



An original structured open-source dataset of non-pharmaceutical interventions in response to COVID-19

AN EMERGENCY RESPONSE PROJECT TO THE COVID-19 CRISIS

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EUROPEAN OPEN
SCIENCE CLOUD

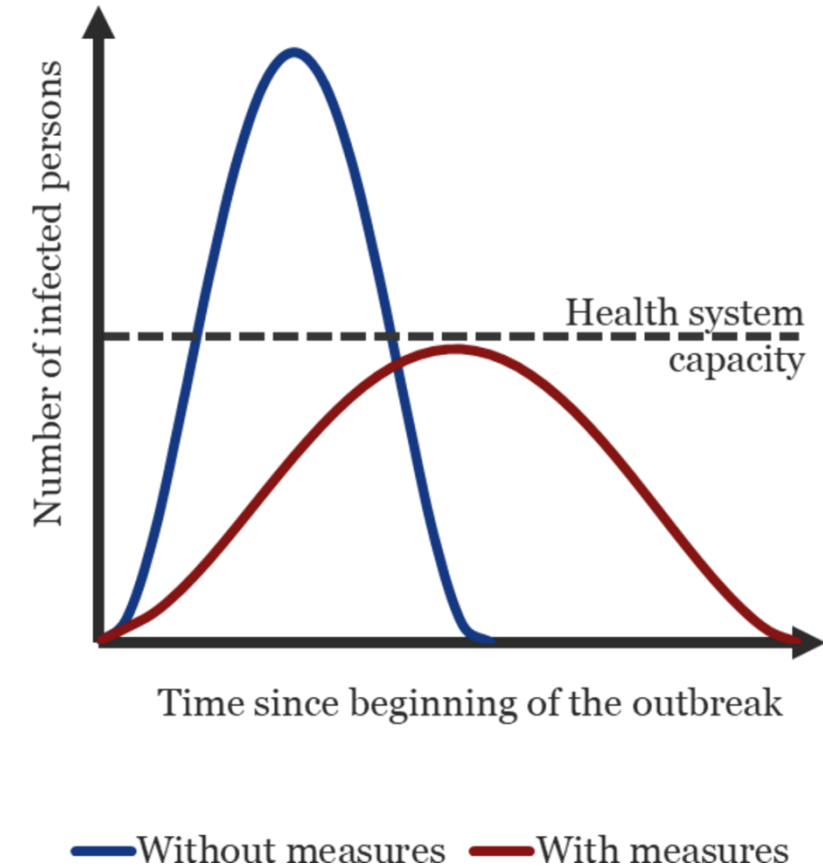
Background

- In response to the COVID-19 pandemic, governments have implemented a wide range of non-pharmaceutical interventions (NPIs), under rapidly changing, unprecedented circumstances.
- These measures aim to:
 - Prevent the introduction of infectious diseases,
 - Control their spread,
 - Reduce their burden on the health system.

Background

The general concept of containing the initial spread of a disease is called “flattening the curve” .

→ Reduce the stress on the healthcare system and help gaining time to develop and produce vaccines and specific medications.



Source: OECD

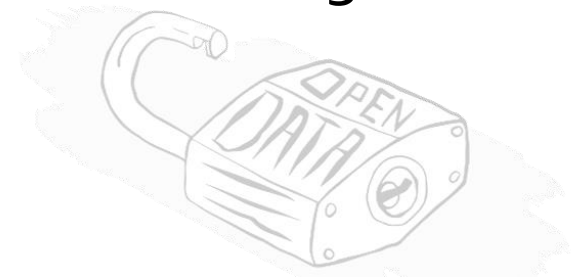
Background

- Government control policies have shown divergences in particular in the timeline of implementation and in the prioritization of the NPIs.
- Sometimes measures were/are limiting civil rights and liberty.
 - Unique in modern human history.
- Monitoring and documenting government strategies during the COVID-19 crisis is crucial to understand the progression of the epidemic.
- Need for data on country-based responses to COVID-19 was urgent (and is still essential). BUT...Limited opportunities to collect these data...

Objective of the project

Started in mid-March 2020, our project aims to **generate a comprehensive structured dataset on government responses to COVID-19**, including the respective time schedules of their implementation.

The dataset is intended to mobilize researchers to generate new insights in support of the fight against COVID-19.

