Interventions

Michele Coscia

First Year Project #1

February 22nd, 2022

Lecture Plan

1) (February 8th) Intro
2) (February 10th) Geospatial Basics
3) (February 15th) Estimating Associations
4) (February 17th) Multivariate Regression
5) **(Today) Interventions**
6) (February 24th) Project Run Through
7) (March 1st) Q&A – Open Supervision
8) (March 3rd) Q&A – Open Supervision

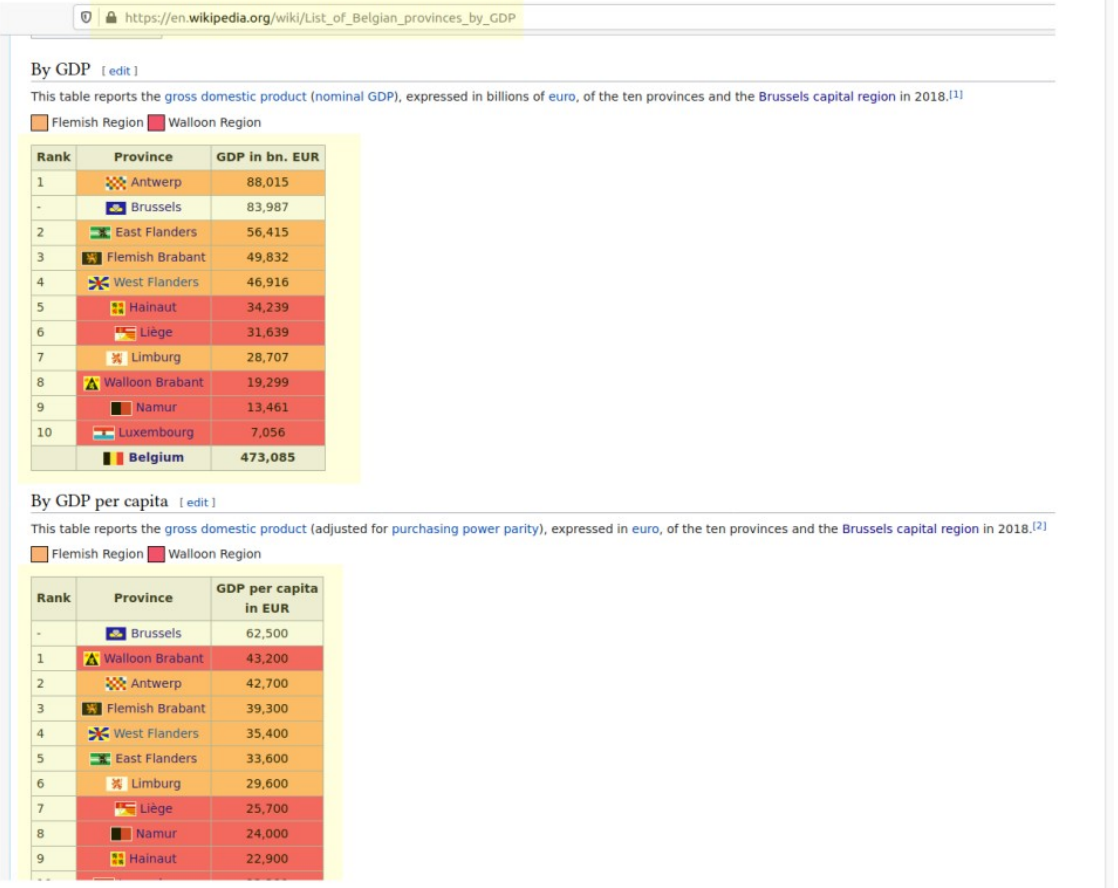
Outline

- Data Scavenging
- Estimating Intervention Effects
- Interventions and Fixed Effects

Data Scavenging

Looking for data

- Wikipedia is always great bet...



https://en.wikipedia.org/wiki/List_of_Belgian_provinces_by_GDP

By GDP [edit]

This table reports the gross domestic product (nominal GDP), expressed in billions of euro, of the ten provinces and the Brussels capital region in 2018.[1]

Flemish Region Walloon Region

Rank	Province	GDP in bn. EUR
1	Antwerp	88,015
-	Brussels	83,987
2	East Flanders	56,415
3	Flemish Brabant	49,832
4	West Flanders	46,916
5	Hainaut	34,239
6	Liège	31,639
7	Limburg	28,707
8	Walloon Brabant	19,299
9	Namur	13,461
10	Luxembourg	7,056
	Belgium	**473,085**

By GDP per capita [edit]

This table reports the gross domestic product (adjusted for purchasing power parity), expressed in euro, of the ten provinces and the Brussels capital region in 2018.[2]

Flemish Region Walloon Region

Rank	Province	GDP per capita in EUR
-	Brussels	62,500
1	Walloon Brabant	43,200
2	Antwerp	42,700
3	Flemish Brabant	39,300
4	West Flanders	35,400
5	East Flanders	33,600
6	Limburg	29,600
7	Liège	25,700
8	Namur	24,000
9	Hainaut	22,900

Looking for data

- ...sometimes in creative ways!

https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Belgium

Van den Brandt [nl] (Groen, Brussels) and Barbara Trachte [fr] (Ecolo, Brussels),[90] with the support of:

