



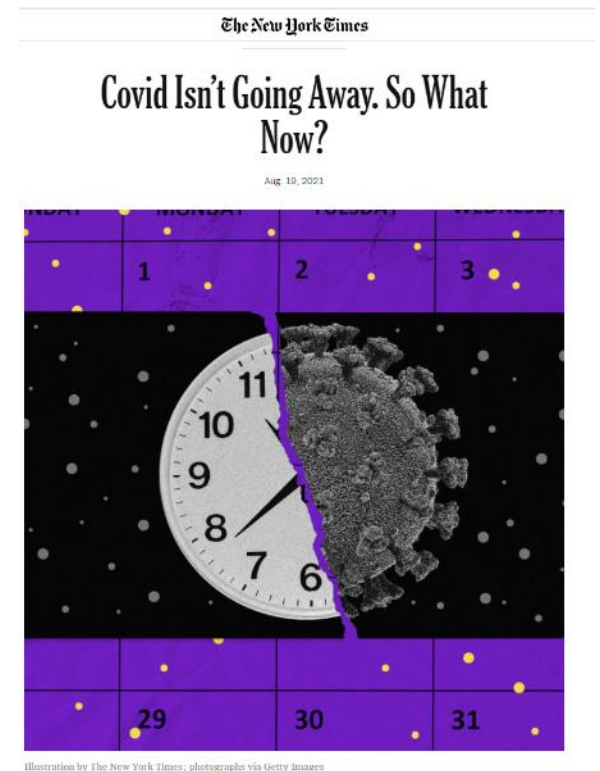
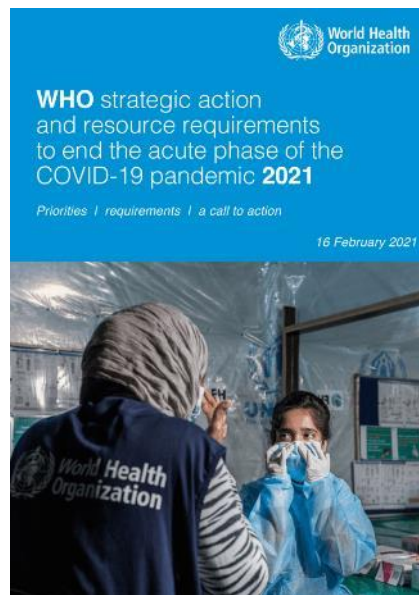
COVID 19 – SARS-Cov-2 – When Does it End?

“

Ending the pandemic is a solvable problem but requires further coordinated global action.

COVID-19 will reshape our world.
We don't yet know when the crisis will end.
But we can be sure that by the time it does,
our world will look very different.

JOSEP BORRELL



Disclaimer

- The views and opinions expressed in this presentation are those of the Presenter and do **not** necessarily represent official policy or position of any of the organizations and bodies to which he is, or has been associated;



- The material in this presentation is general background information about Covid-19. This information is given in outline and summary form and does not purport to be complete. In particular there are aspects of Covid-19 which I do not mention which might be appropriate to you. This presentation was created for informational purposes only.



It MUST not be considered or used as medical/clinical advice or a personal recommendation.



- The content of this presentation is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Always seek the advice of your physician or other qualified health provider with any questions you may have regarding a medical condition. Never disregard professional medical advice or delay in seeking it because of something you have read in this Presentation.



Declaration of Interests

Prof. Andy Barraclough:

I do **NOT** practice clinical medicine in Thailand.

I do **NOT** provide individual medical/clinical advice.



- I have the following financial interest or relationship(s) to disclose with regard to the subject matter of this presentation:
- I have received funding from, and/or worked in various capacities with the following organizations which have enabled my activities on COVID concerns:
- Empower School of Health
- UN agencies, World Health Organization especially WHO SEARO
- GOARN Global Outbreak Alert Response Network

A poster for a panel discussion titled "PANDEMIC PREPAREDNESS AND RESPONSE" with the subtitle "How to build supply chain resilience through private sector partnerships?". It features logos for the World Health Organization South-East Asia, GOARN, and EMPower School of Health. The event is scheduled for 30 November 2021, Tuesday, from 10:00 to 11:30 GMT (UTC+6). It lists panelists and delegates from Academia (Empower School of Health, Mahidol University), UN Agencies (WHO, WFP, etc.), and the Private sector (L'Oréal, TVS Logistics, etc.). A "Register Now" button and a URL are provided at the bottom.