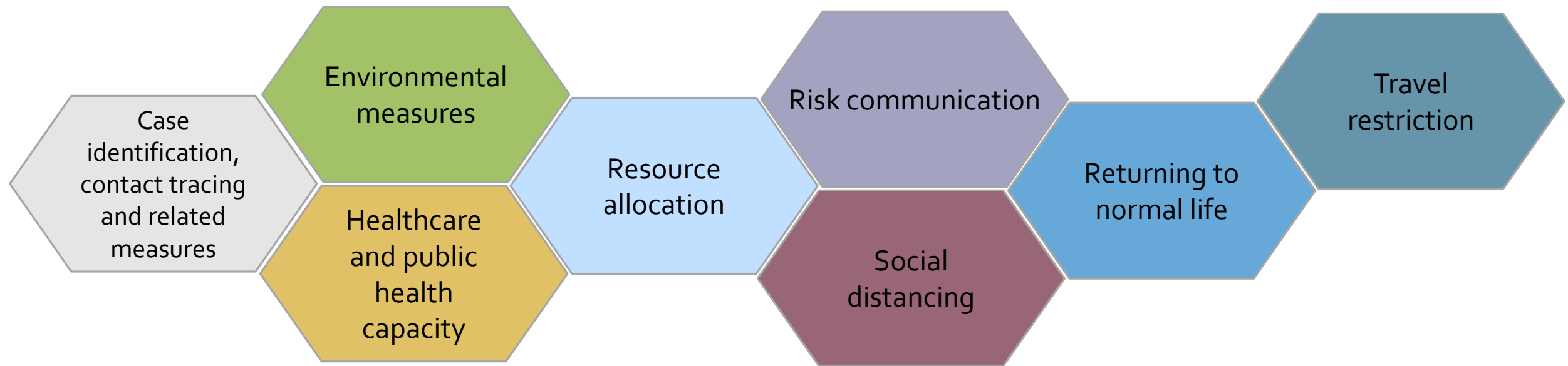


Methods / DATA COLLECTION AND CODING

- Content analysis strategy of existing information sources
 - Systematically transform a large amount of text into a highly organised and concise summary.
- We developed a hierarchical coding scheme specific to NPIs implemented to mitigate the burden of COVID-19
 - Standardize the data collection and obtain a structured dataset that uses a consistent taxonomy, and therefore, promotes common understanding.

Methods / DATA COLLECTION AND CODING

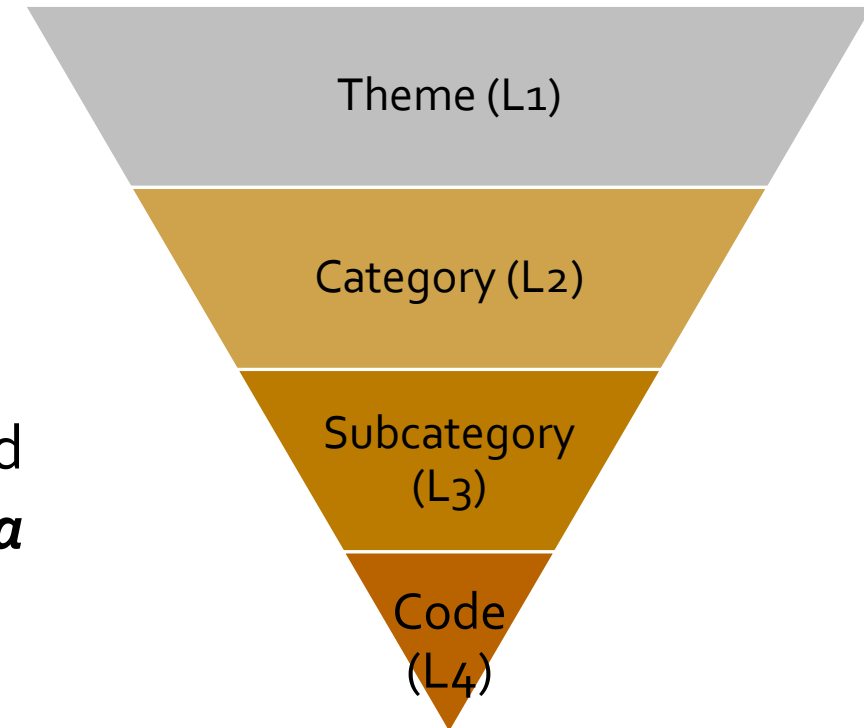
- Literature review on community mitigation strategies and expert knowledge
→ 8 themes (L1) identified:



