COVID-19

Magic Box update

Effects of social distancing measures

Colombia, Cote d'Ivoire, India, Indonesia, Malaysia, Mexico, Mozambique, Myanmar, Nigeria, Ukraine
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**EXPLORATION**

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**COUNTRY OFFICE REPORTS**

*NEW*: (*)impact on air pollution, (^)Poverty disaggregation and (ª) 3 new Countries

- Colombia* ................................................................................................................ pages 13-21
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Overview

Through **data partnerships** with private sector companies **Magic Box** (UNICEF's big data initiative) has access to **aggregated and anonymized human mobility** for multiple countries.

Mobility data can tell us what the situation is in the country, how people are reacting to the enacted polices and highlight differences in regions.

**This deck shows insights for 10 programme countries:**
**Colombia, Cote d'Ivoire, India, Indonesia, Malaysia, Mexico, Mozambique, Myanmar, Nigeria, and Ukraine**

Further, this deck, contains an **exploration section** with insights for non-programme countries which are currently experiencing an epidemic (USA, Japan) and countries which are ahead of the epidemic curve (Germany).
National Reports Structure

For each country we show an analysis on

- **Data coverage**: Analysis of potential bias of mobility data
- **Policy changes**: Analysis of social distance policies implemented in the country
- **Social Distancing – National level**: Monitoring average daily travelled distance & time spent at home
- **Socioeconomic differences**: Social distancing inequalities based on poverty levels
  - Large cities – Zoom in
- **Subnational analysis**: Social distancing disaggregated subrationally
- **Changes in air pollution**: Analysis of country andadmin level air pollution

* New this week. Only for Nigeria and Indonesia. Waiting for poverty data for other countries
Limitations of current approach

The Mobility data presented here is collected through smartphones, but not everybody has a smartphone. Especially the most vulnerable are not represented in this smartphone datasets.

To make the analysis more representative we need:

- Data partnerships with local mobile network operators
- Collaborations with local academics/groups to adapt the analysis to the local context

Air pollution data shows the impact of pandemic control measures (or the relaxation of them) but is also affected by seasonal impact and other environmental factors.

- Weather data should be used to account for seasonalities and non-COVID related effects
Some highlights

- Magic Box has now data for 10 Program Countries: Mozambique, Myanmar and Ukraine are added this week.

- We are incorporating analysis of Socio-economic differences of Social Distancing. Key to understand impact and adequateness of mobility restrictions in low income settings. Only Nigeria and Indonesia this week.

- We are incorporating analysis of air pollution as there has been an overall discourse in the media of the positive effect that social distancing measures and factory closing might be having on pollution but we have concerns that reopening strategies might lead to worsening pre-COVID pollution levels and therefore needs monitoring.

- Change on movement behavior remains high (or growing), correlating with implemented policies:
  - Poor populations are increasing the time spent at home, but the increase in poor areas is considerably less than what we observe in rich areas.
  - Strengthening social distancing policies remains a go-to Government practice: All countries analyzed have been increasing policies for social distancing while seeing an increase in number of confirmed cases.
Exploration Section

May 1\textsuperscript{st} 2020

This section presents updated highlights of our Research collaboration network
Working on social distancing

Insights from USA

From mobility data it is possible to infer home and work locations. In the US, pre lockdown, the number of people physically going to a workplace was approx 60% (aligns well with statistics from the US census).

Post lockdown only approx 35% of individuals have a "going to work" signature. Research is being conducted to see if this decrease can tell us something about unemployment numbers or "working remotely" opportunities.

Data from: Cuebiq & survey data from the US census
Analysis by: Laura Alessandretti – Technical University of Denmark
Unemployment rate rising faster for states that had higher than average unemployment before control measures were put in place.

Google Searches for "Food Stamps" rising accordingly.

Data from: (left) US Dept. Of Labor Employment & Training Division (right) Google Trends
Analysis by: Kelton Minor - Center for Social Data Science, University of Copenhagen
COVID Unemployment

Insights from Spain

Spanish government put in place a mechanism to issue temporary unemployment as a result of COVID.

Just in Catalonia (approx. 3.4M workers and 10% unemployment rate) almost 500K workers (an 13.5%) have been affected by this mechanism, virtually doubling unemployment rates in a matter of weeks.