A poster for "Short Courses in Public Health Commodities Management During Covid-19 Era". It features a photo of a person in a lab coat and logos for WHO, GOARN, and EMPower. It lists four speakers and a moderator. A "Register Now" button and a URL are provided at the bottom.

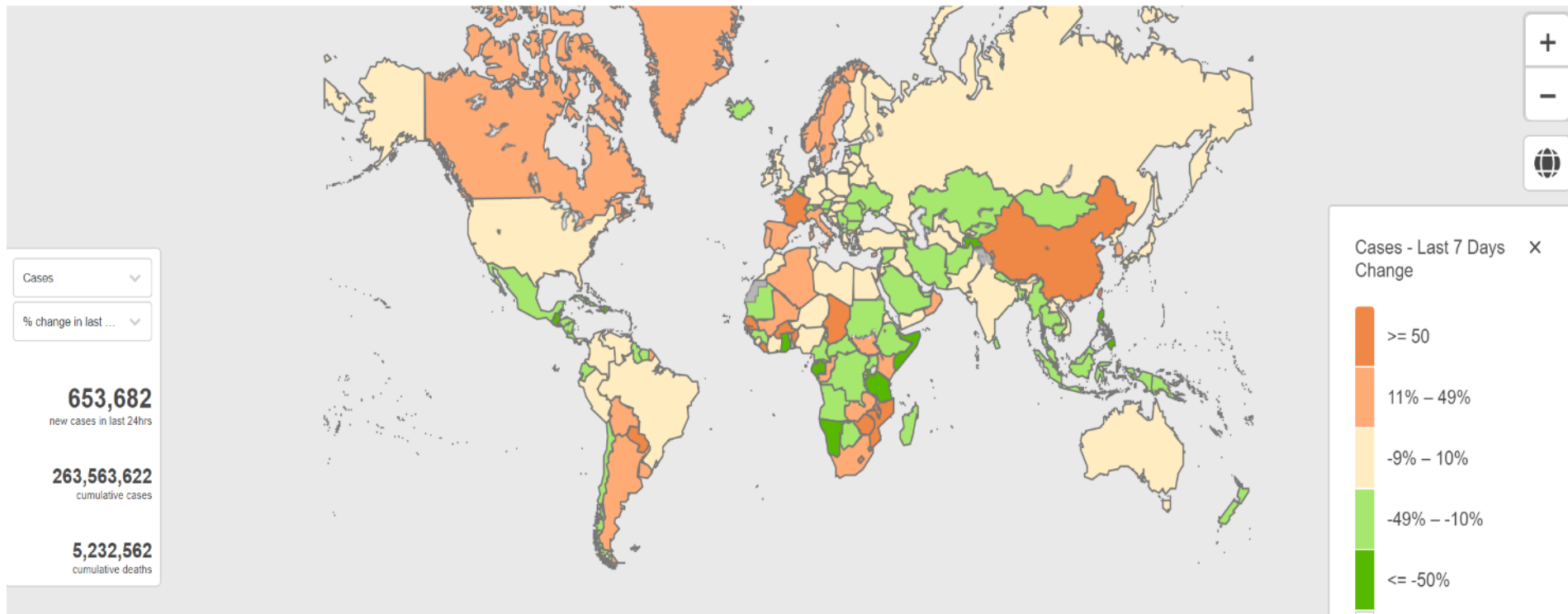
A poster for "THE PANDEMIC QUIZ" featuring a large red question mark. It states the date as 21st September 2021, from 1:30 to 2:30 pm IST. It mentions "Exciting prizes and certificates for the winner and runners up". Logos for WHO, GOARN, and EMPower are at the top. A "Register here" link and a list of participating countries are at the bottom.

Acknowledgments

- The majority of the materials contained in this presentation are extracted from published information which is freely available in the public domain, from such bodies as:
 - Empower School of Health
 - World Health Organization
 - UN agencies
 - USA CDC – Centre for Disease Control
 - McKinsey Reports
- Wherever possible I have cited the internet link to the published information.



Current Situation



Globally, as of 4:57pm CET, 3 December 2021, there have been 263,563,622 confirmed cases of COVID-19, 5,232,562 deaths, reported to WHO. As of 2 December 2021, a total of 7,864,123,038 vaccine doses have been administered.