Methods / DATA COLLECTION AND CODING

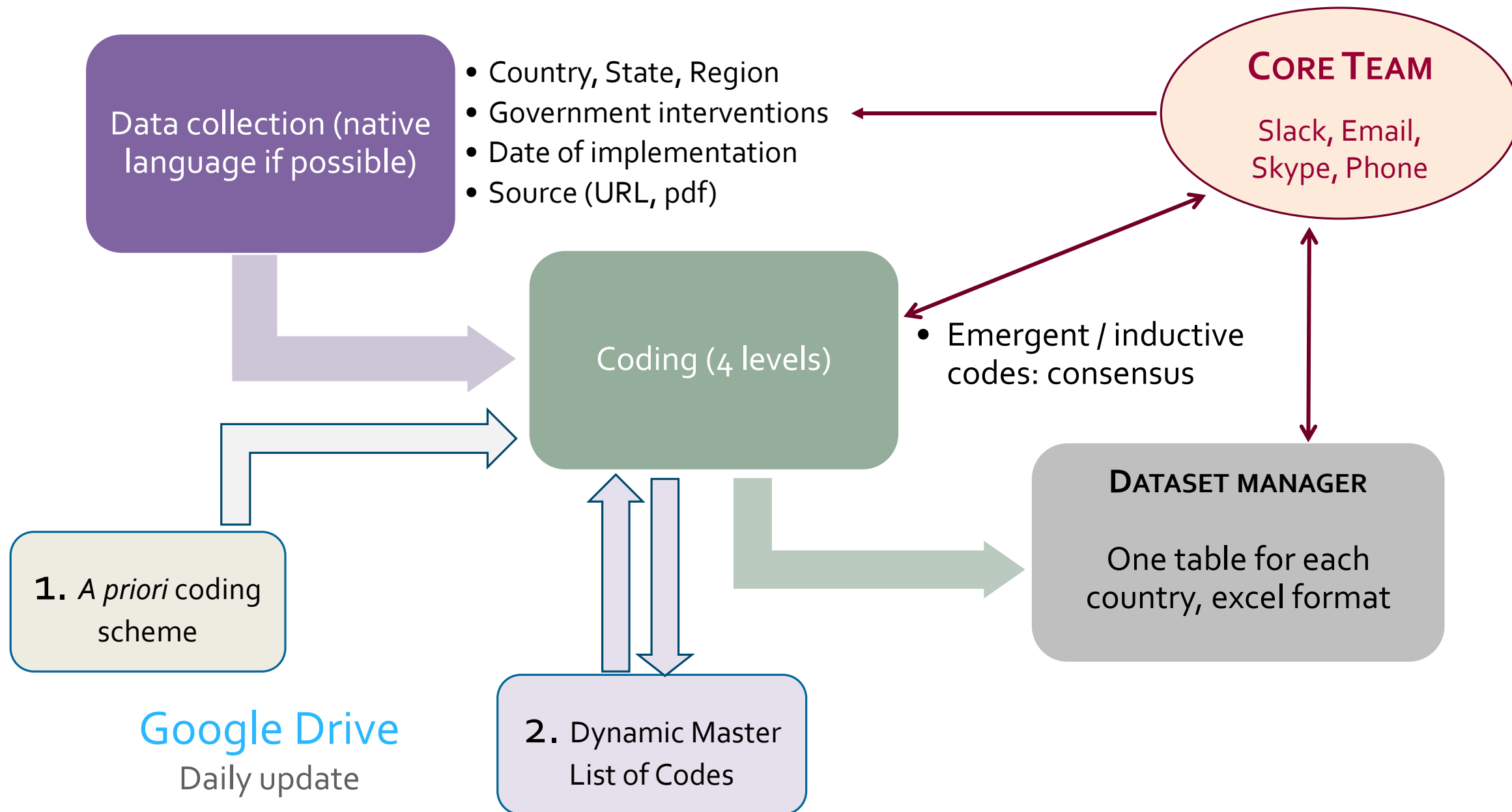
- **Template of *a priori* codes** (mid-March 2020)
 - List of NPIs that have been already implemented by different governments.
 - Each NPI was assigned to a theme.
 - Specific details and descriptions of each NPI → coded into ***a priori* categories** (L2), and into subsequent ***a priori* subcategories** (L3) and **codes** (L4).

