITED

Harnessing big data

## 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

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GO

Global sources change concern sets for

DATA PRIVACY ADVISORY GROUP

DATA PRIVACY AND PROTECTION





**“THE DATA REVOLUTION IS GIVING THE  
WORLD POWERFUL TOOLS THAT CAN HELP  
USHER IN A MORE SUSTAINABLE FUTURE.”**

**- BAN KI-MOON, UN SECRETARY-GENERAL**



**GLOBAL  
PULSE**