<https://covid19.who.int/>

There's (still) a lot of it about

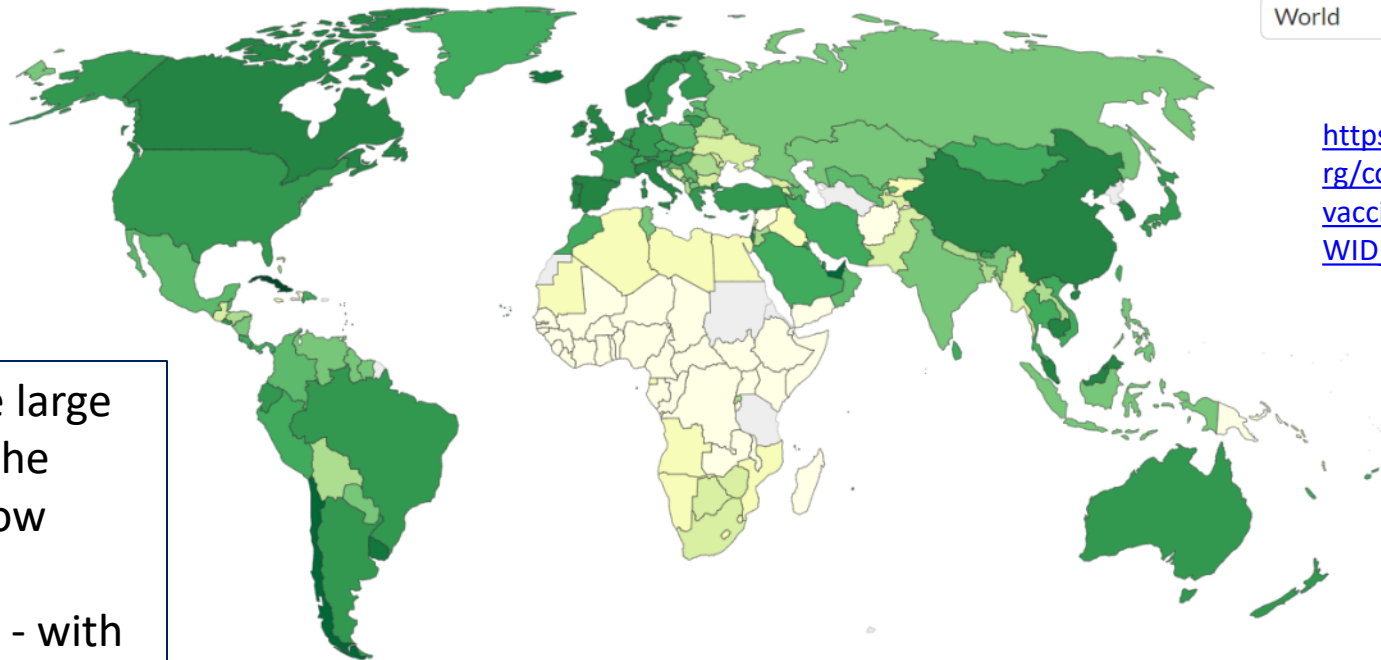
Vaccination Situation

COVID-19 vaccine doses administered per 100 people, Dec 4, 2021

All doses, including boosters, are counted individually. As the same person may receive more than one dose, the number of doses per 100 people can be higher than 100.

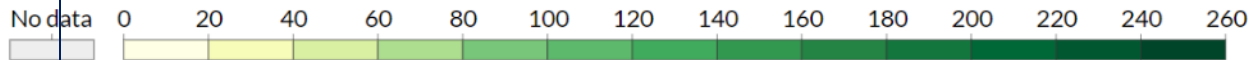
Our World
in Data

World



https://ourworldindata.org/covid-vaccinations?country=OWID_WRL

There are large areas of the world – low income countries - with very low vaccination levels



Source: Official data collated by Our World in Data – Last updated 5 December 2021, 11:40 (London time)