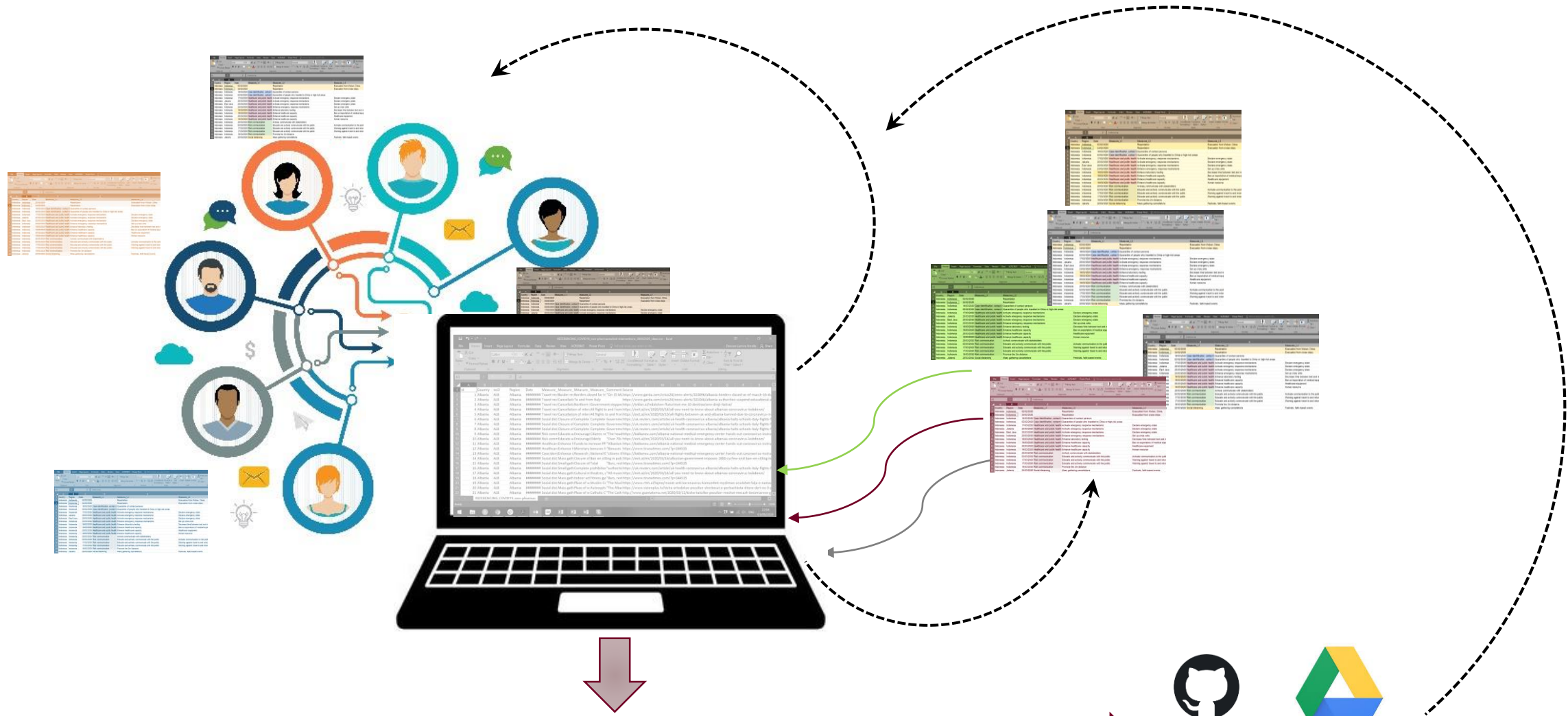
(*a priori* = developed before examining the current data)



Methods / DATA COLLECTION AND CODING

- Sources of data = public sources
 - Official government webpage,
 - Peer-reviewed and non-peer-reviewed scientific papers,
 - Webpages of public health institutions (WHO, CDC, ECDC),
 - Press releases,
 - Newspaper articles,
 - Government communication through social media.





Validation of the data, curation of the codes, check typography, check for duplicates, co-occurrences, redundancies



- Master List of Codes
- Dataset

Results / C_{CCSL} DATASET

The Complexity Science Hub COVID-19 Strategies List (CCCSL) Dataset

- **Dynamic dataset: .csv file** (each row = one NPI + unique ID)
- Master List of Codes + Glossary of Codes (dynamic)
- First release, version 1: **2 April 2020** (~ 3,000 NPIs recorded, 53 countries)
- Communication (Press release, Newspaper articles, [@Nature interview](#))

Results / C_{CCSL} DATASET


COVID19_non-pharmaceutical-interventions_version2_utf8_static_2020-07-12.csv - Excel

