

COVID-19 & Future of Health Economics

SUZUKI, Hiro

Former Vice-Minister for Health

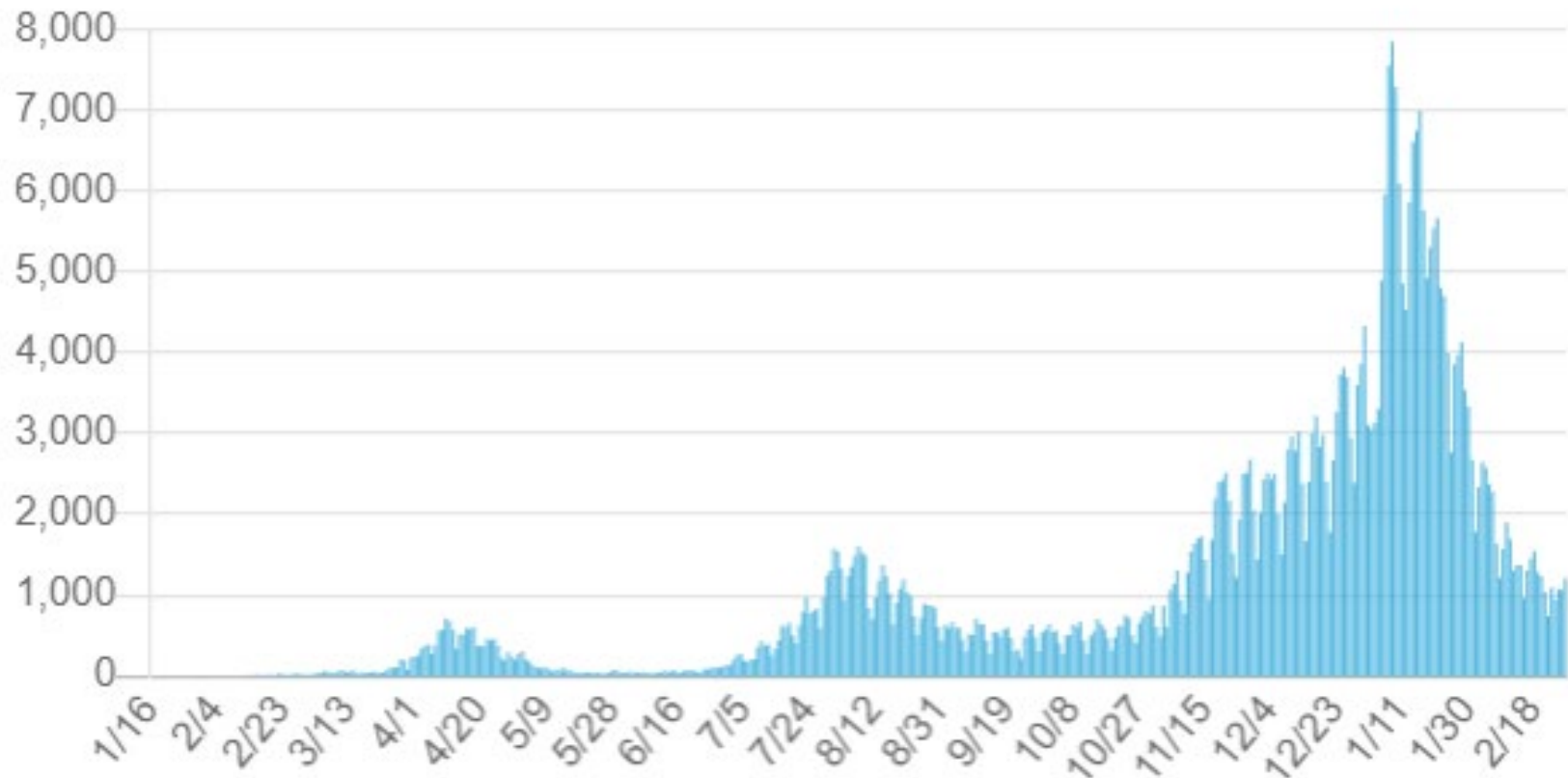
Chief Medical & Global Health Officer

Ministry of Health, Labour & Welfare JAPAN

PCR+/day 1,208 (Total 427,225)

陽性者数

1,208 人
(累計 427,225 人)



Severe COVID-19 Cases with ECMO

COVID-19重症者におけるECMO装着数の推移

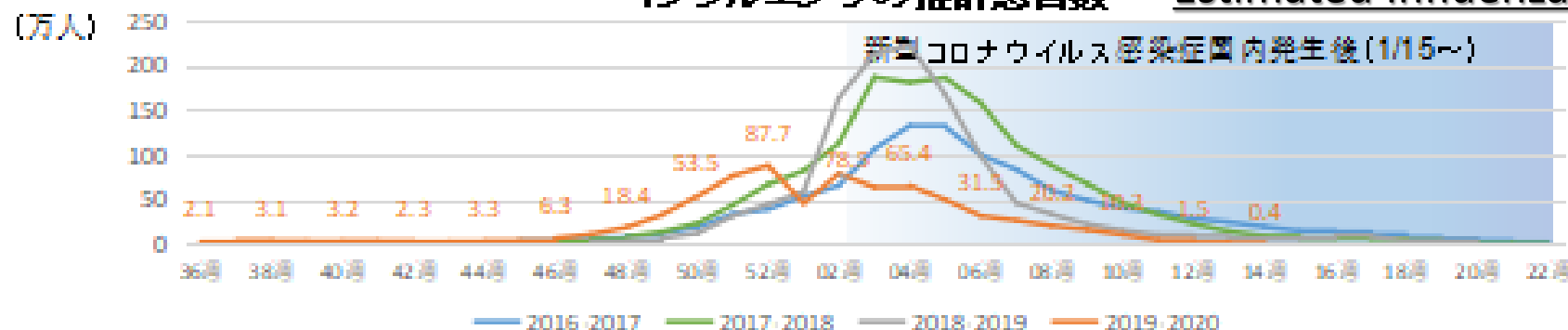
このグラフはCRISISに申告されたECMOが必要な重症患者さんの推移を地方別、都道府県別に示すものです。



2021/02/22 更新

インフルエンザの推計患者数

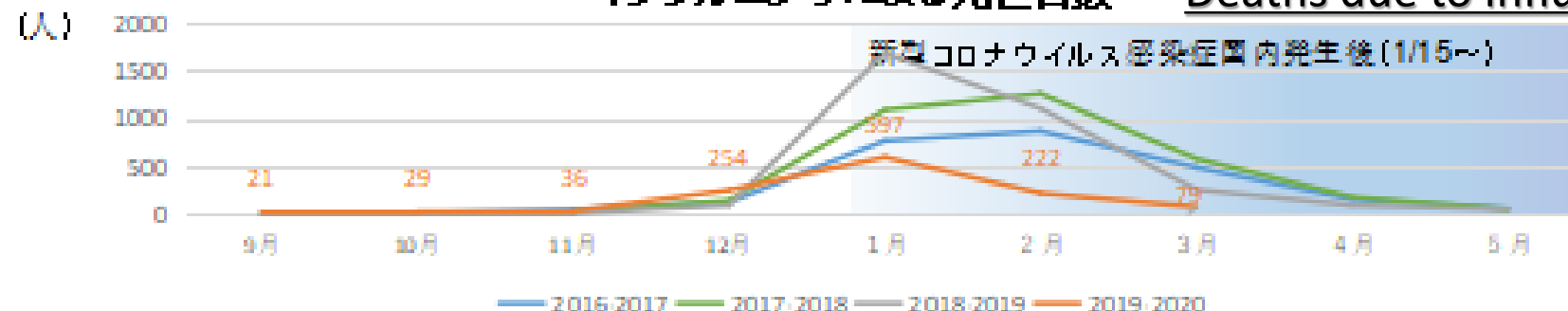
Estimated Influenza Patients



推計患者数	2016-2017	2017-2018	2018-2019	2019-2020
シーズン計	1120万人	1490万人	1210万人	730万人
1月第3週～第14週	810万人	1100万人	850万人	290万人