OurWorldInData.org/coronavirus • CC BY

Dec 2, 2020 Dec 4, 2021

CHART

MAP

TABLE

SOURCES

DOWNLOAD

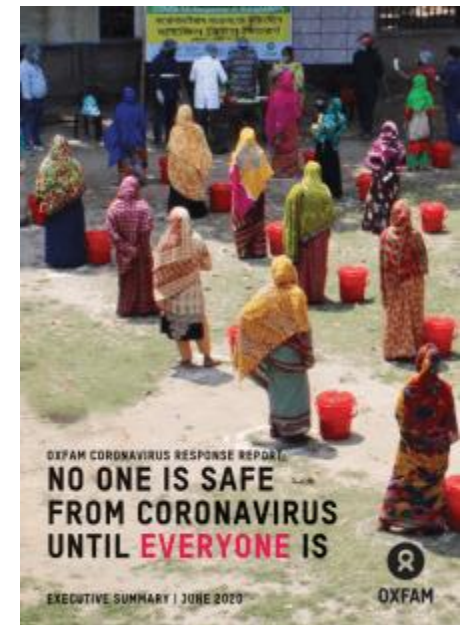


To talk about an end-point, we must define some basic parameters

- **Pandemic**
 - WHO's 'new' definition has become controversial
- **Endemic**
 - Compared to which other disease profile – influenza?
- **The New Normal - Acceptance Level**
 - How many deaths/hospitalizations/cases will a country 'accept' as 'normal'?
- **Threats to achieving an end**
 - No one is safe until everyone is safe
 - What does it mean in reality?
 - Waning immunity



#DefinePublicHealth



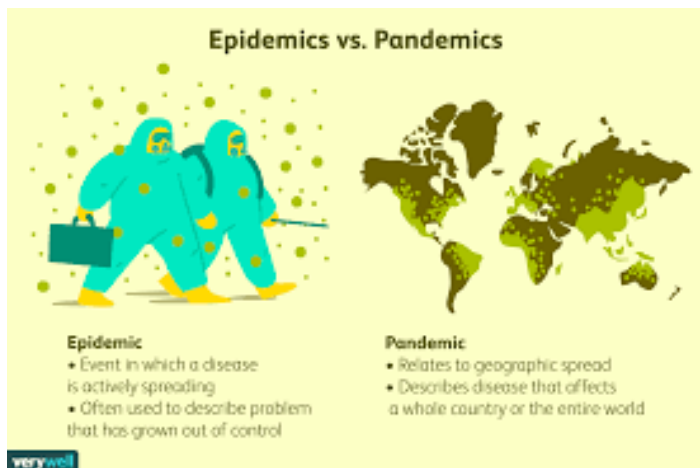
What do we Mean by Pandemic?

- A pandemic is an epidemic of an infectious disease that has spread across a **large region**, for instance multiple continents or worldwide, affecting a substantial number of people. A widespread endemic disease with a **stable number** of infected people is **not** a pandemic.

- Who can declare a pandemic? - WHO

When was COVID-19 declared a pandemic?

- The World Health Organization declared the outbreak a Public Health Emergency of International Concern on 30 January 2020, and a pandemic on 11 March 2020.



It didn't change
because we never
had a (formal)
definition

Confusion on Definitions

In theory "pandemic" refers to how many parts of the world are dealing with an elevated rate of the disease and says nothing about how serious the disease is

BUT there is an increasing trend to only use the term pandemic for very serious (deadly) diseases.

Some have accused WHO of changing the definitions but in fact, WHO never had clear definitions, so its pretty much all new territory.

<https://www.who.int/bulletin/volumes/89/7/11-086173.pdf>

NEED TO KNOW:

OUTBREAK vs. EPIDEMIC vs. PANDEMIC

OUTBREAK

The occurrence of a disease in a specific community in excess of what is expected in a defined area over a given period of time. A single case is enough to constitute an **outbreak**!

EPIDEMIC

The (often rapid) spread of a disease across a larger group in excess of what is normally expected (i.e., a large **outbreak**).

PANDEMIC

An **epidemic** that has spread to several countries or continents.

Pandemic – Key Points

*Bowing to pressure, the World Health Organization announced Friday that it would **rewrite its rules for alerting the world to new diseases**, meaning the swine flu circling the globe will probably never be declared a full-fledged pandemic. Dr. Keiji Fukuda, the deputy director general making the W.H.O. announcement, said that he could not predict exactly what the new rules would be but that criteria would include a “substantial risk of harm to people,” not just the geographic spread of a relatively benign virus.*

<https://www.virology.ws/2009/05/23/who-will-redefine-pandemic/>

New WHO Definition

- Widespread, Global Distribution

AND

- Disease with Substantial harm to people

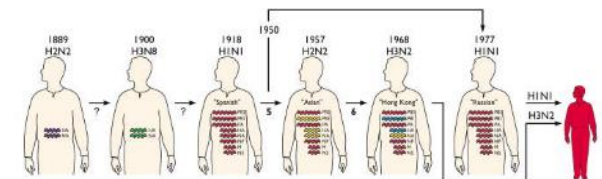
Moving the goal-posts?