Desvars-Larrive Amelie Share

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	id	Country	iso3	State	Region	Date	Measure_L1	Measure_L2	Measure_L3	Measure_L4	Status	Comment	Source		
1	1	Albania	ALB	Albania	Albania	25/02/2020	Risk communication	Educate and actively com	Encourage self-initiated	Travelers returning from high risk are		"The head	https://balkaneu.com/alban		
2	2	Albania	ALB	Albania	Albania	25/02/2020	Resource allocation	Crisis management plans	Financial aid for health	Funds to increase availability of PPE		"Albanian	https://balkaneu.com/alban		
3	3	Albania	ALB	Albania	Albania	25/02/2020	Healthcare and public	Adapt procedures for pa	Implement triage proce	Health hotline		He clarifie	https://balkaneu.com/alban		
4	4	Albania	ALB	Albania	Albania	25/02/2020	Case identification, co	Airport health check	Specific health channel	National passengers arriving from Ch		" Albanian	https://balkaneu.com/alban		
5	5	Albania	ALB	Albania	Albania	08/03/2020	Travel restriction	Airport restriction	Cancellation of internat	Partial cancellation of international fl		Government	https://tvklan.al/ndalohen-f		
6	6	Albania	ALB	Albania	Albania	08/03/2020	Social distancing	Closure of educational in	Complete closure of kindergartens			Government	https://uk.reuters.com/artic		
7	7	Albania	ALB	Albania	Albania	08/03/2020	Social distancing	Closure of educational in	Complete closure of primary and secondary schools			Government	https://uk.reuters.com/artic		
8	8	Albania	ALB	Albania	Albania	08/03/2020	Social distancing	Closure of educational in	Complete closure of universities			Government	https://uk.reuters.com/artic		
9	9	Albania	ALB	Albania	Albania	08/03/2020	Social distancing	Small gathering cancellat	Complete prohibition of gathering			"authoritie	https://uk.reuters.com/artic		
10	10	Albania	ALB	Albania	Albania	08/03/2020	Social distancing	Mass gathering cancellat	Sport events			"Rama sai	https://uk.reuters.com/artic		
11	11	Albania	ALB	Albania	Albania	09/03/2020	Travel restriction	Airport restriction	Cancellation of internat	Partial cancellation of international fl		To and fro	https://www.garda.com/cris		

Webpage: <https://covid19-interventions.com/>

Complexity Science Hub Vienna Website Github Repository Measures Overview

**COMPLEXITY
SCIENCE
HUB
VIENNA**

The CSH COVID-19 Control Strategies List (CCCSL)

Government Interventions in Response to the COVID-19 Epidemic

During the COVID-19 pandemic, interventions were decided under rapidly changing, conjectural conditions, with limited (if any) prior experience. Worldwide, governments have implemented country-specific control strategies to prevent the introduction and mitigate the spread of the virus. However, were those measures effective?

Researchers at the Complexity Science Hub Vienna are building a comprehensive database of non-pharmaceutical interventions (NPIs) taken by the governments worldwide in order to assess the impact of these actions on the spread of the COVID-19 in the respective countries.

Data

Students, researchers, and volunteers are collecting data from public sources on the implemented NPIs, including the time schedules for the implementation.

The dataset describes the implemented NPIs for 57 countries, including the Diamond Princess cruise ship. Measures implemented at the subnational level (state, region, city) are also included.

The CCCSL provides the date of implementation of the NPI. Date of announcement was used when the date of implementation of the NPI could not be found (this is then specified in the field Comment).

NPIs are listed in a standardized manner, i.e. classified using a four-level hierarchical coding scheme (theme/category/subcategory/code). Eight major themes (level 1, L1 of the classification scheme) were identified and each NPI is assigned to one of them:

CCCSL: CSH Covid-19 Control Strategies List

Complexity Science Hub Vienna's list of governmental non-pharmaceutical interventions against Covid-19

This database is "work in progress". Data are continually checked and the database is continually implemented and updated.

With this form, we aim to collect:

- feedback on our database
- new data
- correction and validation of current data.

Your feedback will help us to improve the coverage and quality of the CCCSL database.

