



DATA-POP
ALLIANCE

Changing the world with data



Shared Prosperity Dignified Life



Presidency of the Council of Ministers
Central Administration of Statistics



دائرة الإحصاءات العامة
Department of Statistics

Localized Big data applications for supporting decision making:

COVID19 CASE

Lebanon and Jordan

15 December, 2020

CODE (council of development and ethics)

Members from local Stakeholders and Academia

Responsibilities include *providing counsel, advice and input on:*

- **relevance** of the project
- **methodologies and data sources** for meeting set objectives;
- **ethical** questions and concerns raised by the project;
- **appropriateness** of the system to respond in **emergency** contexts;
- **appropriateness of data protection** measures and security measures for data subjects;
- ways and means to enhance the project's scope, **visibility and outreach** to **relevant** groups;
- **opportunities to engage concerned government agencies, organizations and civil society;**
- **recommendations** for possible extension, **application and improvement** of the project.

I. Project

Evaluate the effectiveness of a set number of government policies adopted to respond to the crisis and mitigate its effects on the populations, with a particular emphasis on using alternative sources of data in evaluation.

Questions:

1. Under crisis pressure, **which** governmental decisions are most relevant to track?
2. **Who** are the owners, stakeholders, and target beneficiaries of each policy?
3. **What** are the activities, outputs, outcomes, and impacts of each policy?
4. What are the **indicators** that measures performance of change?
5. What are the **available** data sources for each indicator?
6. What are the **motivational logic** for each **nontraditional data source**?

National Policy Selection Criteria: Score 1 to 5

1. How **Relevant** is policy measure of interest?
2. What is **Level** of ambition & scope?
3. Who are **Target** populations of interest? The most vulnerable/deprived in society?
4. What is the **Extent** of coverage of the policy
5. Are the policies **operational** to assess their impact?
6. How far is there available and accessible **data** (traditional & non-traditional) which allows for the effectiveness evaluation of policies?
7. How far does the policy relate to **SDGs** of interest and/or of **priority**?

Selected policies for Lebanon

N°	Category	Policy description and its significance	Initiating ministry / Policy owner
LB1	Cash transfer / Food distribution	Social solidarity program within the social emergency plan to address the repercussions of the Coronavirus	Ministry of Social Affairs
LB2	E-learning	Hybrid model of return to schools: e-learning and presence	Ministry of Education
LB3	Support to SMEs (private sector)	Intermediate Circular No. 547 related to granting exceptional loans to customers who were unable to pay their payments and dues during the months of March, April, May and June 2020 due to the Covid-19 crisis	Banque du Liban
LB4	Disaster response	Solid waste removal and management plan after the Beirut port blast	Ministry of Environment, UNDP and other local initiatives
LB5	Capacity increase	COVID-19 management plan: increasing the capacity of hospital beds and isolation center beds	Ministry of Health

Selected policies for Jordan

N°	Category	Policy description and its significance	Initiating ministry/ Policy owner
JO1	Cash transfer / Food distribution	Tkiyet Um Ali - social protection for those not covered by SSC & NAF	Ministry of Planning and International Cooperation TUA
JO2	Education	'Darsak' official e-learning portal	Ministry of Education
JO3	Cash transfer / Food distribution	Jordan Emergency Cash Transfer COVID-19 Response Project	National Aid Fund
JO4	Disability	Protection and Response Measures for Persons with Disabilities	The Higher Council for the Rights of the People with Disabilities
JO5	Support to SMEs	Defense order no.9: Tadamun 1 & Tadamun 2	Social Security Corporation

Policy description (Include official date)	Information				LINKS		
	Policy Owner	Beneficiaries	Stakeholders	Data sources	Social media + news analysis	Interviews	Data analysis
Policy logframe/ Theory of Change (TOC)							
	Description	Indicators	Traditional Data	Non-traditional			
Activities							
Output							
Outcomes							
Impact							
More info on Non-Traditional Data Sources							
Motivation	Source	Comments:					