- Experts observed at the time that the WHO's guidance on categorizing epidemics seemingly had political considerations. The “complicated pandemic definitions” that the WHO and the CDC had deployed seemed crafted “in a deliberate attempt to garner political attention and **financial support for pandemic preparedness**,” researcher Heath Kelly argued in the Bulletin of the World Health Organization.



Red Cross workers on duty in St. Louis, Missouri, during the Spanish influenza epidemic, 1918. Universal History Archive/Universal Images Group via Getty Images



- <https://www.vox.com/future-perfect/2020/3/9/21163412/who-coronavirus-covid19-pandemic-world-health-organization>

A ‘medical’ definition based on money?

Why is the definition of Pandemic important ?

- Aid Money and Vaccine Prices

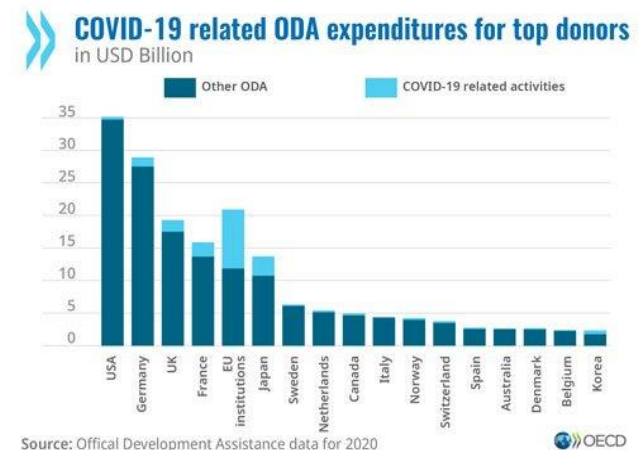
- World Health organization is the recognized body for declaring the start and end of a pandemic.
- Once a pandemic is declared over, aid money stops flowing and prices of vaccines change



Vaccine Pricing

- Pfizer, Moderna, and Johnson & Johnson pledged affordable vaccines — but only as long as there's a “pandemic.”

- <https://theintercept.com/2021/03/18/covid-vaccine-price-pfizer-moderna/>
- *Pfizer's CFO, Frank D'Amelio,... While the current cost is \$39 for the two shot regimen, D'Amelio has said that this is “pandemic” pricing and that in the future this is likely to change. D'Amelio had a chance to broaden this view at the Barclays Global Healthcare Conference.*
- <https://www.forbes.com/sites/johnlamattina/2021/03/23/how-will-covid-19-vaccines-be-priced-post-pandemic/?sh=294488222dfd>
- *Pfizer raised the price of its Covid-19 vaccine by more than a quarter and Moderna by more than a tenth in the latest EU supply contracts*
- <https://www.ft.com/content/d415a01e-d065-44a9-bad4-f9235aa04c1a>

