12th World Telecommunication/ICT Indicators Symposium (WTIS-14)

Tbilisi, Georgia, 24-26 November 2014

Presentation

Document C/4-E
24 November 2014

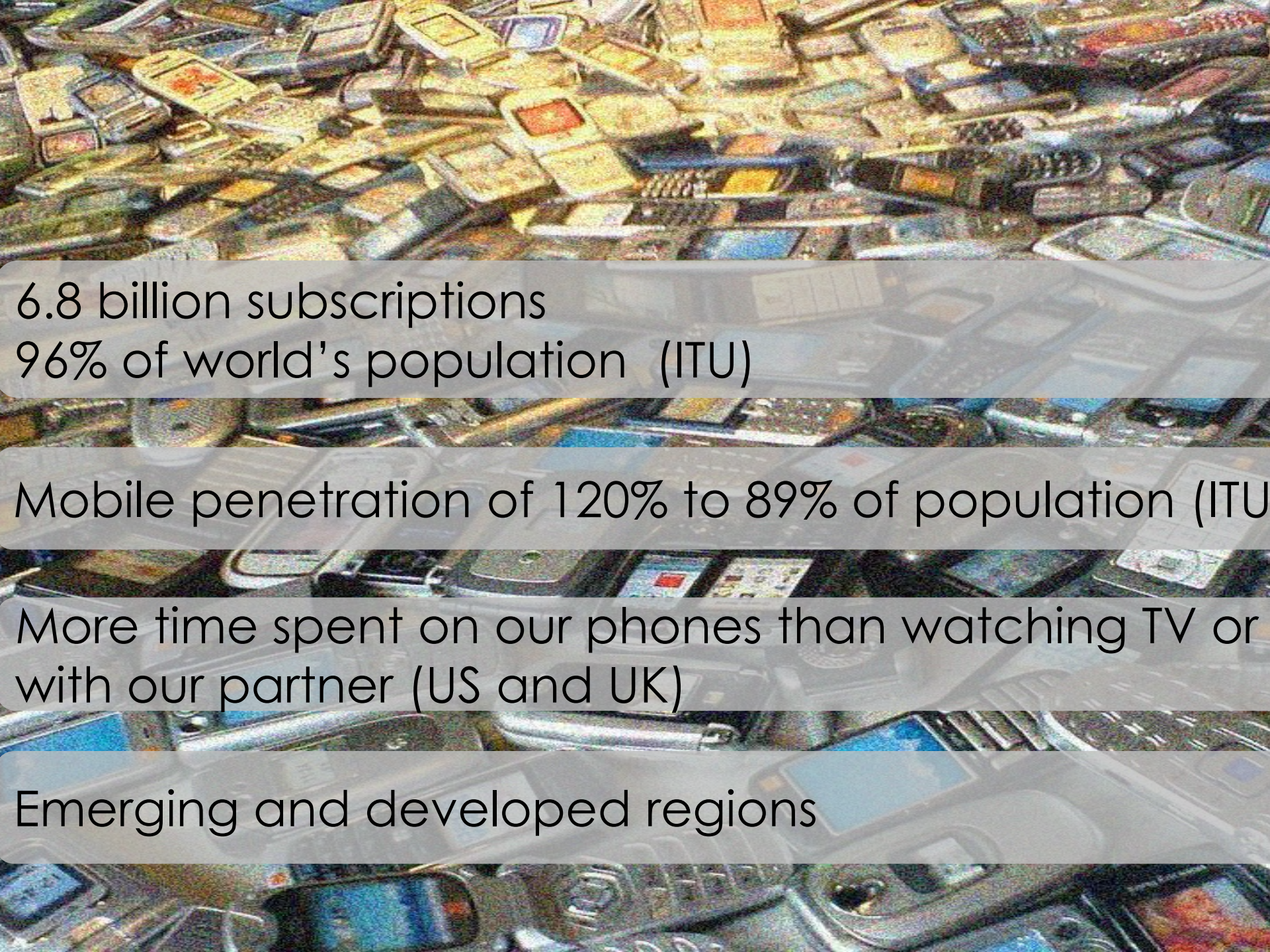
English

SOURCE: Telefonica Research

TITLE: Big Data for Social Good

Big Data for Social Good

Nuria Oliver, PhD
Scientific Director
User, Data and Media Intelligence
Telefonica Research