インフルエンザによる死亡者数

Deaths due to Influenza

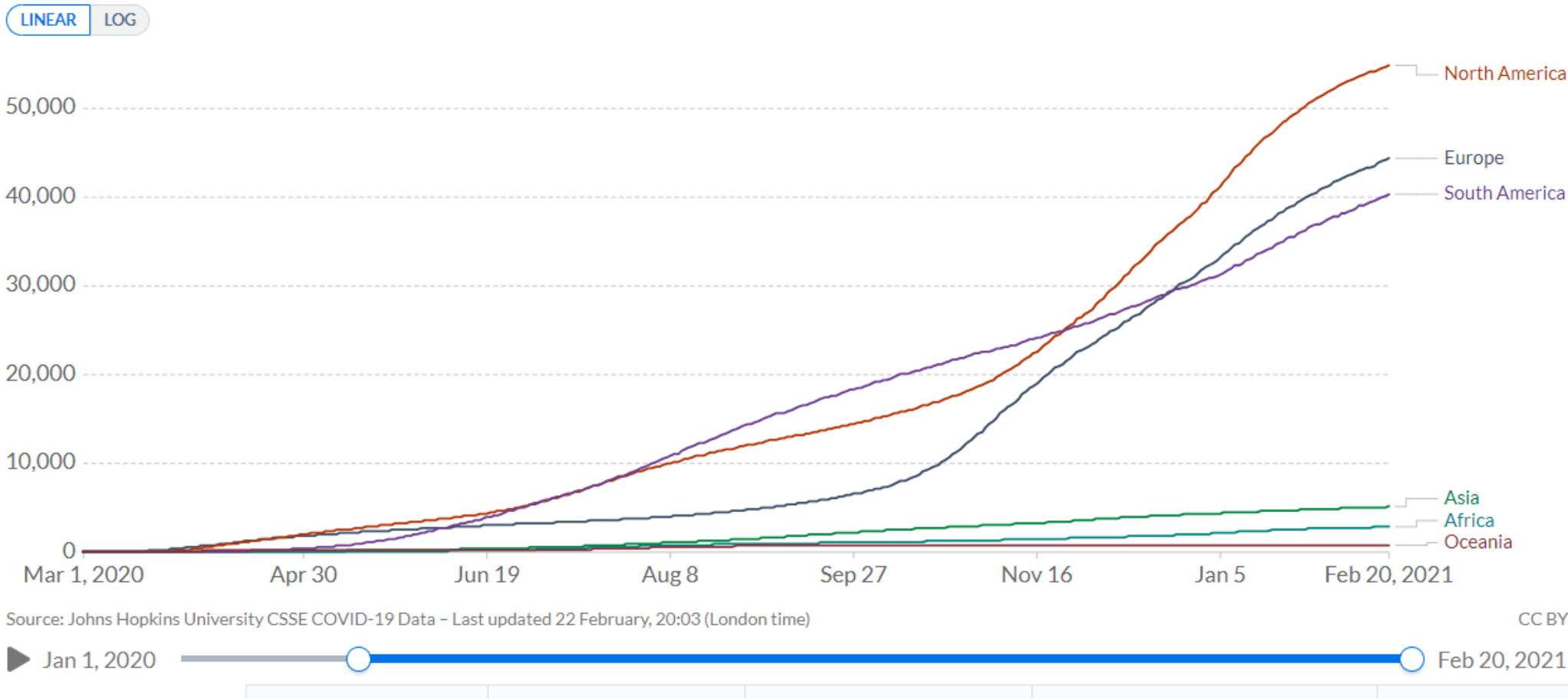


死亡者数	2016-2017	2017-2018	2018-2019	2019-2020
シーズン計※	2546人	3364人	3319人	1238人※
1月～3月	2129人	2933人	3050人	898人

※2019-2020の死亡者数は2020年3月までの数値

Cumulative confirmed COVID-19 cases per million people

The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.



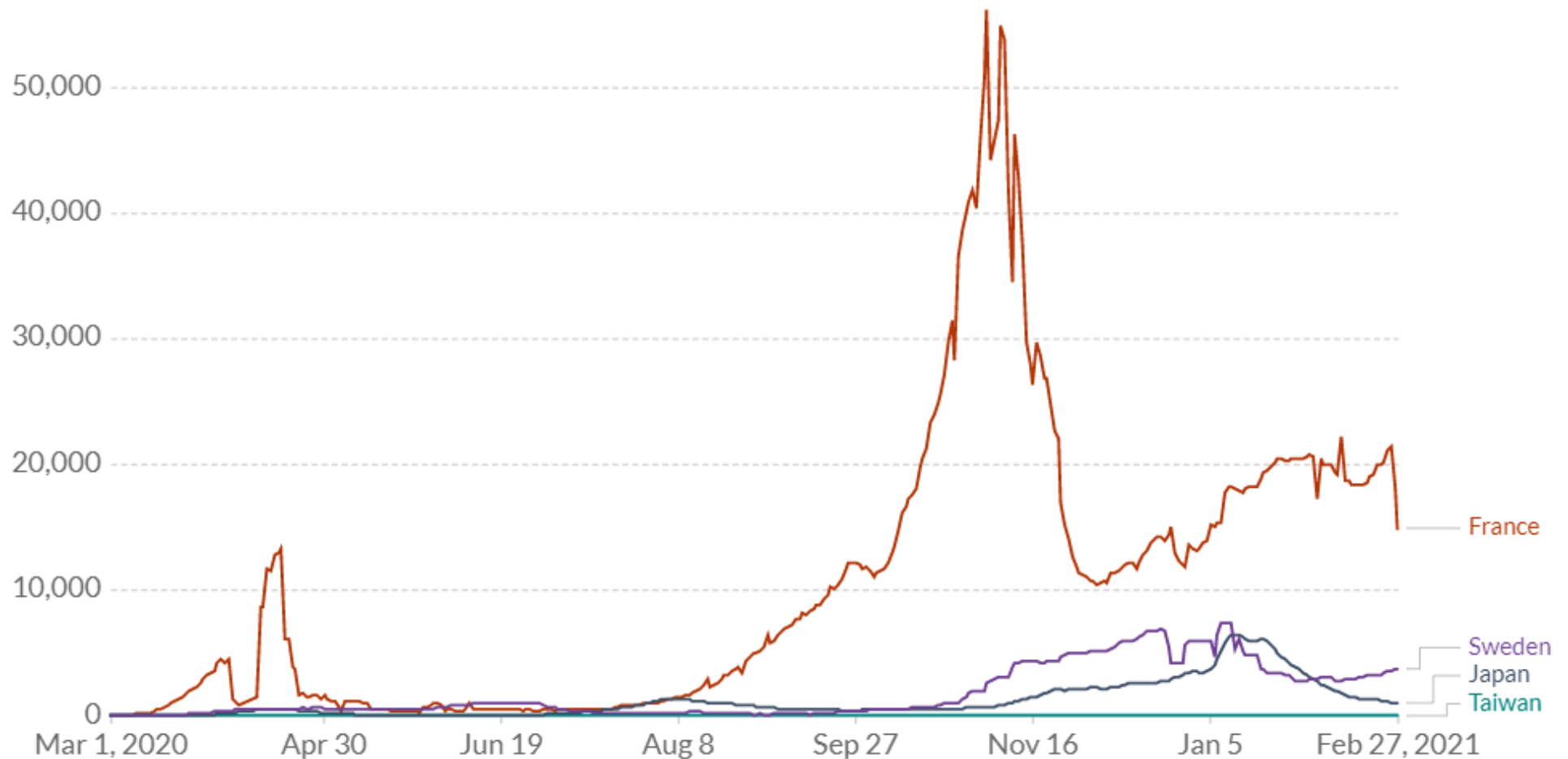
Daily new confirmed COVID-19 cases

Shown is the rolling 7-day average. The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.

LINEAR

LOG

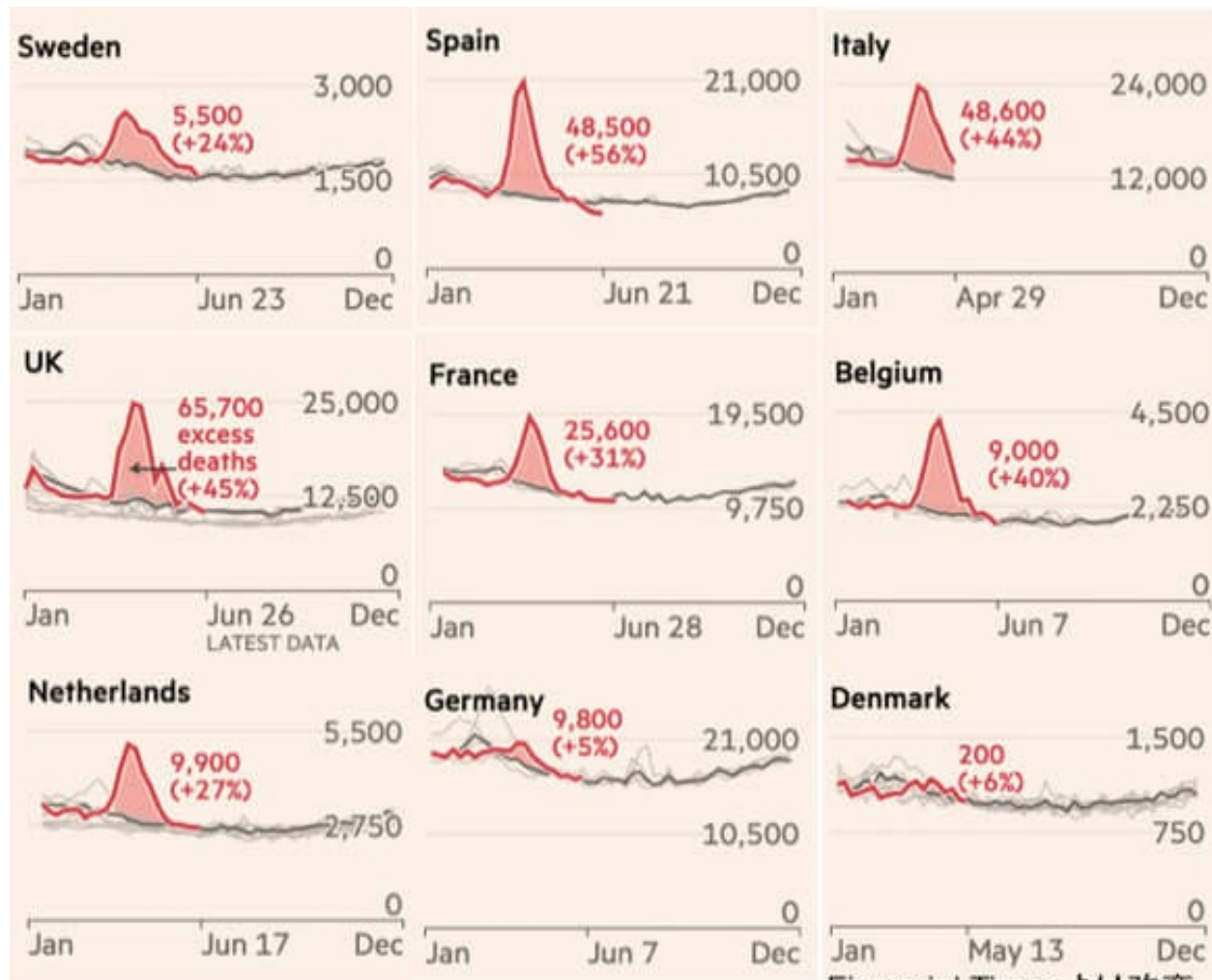
+ Add country



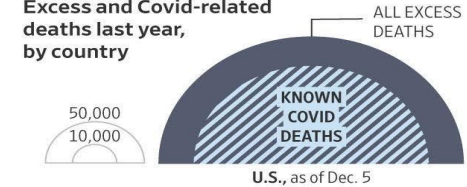
Source: Johns Hopkins University CSSE COVID-19 Data - Last updated 28 February, 06:02 (London time)