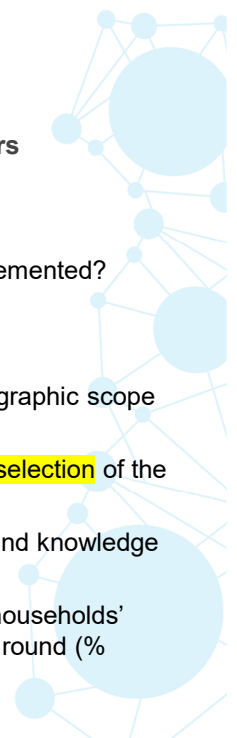
Inclusion of Concerned Stakeholders

Stakeholders (Lebanon)	Relevance
Lebanon DRM (UNDP - Gov)	LB1-2-3-4-5
Ministry of Public Health	LB 5
Ministry of Social Affairs	LB 1
Ministry of Economy and Trade	LB 3
Ministry of Education and Higher Education	LB 2
Banque du Liban	LB 3
Caritas	LB 1 - 4 - 5
Lebanese Red Cross	LB 5
Issam Fares Institute of Public Policy (AUB)	LB 1-2-3-4-5

PROPOSED SAMPLE: Ministry of Social Affairs

LB1: Social solidarity program

1. What were the **dates** for the aid distribution?
2. How was the **process** of aid distribution implemented?
3. How many families **benefited**?
4. How much was **distributed (LL)**?
5. How was the **distribution** categorized by geographic scope (level-Village – Street – Kadaa)?
6. Based on which **data** or knowledge was the **selection** of the beneficiary families/ individuals performed?
7. Do you have indicators for dispersed funds and knowledge of **spending venues**?
8. Do you have a status refresh of beneficiary households' situation? **List renewal and correction** for 2nd round (% correction)



Candidate Data sources

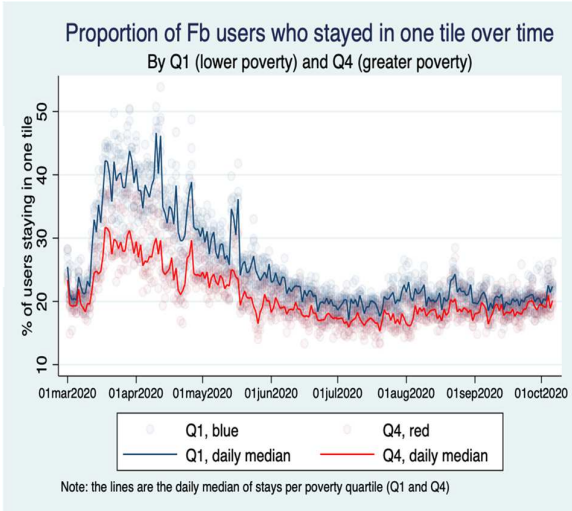
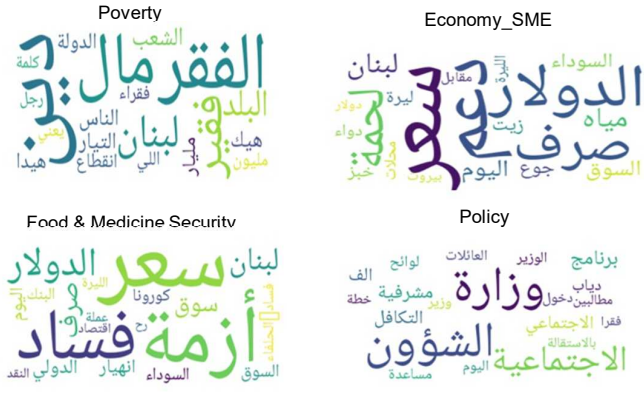
Sources	What are we measuring?
Twitter Data Word Cloud analysis Sentiment analysis	To identify what are the topics that people are preoccupied or are talking about the most.
	To understand what is the general sentiment expressed about the topics of interest.
Google search trends	To gauge generated interest among the population. Juxtaposing these results with the major events could show what people are searching for and what are their needs and interests .
	To be used as a proxy for unemployment.
GDELT analysis	To gauge the sentiment expressed about certain topics as well as the policy being studied .