6.8 billion subscriptions
96% of world's population (ITU)

Mobile penetration of 120% to 89% of population (ITU

More time spent on our phones than watching TV or with our partner (US and UK)

Emerging and developed regions

Cell Phones as Sensors of Human Activity

Digital footprints enable large-scale analysis of human behavior

Bits

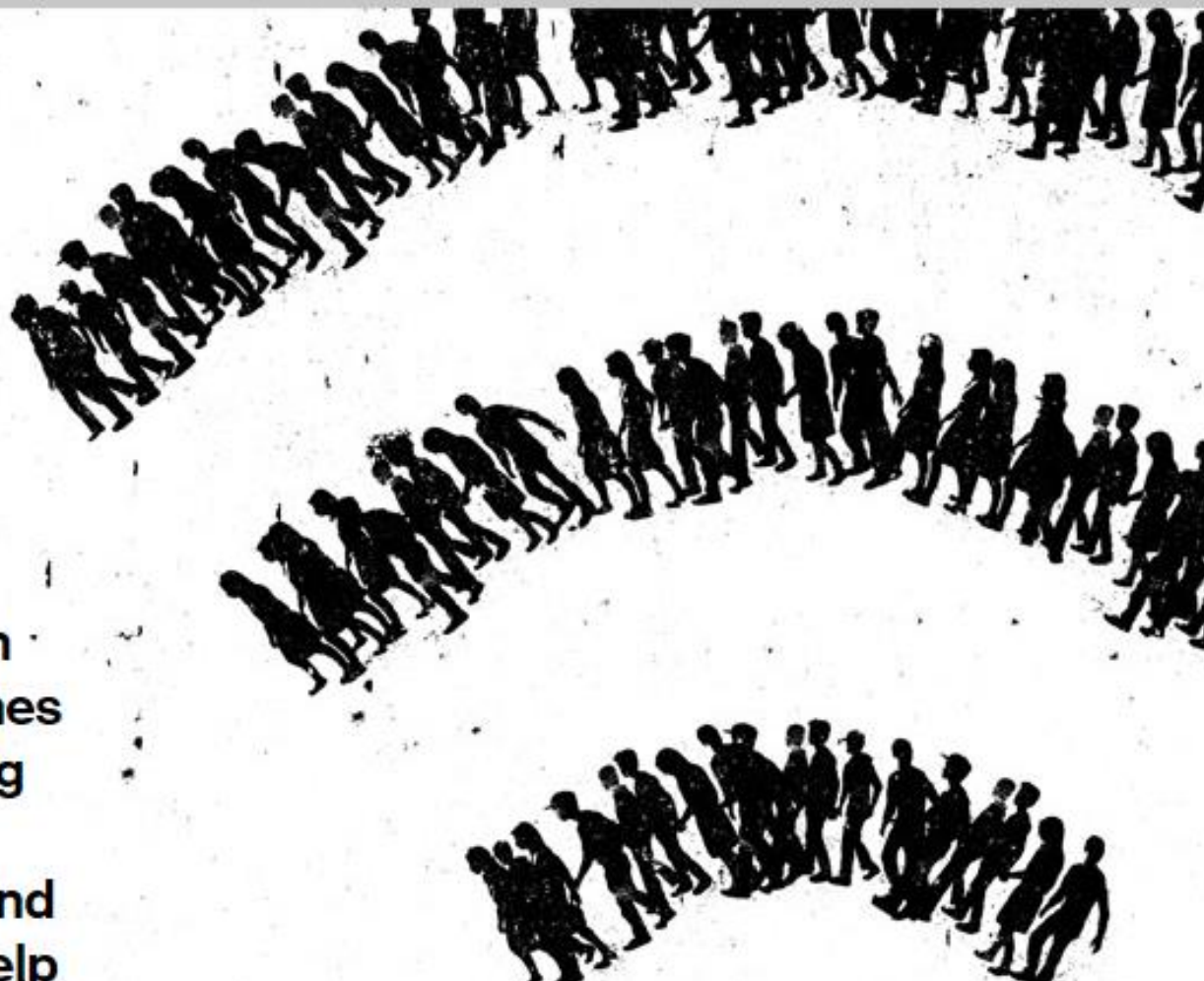
Business ▪ Innovation ▪ Technology ▪ Society

