Data Visualization

COVID19

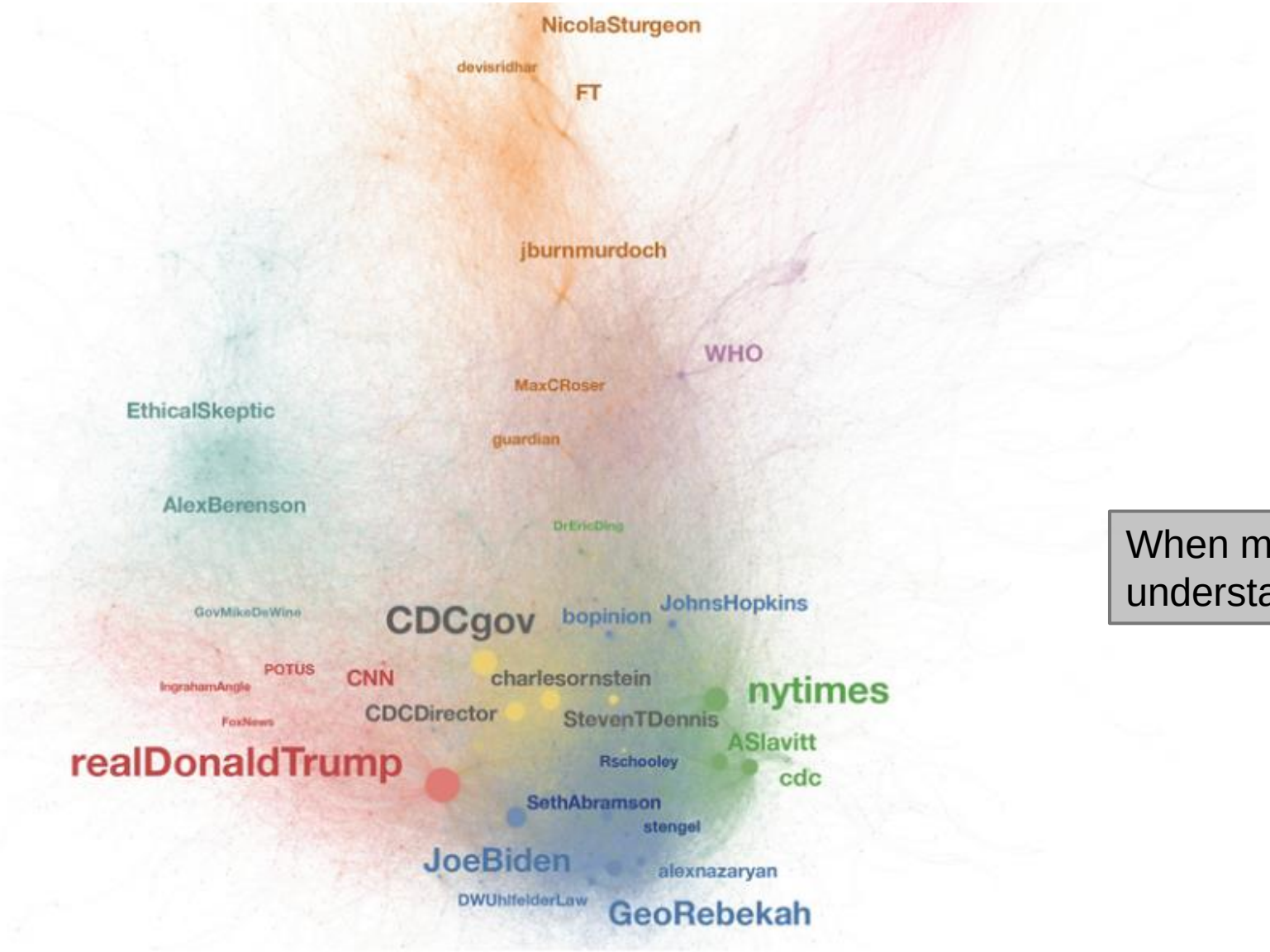
M126 | Maria Roussou

COVID 19 data visualization

- Shneiderman, B. (2020, April). **Data Visualization's Breakthrough Moment in the COVID-19 Crisis**. *Nightingale: The Journal of the Data Visualization Society*. Retrieved from https://medium.com/nightingale/data-visualizations-breakthrough-moment-in-the-covid-19-crisis-ce46627c7db5

- Ackerman, D. (2021, March). When more Covid-19 data doesn't equal more understanding. *MIT News*. Retrieved from https://news.mit.edu/2021/when-more-covid-data-doesnt-equal-more-understanding-0304

COVID 19 data visualization



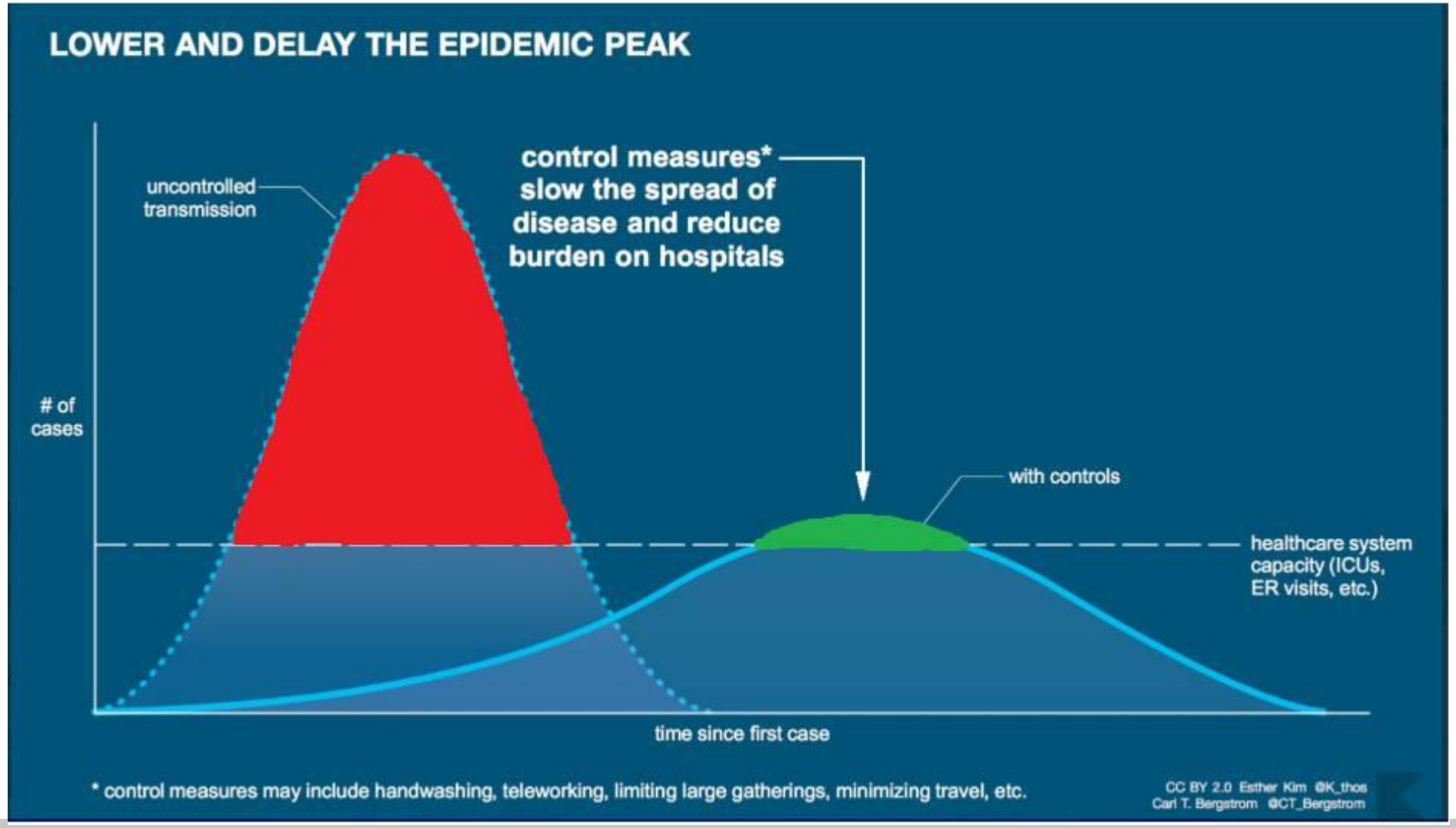
This figure shows a network visualization of Twitter users appearing in the research. Color encodes community and nodes are sized by their degree of connectedness.

Courtesy of the researchers

When more Covid-19 data doesn't equal more understanding. *MIT News*.