List of countries & implemented measures:

<https://drive.google.com/drive/folders/1041U8iWPD5GI6KHIn9Dg7THkXlo3-gui>

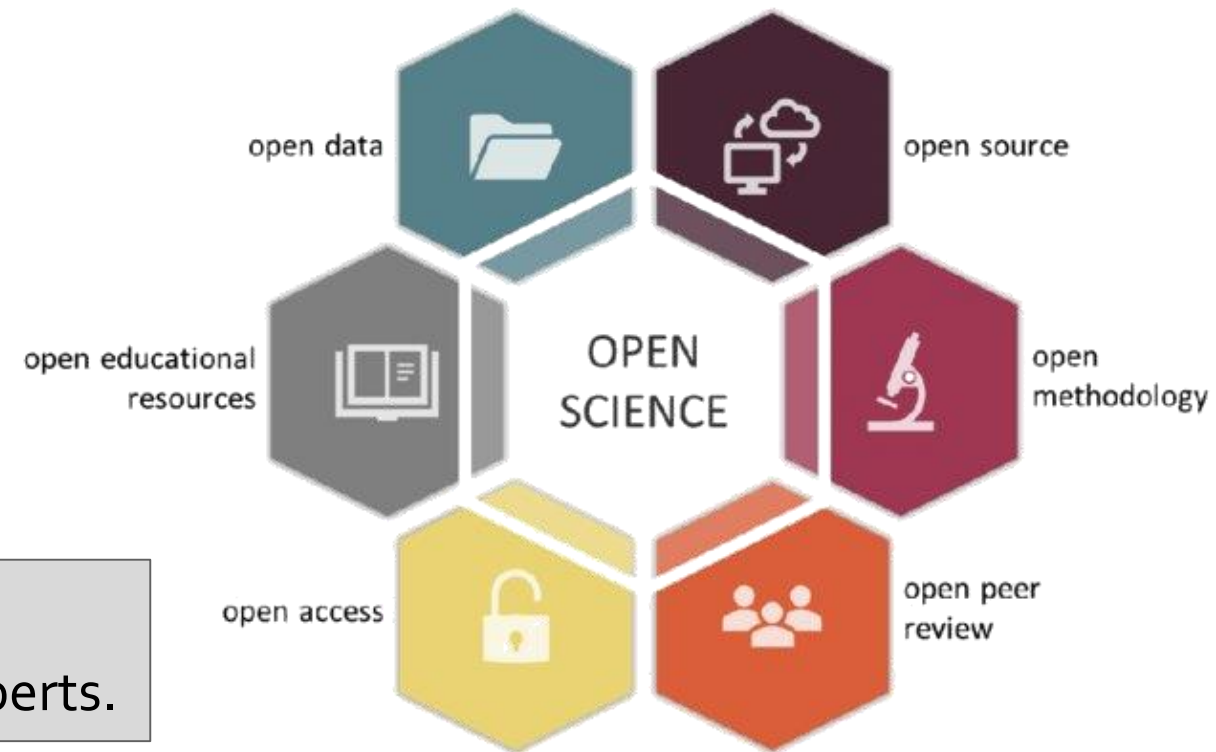
Choose:

- ☐ I want to add measures to a country
- ☐ I want to correct the existing list
- ☐ I have comments, ideas, suggestions

Google Form: <https://bit.ly/2KsYOTn>

Results / O_{PEN} SCIENCE

- Dataset and related documentation
- User-friendly materials
- Open access publication



Allow a maximum understanding of the data and promote use of the dataset, even among non-experts.

Source: Gallagher, R. V. et al. Open Science principles for accelerating trait-based science across the Tree of Life. Nature Ecology & Evolution 4, 294-303 (2020).

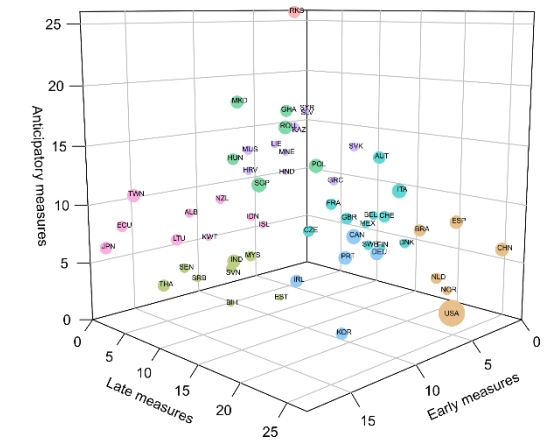
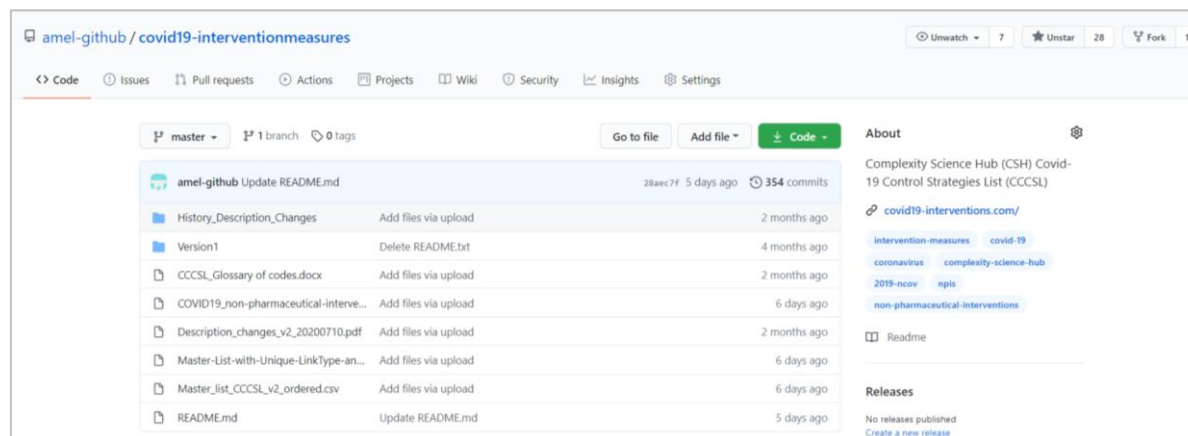
Results / OPEN SCIENCE