- the National Crisis Centre (NCCN)[91] led by Bart Raeymaekers;
- the national public health institute of Belgium (Sciensano);
- the Risk Assessment Group (RAG) presided by Sciensano;
- the Risk Management Group (RMG) led by Paul Pardon MD;
- the Scientific Committee for Coronavirus (Steven Van Gucht, Marc Van Ranst, Nathalie Bossuyt, Erika Vlieghe and Charlotte Martin);
- other regional agencies such as the Agency for Care and Health in Flanders, the Agence wallonne pour une vie de qualité (AViQ) in Wallonia and the Common Community Commission in Brussels.[92]

Containment measures [edit]

On 29 January, Belgium issued a travel notice advising against non-essential flights to China, Hong Kong excluded, with some travel companies cancelling all flights to China.[93]

On 1 March, as a second case of coronavirus was confirmed in Belgium, *phase 2* of the health risk containment strategy was activated.[94][*further explanation needed*] The mayor of Sint-Lambrechts-Woluwe, Olivier Maingain, was one of the only mayors to take measures to prevent the spreading of the new coronavirus by restricting access to schools, sports facilities and public places for persons returning from areas at risk[95] and only a few schools, such as the International School Ghent, quarantined pupils returning from infected areas, such as Northern Italy.[96]

On 10 March, the government advised citizens to cancel any indoor scheduled events to be attended by more than 1,000 people for the month of March. Prime Minister Wilmès stressed this was not an interdiction but rather a recommendation.[97] Schools remained open but are advised to cancel both trips abroad and multi-day excursions in general. Companies were advised to have their personnel work from home as much as possible and allow flexible working times to allow a better spread of public transport use throughout the day. The authorities called this *reinforced phase 2*.[98]

Late in the evening on 12 March, after a meeting of the National Security Council, the Belgian government moved into the federal phase of crisis management, and ordered the closure of schools, discos, cafes and restaurants, and the cancellation of all public gatherings for sporting, cultural or festive purposes from Friday 13 March at midnight onwards.[99] It was stressed that the measures taken were not a lockdown because people were not required to stay home.[100]

On 17 March, the National Security Council decided to take additional measures, based on the spread of COVID-19 in Belgium and on recommendations of experts. Stricter social distancing measures were imposed from noon the following day until 5 April, with non-essential travel prohibited, non-essential shops to close, gatherings banned, with penalties for corporate and individual persons who failed to comply with the restrictions.[101][*specify*]

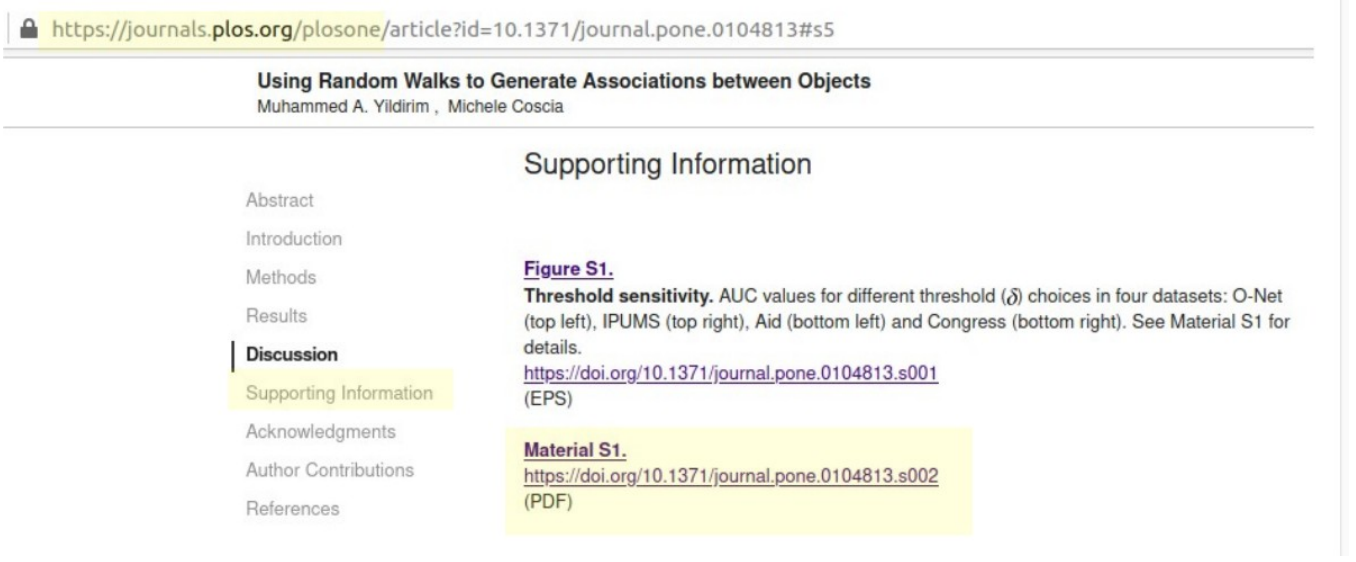
On 20 March at 3 pm Belgium closed its borders to all non-essential travel.[102] Earlier, the governor of West Flanders had complained about Dutch and French citizens coming to Belgium for tourism or shopping,[103] while mayors of municipalities close to the border with the Netherlands such as Paul Van Miert of Turnhout urged their Dutch counterparts to request their national authorities in the Netherlands to implement similar measures as in Belgium, to stop Belgian citizens going to Dutch cafés or restaurants.[104] From 25 March onwards, people arriving at Brussels Airport were handed a leaflet with the compelling advice to quarantine themselves for a fortnight.[105]