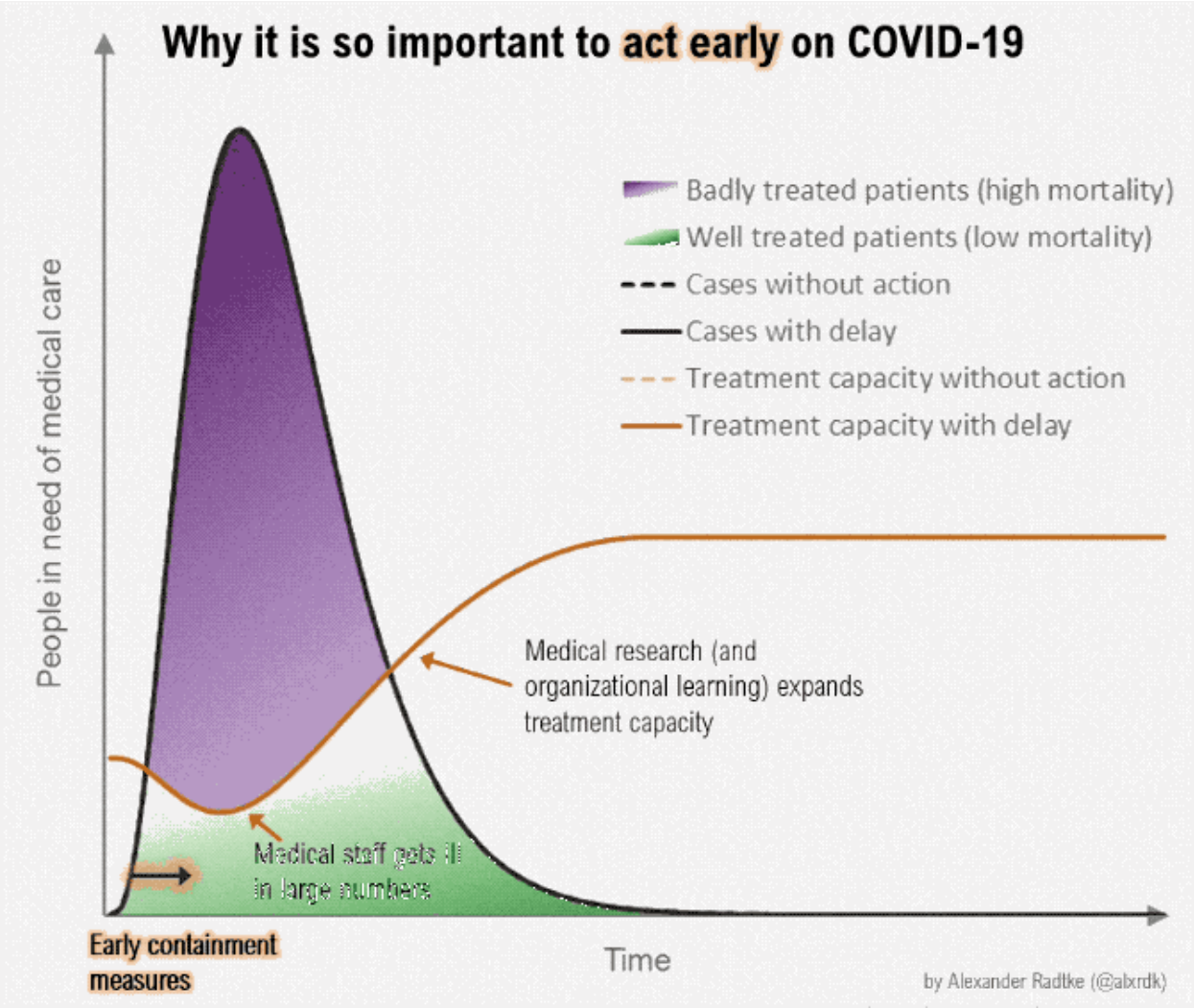
COVID 19 data visualization

- COVID-19 epidemic: Flatten the curve



COVID 19 data visualization

- COVID-19 epidemic: Flatten the curve



COVID 19 data visualization

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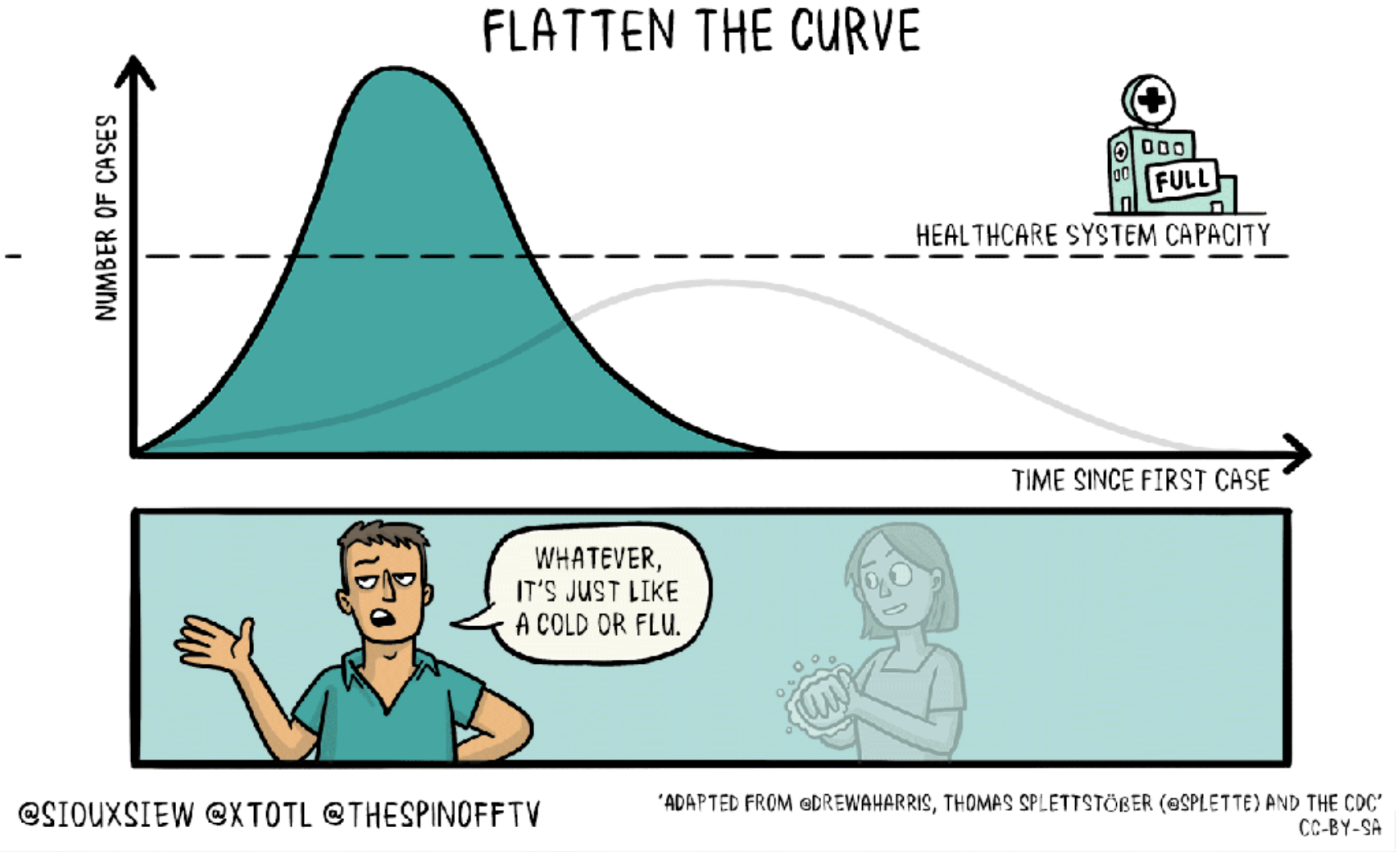
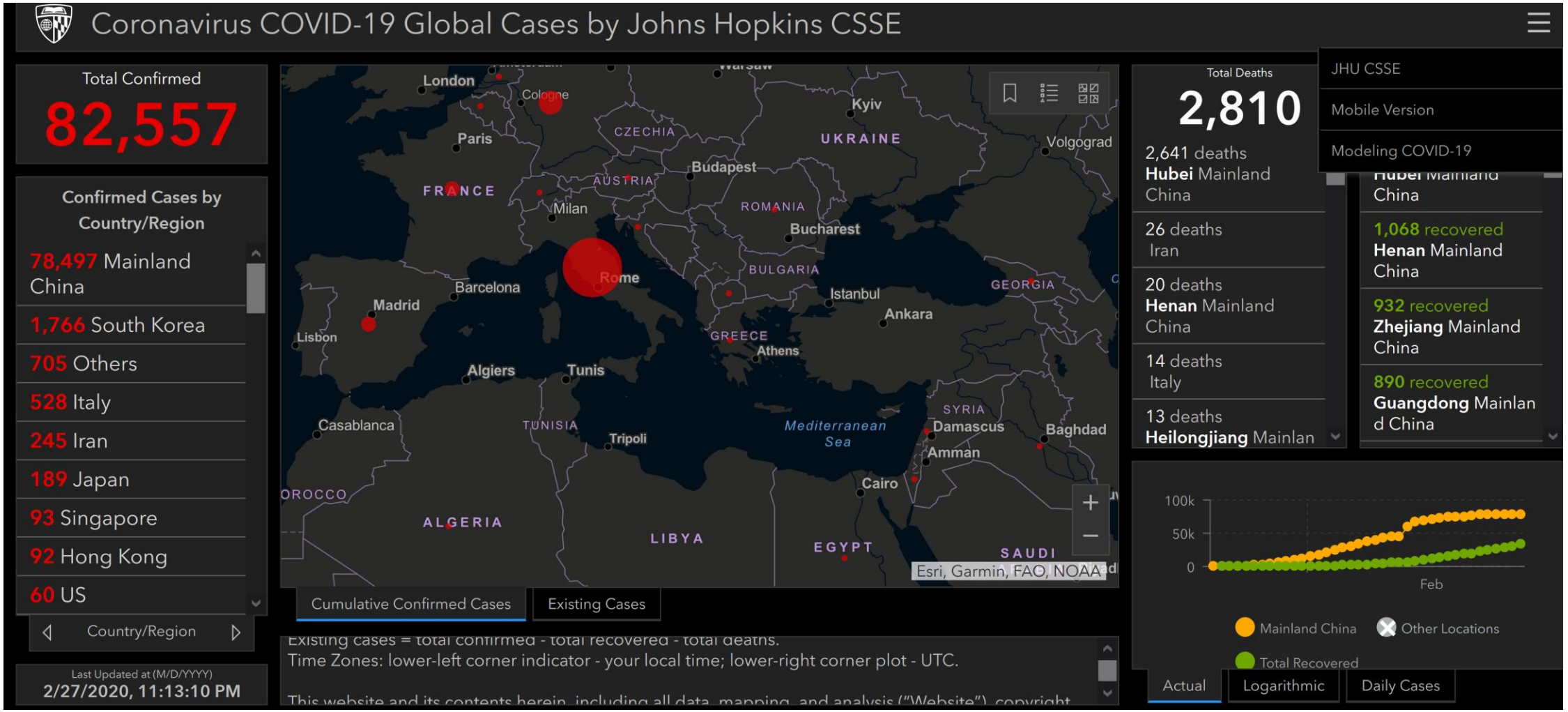