- Open source repository: Dataset & related documentation

<https://github.com/amel-github/covid19-interventionmeasures>

- Open source repository: R codes

<https://github.com/amel-github/CCCSL-Codes>



Results / O_{PEN} SCIENCE

- Open source library: Library of information sources

https://www.zotero.org/groups/2488884/cccsi_covid_measure_project/library

The screenshot shows the Zotero web interface. On the left, under 'Group Libraries', the 'CCCSL Covid Measure Project' is expanded, showing sub-libraries for Africa, Asia, Europe, North America, Oceania, South America, Diamond Princess, and Resources and publications. The main area displays a list of 57 items. The table below shows the first 15 items:

Title	Creator	Date
Austrian Airlines - Current travel alerts		
Austrian Airlines Extends China Flight Ban as ...		
Bundeskanzler Kurz dankt Österreichs Bevölk...		
Corona in Österreich: Sieben bestätigte Fälle		
Corona in Österreich: Sieben bestätigte Fälle ...		
Corona Virus in Austria		2020-03-30
"Corona-Gesetz" gilt ab Mitternacht, Regieru...		
Corona-Virus: Weitere Vorgehensweise für K...		
Coronavirus - Legal		
Coronavirus (2019-nCoV) – Repatriation oper...	étrangères	
Coronavirus (2019-nCoV) – Repatriation oper...		
Coronavirus in Austria: Live-Ticker		
Coronavirus in Austria: Live-Ticker - Vindobo...		
Coronavirus: Einreisestopp aus Italien, Unis g...		
Coronavirus: Erste Schulen schließen ab Mon...		
Coronavirus: Erste Schulen schließen ab Mon...		

57 items in this view



Results / OPEN SCIENCE

- Open platform: **World Pandemic Research Network** (<https://wprn.org/>)

Searchable global directory of the scientific resources available on the Covid-19 pandemic.



Results / O_{PEN} SCIENCE

- Publication: Open access journal
- Pre-print server: [MedRXiv](#), 8 May 2020
- Peer-review publication, 27 Augusts 2020, *Scientific data* (<https://doi.org/10.1038/s41597-020-00609-9>)

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nature > scientific data > data descriptors > article

Data Descriptor | [Open Access](#) | Published: 27 August 2020

A structured open dataset of government interventions in response to COVID-19

Amélie Desvars-Larrive , Elma Dervic, [...] Stefan Thurner

Scientific Data **7**, Article number: 285 (2020) | [Cite this article](#)

3534 Accesses | 1 Citations | 229 Altmetric | [Metrics](#)

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Associated Content

Collection

[Open data in the COVID-19 pandemic](#)