CC BY

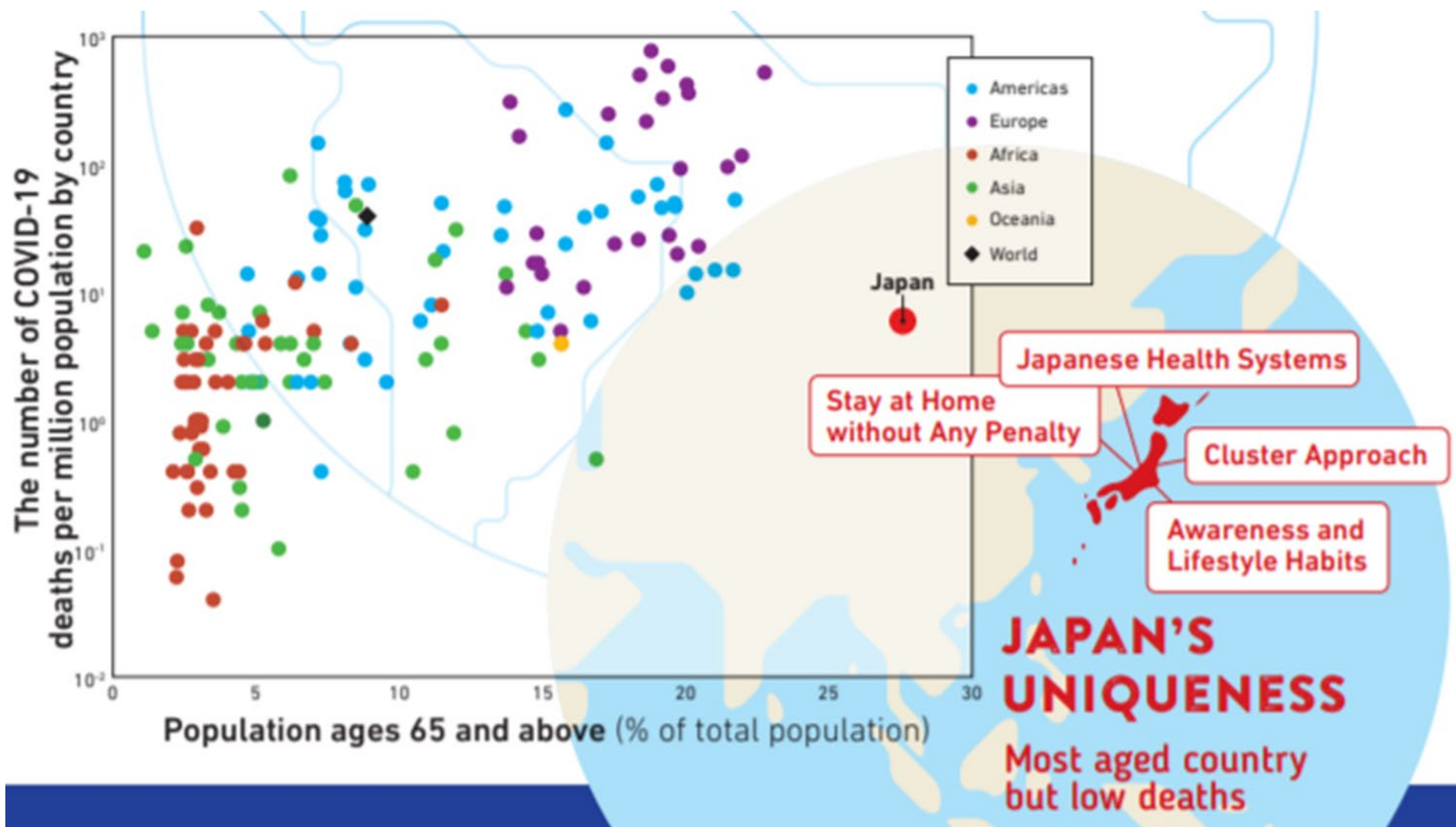
Excess Mortality



Financial Timesより改変



At least nine countries saw negative excess deaths, meaning total deaths fell below expected numbers, despite the Covid-19 pandemic.