May 19, 2011, *7:06 pm* **The Sensors Are Coming!**
By NICK BILTON

ieee spectrum INSIDE TECHNOLOGY

Telecom / Wireless
NEWS
Cellphones for Science
Scientists want to put sensors into everyone's hands

Big Data from Cheap Phones



Collecting and analyzing information from simple cell phones can provide surprising insights into how people move about and behave—and even help

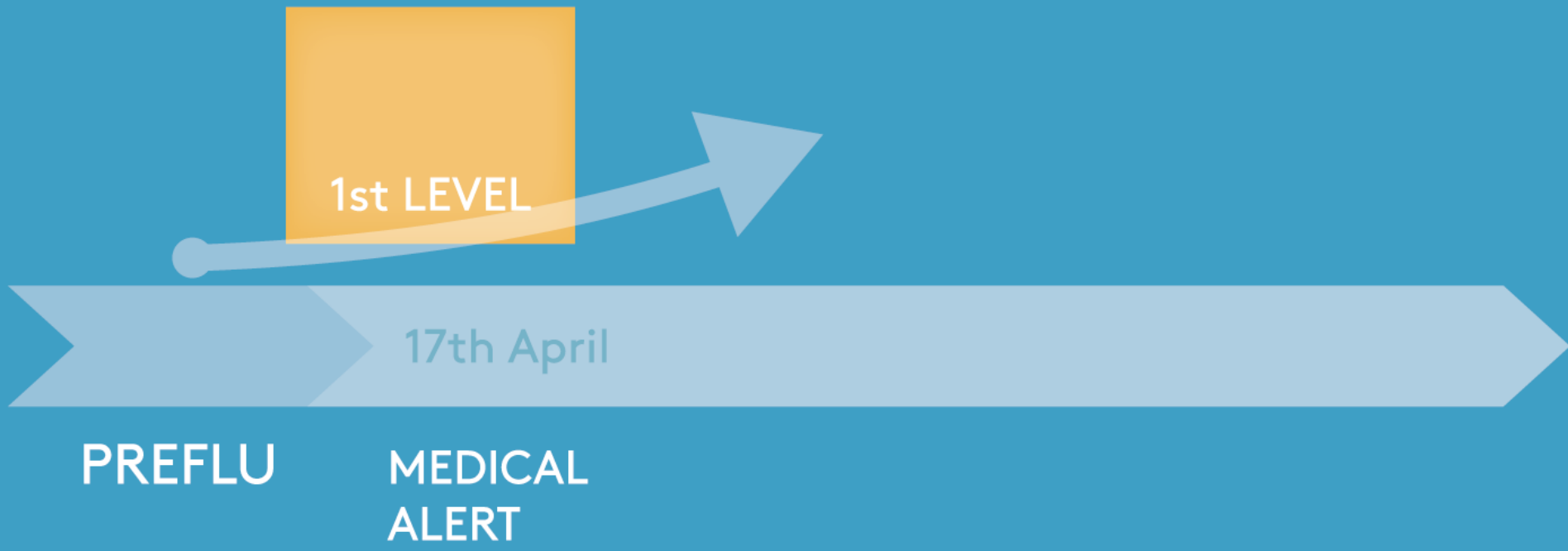
Can mobile digital footprints be used to understand aspects of human behavior that could help improve the world?