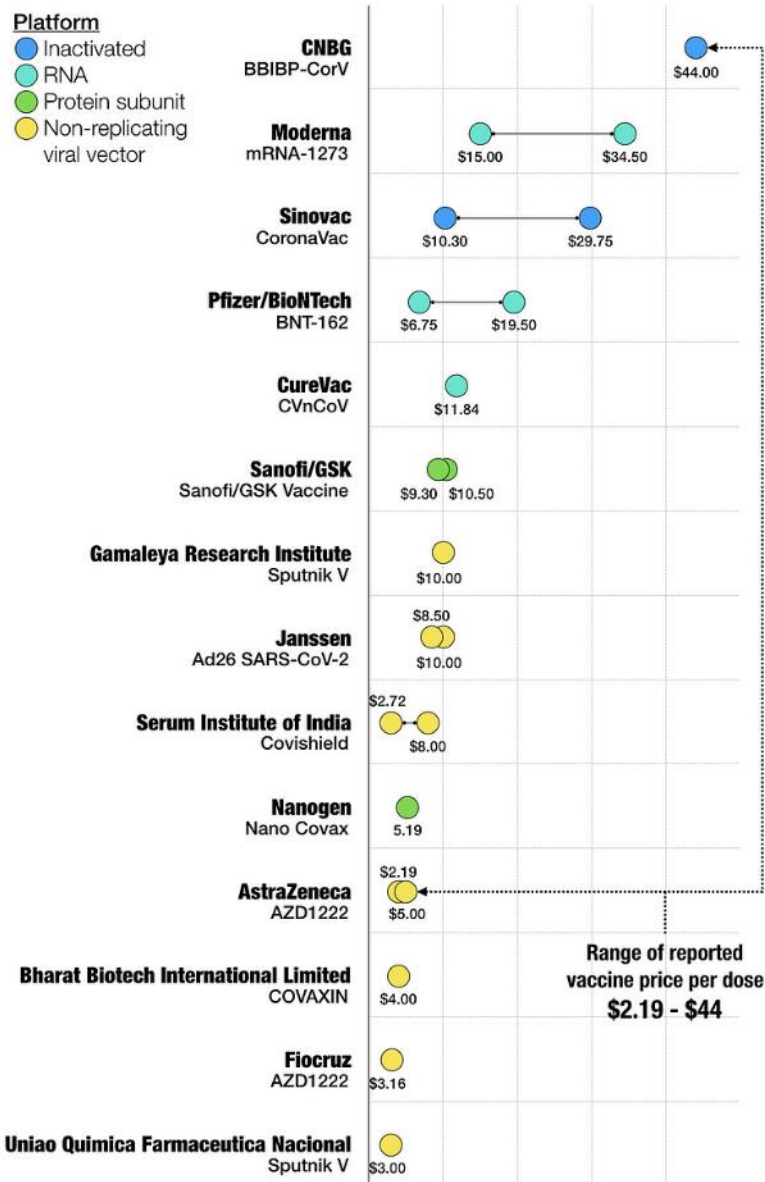


COVID-19 Vaccine Prices

Price per dose, USD

Platform

- Inactivated
- RNA
- Protein subunit
- Non-replicating viral vector



Source: UNICEF (All prices subject to trade agreements.)

@theinformatics Feb 2021

Manufacturer	Name	Mechanism of action	Regulatory (emergency use) approved in
Pfizer BIONTECH	Comirnaty (BNT162b2)	mRNA-based vaccine	EU, US, UK, Canada, Australia, Japan, South Korea
moderna	mRNA-1273	mRNA-based vaccine	EU, US, UK, Canada
AstraZeneca	Covishield (AZD1222)	Adenovirus vaccine	EU, UK, Brazil, India
sinovac	CoronaVac	Inactivated vaccine (formalin+ alum adjuvant)	China
SINOPHARM	BBIBP-CoV	Inactivated vaccine	China
CanSinoBIO	Convidicea (Ad5-nCoV)	Recombinant vaccine (adenovirus type 5 vector)	China (Military use)
武汉生物制品研究所有限责任公司	No named yet	Inactivated vaccine	China
NOVAVAX	Covaxin	Inactivated vaccine	India
СЗНП и фармацевтическая компания «Спутник	Sputnik V	Non-replicating viral vector	Russia
BEKTOP	EpiVacCorona	Peptide vaccine	Russia
Johnson & Johnson	Ad26.COV2.S (JNJ-78436735)	Non-replicating viral vector	US

<https://www.researchpartnership.com/resources/article/revisiting-covid-19-vaccine-pricing-post-pandemic-payers-expectations>

*Bernstein's Gal forecasts the minimum cost for vaccines and drugs to be in **the \$40 billion range globally**. And that's in a best case scenario in which the currently circulating strains are suppressed and a booster won't be necessary until 2023.*

<https://www.biopharmadive.com/news/coronavirus-vaccines-pricing-questions-moderna-pfizer/594762/>

Endemic

- The amount of a particular disease that is usually present in a community is referred to as the baseline or endemic level of the disease.
- This level is not necessarily the desired level, which may in fact be zero, but rather is the observed level.
- In the absence of intervention and assuming that the level is not high enough to deplete the pool of susceptible persons, the disease may continue to occur at this level indefinitely.
- Thus, the baseline level is often regarded as the expected level of the disease.

- <https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section11.html>



Main Tropical Diseases in Thailand

Malaria.
Dengue.
Japanese Encephalitis.
Leptospirosis.
Soil-transmitted worm diseases.
Hepatitis B.
Hepatitis A.
HIV.