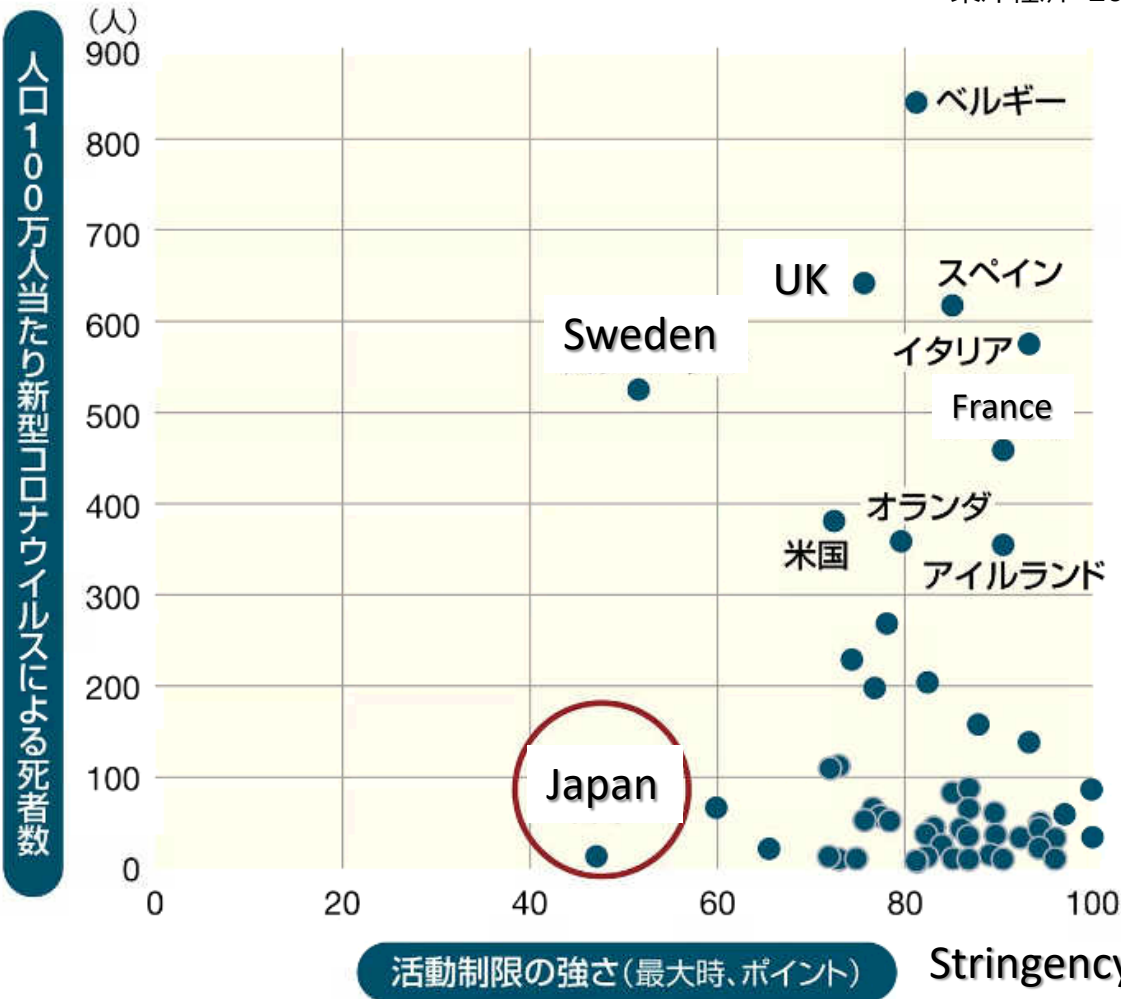
日本の人口比の死者数は欧米に比べて少ない

—活動制限と死者数の関係—

東洋経済 2020年7月18日号

Toyo Keizai

Mortality among
Million Population



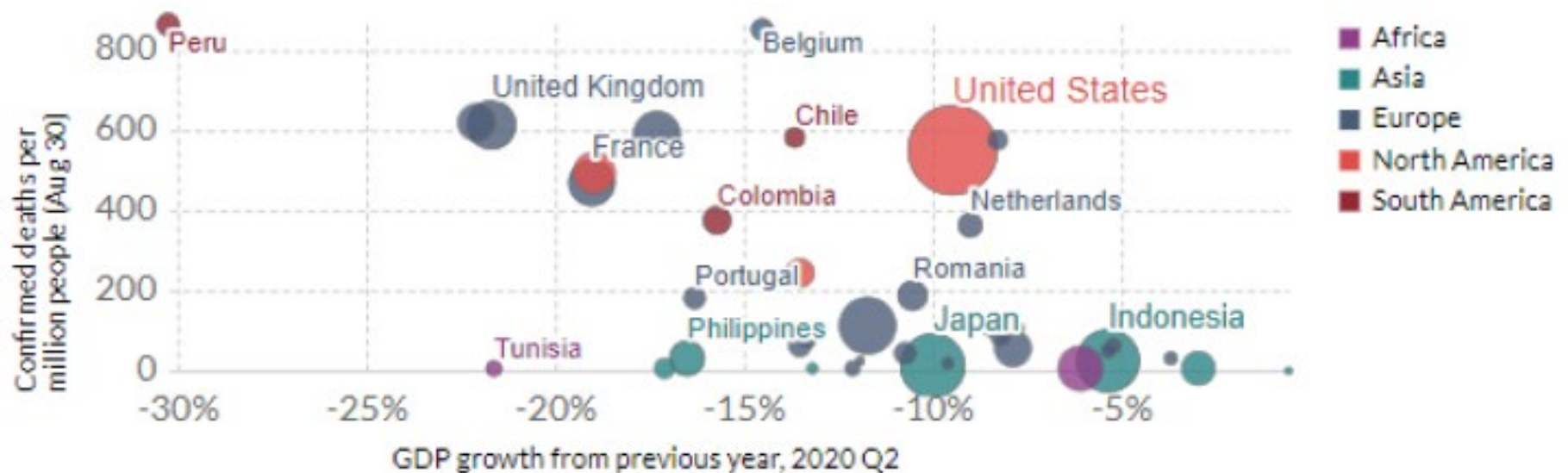
(注) 6月28日時点のデータ。以下の条件を満たす国のみ抽出

- ①人口が100万人以上
- ②1人当たりGDPが1万ドル以上
- ③死亡率が100万人当たり1人以上

(出所) オックスフォード大学“Coronavirus Government Response Tracker”

Economic decline in the second quarter of 2020 vs rate of confirmed deaths due to COVID-19

The vertical axis shows the number of COVID-19 deaths per million, as of August 30. The horizontal axis shows the percentage decline of GDP relative to the same quarter in 2019. It is adjusted for inflation.



Source: European CDC, Eurostat, OECD and individual national statistics agencies

CC BY

Note: Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19. Data for China is not shown given the earlier timing of its economic downturn. The country saw positive growth of 3.2% in Q2 preceded by a fall of 6.8% in Q1.

[Select countries](#) ☐ Hide countries < 1 million people

Why? East Asian Success

- ① Mask Wearing, Bowing not Kissing or Hugging
- ② BCG Inoculation; not shown in Israel
- ③ Ethnic Difference: Socio-Economic or Bio-Medical?
- ④ Cross immunity in East-Asia
- ⑤ Ban Family Visits in Long-term Care Facilities for the Elderly

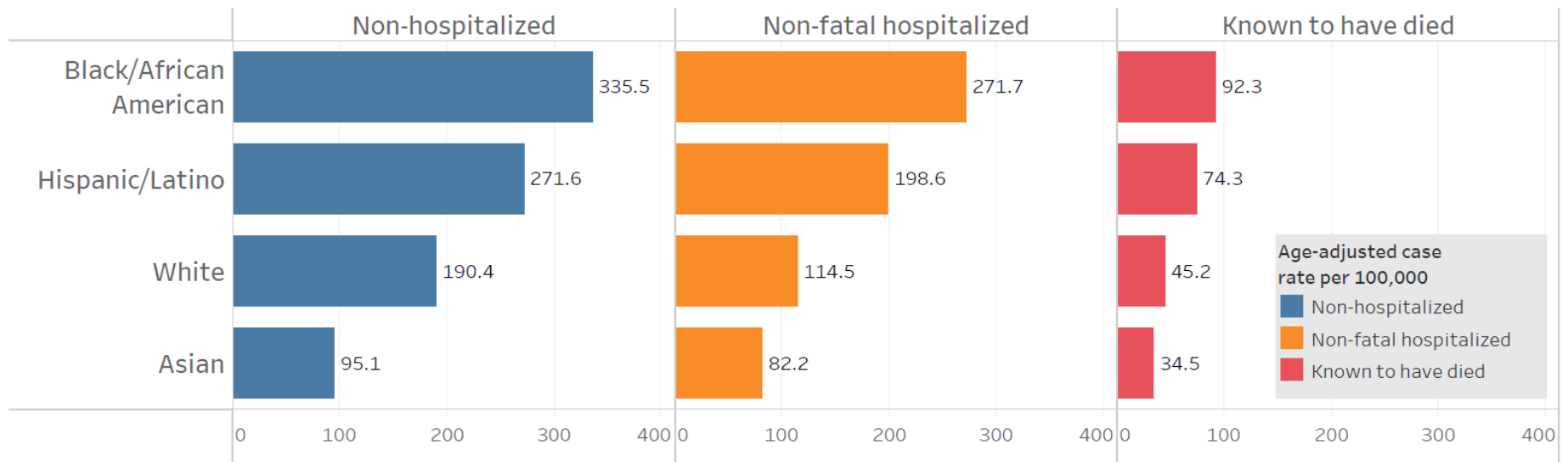
BCG接種歴

Table. Results of SARS-CoV-2 PCR Testing by Age Group

	Birth year		Difference (95% CI)	P value
	1979-1981 (BCG vaccinated)	1983-1985 (BCG unvaccinated)		
Total population	297 340	301 600		
Immigrants in total population, No. (%) ^a	14 569 (4.9)	13 873 (4.6)		
No. of tests	3064	2869		
Proportion of population tested, %	1.02	0.96		
Men tested, No. (%)	1509 (49.2)	1458 (50.8)		.29
Positive results				
No. (%)	361 (11.7)	299 (10.4)	1.3 (−0.3 to 2.9)	.09
No. per 100 000 population in age group ^b	121	100	21 (−10 to 50)	.15
Men with positive result, No. (%)	181 (50)	152 (51)		.87
No. with severe disease	1	1		

人種

Age-adjusted rates of lab confirmed COVID-19 non hospitalized cases, estimated non-fatal hospitalized cases, and patients known to have died 100,000 by race/ethnicity group as of April 16, 2020



From: **Racial/Ethnic Variation in Nasal Gene Expression of Transmembrane Serine Protease 2 (TMPRSS2)**