Pandemics

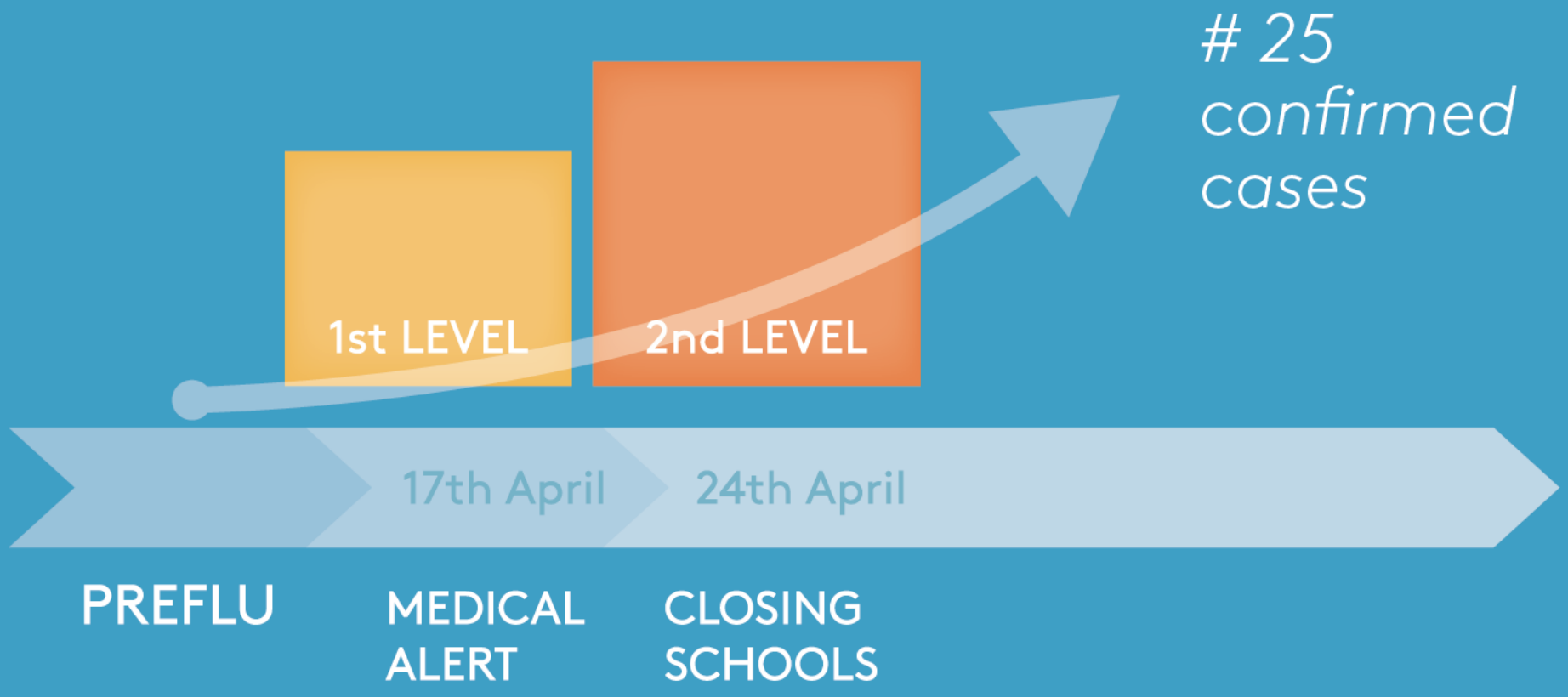
2009 H1N1 Mexico Timeline

PREFLU

2009 H1N1 Mexico Timeline



2009 H1N1 Mexico Timeline

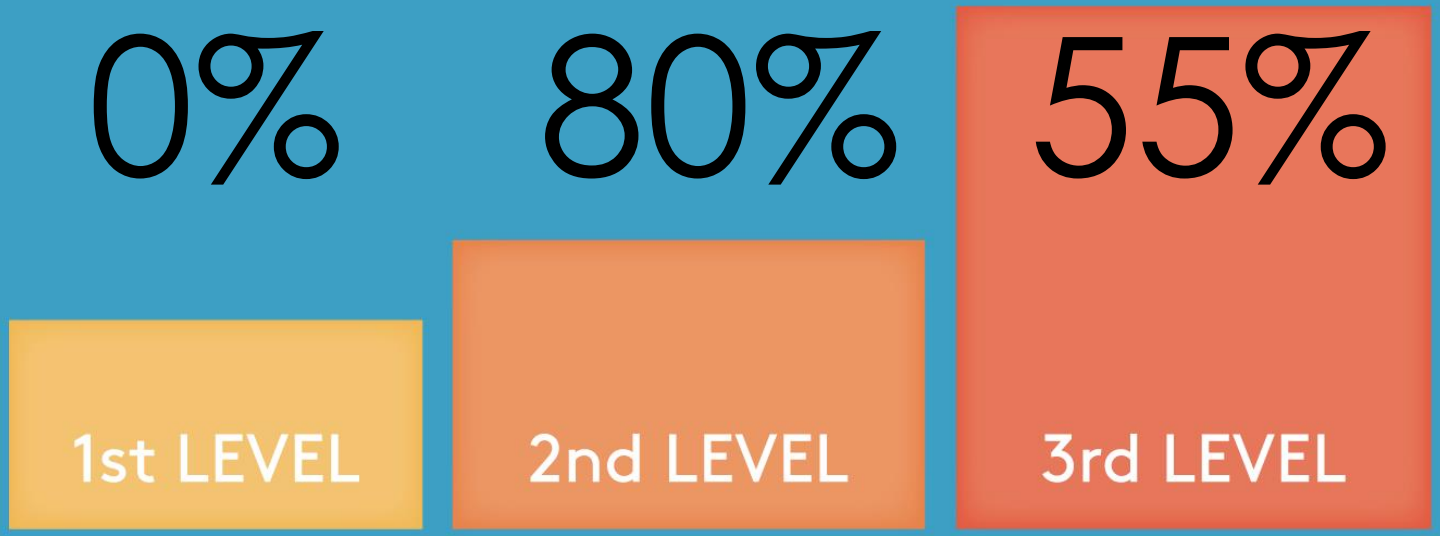


2009 H1N1 Mexico Timeline

Mexico 2012 Earthquake
Magnitude: 7.4
Date & Time: March 20, 2012 at 12:02:48 PM
Location: 16.662°N, 98.188°W
Depth: 20 km (12.4 miles)
Damage: 2 deaths
13 injuries
800 houses collapsed
Data: U.S. Geological Survey
Telefonica Mexico
OpenStreetMap
Telefónica
Legend
Less activity
More activity
7.4
5.3
Earthquake
Aftershocks
11:56