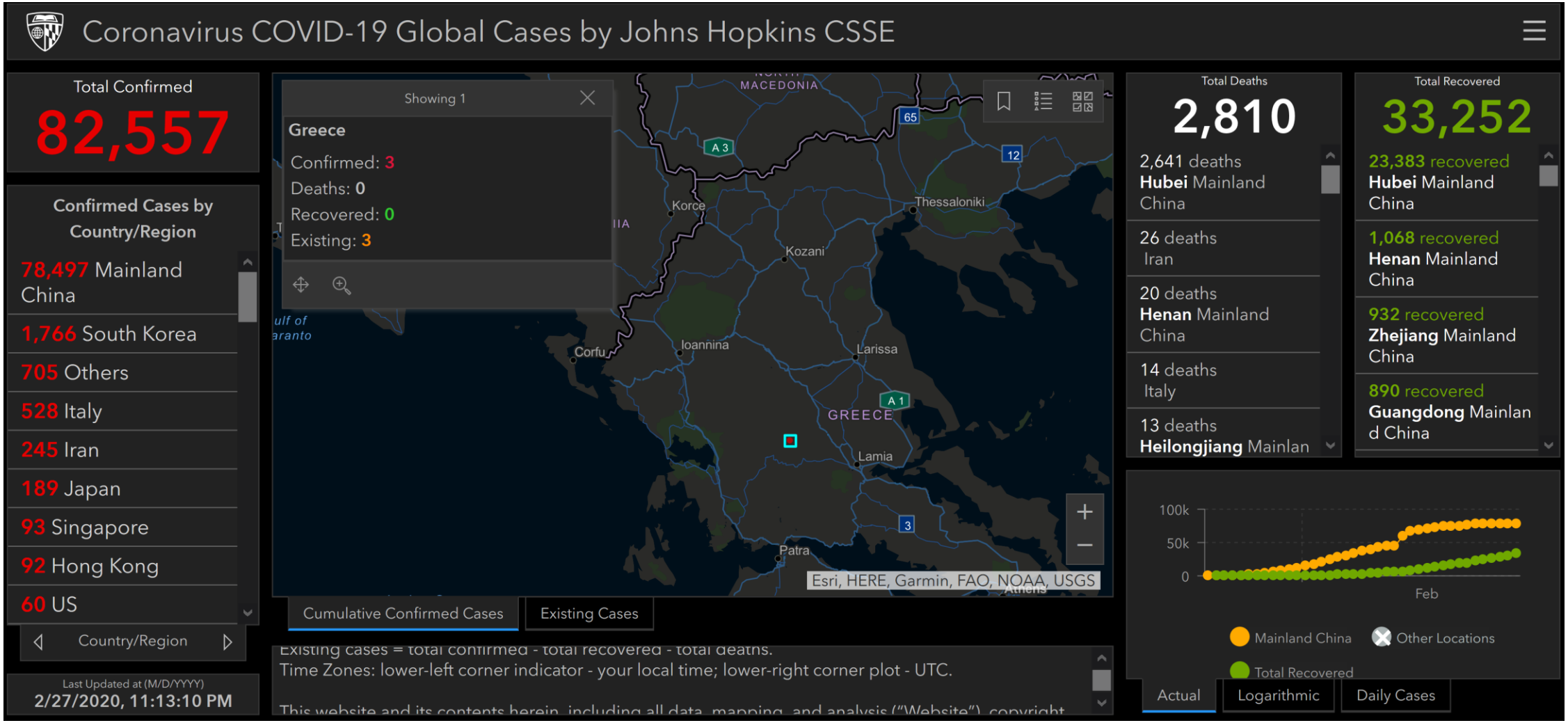
COVID 19 data visualization

- COVID-19 epidemic: Real-time outbreak

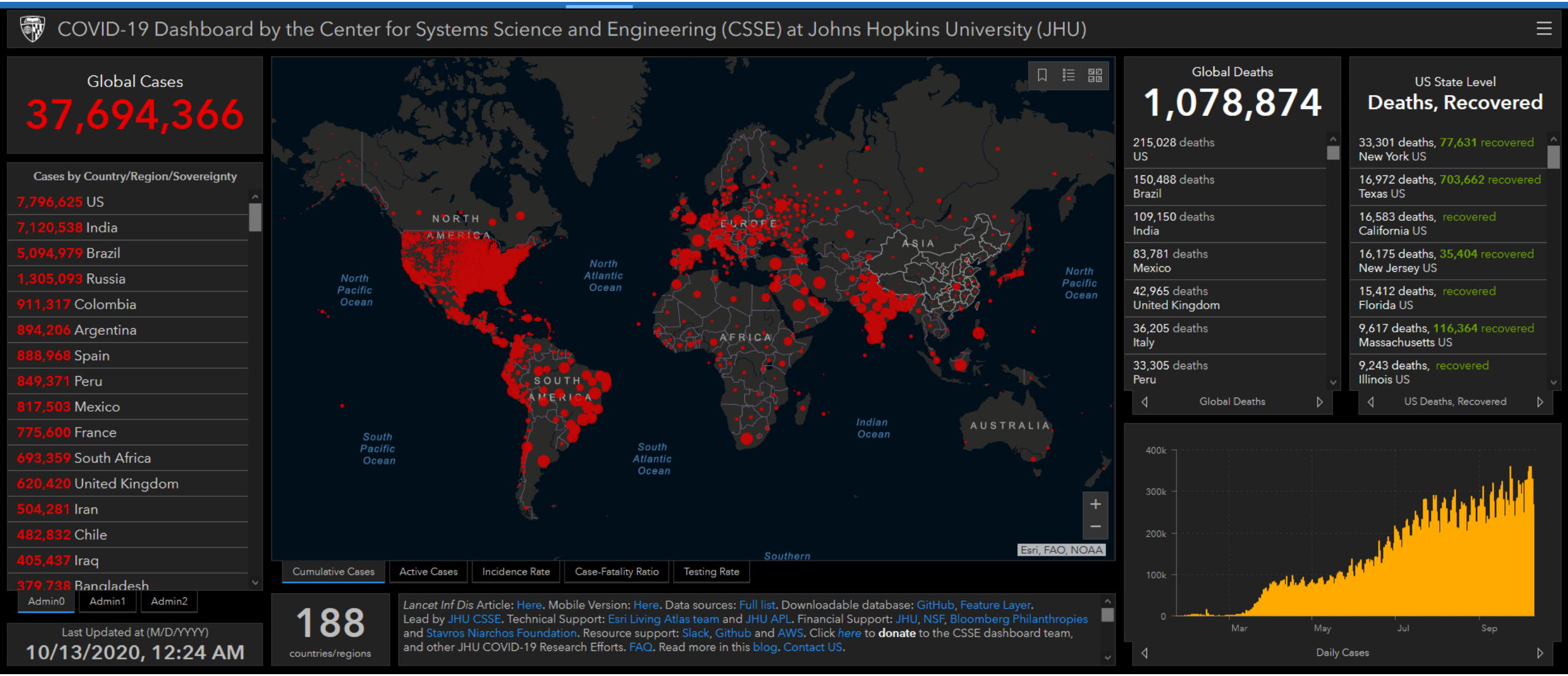


COVID 19 data visualization

- COVID-19 epidemic: Real-time outbreak



COVID 19 data visualization

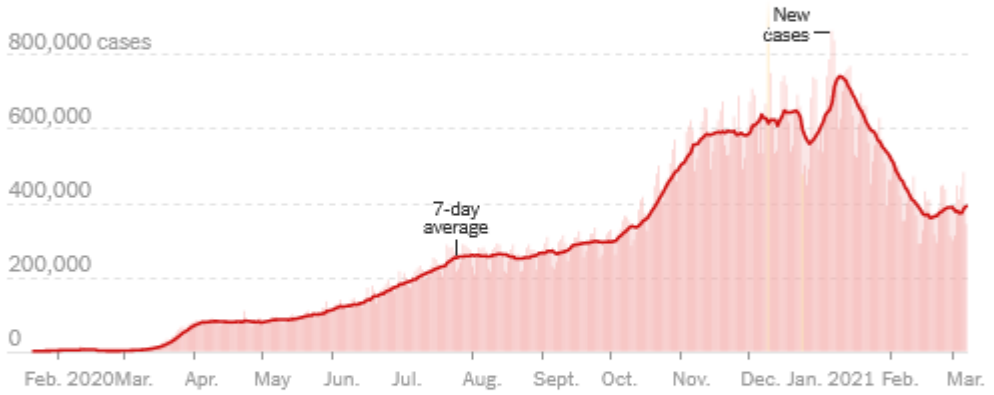


Johns Hopkins University COVID-19 dashboard

COVID 19 data visualization

Coronavirus World Map: Tracking the Global Outbreak

Updated March 8, 2021, 12:04 A.M. E.T.

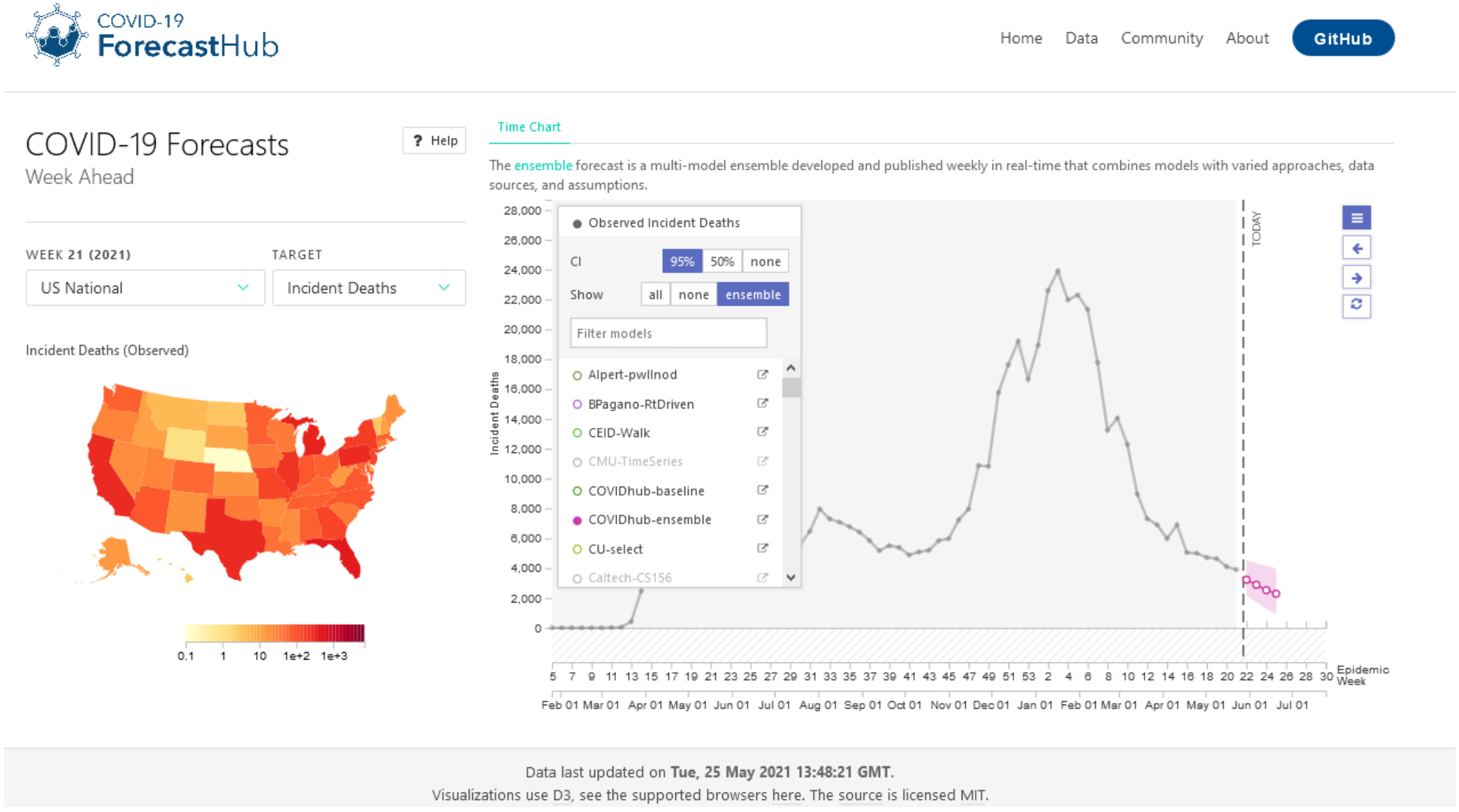


	TOTAL REPORTED	ON MARCH 7	14-DAY CHANGE
Cases	116.8 million+	342,103	+7% →
Deaths	2.5 million+	5,260	-8% →

Day with reporting anomaly. 14-day change trends use 7-day averages.