JAMA. Published online September 10, 2020. doi:10.1001/jama.2020.17386

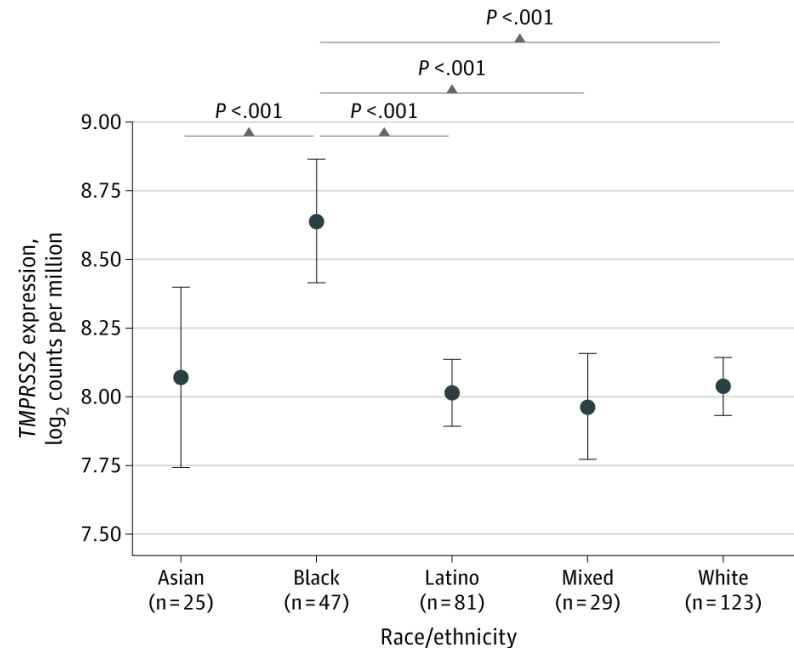
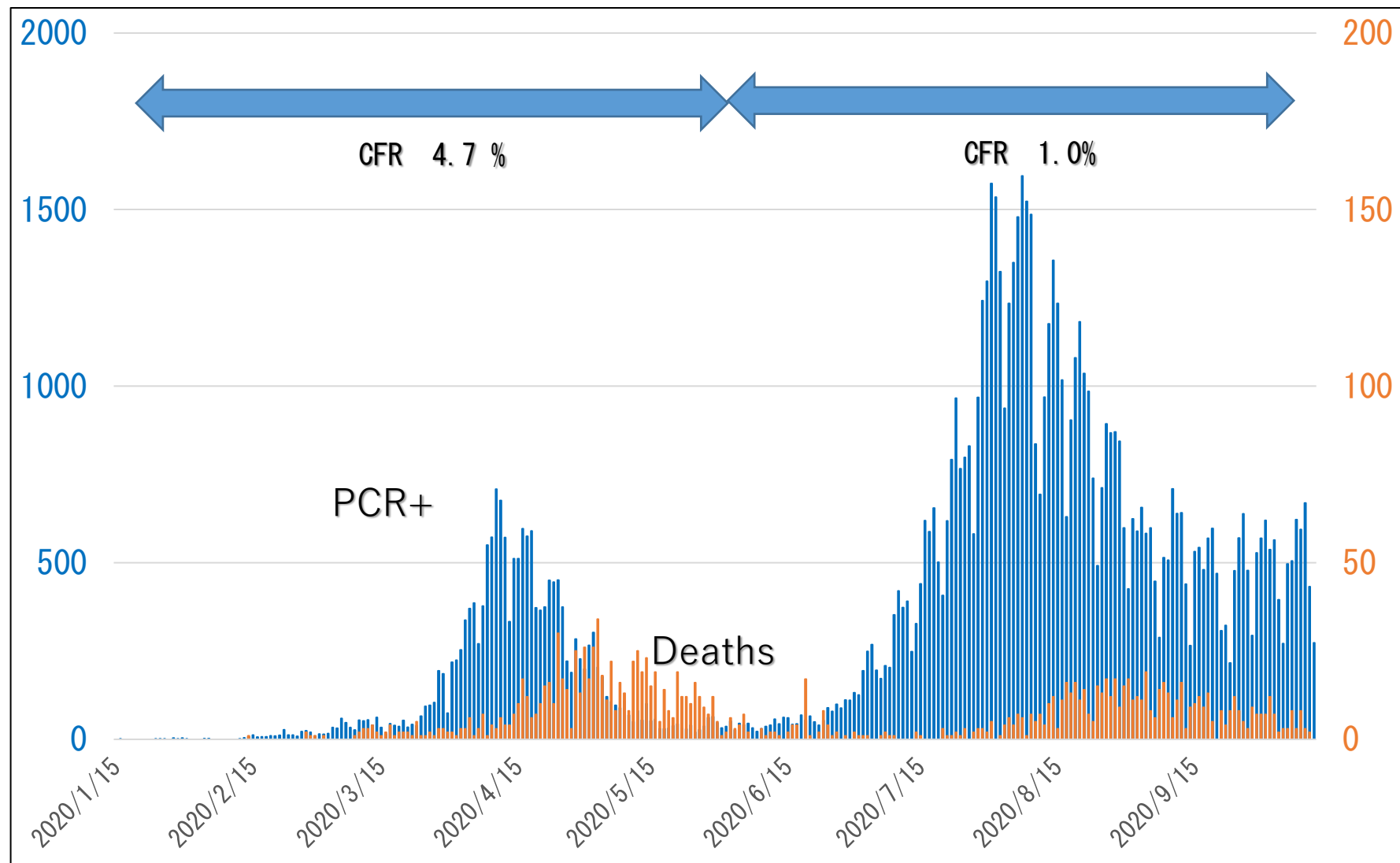


Figure Legend:

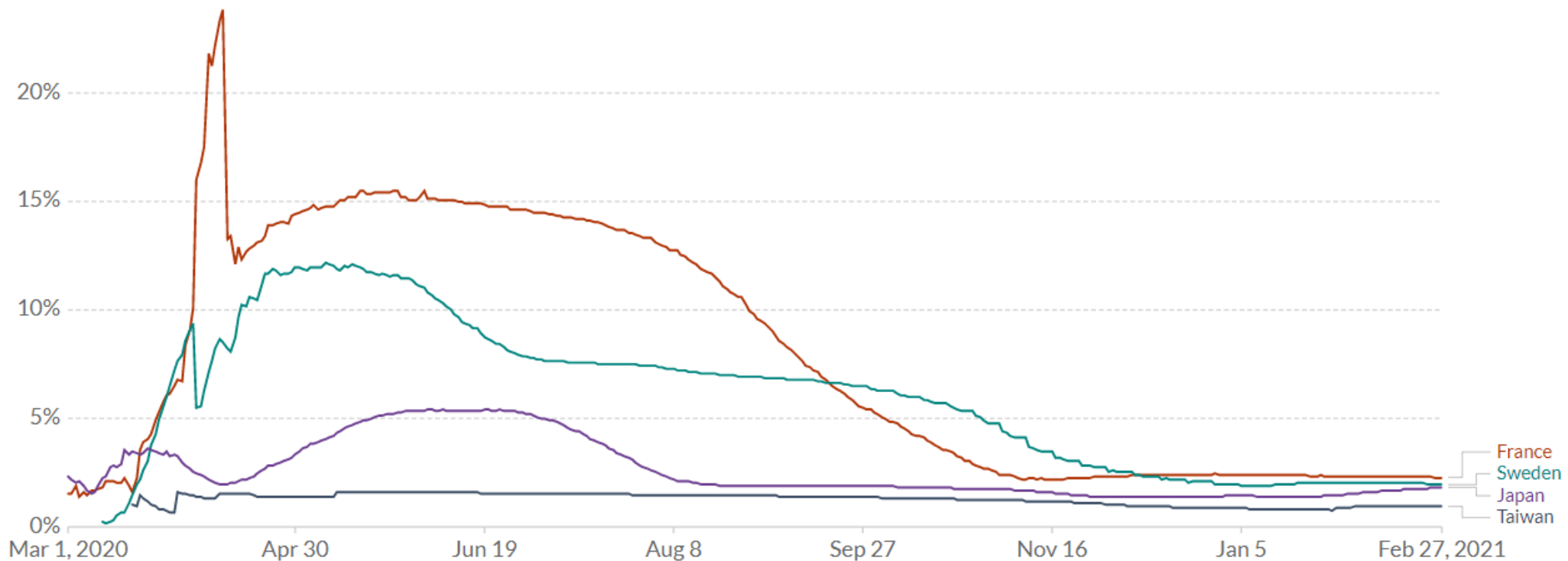
Nasal Gene Expression of TMPRSS2 in Self-Identified Racial/Ethnic Groups The data points indicate means and the error bars indicate 95% CIs for transmembrane serine protease 2 (TMPRSS2) gene expression in self-identified racial/ethnic groups. The P values were calculated using linear regression modeling in which TMPRSS2 gene expression was the dependent variable and race/ethnicity was the independent variable.

Changes in Case-Fatality Rate



Case fatality rate of the ongoing COVID-19 pandemic

The Case Fatality Rate (CFR) is the ratio between confirmed deaths and confirmed cases. During an outbreak of a pandemic the CFR is a poor measure of the mortality risk of the disease. We explain this in detail at OurWorldInData.org/Coronavirus



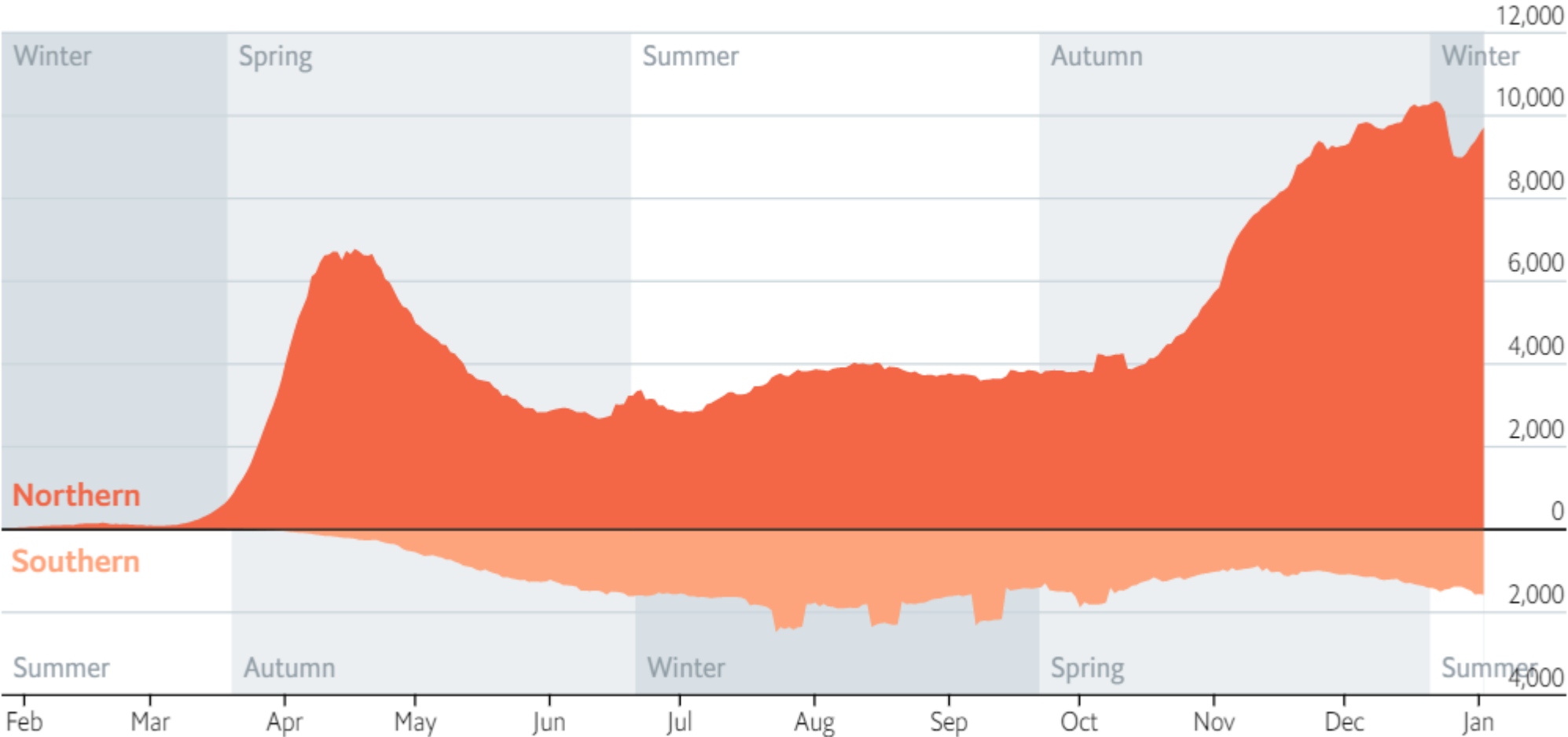
Source: Johns Hopkins University CSSE COVID-19 Data - Last updated 28 February, 06:02 (London time)