On 27 March, the National Security Council and the governments decided to extend the measures until 19 April (end of the Easter vacation).[106] On 15 April, the containment measures were extended until the 3 May.[107]

Concrete blocks in Mouscron, used to avoid

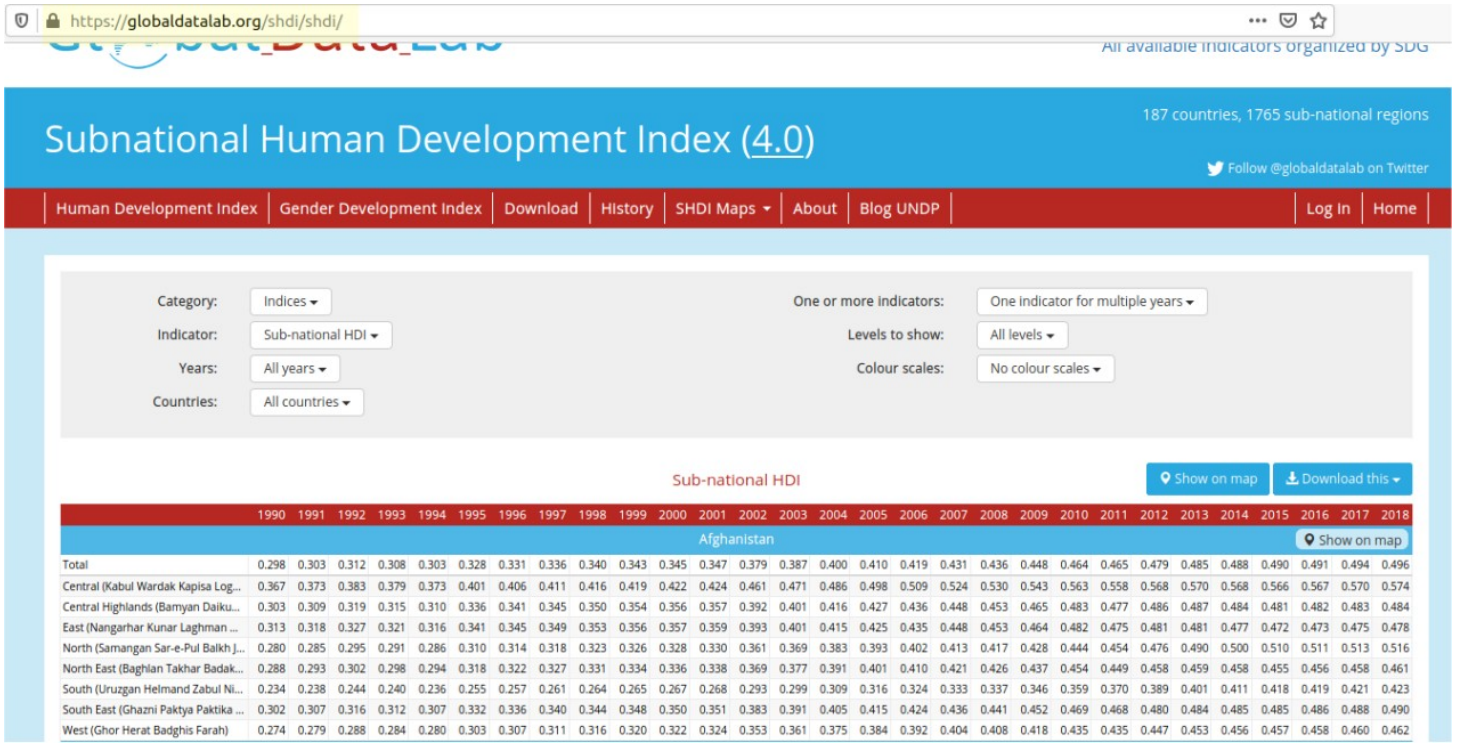
Looking for data

- Some journals mandate authors to share their data publicly: Plos One, Nature Human Behaviour, …



Looking for data

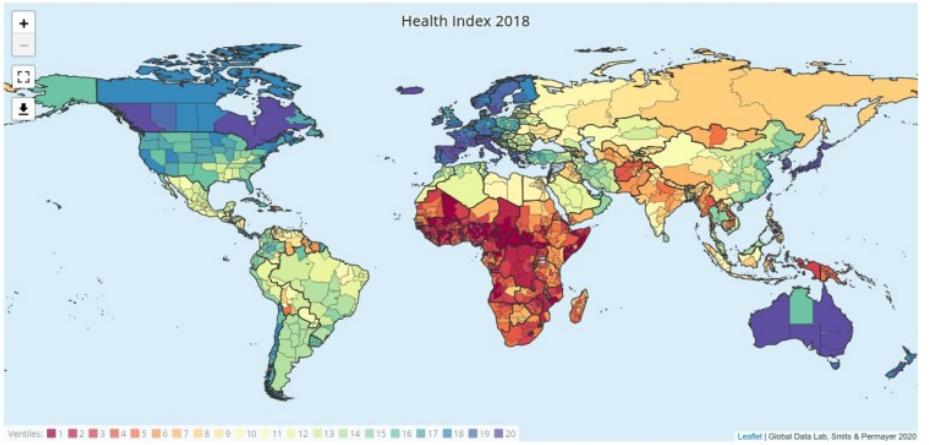
- International institutions are waking up!
- Hit the World Bank, European agencies, …
- Example, HDI by region:

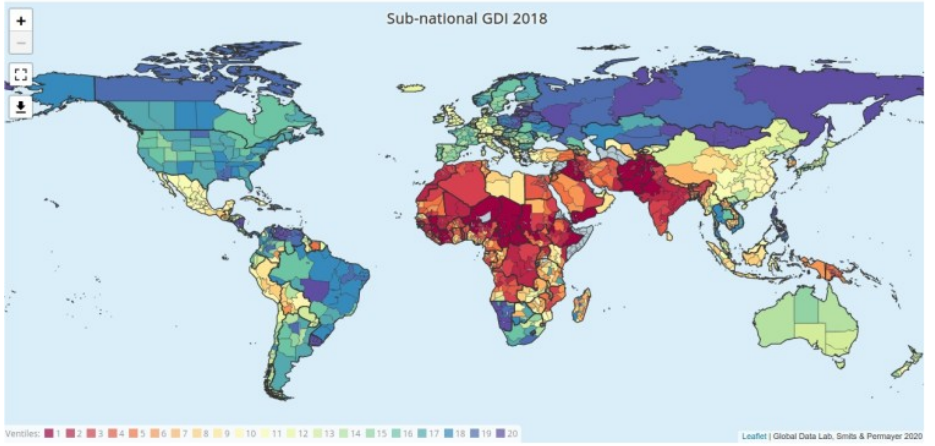


	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total	0.298	0.303	0.312	0.308	0.303	0.328	0.331	0.336	0.340	0.343	0.345	0.347	0.379	0.387	0.400	0.410	0.419	0.431	0.436	0.448	0.464	0.465	0.479	0.485	0.488	0.490	0.491	0.494	0.496
Central (Kabul Wardak Kapisa Log...	0.367	0.373	0.383	0.379	0.373	0.401	0.406	0.411	0.416	0.419	0.422	0.424	0.461	0.471	0.486	0.498	0.509	0.524	0.530	0.543	0.563	0.558	0.568	0.570	0.568	0.566	0.567	0.570	0.574
Central Highlands (Bamyan Daiku...	0.303	0.309	0.319	0.315	0.310	0.336	0.341	0.345	0.350	0.354	0.356	0.357	0.392	0.401	0.416	0.427	0.436	0.448	0.453	0.465	0.483	0.477	0.486	0.487	0.484	0.481	0.482	0.483	0.484
East (Nangarhar Kunar Laghman ...	0.313	0.318	0.327	0.321	0.316	0.341	0.345	0.349	0.353	0.356	0.357	0.359	0.393	0.401	0.415	0.425	0.435	0.448	0.453	0.464	0.482	0.475	0.481	0.481	0.477	0.472	0.473	0.475	0.478
North (Samangan Sar-e-Pul Balkh J...	0.280	0.285	0.295	0.291	0.286	0.310	0.314	0.318	0.323	0.326	0.328	0.330	0.361	0.369	0.383	0.393	0.402	0.413	0.417	0.428	0.444	0.454	0.476	0.490	0.500	0.510	0.511	0.513	0.516
North East (Baghlan Takhar Badak...	0.288	0.293	0.302	0.298	0.294	0.318	0.322	0.327	0.331	0.334	0.336	0.338	0.369	0.377	0.391	0.401	0.410	0.421	0.426	0.437	0.454	0.449	0.458	0.459	0.458	0.455	0.456	0.458	0.461
South (Uruzgan Helmand Zabul Ni...	0.234	0.238	0.244	0.240	0.236	0.255	0.257	0.261	0.264	0.265	0.267	0.268	0.293	0.299	0.309	0.316	0.324	0.333	0.337	0.346	0.359	0.370	0.389	0.401	0.411	0.418	0.419	0.421	0.423
South East (Ghazni Paktya Paktika ...	0.302	0.307	0.316	0.312	0.307	0.332	0.336	0.340	0.344	0.348	0.350	0.351	0.383	0.391	0.405	0.415	0.424	0.436	0.441	0.452	0.469	0.468	0.480	0.484	0.485	0.485	0.486	0.488	0.490
West (Ghor Herat Badghis Farah)	0.274	0.279	0.288	0.284	0.280	0.303	0.307	0.311	0.316	0.320	0.322	0.324	0.353	0.361	0.375	0.384	0.392	0.404	0.408	0.418	0.435	0.435	0.447	0.453	0.456	0.457	0.458	0.460	0.462

Global Data Lab

- Health index
- Gender equality
- And more!