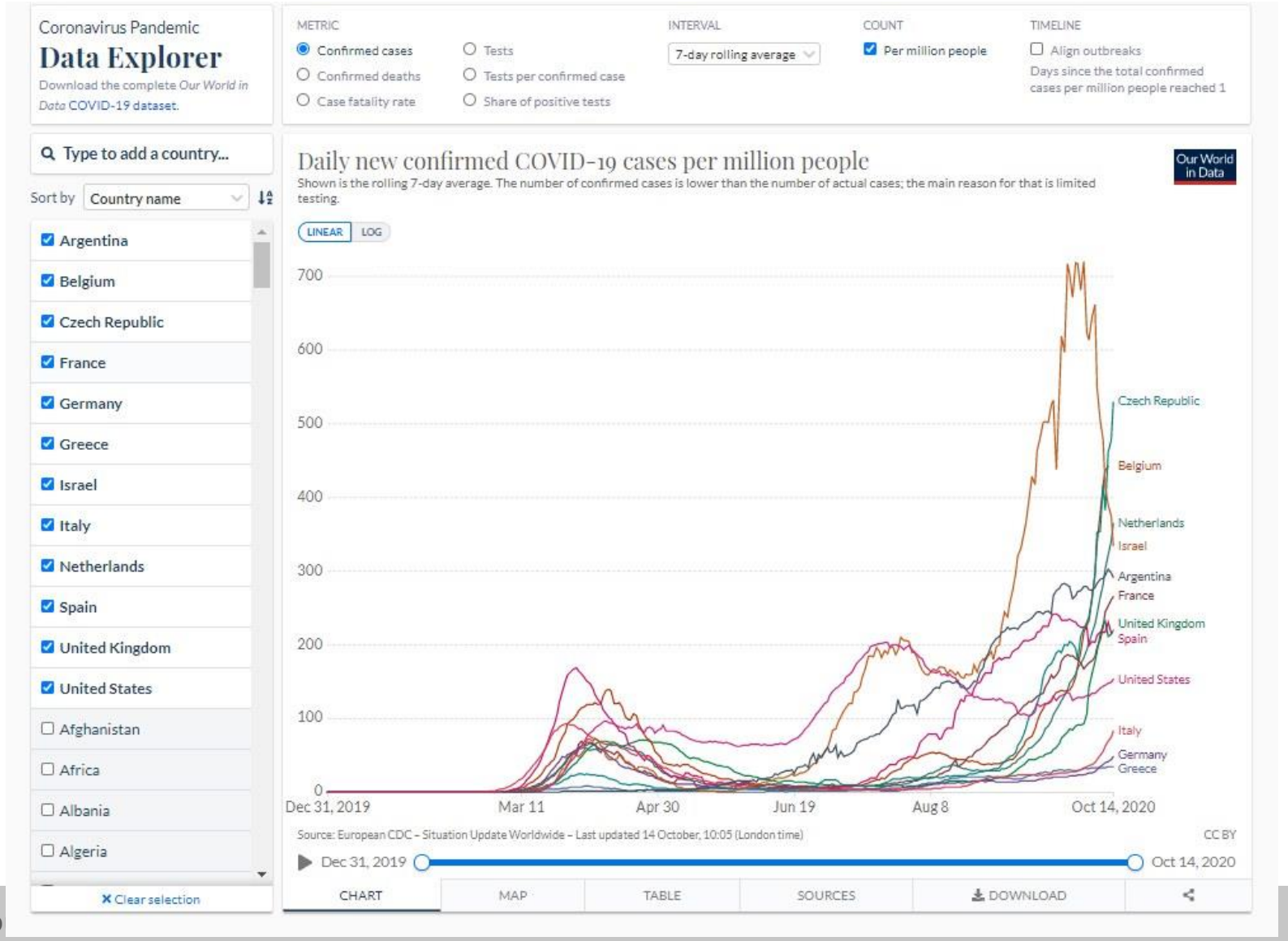
Jump to: Map | Country table | New cases | Tips