CC BY

Feb 21, 2020 Feb 27, 2021

New confirmed covid-19 deaths by hemisphere

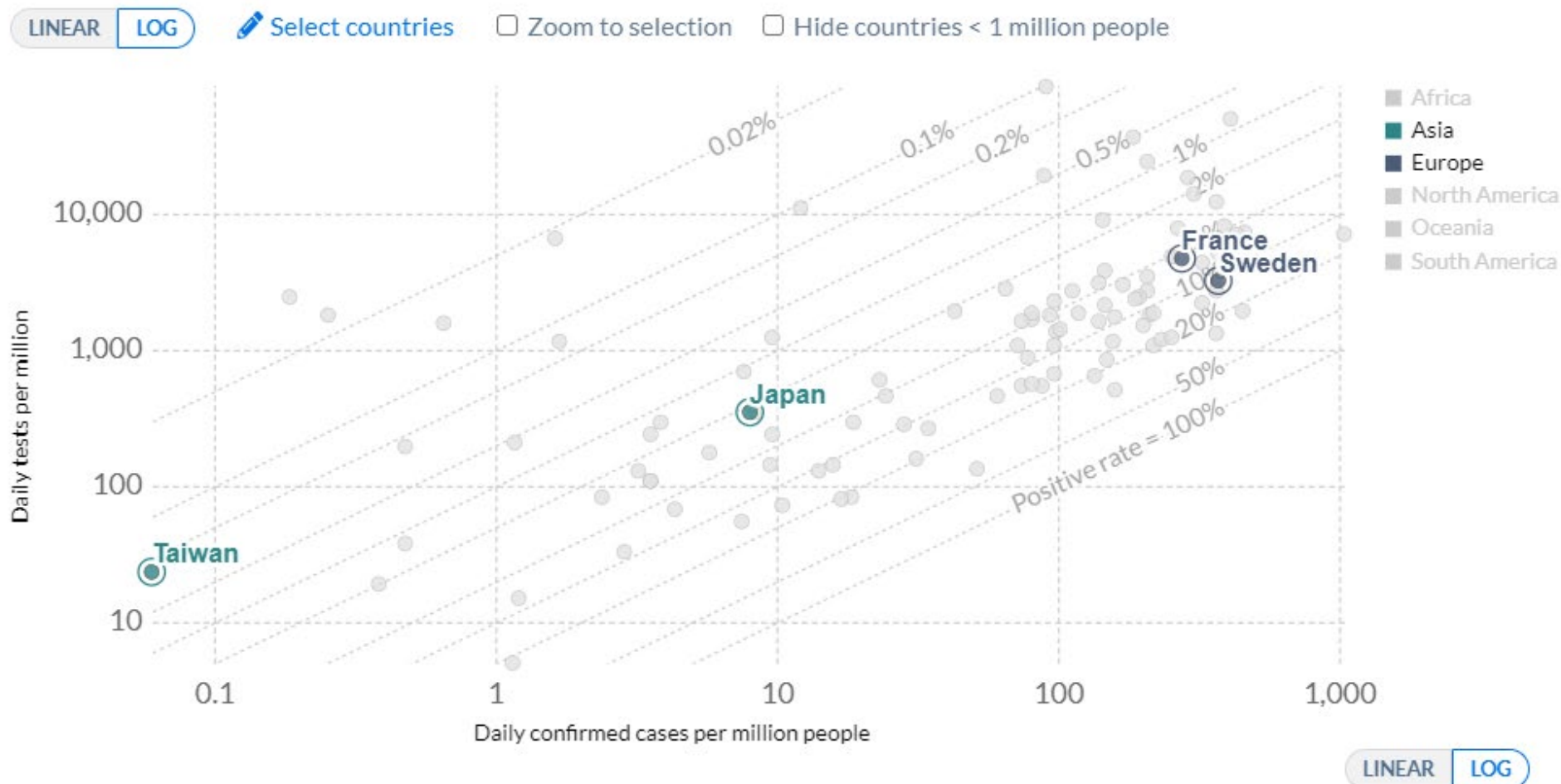
2020, rolling seven-day average. Last updated on January 11th



COVID-19: Daily tests vs. Daily new confirmed cases per million

The figures are given as a rolling 7-day average.

Our World
in Data



Source: Testing data from official sources collated by Our World in Data, confirmed cases from Johns Hopkins University CSSE

CC BY

Note: Comparisons of testing data across countries are affected by differences in the way the data are reported. Daily data is interpolated for countries not reporting testing data on a daily basis. Details can be found at our Testing Dataset page.

▶ Jan 25, 2020

2021/03/02

○ Feb 26, 2021

International HTA Symposium

18











Concerns for COVID-19 Vaccines

- Anaphylactic shock (1/5,000 for penicillin, 1/250,000 COVID vaccine, 1/million usual vaccines)
- ADEM
- ADE

Hope in a vial

Covid-19 vaccines, to January 6th 2021

Approved by: ● Stringent regulators ● Other regulators

Producer	Name	Type	Price per dose, \$*	Doses delivered in 2020 and promised for 2021*	Approved in
● AstraZeneca-Oxford Uni.	AZD1222 [†]	Viral vector	1.50-4	 3.0bn in total	Britain, India and 3 others
Novavax	NVX-CoV2373	Protein subunit	16	 2.1bn	–
● Pfizer-BioNTech	tozinameran	mRNA	19.50	 1.4bn	Britain, EU, US and 21 others
● Sinopharm	BBIBP-CorV	Inactivated	<77	 1.3bn	Bahrain, China, Egypt, UAE
● Gamaleya Centre	Sputnik V	Viral vector	<10	 1.0bn	Argentina, Belarus, Russia
Johnson & Johnson	JNJ-78436735	Viral vector	10	 1.0bn	–
● Sinovac Biotech	CoronaVac	Inactivated	14	 900m	China
● Moderna	mRNA-1273	mRNA	32-37	 770m	Canada, EU, Israel, US
● Bharat Biotech-ICMR	Covaxin	Inactivated	1	 720m	India
CureVac	CVnCoV	mRNA	12.30	 300m	–

Sources: Regulatory Affairs Professionals Society; The Economist Intelligence Unit; Morgan Stanley; press reports; government websites; company websites