Candidate Data sources

Sources	What are we measuring?
Mobility analysis Facebook Data4Good Google mobility	Changes in mobility patterns since the start of the pandemic per district/region.
Mobility analysis coupled with traditional socio-economic indicators	Combining mobility analysis data with other available socio-economic indicators could shed light on and suggest certain correlations or potential relationships for measuring effectiveness .
Satellite images	Night-time lights in satellite images could be used as a proxy for poverty & economic activity. Possible measurement of air pollution via satellite images.
Open street map	Mapping of educational institutions and/or medical institutions.
Electricity consumption	can be used as a proxy for economic activity to identify effects on economic activity .

Lebanon 1: Twitter & Mobility examples

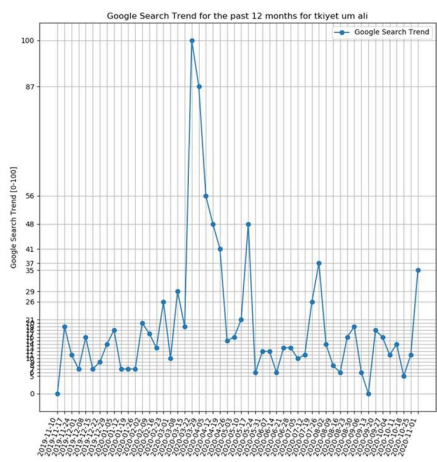
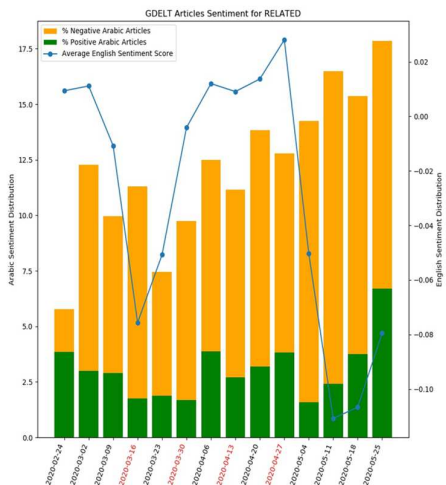
Top 20 most frequent Twitter words for the topics of interest for the months March, April, May



Total tweets: 3868
 Total Arabic tweets:
 1345 (35%)
 Total English tweets:
 2523 (65%)

Mobility: Individuals in poorer areas had lower reductions in mobility and for a shorter period of time
Note: the poverty indicator is based on the % of people who declared themselves as poor or very poor in the Labour Force and Household Conditions Survey by CAS.
Q1 qazas: Batroun, Jbeil, Bcharreh, Koura, Rachaya, Keserwan, Saida
Q4 qazas: Tripoli, Zahleh, Akkar, Baalbek, Hermel, Minieh-Danniyeh

Jordan 1: GDELT and Google Search Trends



Total unique articles: 10362
 Total unique Arabic articles: 5295 (51%)
 Total unique English articles: 5067 (49%)

Important dates

- Lockdown: week of March 16
- TUA's 1st batch of in-kind aid distribution: week of March 30
- 2nd batch of in-kind aid distribution: week of April 13
- Signing agreement between the Ministry of Planning grant to support the families of day laborers affected by the repercussions of the Coronavirus crisis: week of April 27

Tkiyet Um Ali NGO reached a sudden peak of 100% on March 29th, which coincides with the date of announcement of JO1.