COVID 19 data visualization



Linear & logarithmic daily cases

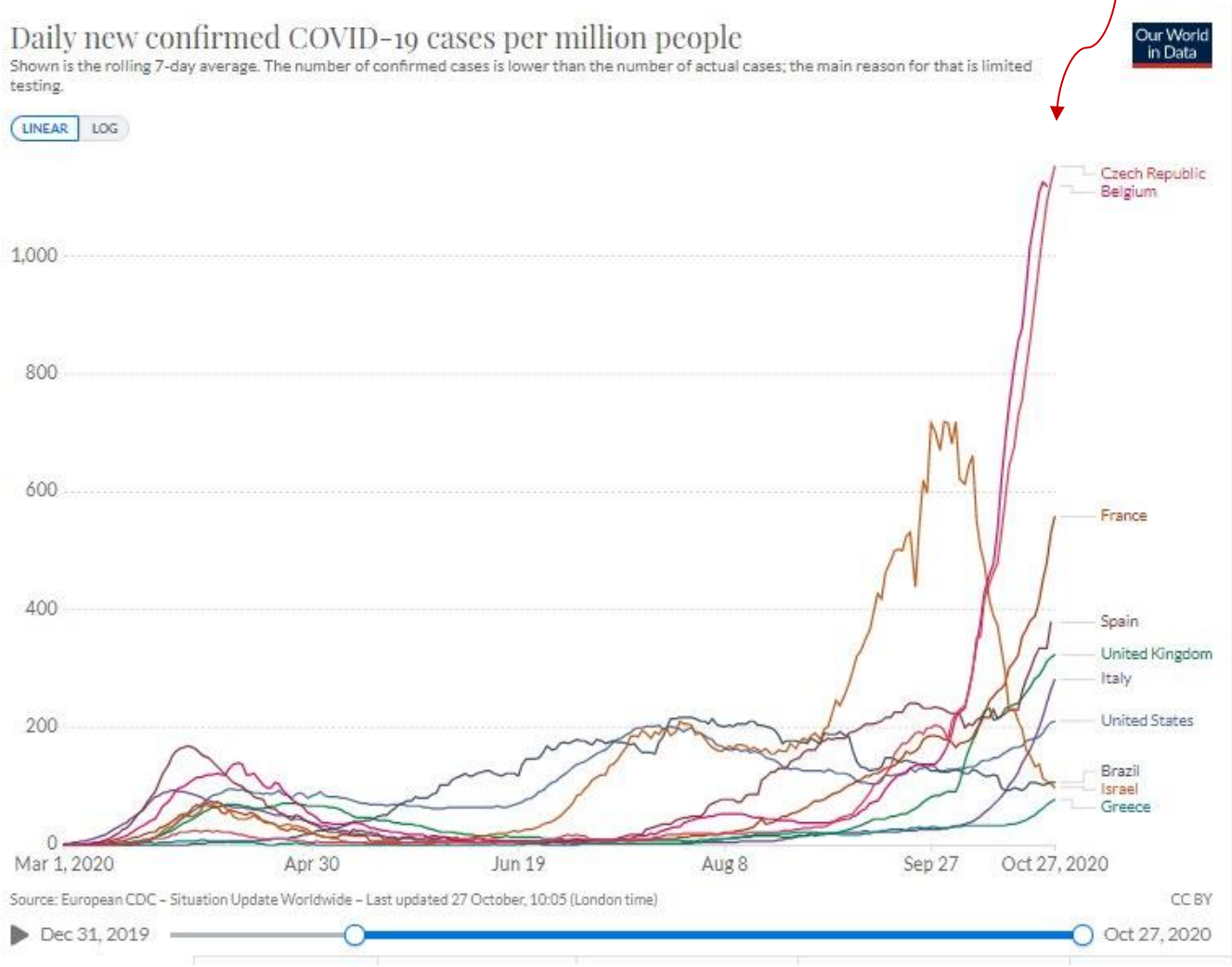
- Our World in Data – ECDC data



Linear & logarithmic daily cases

- Our World in Data

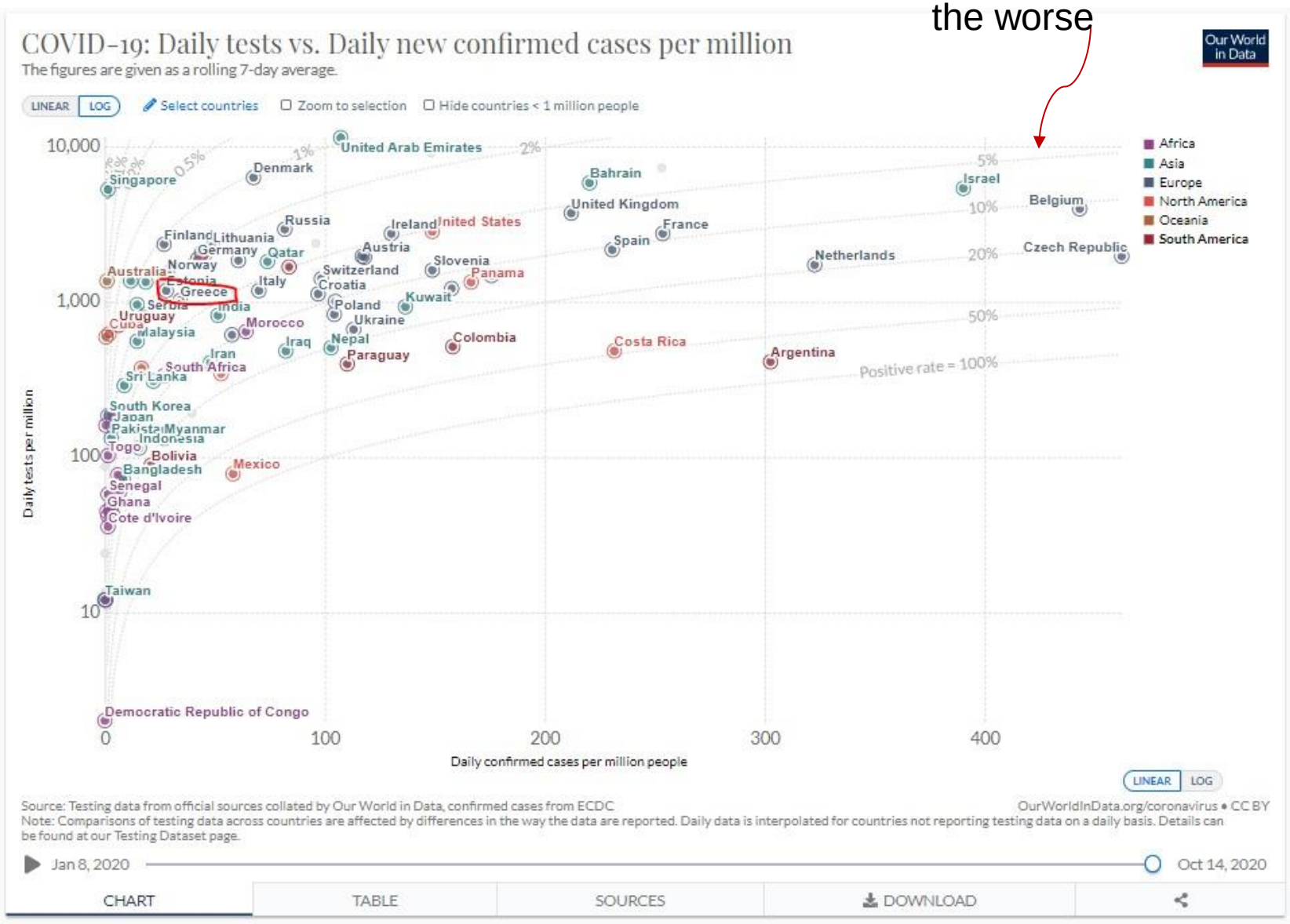
the more up here
the worse



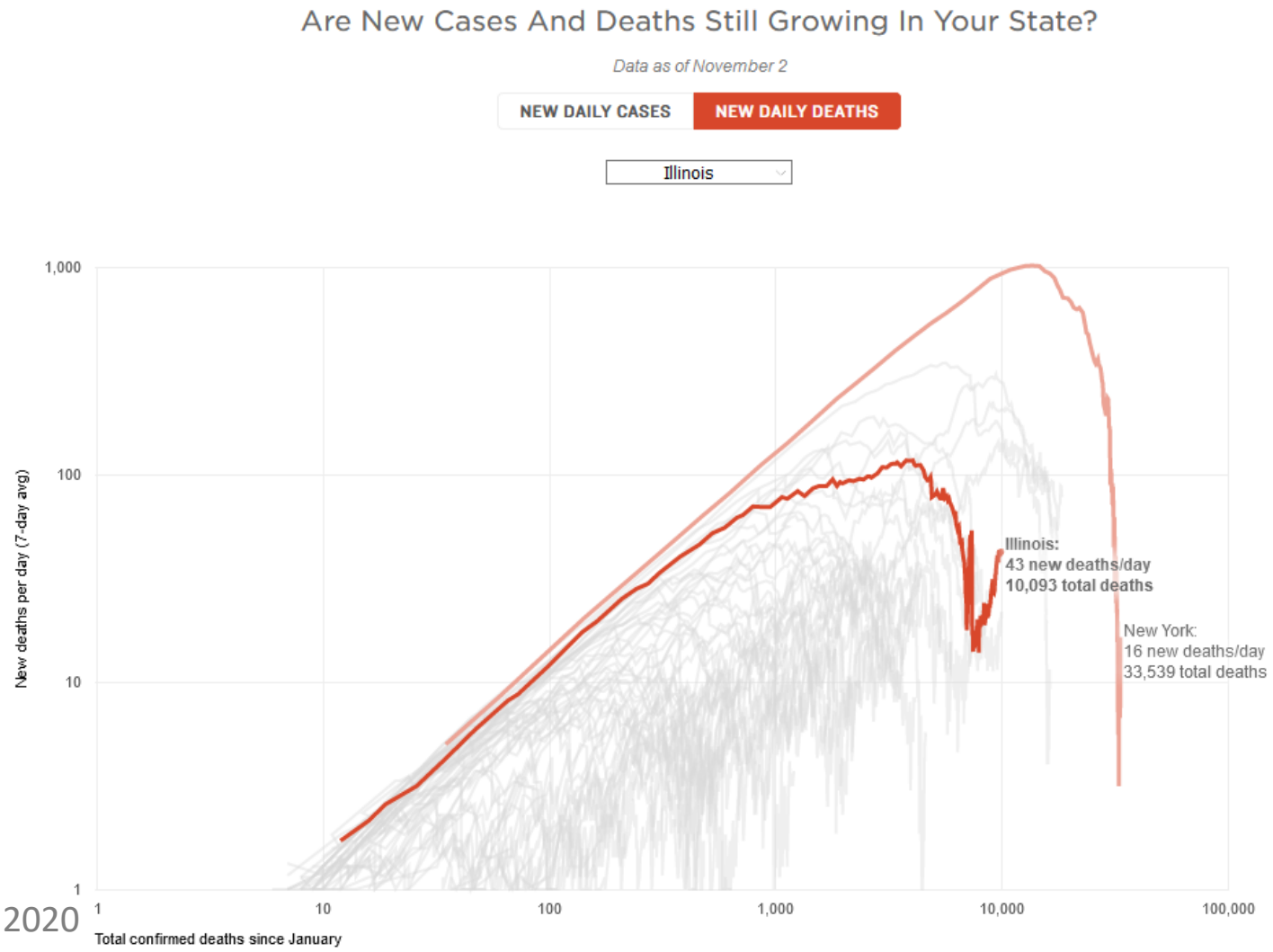
Linear & logarithmic daily tests vs. cases

- Our World in Da

the more up here
the worse

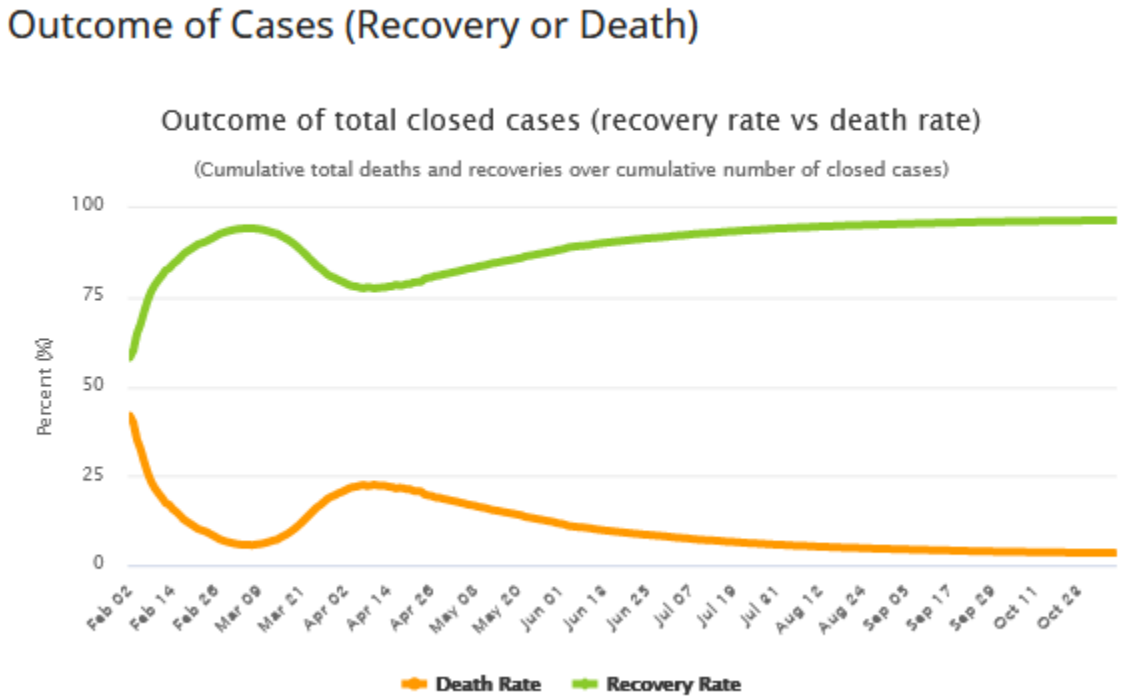


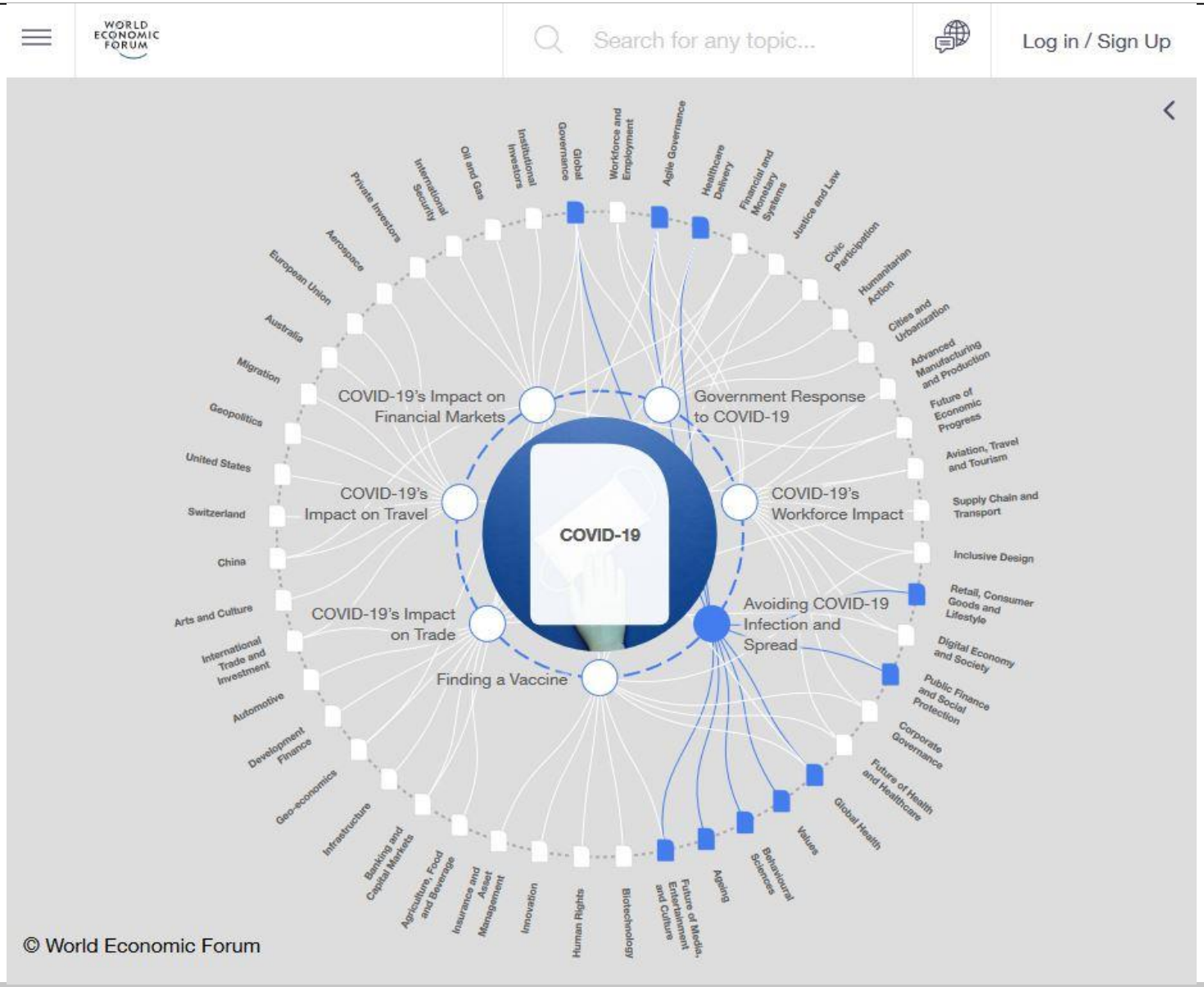
- Compare state outbreaks - daily growth or decline