*Estimate †Covishield in India

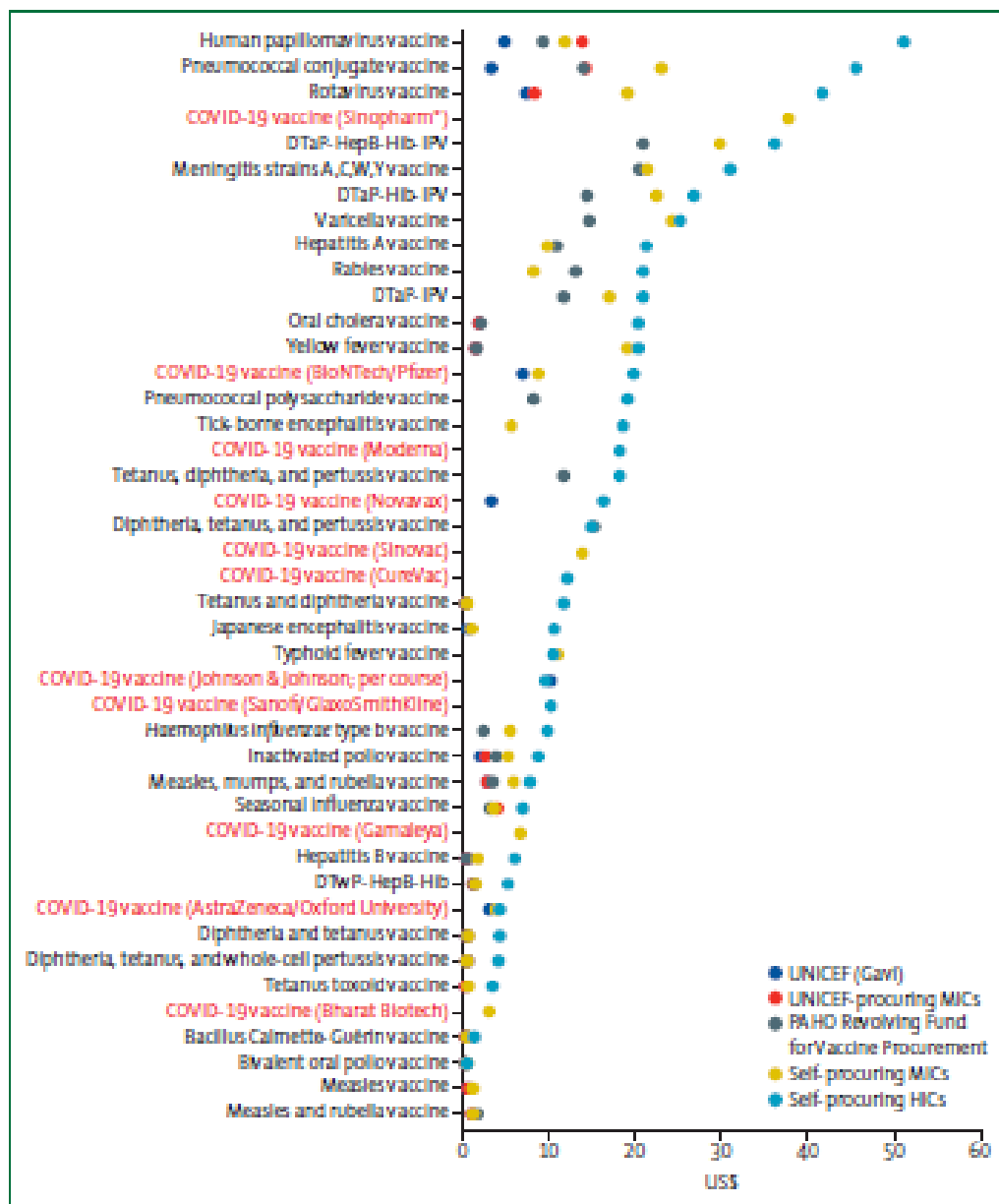


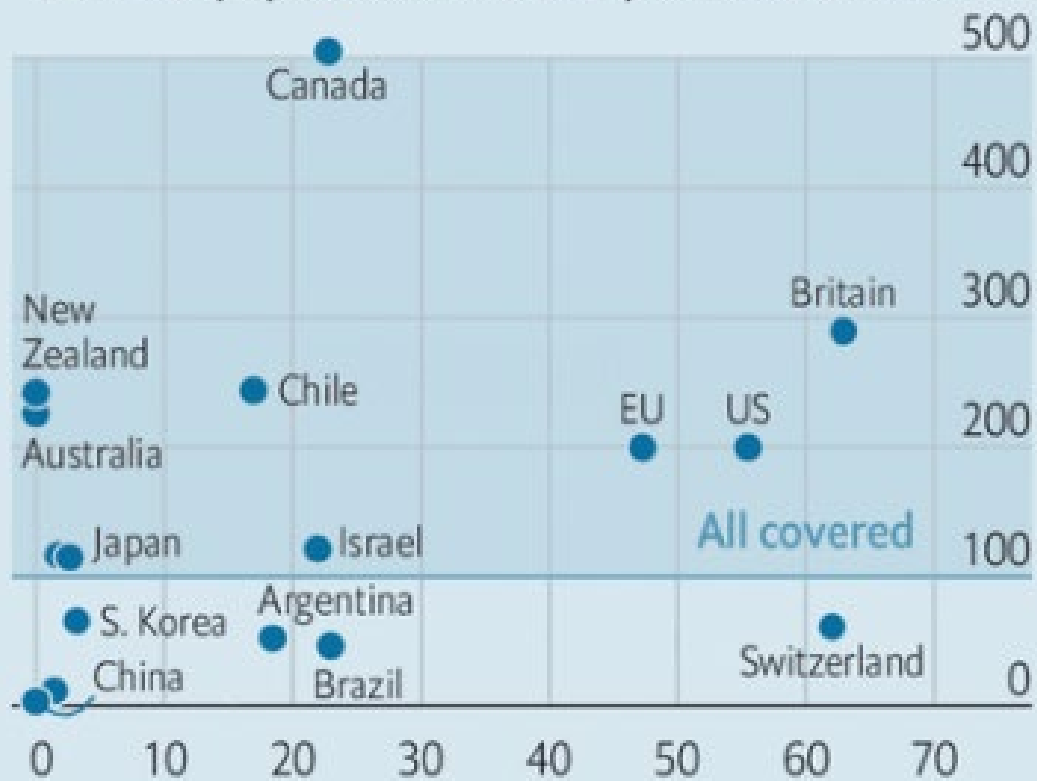
Figure 3: Median price per dose for existing vaccines and for leading COVID-19 vaccine candidates by procurement or country income group

Surplus and deficit

Covid-19 vaccine coverage

3

Share of population covered by ordered vaccines, %

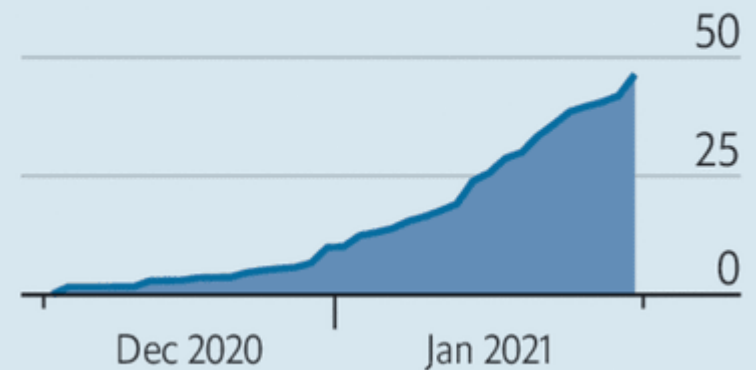


Deaths per million people, Dec 28th 2020-Jan 3rd 2021

Sources: Duke Global Health Innovation Centre; JHU

Vaccine doses administered

World, cumulative to Jan 19th, m



The Economist

Going in the right direction

2

Israel, change in critically ill covid-19 patients from previous week, by age group, 2021, %