Conclusions

- social media and news analysis confirm: population is preoccupied with the current state of the economy, and the need to provide adequate financial support to the population at large.
- **Targeting**
 - mobility mapping analyses suggests that the poorer districts are less likely to strictly abide by the lockdown measures: necessity to go out to work.
 - Supporting those in need economically becomes all the more important.
 - recommended to identify populations with high urban mobility in order to advise and support them to limit and reduce the potential risk
 - recommended that contact protection equipment is provided along with the support provided to vulnerable populations.
- **Communication** about the available aid/support and the procedures should also be reinforced in these areas, as well as the communication about the disease and protection against it.
- Recommendation to compare with the data from the aid distribution campaign for the targeted districts.

Jordan Policy 2: Darsak Platform

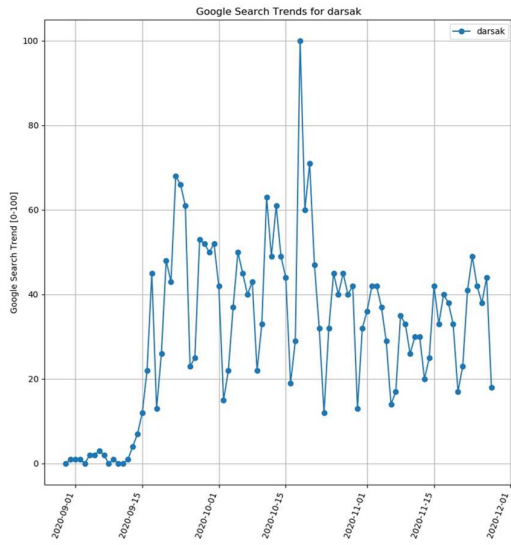
GDELT

Twitter

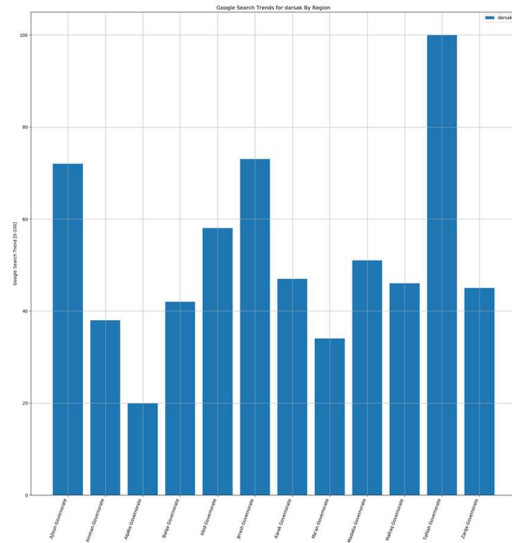
Google Search trends

Website Usage Analytics

JO2: Google Search Trends Results

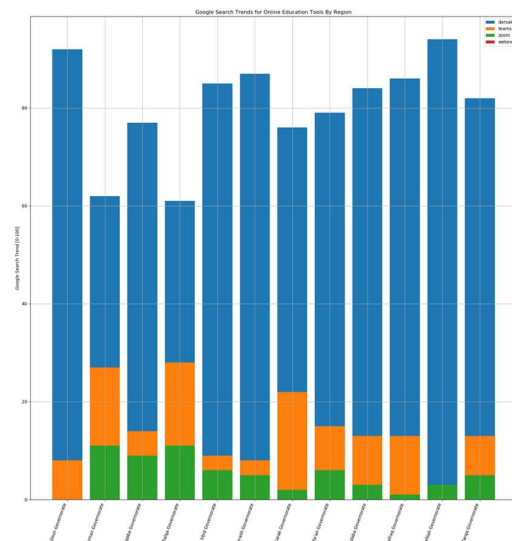
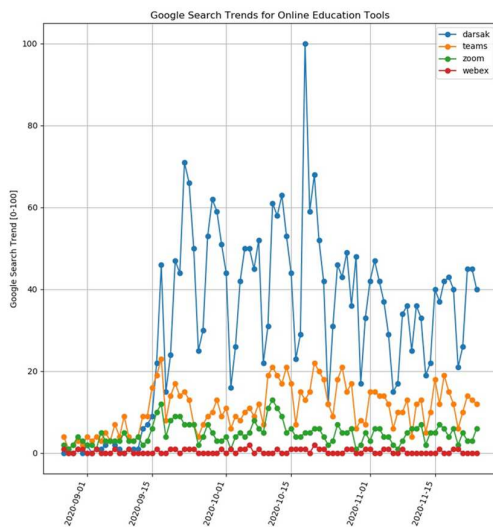