New York Times Interactive, 2020

- Worldometer

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Government Response to COVID-19
COVID-19's Impact on Travel
COVID-19's Workforce Impact
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Avoiding COVID-19 Infection and Spread
Finding a Vaccine
Global Governance
Workforce and Employment
Agile Governance
Healthcare Delivery
Financial and Monetary Systems
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Civic Participation
Humanitarian Action
Cities and Urbanization
Advanced Manufacturing and Production
Future of Economic Progress
Aviation, Travel and Tourism
Supply Chain and Transport
Inclusive Design
Retail, Consumer Goods and Lifestyle
Digital Economy and Society
Public Finance and Social Protection
Corporate Governance
Future of Health and Healthcare
Global Health
Values
Behavioural Sciences
Ageing
Future of Media, Entertainment and Culture
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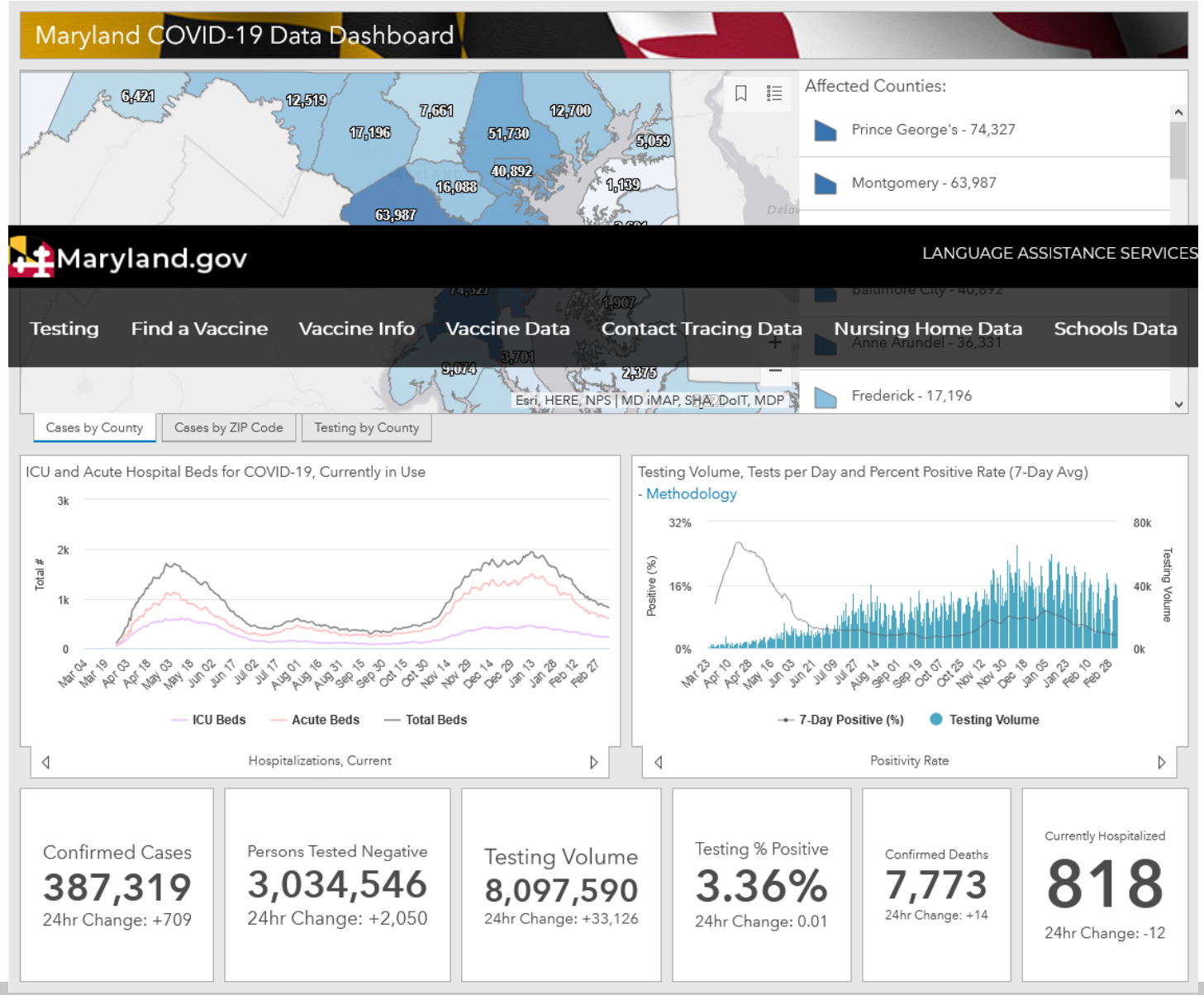
COVID 19 data visualization