Collection

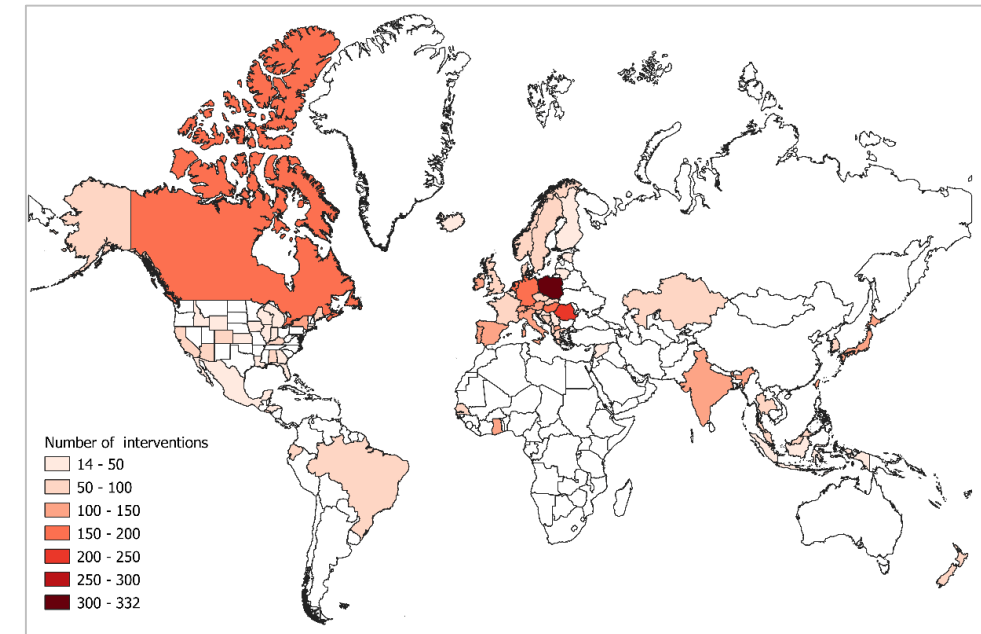
Results / SUMMARY

The Complexity Science Hub COVID-19 Strategies List (CCCSL) Dataset

- A structured, exhaustive **open** dataset on COVID-19 NPIs.
- Readily usable for modelling and machine learning purposes.
- The specific, standardized coding and the Library of sources enhance the flexibility of use.
- Value-added
 - Remarkable granularity of the data on NPIs.
 - Use of self-explanatory codes (words/short sentences), which, completed with the Glossary of Codes, makes the dataset readily intelligible, even for non experts.
 - User friendly open-source documentation

Recent development

- Version 2: 7 May 2020
- Consolidated coding scheme
- 57 countries (added: USA with data at the state level for 24 States, Poland, Ghana, Senegal)
- > 6,100 NPIs (3 Sept. 2020)
- Eight themes, 63 categories, > 500 subcategories, and > 2,000 codes



Joining the global effort

- The CCCSL has been integrated in the WHO – PHSM Global Dataset
- We committed in April 2020



PHSM Dataset

Download the country reported public measures during COVID-19 dataset

The datasets have last been updated on:

ACAPS	19 August 2020
CDC_ITF	19 August 2020
CSHVienna	19 August 2020
GPHIN	19 August 2020
IHR	19 August 2020
JH_HIT	19 August 2020
OxCGRT	19 August 2020

[Download data set and taxonomy](#)

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/phsm>

Perspectives

- We plan to:
 - Maintain the dataset quality level with regular updates on the countries currently described.
 - Increase the geographic coverage of the dataset.
 - Further stabilize our coding scheme (in particular regarding measures related to “Retuning to normal life”).
 - Maintain the work with the WHO.
 - Further develop our visualisation tool.
- Updates are planned until the end of December 2020.

Benefit and impact

- The consistent coding of the NPIs uniquely enables inter-country comparison of the COVID-19 responses and a global overview of the decision patterns.
- Combined with case data, the dataset enables to assess the effectiveness of the NPIs and to develop preparedness plan anticipating a second wave of cases.
- It can also improve the risk assessment of lifting some restrictions.
- We envision the dataset to become a long-lasting data source for assessing the impact of the NPIs on public health, the economy, and human rights.

Acknowledgments

- David Garcia and Stefan Thurner
- Data exploration and visualisation: Elma Dervic, Nils Haug, Jana Lasser, Johannes Sorger
- Data collection: Alexandra Roux

- All other contributors

Ahne V., Álvarez S., Bartoszek M., Berishaj D., Bulska D., Chakraborty A., Chen E., Chen X., Cserjan D., Dervic A., Di Natale A., Ferreira M.R., Flores Tames E., Garncarek Z., Gliga D.S., Gooriah L., Grzymała-Moszczyńska J., Jurczak A., Haberfellner S., Hadziavdic L., Holder S., Korbel J., Lederhilger D., Niederkrotenthaler T., Pacheco A., Pocasangre-Orellana X.M., Reddish J., Reisch V., Stangl J., Stoeger L., Takriti H., Ten A., Vierlinger R.