09:00

Impact of Government Measures on Mobility

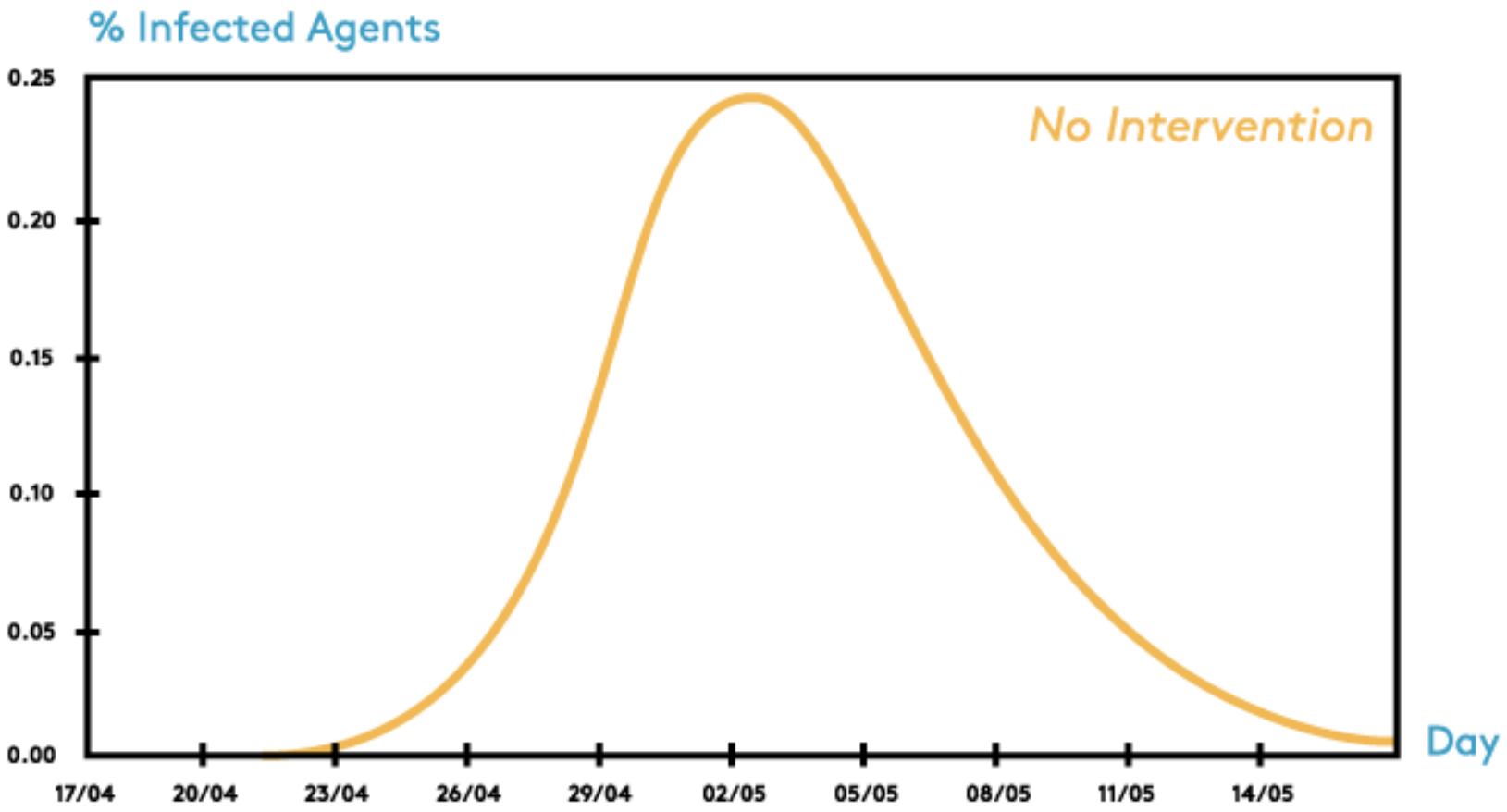


Medical Alert

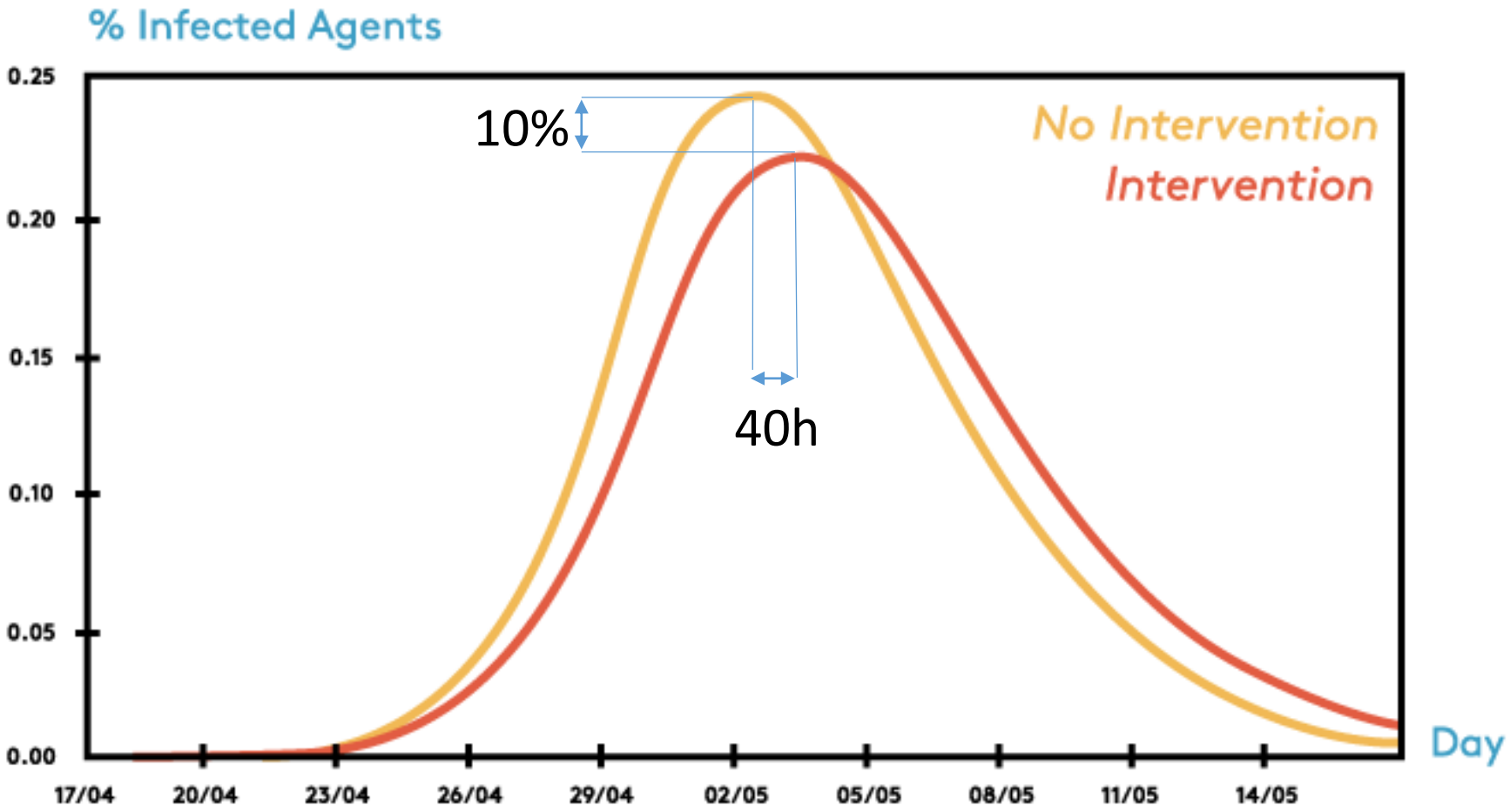
School and University Closures

Interruption of non-essential activities

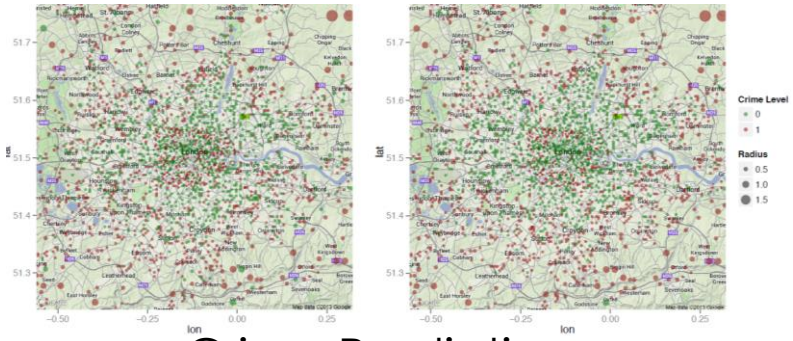
Impact on disease propagation



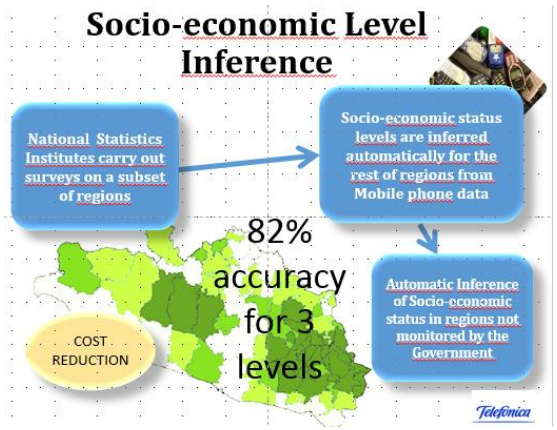
Impact on disease propagation

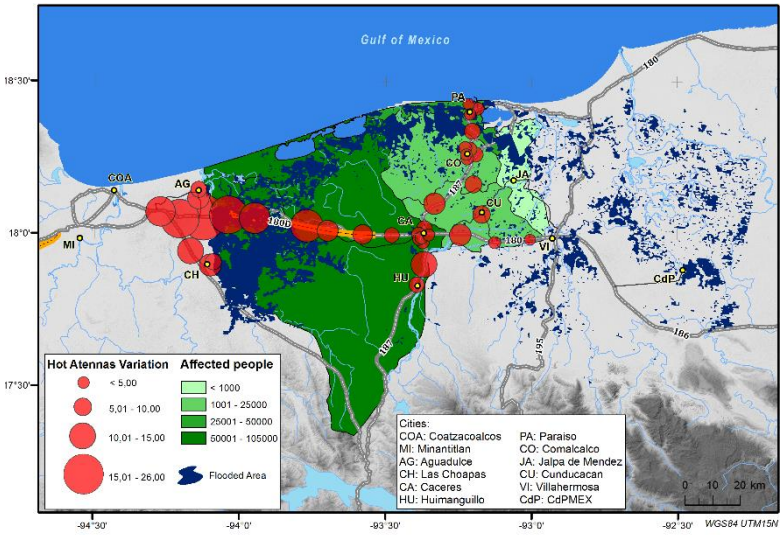


Big Data for Social Good



Crime Prediction





Analysis of impact of floods

UNIVERSITY OF TRENTO - Italy

Massachusetts Institute of Technology

UNIVERSIDAD POLITÉCNICA MADRID

United Nations GLOBAL PULSE

MÉXICO GOBIERNO FEDERAL

Relevant Publications

"An Agent-Based Model Of Epidemic Spread Using Human Mobility and Social Network Information", Vanessa Frias-Martinez et al, 3rd International Conference on Social Computing, SocialCom '11, Boston, USA, 2011.

"Flooding through the Lens of Mobile Phone Activity"
Pastor-Escuredo, D., Torres Fernandez, Y., Bauer, J.M., Wadhwa, A., Castro-Correa, C., Romanoff, L., Lee, J.G., Rutherford, A., Frias-Martinez, V., **Oliver, N.**, Frias-Martinez, E. and Luengo-Oroz, M.
To appear in Proceedins of IEEE Global Humanitarian Technology Conference, GHTC 2014, Silicon Valley, CA, Oct 2014