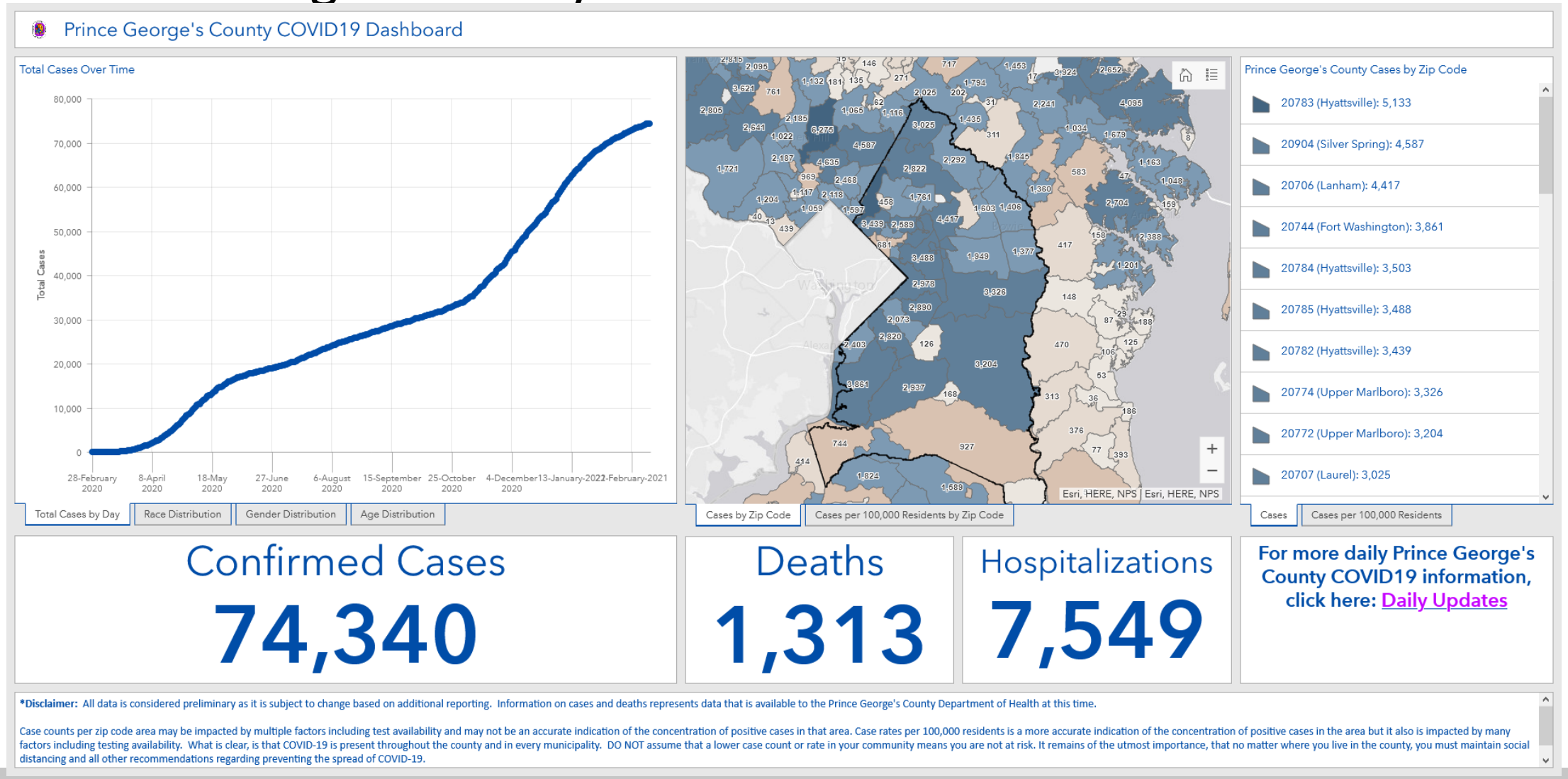
COVID 19 data visualization

- dashboards



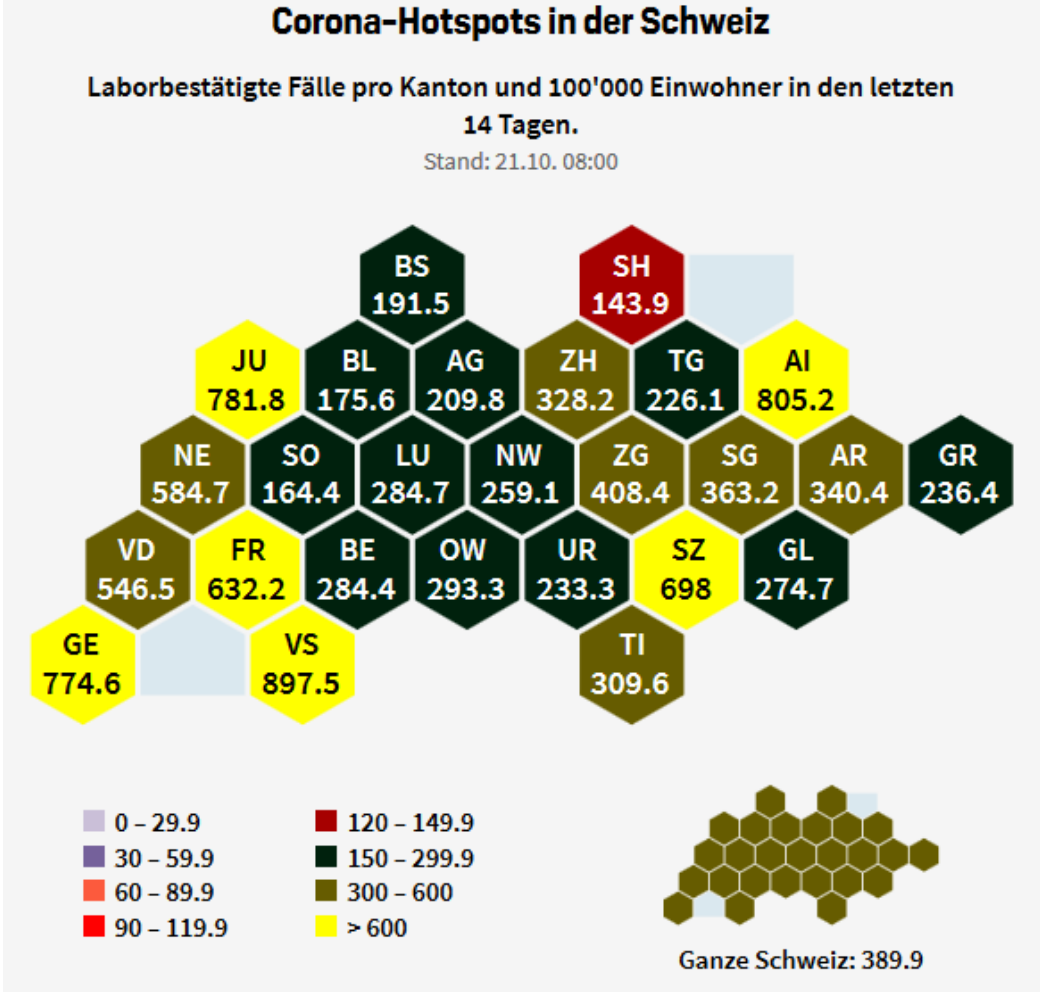
COVID 19 data visualization

- Prince George's County COVID19 Dashboard



Misleading use of color scale

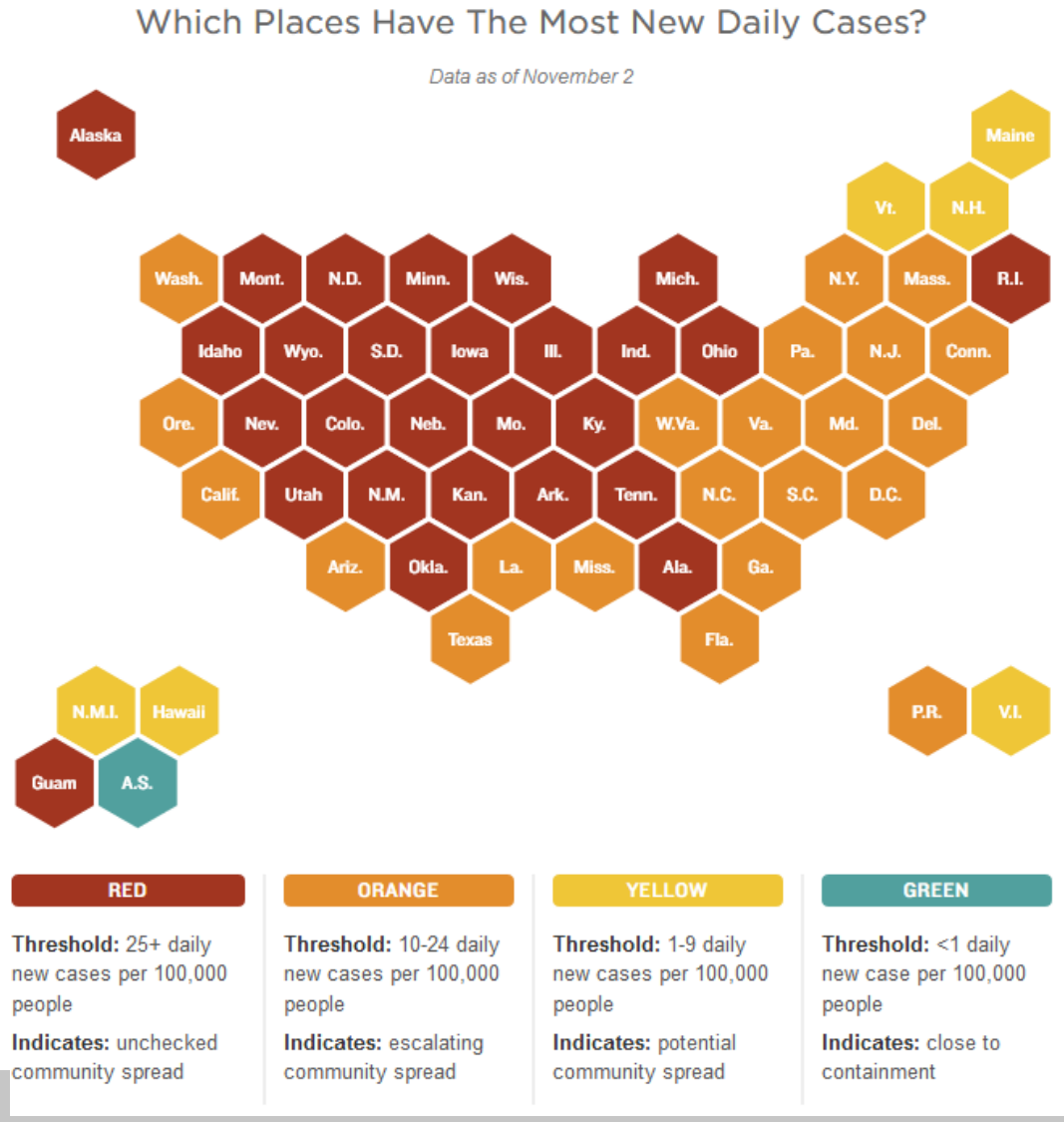
- New COVID-19 cases in Switzerland, by canton



https://www.reddit.com/r/dataisugly

More rational use of color scale

- New COVID-19 cases in the USA, by state

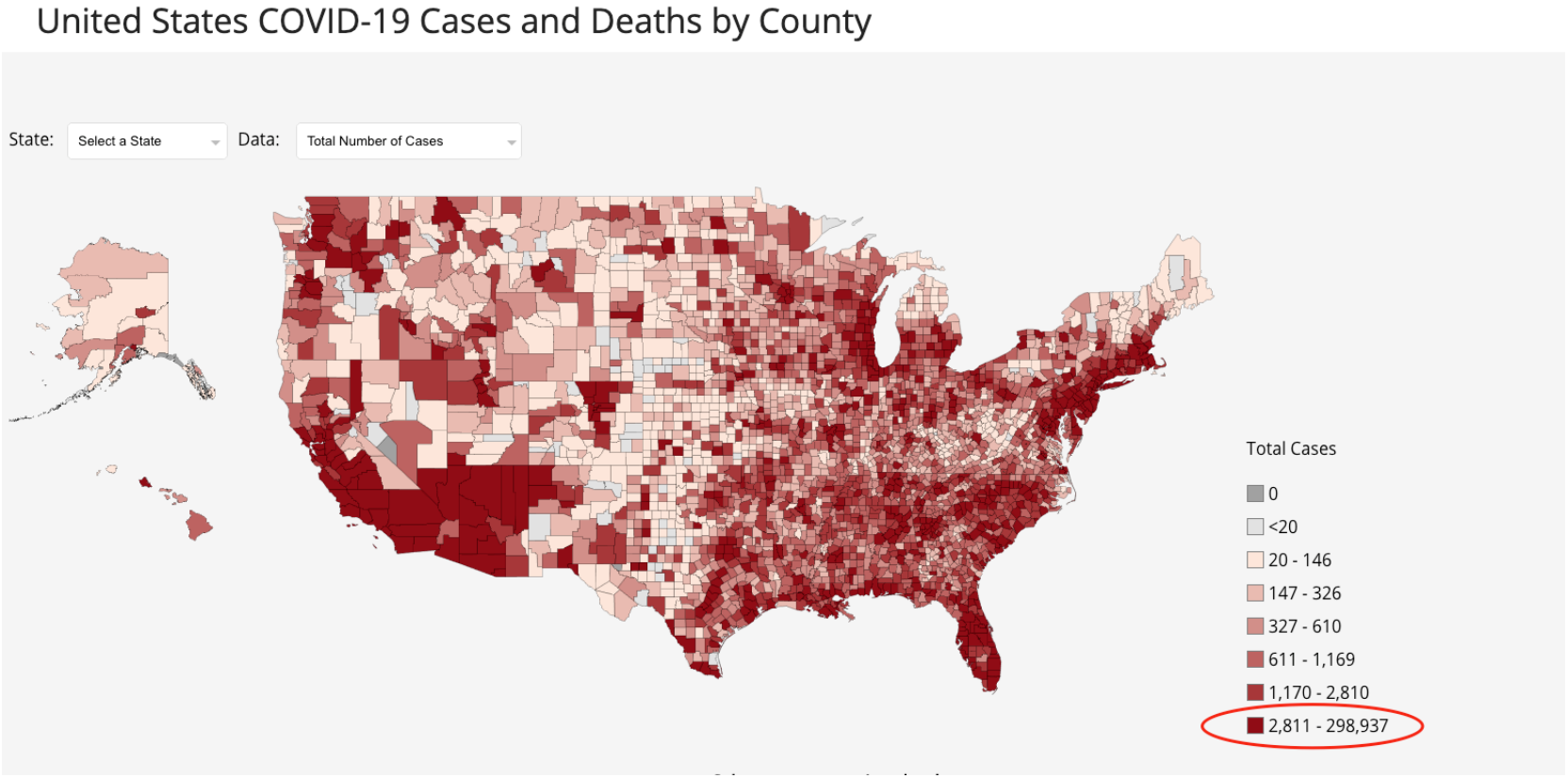


https://www.reddit.com/r/dataisugly

NPR site

Misleading use of color scale

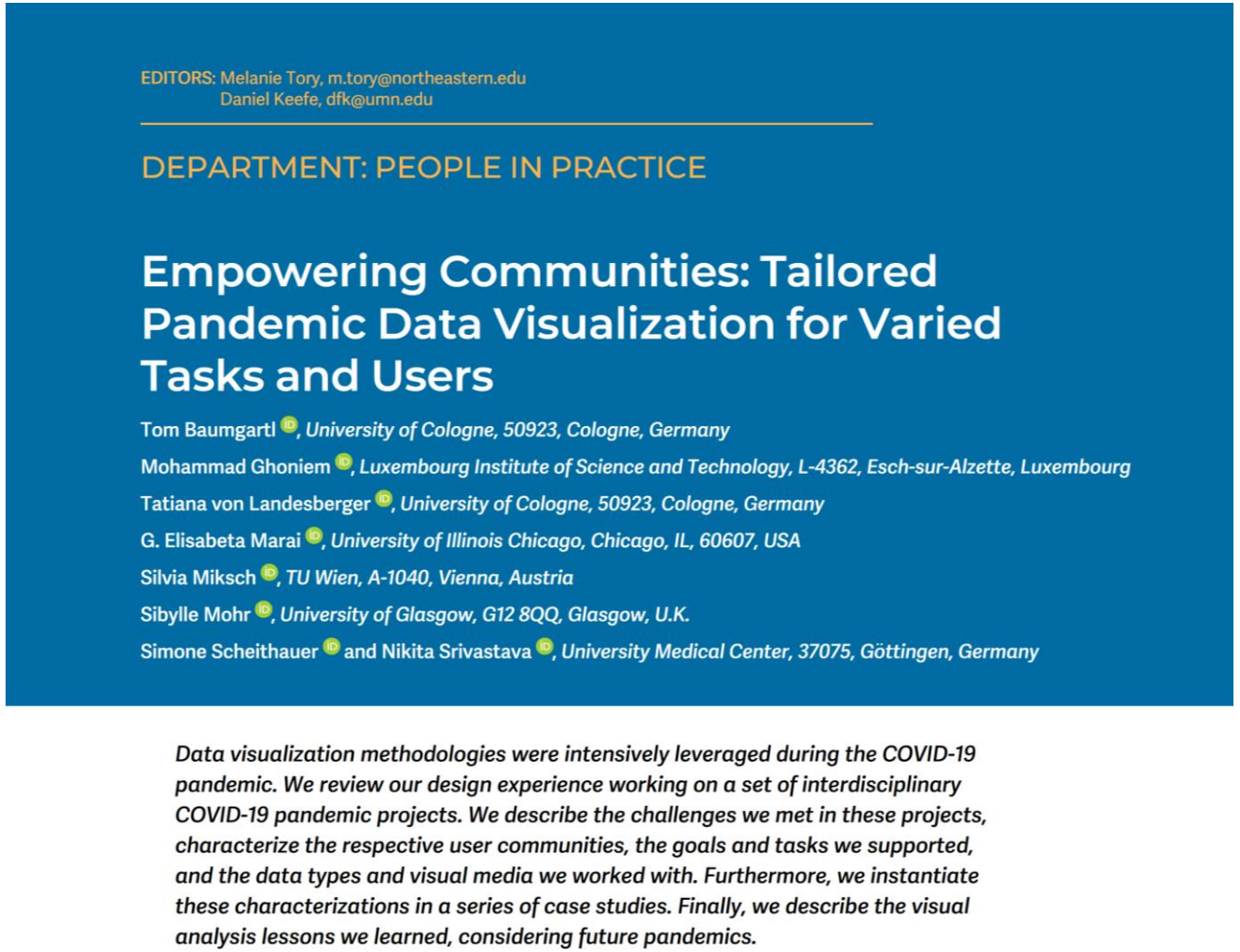
- ~3000 or ~300000?



https://www.reddit.com/r/dataisugly

- **List of Visualizations related to the Coronavirus Covid-19 Pandemic**
  https://docs.google.com/document/d/1g_t_v_2JsYtO5CePwCkcD1m-rRfUuaSupumWbWiF0cs/edit

2025 article



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DEPARTMENT: PEOPLE IN PRACTICE

Empowering Communities: Tailored Pandemic Data Visualization for Varied Tasks and Users

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Mohammad Ghoniem, *Luxembourg Institute of Science and Technology, L-4362, Esch-sur-Alzette, Luxembourg*
Tatiana von Landesberger, *University of Cologne, 50923, Cologne, Germany*
G. Elisabeta Marai, *University of Illinois Chicago, Chicago, IL, 60607, USA*
Silvia Miksch, *TU Wien, A-1040, Vienna, Austria*
Sibylle Mohr, *University of Glasgow, G12 8QQ, Glasgow, U.K.*
Simone Scheithauer and Nikita Srivastava, *University Medical Center, 37075, Göttingen, Germany*

Data visualization methodologies were intensively leveraged during the COVID-19 pandemic. We review our design experience working on a set of interdisciplinary COVID-19 pandemic projects. We describe the challenges we met in these projects, characterize the respective user communities, the goals and tasks we supported, and the data types and visual media we worked with. Furthermore, we instantiate these characterizations in a series of case studies. Finally, we describe the visual analysis lessons we learned, considering future pandemics.