Darsak platform across time (sep-nov) peaked during exams period (october)



Darsak platform across regions (Sep-Nov) peaked in Tafilaah governorate

JO2: Google Search Trends Results



Darsak v.s. Other tools for online teaching. (Sep - Nov) across time and region

Example of Usage of Website Analytics

Site Metrics

All visitors to this site

Estimate ?

Engagement

Past 90 Days

9.1 ↑ 220%

Daily Pageviews per Visitor

16:51 ↑ 298%

Daily Time on Site ?

9.8% ↓ 57%

Bounce rate ?

Estimates of the time spent on the Darsak platform, % of users who only visit one page and leave (bounce rate), average of pages visited per user

Global Rank Trend Over the Past Year



Rank trend (is it becoming more or less popular)

Darsak.gov.jo summary:

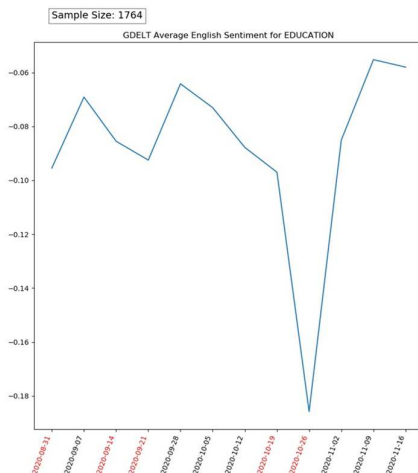
- ranks 22nd in Jordan
- Its global rank has gone up by 134,851 positions since 3 months ago.
- Receives approximately 206,342 unique visitors each day.

Sources explored: siteindices.com and alexa.com/siteinfo

GDELT Results

Scraped September, October, November

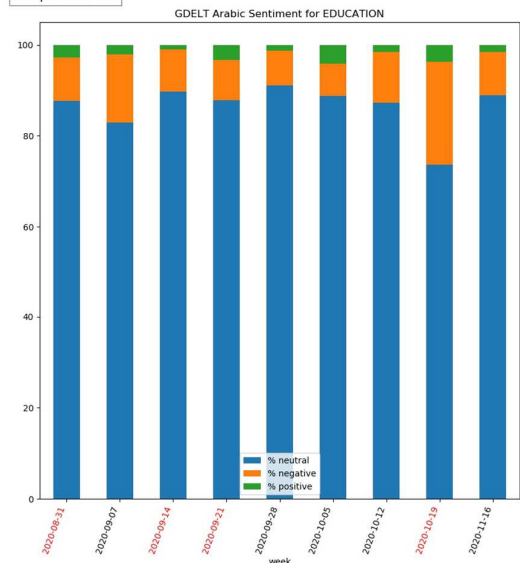
GDELT threshold is minimum 50 articles per week



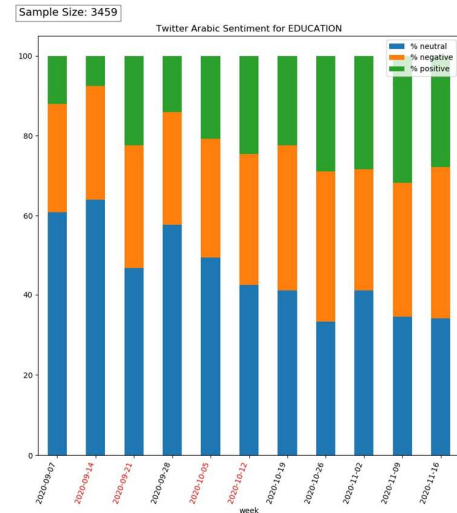
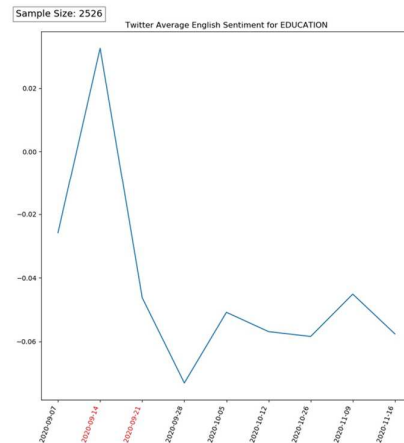
Key dates:

- 01-09-2020: New academic year, students returned to schools
- 14-09-2020: The government announced temporary return to online education for 2 weeks
- 25-09-2020: The government announced extending online education until at least the end of the first semester
- ** decrease in GDELT and Twitter sentiment towards the end of October

Sample Size: 789



Twitter Results



Key dates:

- 01-09-2020: New academic year, students returned to schools
- 14-09-2020: The government announced temporary return to online education for 2 weeks
- 25-09-2020: The government announced extending online education until at least the end of the first semester
- ** decrease in GDELT and Twitter sentiment towards the end of October

Sentiment Analysis: Jordan DARSAK (Education)

- For GDELT, tendency towards slightly negative sentiment proceeds announcements of return to online teaching (negative education sentiment leads to return to online)
- For twitter, tendency towards more steep negative sentiment follows announcements of return to online teaching (return to online leads to negative sentiment → are parents and students not happy about online teaching?)
- However, GDELT sentiment is not as negative as Twitter
 - Arabic negative sentiment: max of 20% for GDELT compared to a max of 50% for Twitter
- For both sources, there is a major decrease in sentiment for the last two weeks of October

Lebanon Education - E-Books Download

Center for Educational Research and Development Website, through which the ministry made the school books available for download as PDF.

Site Metrics

All visitors to this site

Estimate ?

Engagement

Past 90 Days

3.7 ↘ 11.8%

8:38 ↘ 7%

29.1% ↘ 23%

Daily Pageviews per Visitor ?

Daily Time on Site ?

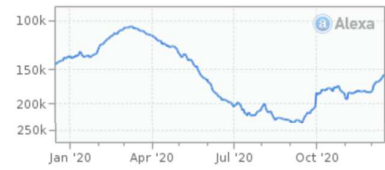
Bounce rate ?

In the past 90 days (new academic year), daily pageview per visitor and daily time spent on site decreased, while % of users who only visit one page and leave (bounce rate) increased.

Crdp.org summary:

- ranks 148th in Lebanon
- Its global rank has gone down by 55,017 positions since 3 months ago.
- Receives approximately 19,780 unique visitors each day.

Global Rank Trend Over the Past Year



Rank trend: site is becoming less popular (more popular in previous academic year, less popular this year)

This site ranks:

#157,247

In global internet traffic and engagement over the past 90 days

↘ 78.1 K



However, increase in the rank when comparing December to previous months of the year

Google Search Trends - E-Books Download

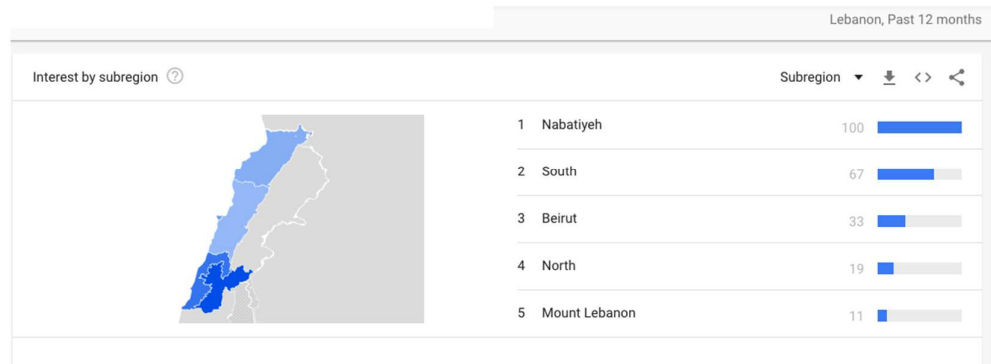
Google search trends for the Center for Educational Research and Development

Interest over time ?