State of emergency declared on March 14th

Data from: Generalitat de Catalunya
Analysis by: Raquel Perez Arnal, Barcelona Supercomputing Center – C19 Global Data science Project [https://www.covid19analytics.org/]
Gender & Age on Social Distancing
Insights from Tokyo

It is important to understand how social distancing policies are affecting different demographics

This analysis shows

- **Women** have **greater reduction in movements**
- **Young adults** exhibit largest decrease in mobility

Data from: Docomo
Analysis by: Kunihiko Miyoshi and Hiroshi Maruyama– C19 Global Data science Project [https://www.covid19analytics.org/](https://www.covid19analytics.org/)
More info at: [https://www.covid19analytics.org/project-details/social-distancing#mobility-changes-tokyo](https://www.covid19analytics.org/project-details/social-distancing#mobility-changes-tokyo)
Sustainability over time
Insights from Germany

In Germany mobility initially declined after the government enacted social distancing measures, however, recently there has been an increase.

This has been linked to public perception of the restrictions, where a larger portion of the population is beginning to think measures are "too strict".

Data from: Mobile Network Providers + Surveys
Analysis by: Frank Schlosser - Humboldt University and German CDC (Robert Koch Institute)
Colombia

May 1<sup>st</sup> 2020
Data Coverage

Data for approx. **105,000 users** (out of 49.7 million inhabitants)

**representativeness of data**

**concentration of data**

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Policy changes

Sharp increase on Containment Policies.

Containment index computed by Oxford University considering Closures of Schools, Workplaces, Public transportation, cancellation of public events and restrictions for internal movements and international travels.

Colombia

Cases: 6211
Deaths: 279
Stringency: 93.38

Data from: https://www.bsg.ox.ac.uk/research/research-projects/oxford-covid-19-government-response-tracker
https://www.acaps.org/covid19-government-measures-dataset

Analysis from: UNICEF MagicBox
Social Distancing - National

We are here looking at how people's behavior differs from normal (Feb 2020)

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Subnational analysis

Looking across regions we see how people's behavior changes from Feb 2020.

Administrative regions with low number of active users per 10,000 people are grayed out.

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Change in NO2 concentration between 2019 Mar and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Evolution over time of NO2 concentration between 2019 and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution
Subnational analysis

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Cote d'Ivoire

May 1st 2020
Data Coverage

- We have data from approx. **5,000 users** (out of 25,07 million inhabitants)
- A large majority of users live in Abijan

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Social Distancing - National

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Data from: Cuebiq
Analysis from: UNICEF MagicBox
Changes across regions

- Looking across regions we see how people's behavior changes from Feb 2020.
- Data for Cote d’Ivoire is very noisy. Only Abidjan has enough data for an analysis.
Changes in Air Pollution

Change in NO2 concentration between 2019 Mar and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Evolution over time of NO2 concentration between 2019 and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Subnational analysis

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Data Coverage

We have data for approx. **200,000 users** (out of 1,353 million inhabitants)

**Representativeness of data**

- Active users per 10,000 people

**Concentration of data**

- Datapoints

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Policy changes

Sharp increase on Containment Policies.

Containment index computed by Oxford University considering Closures of Schools, Workplaces, Public transportation, cancellation of public events and restrictions for internal movements and international travels

Data from: https://www.bsg.ox.ac.uk/research/research-projects/oxford-covid-19-government-response-tracker
https://www.acaps.org/covid19-government-measures-dataset

Analysis from: UNICEF MagicBox
Changes in movement

We are here looking at how people's behavior differs from normal (Feb 2020)

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Changes across regions

Looking across regions we see how people's behavior changes from Feb 2020.

Administrative regions with low number of active users per 10,000 people are grayed out.

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Subnational analysis

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Change in NO2 concentration between 2019 Mar and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Evolution over time of NO2 concentration between 2019 and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution
Subnational analysis

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Data Coverage

- We have data from approx. **200,000 users** (out of 267.7 million inhabitants)
- Regions with high number of users include Jakarta, Bali, and Balikapan.
- The region with least users is on the Papua Island.

**Data from:** Cuebiq

**Analysis from:** UNICEF MagicBox
Policy changes

Increase on Containment Policies, sudden drop and loss of data.