Baumgartl, T., Ghoniem, M., Von Landesberger, T., Marai, G. E., Miksch, S., Mohr, S., Scheithauer, S., & Srivastava, N. (2025). Empowering Communities: Tailored Pandemic Data Visualization for Varied Tasks and Users. *IEEE Computer Graphics and Applications*, *45*(1), 130–138. https://doi.org/10.1109/MCG.2024.3509293

2025 article presenting COVID 19 data viz projects

TABLE 1. Media, clients, data, goals, and encodings across projects.

Project & Media	User Groups	Data	Goals/Tasks	Encodings
COVis Interactive web application	• Journalists • Public	• COVID-19 statistics • Public measures • Predictive model data	• Identify national behavior & event impact • Track temporal changes • Interpret patterns	• Line, bar, and event charts • Storytelling integration • Logistic regression model
CONTACT Interactive web application	• Disease modelers • Health experts • Policymakers	• SEIR model outputs • Transmission trees	• Analyze transmission patterns • Evaluate quarantine impact • Communicate contact tracing efficiency	• Transmission trees • Network visuals • Line graphs
MOTIV Interactive web application; screenshots for print/media	• Communication researchers • Policymakers	• Health, demographic, and socio-economic data • Social media • Political context	• Understand public response • Assess stay-at-home impact • Leverage an inference model • Share findings	• Choropleth and glyph maps • Timelines, bar charts • Custom encodings (AI inference model)
B-FAST Interactive web application	• Infection control staff • Epidemiologists • Healthcare professionals	• Patient data (vaccinations, stays, diagnoses)	• Detect outbreak indicators • Identify transmission pathways	• Histograms • Timelines • Node-link diagrams • Storyline visualizations
HEADS Interactive app	• Researchers • Health officials • Policymakers • General public	• Aerosol emission data • Virus dynamics • Environmental parameters	• Assess infection risk • Model aerosol spread • Evaluate safety measures	• Line charts • Animated aerosol simulations • Traffic light risk system

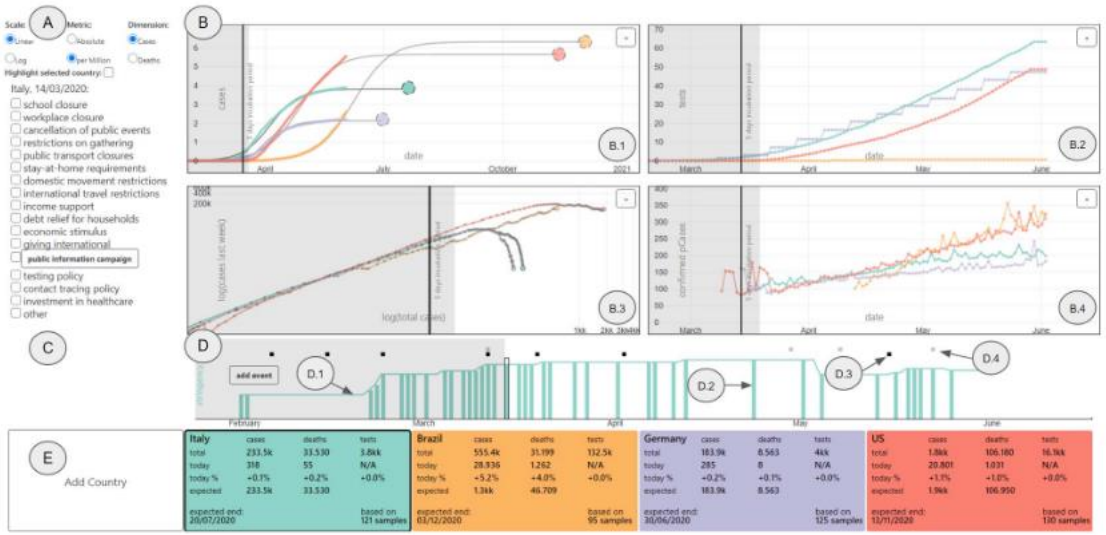
Baumgartl, T., Ghoniem, M., Von Landesberger, T., Marai, G. E., Miksch, S., Mohr, S., Scheithauer, S., & Srivastava, N. (2025). Empowering Communities: Tailored Pandemic Data Visualization for Varied Tasks and Users. *IEEE Computer Graphics and Applications*, *45*(1), 130–138. https://doi.org/10.1109/MCG.2024.3509293

2025 article presenting COVID 19 data viz projects: Lessons learned

- Start collaborations ahead of time, to give the teams enough time to assimilate principles of team science, to build visual literacy, and to train and adapt continuously during the interpandemic period.
- Document the data types and features to visualize
- Leverage visual scaffolding by adopting visual encodings existent in the application domains.
- Consider carefully the activities to support with the right level of transparency and detail needed for different users

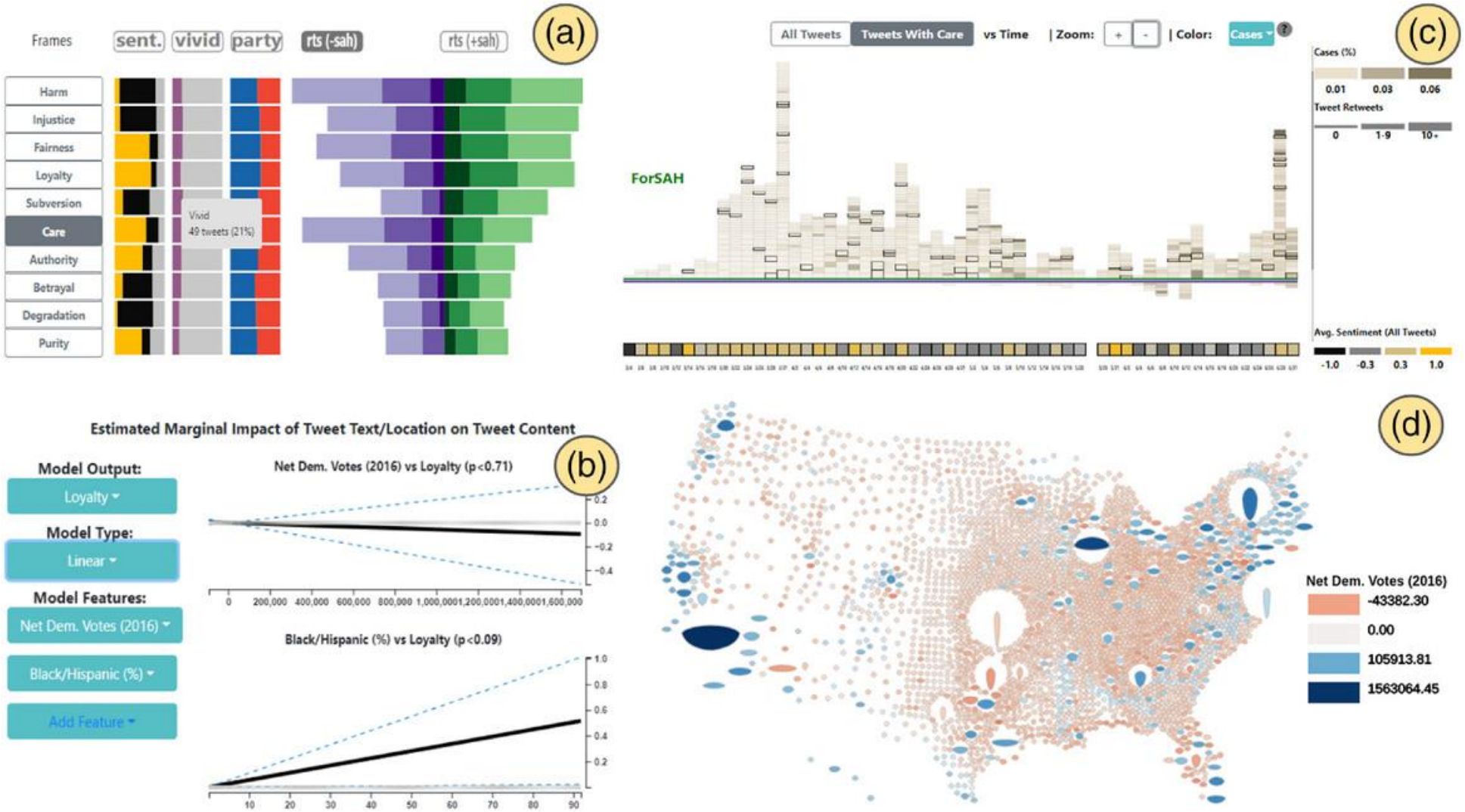
Baumgartl, T., Ghoniem, M., Von Landesberger, T., Marai, G. E., Miksch, S., Mohr, S., Scheithauer, S., & Srivastava, N. (2025). Empowering Communities: Tailored Pandemic Data Visualization for Varied Tasks and Users. *IEEE Computer Graphics and Applications*, *45*(1), 130–138. https://doi.org/10.1109/MCG.2024.3509293

COVIs: Supporting Temporal Visual Analysis of Covid-19 Events Usable in Data-Driven Journalism



Leite, R. A., Schetinger, V., Ceneda, D., Henz, B., & Miksch, S. (2020). COVIs: Supporting Temporal Visual Analysis of Covid-19 Events Usable in Data-Driven Journalism. *2020 IEEE Visualization Conference (VIS)*, 56–60. https://doi.org/10.1109/VIS47514.2020.00018

MOTIV: Visual Exploration of Moral Framing in Social Media



Wentzel, A., Levine, L., Dhariwal, V., Fatemi, Z., Bhattacharya, A., Eugenio, B. D., Rojecki, A., Zheleva, E., & Marai, G. E. (2024). MOTIV: Visual Exploration of Moral Framing in Social Media. *Computer Graphics Forum*, *43*(6), e15072. https://doi.org/10.1111/cgf.15072

Thank you!

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