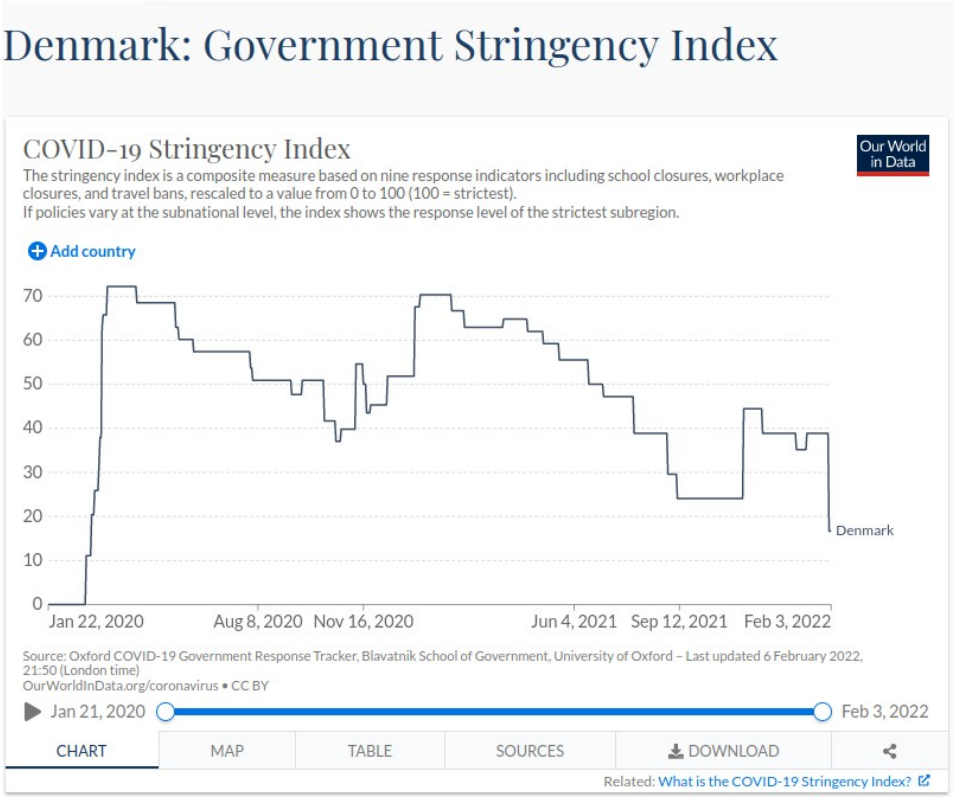


Additional Corona Data

- Our World in Data for country-country comparisons

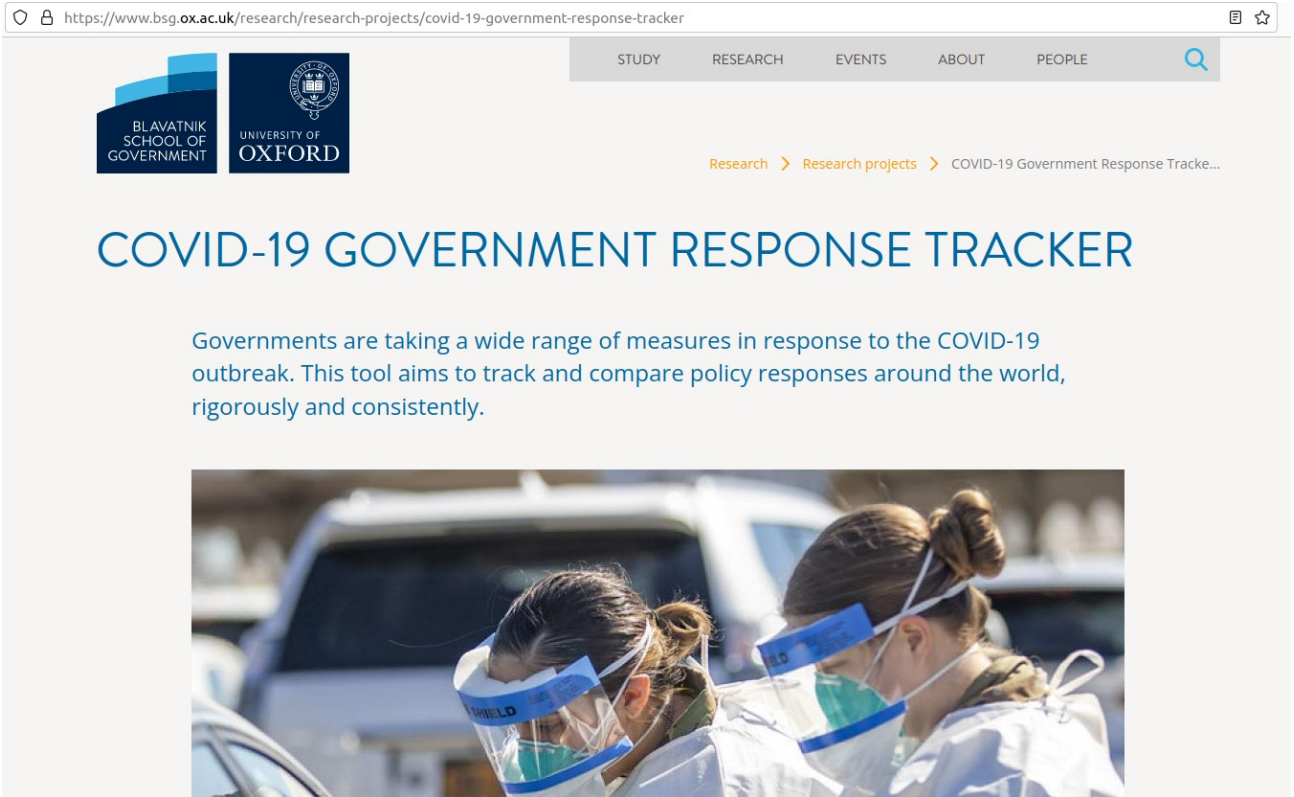
Stringency Index

- Quantification of **overall** intervention at the **country** level

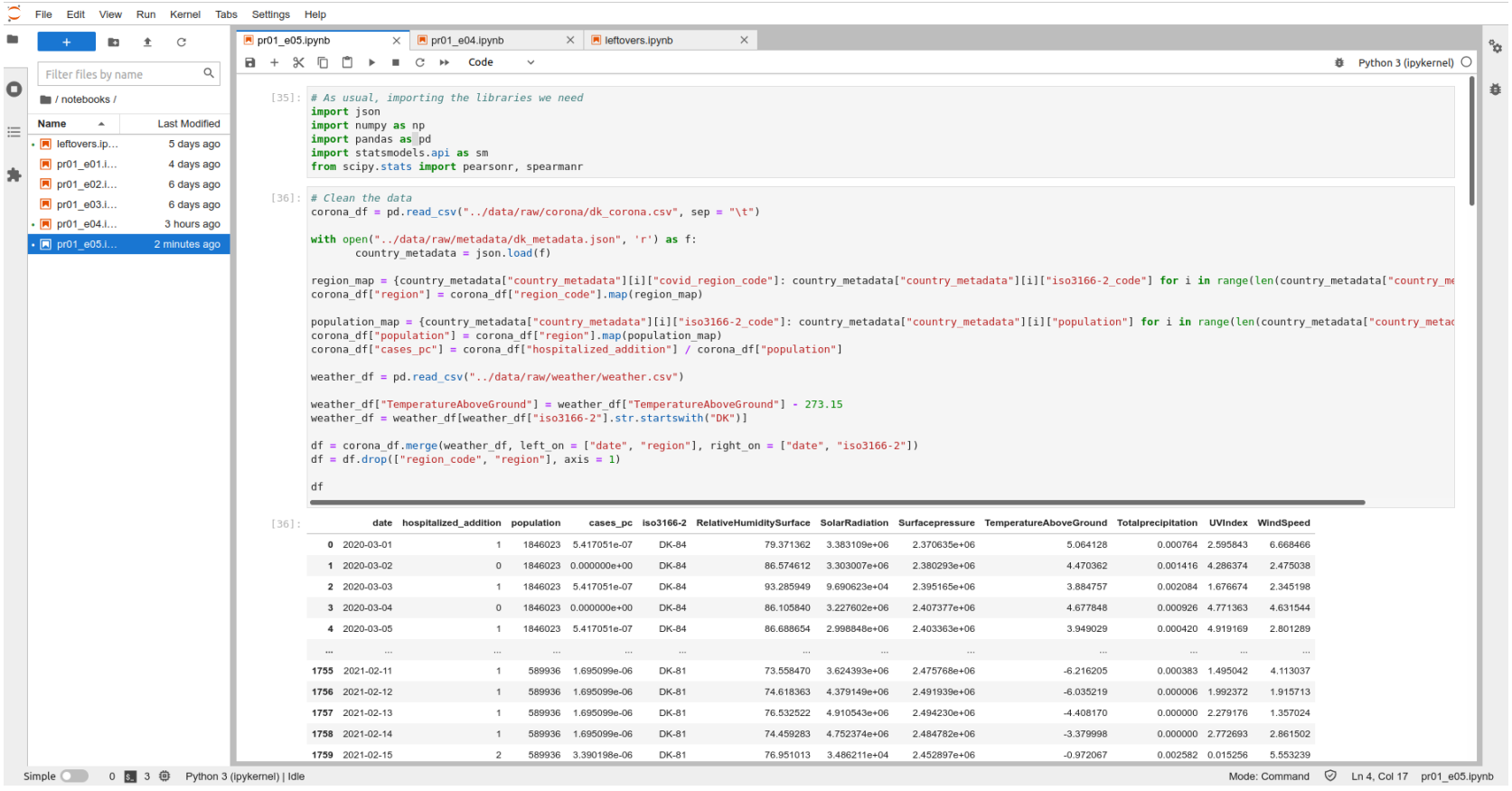


Covid Interventions

- More granular data about **specific** interventions