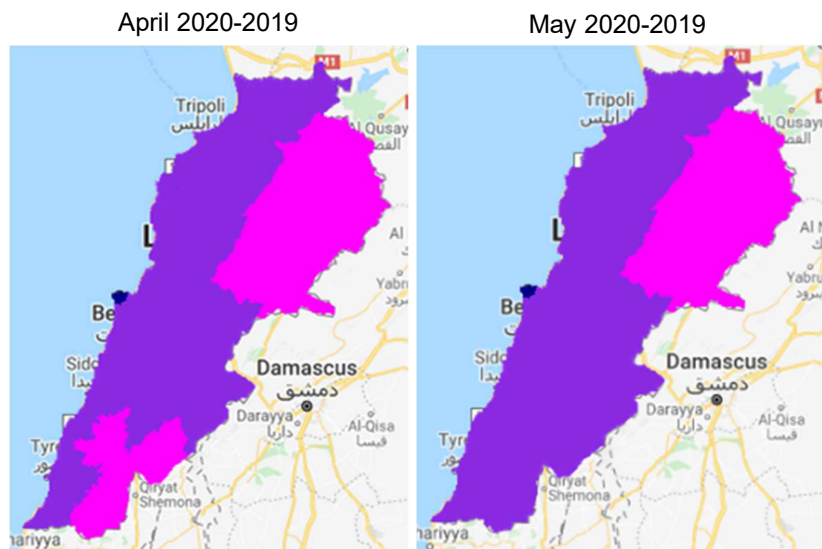
Peaked in November in the week of announcement of closure of schools ahead of nationwide lockdown

Peaked mostly in the southern governorates



Night-time light analysis: Admin Division Change Map LEBANON

- Categories: average change by administrative division for each state between the years 2019 and 2020.
- **DarkBlue**: a negative change between -60 and -30 was detected,
- **DarkViolet**: change between -30 and 0
- **Magenta**: + change between 0 and 30
- **Red**: positive increase greater than 30 was observed.
- **Second filter needs to be applied (the filtering mentioned before was already applied).**



Outreach & Usability of Results

Prototype of Platform

1. What are the **main challenges** that your organisation/agency faces in terms of disaster response?
2. What type of information and **data** informs the **design of your responses** and programs?
3. **What data** supports policy / **decision making** in your work?
4. Do you **collect data**?
5. If so **how**? What is your **data collection process** and systems?
6. What are the **methods** you use to **receive new cases**, hotline numbers or online platforms?
7. Do you work on **data gathering/collection**?
8. Do you **use real-time / big data sources** /technology to obtain information?

Playbook for the use of emerging data non-traditional Big Data sources in:

- **informing** policy making and
- **tracking** of the implementation and effectiveness



Key messages

- 1. Some Data sources are made available only during Crisis**
 - What is criteria
 - Who determines local/international crisis
- 2. Suspected concerns/trends were confirmed by SM (Tweeter)**
- 3. Non traditional Data sources analysis facilitated better granularity**
- 4. In cyclic crisis like Covid-19, possible to “near real time” correction**
- 5. Bias due to technology dependence is a calculated risk**

Why do Statistics organizations need the new techniques?

Added Value:

1. Achieved improvements in quality metrics (e.g. accuracy, mean squared error)
2. New decision-support, start- assistive tool. Gain experience in a low-risk setting.
3. Opens possibilities - satellite imagery, social media at scale and frequency not affordable or possible with human labor
4. Improve efficiency by automating certain processes
5. Support relevance of official statistics as disruptive technologies are accessible
6. Demanding tech savvy, connected public with remote competitors!