Containment index computed by Oxford University considering Closures of Schools, Workplaces, Public transportation, cancellation of public events and restrictions for internal movements and international travels.

Data from: https://www.bsg.ox.ac.uk/research/research-projects/oxford-covid-19-government-response-tracker
https://www.acaps.org/covid19-government-measures-dataset

Analysis from: UNICEF MagicBox
National changes in movement

We are here looking at how people's behavior differs from normal (Feb 2020)

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Socioeconomic differences

Indonesia

Poverty definition (Indonesia):
- **Poor regions** (poverty rate higher than 20%)
- **Middle regions** (poverty rate between 5%-10%)
- **Richer regions** (poverty rate less than 5%)

Disaggregating social distancing behavior according to **poverty levels** to understand suitability differences of social distancing to

**Mobility data from:** Cuebiq
**Poverty data from National Social-Economic Household Survey (SUSENAS)**
**Analysis from:** UNICEF MagicBox
Subnational analysis

Looking across regions we see how people's behavior changes from Feb 2020.

Administrative regions with low number of active users per 10,000 people are grayed out.

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Subnational analysis

Data from: Cuebiq

Analysis from: UNICEF MagicBox
Changes in Air Pollution

Change in NO2 concentration between 2019 Mar and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Evolution over time of NO2 concentration between 2019 and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Subnational analysis

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Malaysia

May 1\textsuperscript{st} 2020
Data Coverage

- We have data from approx. **90,000 users** (out of 31.5 million inhabitants)
- Large adoption rates in Kuala Lumpur (25 /10k) and Labuan Island (36/10k)

representativeness of data

concentration of data
Policy changes

Sharp increase on Containment Policies.

Containment index computed by Oxford University considering Closures of Schools, Workplaces, Public transportation, cancellation of public events and restrictions for internal movements and international travels

Malaysia

Cases: 5945
Deaths: 100
Stringency: 71.03

Data from: https://www.bsg.ox.ac.uk/research/research-projects/oxford-covid-19-government-response-tracker
https://www.acaps.org/covid19-government-measures-dataset
Analysis from: UNICEF MagicBox
We are here looking at how people's behavior differs from normal (Feb 2020)

**National changes in movement**

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Subnational analysis

Looking across regions we see how people's behavior changes from Feb 2020.

Data from: Cuebiq
Analysis from: UNICEF MagicBox

Administrative regions with low number of active users per 10,000 people are grayed out.
Subnational analysis

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Change in NO2 concentration between 2019 Mar and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Evolution over time of NO2 concentration between 2019 and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Subnational analysis

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Mexico

May 1\textsuperscript{st} 2020
Data Coverage

- We have data from approx. **1 million users** (out of 136.2 million inhabitants)
- Large adoption rates some states (above 150/10k persons). Mexico City has (80/10k persons)
Policy changes
Gradual increase on Containment Policies.

Containment index computed by Oxford University considering Closures of Schools, Workplaces, Public transportation, cancellation of public events and restrictions for internal movements and international travels

Mexico

Cases: 17799
Deaths: 1732
Stringency: 83.99

Data from: https://www.bsg.ox.ac.uk/research/research-projects/oxford-covid-19-government-response-tracker
https://www.acaps.org/covid19-government-measures-dataset
Analysis from: UNICEF MagicBox
We are here looking at how people's behavior differs from normal (Feb 2020)

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Subnational analysis

Looking across regions we see how people's behavior changes from Feb 2020.
Subnational analysis

Data from: Cuebiq
Analysis from: UNICEF MagicBox
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Change in NO2 concentration between 2019 Mar and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Evolution over time of NO2 concentration between 2019 and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Subnational analysis

Data from: European Union/ESA/Copernicus

Analysis from: UNICEF MagicBox
Mozambique

May 1\textsuperscript{st} 2020
Data Coverage

- Data for approx. **5,000 users** (out of 29.5 million inhabitants)
- A large majority of users live in Maputo
Policy changes
Sharp increase on Containment Policies.