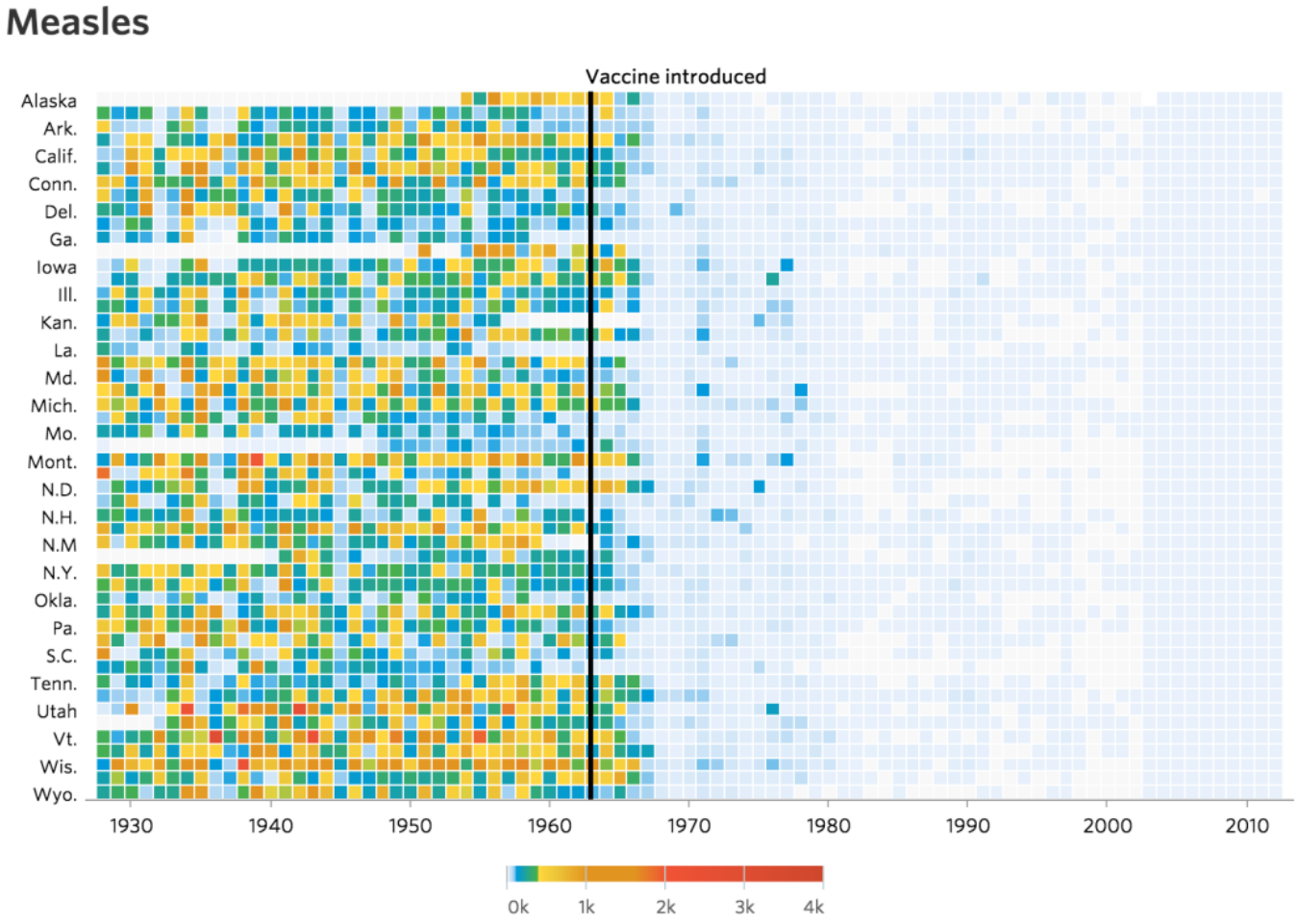


Let’s integrate some data



Estimating Intervention Effects

The Ideal Scenario

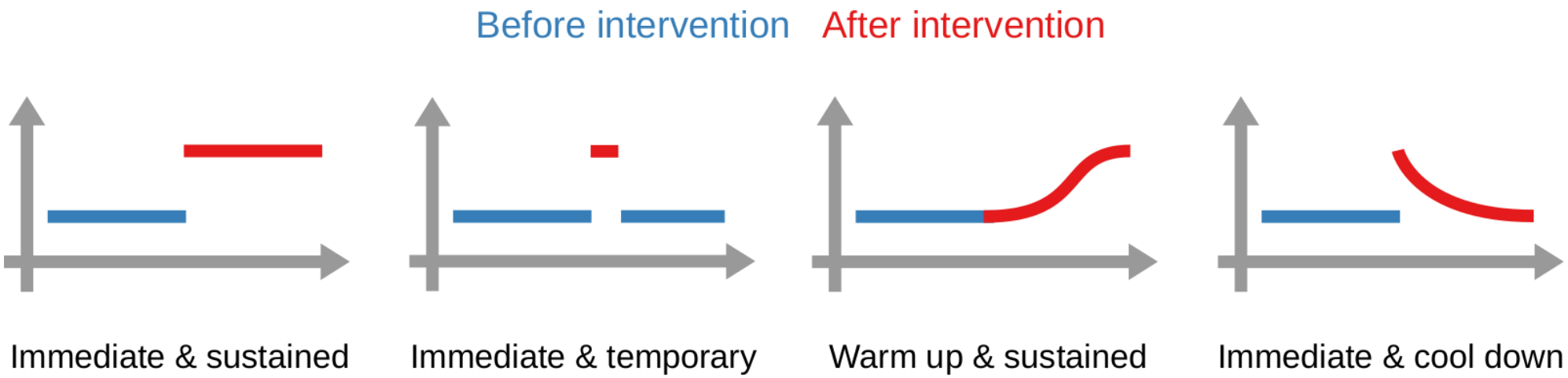


It’s never that easy...

- Did the lockdown work?
- Too many things happen at the same time:
  - New variants
  - Ebb & flow of epidemics
  - Individual & collective behavior
  - Influence of weather
    - Which interacts with collective behavior
- Vaccine development

It’s never that easy...

- Also: what type of effect did the intervention cause?



Interventions and Fixed Effects

A Rule of Thumb

- You don’t know what an intervention did
- You only know if it’s on or off
- How to implement it?
- Fixed Effects!