Thailand appears willing to accept its rate of deaths from Road Traffic Accidents of around 56 per day, whereas the UK is around 5

<https://tdri.or.th/en/2020/11/road-accidents-biggest-health-crisis/#:~:text=Thailand's%20roads%20are%20the%20deadliest,about%2056%20deaths%20a%20day.>

Towards an end-game – with major risks

- There is a growing recognition and the **start** of a consensus that:
- *.. a more realistic epidemiological endpoint might arrive not when herd immunity is achieved but when countries are able to control the burden of COVID-19 enough that it can be **managed as an endemic disease**. The biggest risk to a country's ability to do this would likely then be the emergence of a new variant that is more transmissible, more liable to cause hospitalizations and deaths, or more capable of infecting people who have been vaccinated.*
- <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/when-will-the-covid-19-pandemic-end>

Why 'zero Covid' is no longer a realistic strategy

*Many countries now have high levels of the virus circulating and aren't aiming to eradicate it. There will always be the risk of importation by infected travelers from other regions. Vietnam, Thailand and South Korea, once cited as zero Covid success stories, have struggled to contain the virus when it's been imported despite various border controls being in place. **Accepting that Covid-19 will become endemic** – as many already are – and preparing for that eventuality may be **the only realistic endgame strategy** for all countries.*

<https://www.rte.ie/brainstorm/2021/0820/1241864-zero-covid-public-health-new-zealand-australia/>

Even without herd immunity, a transition toward normalcy is possible

two possible endpoints for the COVID-19 pandemic:

- a transition toward normalcy,
- and herd immunity
- *“Indeed, our scenario analysis suggests that the United States, Canada, and many European countries would likely have reached herd immunity by now if they had faced only the ancestral SARS-CoV-2 virus and if a high percentage of those eligible to receive the vaccine had chosen to take it. But as the more infectious Delta variant becomes more prevalent within a population, more people within that population must be vaccinated before herd immunity can be achieved”*
- <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/when-will-the-covid-19-pandemic-end>

Delta variant renders herd immunity from Covid ‘mythical’

Reaching herd immunity is “not a possibility” with the current Delta variant, the head of the Oxford Vaccine Group has said.

The problem with this virus is [it is] not measles. If 95% of people were vaccinated against measles, the virus cannot transmit in the population,” he told the all-party parliamentary group (APPG) on coronavirus.

“The Delta variant will still infect people who have been vaccinated. And that does mean that anyone who’s still unvaccinated at some point will meet the virus ... and we don’t have anything that will [completely] stop that transmission.”

<https://www.theguardian.com/world/2021/aug/10/delta-variant-renders-herd-immunity-from-covid-mythical>

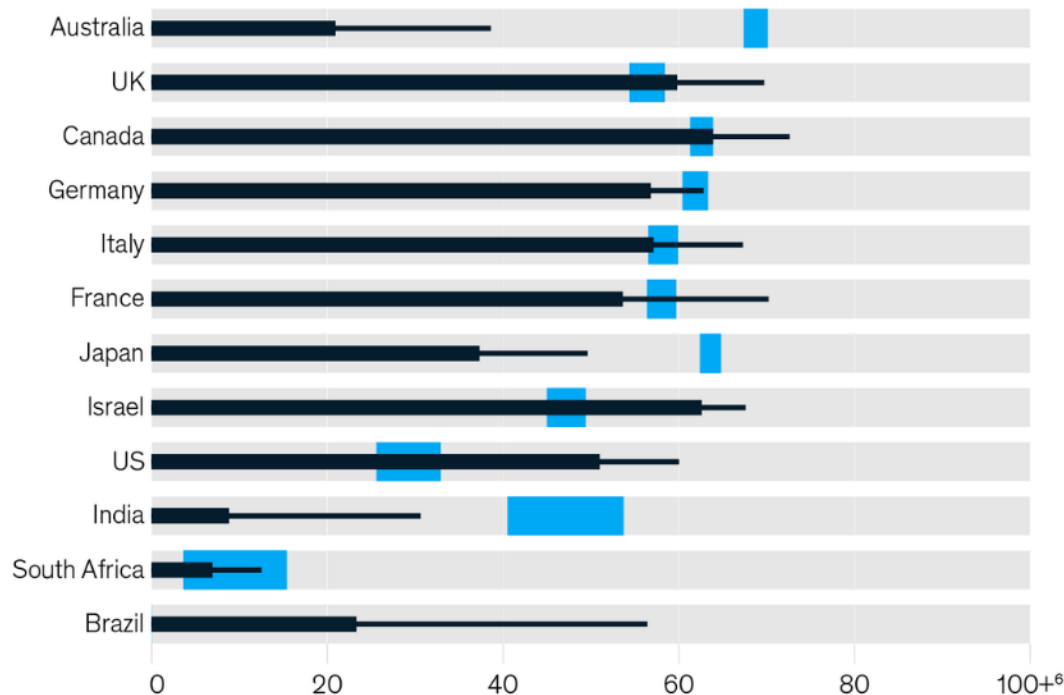
Herd Immunity- Ancestral Variant ONLY

<https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/when-will-the-covid-19-pandemic-end>

Because of the highly transmissible Delta variant, countries may have to reach higher COVID-19 vaccination rates to achieve herd immunity.