Source: Eran Segal

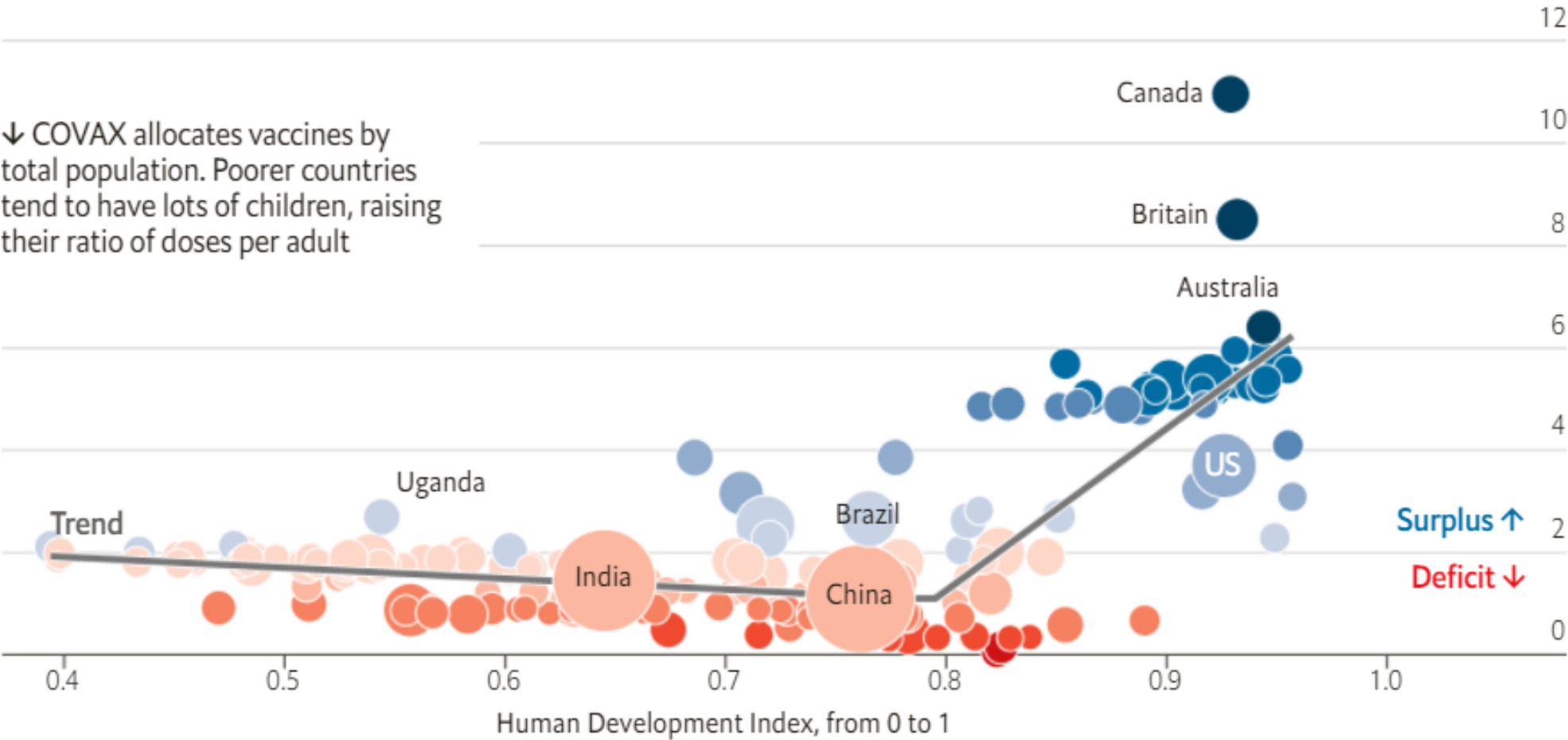
The Economist

1月2日に60歳以上の
接種率が40%を超えた。

At February 10th 2021, countries
sized by population in 2018



Human development v doses ordered per adult*, 2020, size=adult population

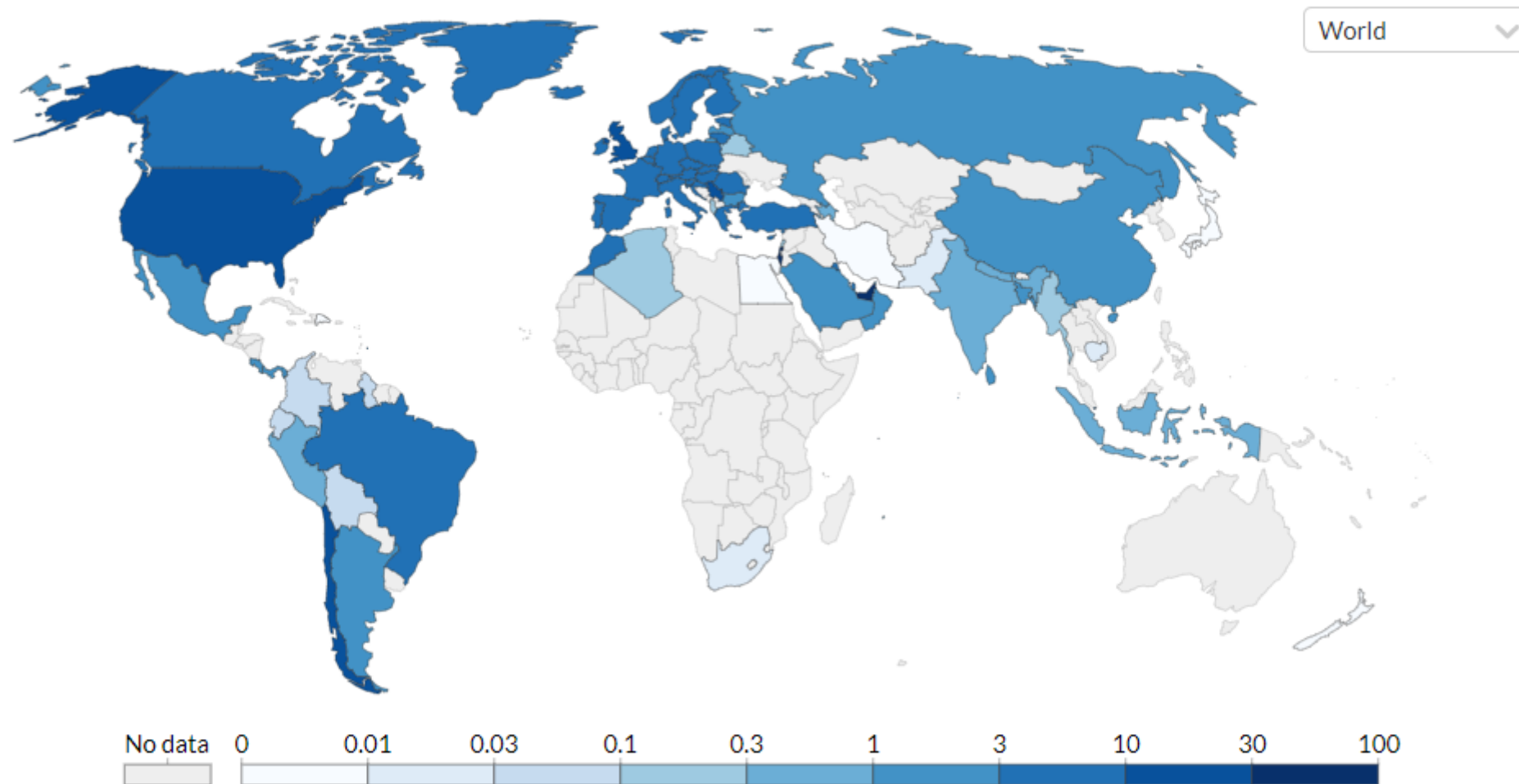


*Aged 15 and over

COVID-19 vaccine doses administered per 100 people, Feb 21, 2021

Our World
in Data

Total number of vaccination doses administered per 100 people in the total population. This is counted as a single dose, and may not equal the total number of people vaccinated, depending on the specific dose regime (e.g. people receive multiple doses).



Source: Official data collated by Our World in Data – Last updated 22 February, 10:20 (London time)

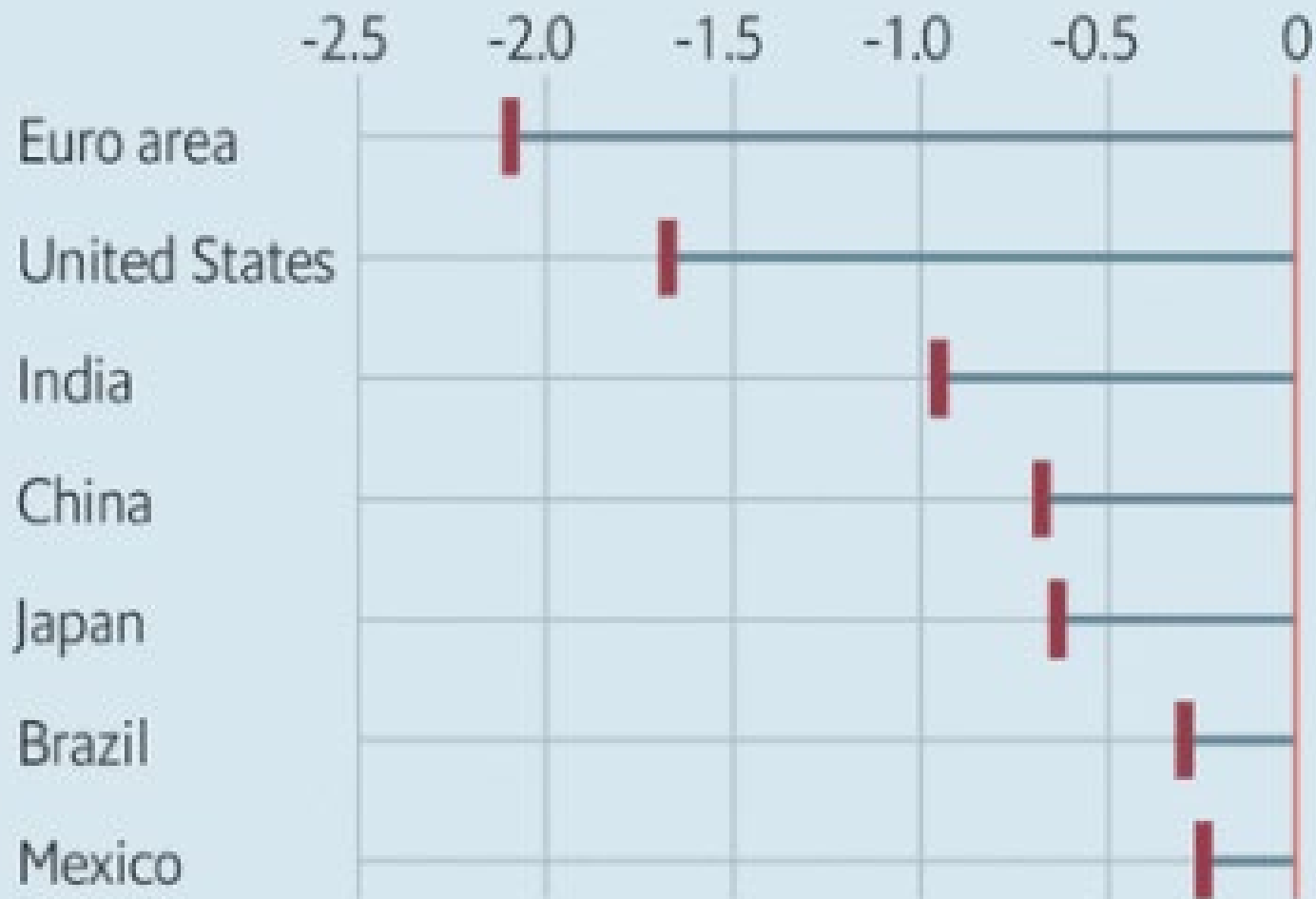
CC BY

▶ Dec 13, 2020

○ Feb 21, 2021

GDP shortfall, 2020-21

Relative to pre-pandemic projections



Sources: World Bank; *The Economist* *Constant 2010 \$ †Estimate

Issues to consider

- HTA of different interventions
- PCR test: Sensitivity & specificity
- Decision making amid uncertainty: evidence provider vs decision maker
- HTA and EUA (cost consideration in crisis)
- PPE shortage ← stockpiling, diversification of imports & subsidy to domestic producers
- Aftermath of large capital spending for COVID-19 pandemic control and economic stimulus
- Pandemic will be repeated periodically once in 4-5 yrs.

Conclusions

- No country is safe unless every country is safe.
 - global health diplomacy and access equity
- You need a fire brigade when your house is on fire; you have to have it prepared before it.
 - lessons for next pandemic (surge capacity, speedy R&D, international movement of people, PPE shortage, ECMO triage)
- Resident Kennedy and Cuban Missile Crisis