"Once Upon a Crime: Towards Crime Prediction from Demographics and Mobile Data" - A. Bogomolov, B. Lepri, J. Staiano, **N. Oliver**, F. Pianesi, A. Pentland 16th ACM International Conference on Multimodal Interaction (ICMI 2014)

Talk at WIRED 2013. London UK

http://www.wired.co.uk/news/archive/2013-10/17/nuria-oliver

8TH ANNUAL CRUNCHIES AWARDS Get Your 8th Annual Crunchies Tickets Today!

AOL Privacy Policy and Terms of Service

Column big data ebola

Using Big Data To Fight Pandemics

Posted Nov 8, 2014 by Nuria Oliver (@nuriaoliver)

2,979 SHARES

Next Story

http://techcrunch.com/2014/11/08/using-big-data-to-fight-pandemics/

Challenges

Ebola and big data

Waiting on hold

Mobile-phone records would help combat the Ebola epidemic. But getting to look at them has proved hard

Oct 25th 2014 | From the print edition

Timekeeper | Like 129 | Tweet 327

IN THE battle against Ebola, mobile phones could be invaluable—not just in themselves, as devices that can be used to send people public-health information or let them call helplines, but also because of the data they generate. Phone companies use call-data records, or CDRs, to manage their networks and bill their customers. These records include a caller's identity, the time of the call, the phone tower that handled it and the

Comment (5) | Timekeeper reading list | E-mail | Reprints & permissions | Print

Advertisement

Recent Activity

Peer-to-peer rental
145 people recommend this.

Why does liberal Iceland want to ban online pornography?
1,380 people recommend this.

Is The Economist left- or right-wing?
2,533 people recommend this.

Farming as rocket science
2,761 people recommend this.

Regulatory

1. Lack of updated regulation
2. Lack of clear guidelines regarding safe data handling, processing and sharing for humanitarian purposes

Technical

1. Representativeness of the data, generalization
2. Combination of data from multiple sources
3. Real-time analysis and prediction
4. Lack of ground truth → intervention to validate

Privacy

1. Potential privacy risks need to be minimized and understood
2. Clear code of conduct and ethical principles

Opportunities

Aggregated and Anonymized Mobile Phone Data allows us to *quantitatively*

- Model and understand large-scale human behavior (e.g. levels of activity, mobility patterns)
- Measure behavioral changes
- Predict/Classify external information
- Enhance the tools currently used by policy makers and provide critical information in areas like urban planning, crisis management or global health

What can we all do to *responsibly* turn this opportunity into a reality ?

Thanks!

nuria.oliver@telefonica.com
@nuriaoliver

Telefonica