Containment index computed by Oxford University considering Closures of Schools, Workplaces, Public transportation, cancellation of public events and restrictions for internal movements and international travels

Mozambique

Cases: 76  
Deaths: 0  
Stringency: 53.83

Data from: https://www.bsg.ox.ac.uk/research/research-projects/oxford-covid-19-government-response-tracker  
https://www.acaps.org/covid19-government-measures-dataset  
Analysis from: UNICEF MagicBox
Social Distancing - National

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Data from: Cuebiq
Analysis from: UNICEF MagicBox
Subnational analysis

- Looking across regions we see how people's behavior changes from Feb 2020.
- Data for Mozambique is very noisy. Only Maputo and surrounding region have enough data for an analysis.
Subnational analysis

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Change in NO2 concentration between 2019 Mar and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Evolution over time of NO2 concentration between 2019 and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Subnational analysis

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Myanmar

May 1\textsuperscript{st} 2020
Data Coverage

- Data for approx. **20,000 users** (out of 53.7 million inhabitants)
- A large majority of users live in Naypyidaw and Yangon

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Policy changes
Sharp increase on Containment Policies.

Containment index computed by Oxford University considering Closures of Schools, Workplaces, Public transportation, cancellation of public events and restrictions for internal movements and international travels

Myanmar

Cases: 150
Deaths: 6
Stringency: 81.69

Data from: https://www.bsg.ox.ac.uk/research/research-projects/oxford-covid-19-government-response-tracker
https://www.acaps.org/covid19-government-measures-dataset
Analysis from: UNICEF MagicBox
Social Distancing - National

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Data from: Cuebiq
Analysis from: UNICEF MagicBox
Subnational analysis

Looking across regions we see how people's behavior changes from Feb 2020.
Subnational analysis

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Analysis from: UNICEF MagicBox
Changes in Air Pollution

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Analysis from: UNICEF MagicBox
Changes in Air Pollution
Subnational analysis

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Data Coverage

- Data for approx. **70,000 users** (out of 196 million inhabitants)
- A large majority of users live in Lagos and Abuja

Data from: Cuebiq
Analysis from: UNICEF MagicBox
Policy changes
Sharp increase on Containment Policies.

Containment index computed by Oxford University considering Closures of Schools, Workplaces, Public transportation, cancellation of public events and restrictions for internal movements and international travels

Data from: https://www.bsg.ox.ac.uk/research/research-projects/oxford-covid-19-government-response-tracker
https://www.acaps.org/covid19-government-measures-dataset
Analysis from: UNICEF MagicBox
Social Distancing - National

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Data from: Cuebiq
Analysis from: UNICEF MagicBox
Socioeconomic differences

Disaggregating social distancing behavior according to poverty levels to understand suitability differences of social distancing to

Poverty definition (Nigeria):

- **Poor areas** (more than 50% living below poverty line)
- **Middle income** (20%-50% people living below poverty line)
- **Richer areas** (less than 20% below poverty line)

Data from: Cuebiq + WorldPop
Analysis from: UNICEF MagicBox
Poverty definition (Nigeria):

- **Poor** areas (more than 50% living below poverty line)
- **Middle** income (20%-50% people living below poverty line)
- **Richer** areas (less than 20% below poverty line)
Subnational analysis

- Looking across regions we see how people's behavior changes from Feb 2020.
- Data for Cote d’Ivoire is very noisy. Only Abidjan has enough data for an analysis.
Subnational analysis

Data from: Cuebiq
Analysis from: UNICEF MagicBox
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Change in NO2 concentration between 2019 Mar and now

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Analysis from: UNICEF MagicBox
Changes in Air Pollution

Evolution over time of NO2 concentration between 2019 and now

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Changes in Air Pollution

Subnational analysis

Data from: European Union/ESA/Copernicus
Analysis from: UNICEF MagicBox
Ukraine

May 1st 2020
Data Coverage

- Data for approx. 70,000 users (out of 42 million inhabitants)
- A large majority of users live in Kiev
Policy changes

Sharp increase on Containment Policies.

Containment index computed by Oxford University considering Closures of Schools, Workplaces, Public transportation, cancellation of public events and restrictions for internal movements and international travels.

Data from: https://www.bsg.ox.ac.uk/research/research-projects/oxford-covid-19-government-response-tracker
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Subnational analysis

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Administrative regions with low number of active users per 10,000 people are grayed out.
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