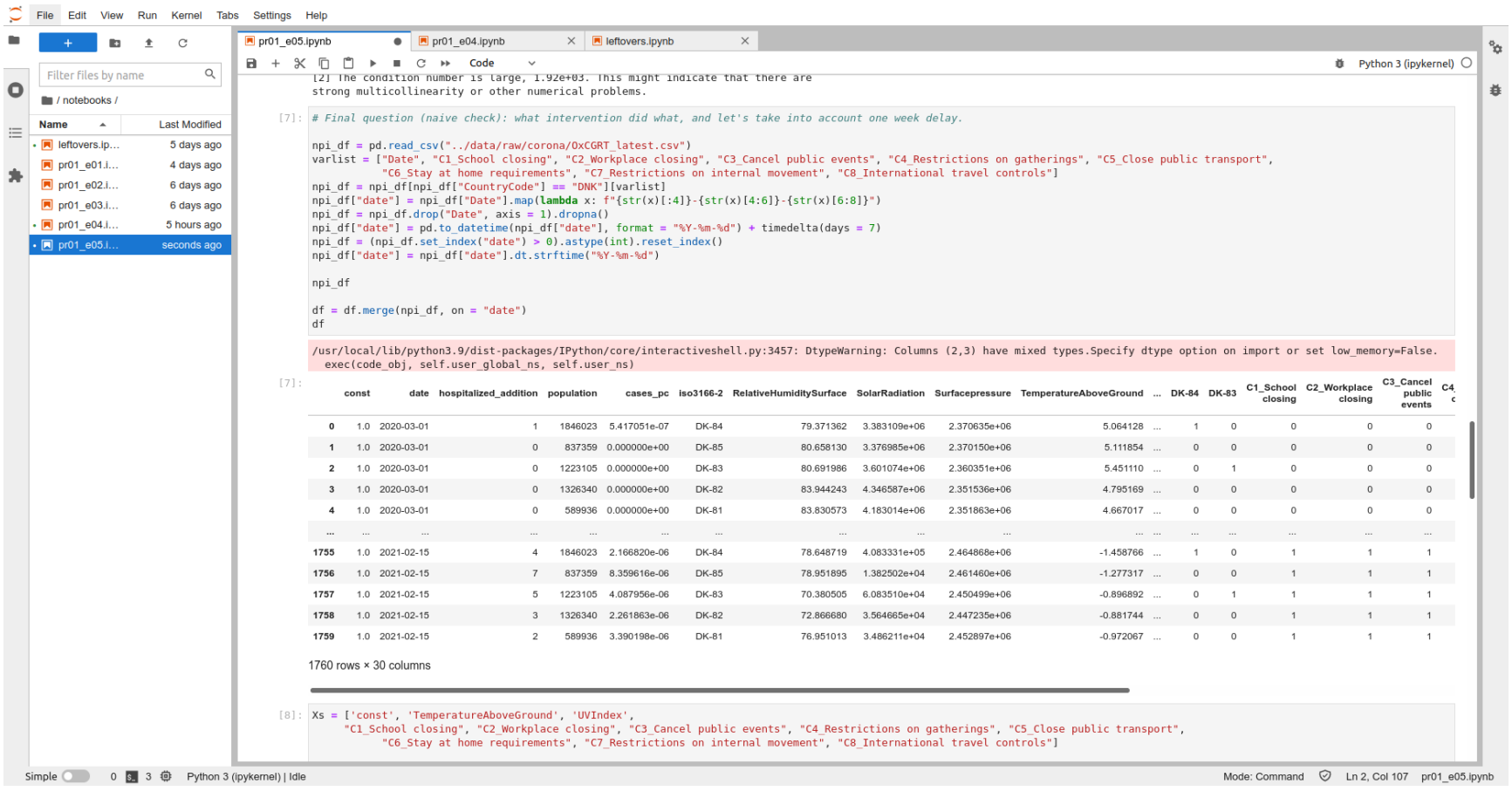
Interventions and Fixed Effects

- Create a column for intervention
- Value = 1 if the intervention is in place
- Value = 0 if it is not

Beware!

- It might take time for an intervention to take effect
- You should shift your observations accordingly
- By how much depends on the Y variable (and on the intervention)
  - Cases > Hospitalizations > Deaths

Let’s Intervene



	const	date	hospitalized_addition	population	cases_pc	iso3166-2	RelativeHumiditySurface	SolarRadiation	Surfacepressure	TemperatureAboveGround	...	DK-84	DK-83	C1_School closing	C2_Workplace closing	C3_Cancel public events	C4_
0	1.0	2020-03-01	1	1846023	5.417051e-07	DK-84	79.371362	3.383109e+06	2.370635e+06	5.064128	...	1	0	0	0	0	
1	1.0	2020-03-01	0	837359	0.000000e+00	DK-85	80.658130	3.376985e+06	2.370150e+06	5.111854	...	0	0	0	0	0	
2	1.0	2020-03-01	0	1223105	0.000000e+00	DK-83	80.691986	3.601074e+06	2.360351e+06	5.451110	...	0	1	0	0	0	
3	1.0	2020-03-01	0	1326340	0.000000e+00	DK-82	83.944243	4.346587e+06	2.351536e+06	4.795169	...	0	0	0	0	0	
4	1.0	2020-03-01	0	589936	0.000000e+00	DK-81	83.830573	4.183014e+06	2.351863e+06	4.667017	...	0	0	0	0	0	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1755	1.0	2021-02-15	4	1846023	2.166820e-06	DK-84	78.648719	4.083331e+05	2.464868e+06	-1.458766	...	1	0	1	1	1	
1756	1.0	2021-02-15	7	837359	8.359616e-06	DK-85	78.951895	1.382502e+04	2.461460e+06	-1.277317	...	0	0	1	1	1	
1757	1.0	2021-02-15	5	1223105	4.087956e-06	DK-83	70.380505	6.083510e+04	2.450499e+06	-0.896892	...	0	1	1	1	1	
1758	1.0	2021-02-15	3	1326340	2.261863e-06	DK-82	72.866680	3.564665e+04	2.447235e+06	-0.881744	...	0	0	1	1	1	
1759	1.0	2021-02-15	2	589936	3.390198e-06	DK-81	76.951013	3.486211e+04	2.452897e+06	-0.972067	...	0	0	1	1	1	

Q&A