Vaccine coverage¹ and potential level for herd immunity,² % of population

Vaccine coverage, % ■ Full — 1 dose ■ Potential coverage for herd immunity



**Less than
80% to
achieve
Herd
Immunity**

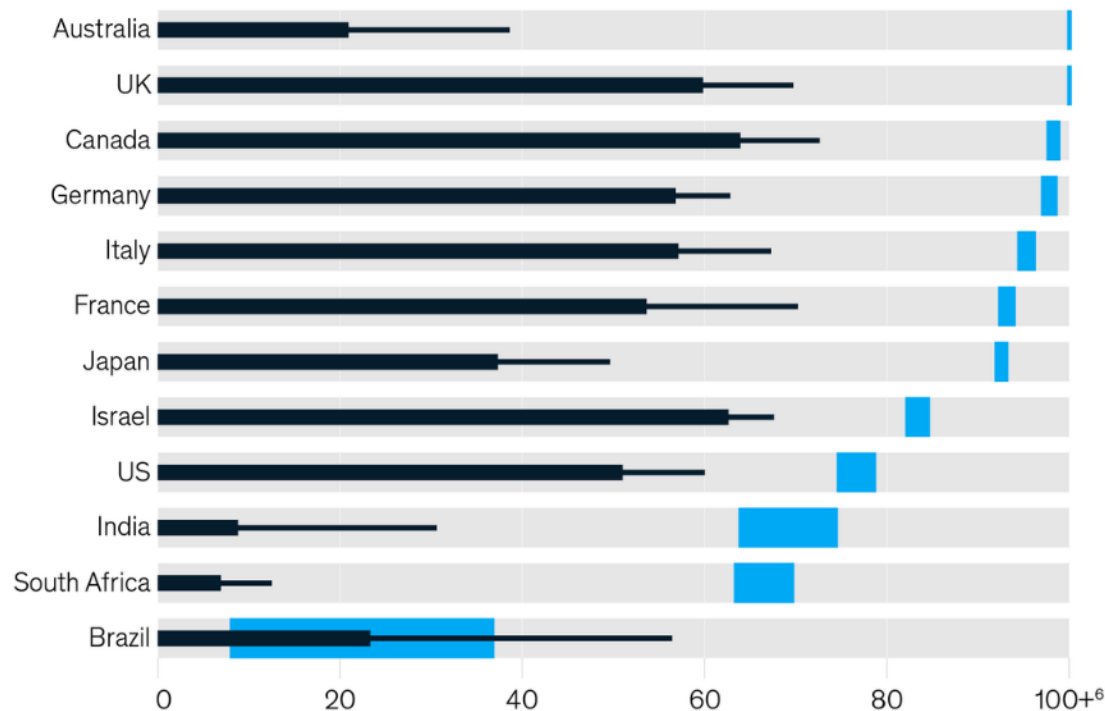
Herd Immunity- Current Variant Mix

<https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/when-will-the-covid-19-pandemic-end>

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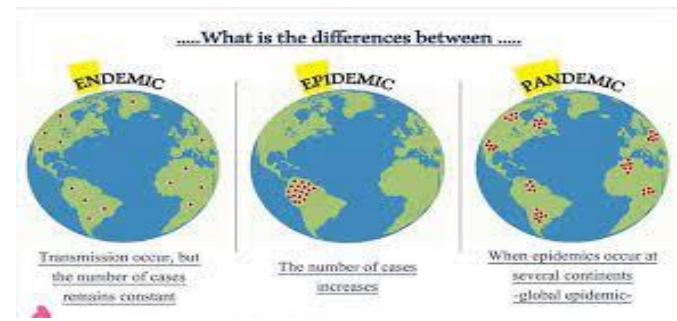
Vaccine coverage, % ■ Full — 1 dose ■ Potential coverage for herd immunity



With Delta Variant factored in More than 95%

Endemic COVID-19 may be a more realistic endpoint than herd immunity

- Previous hopes of herd immunity as a likely epidemiological endpoint for some countries, have been put out of reach by Delta variant – at least in the short term.
- Instead, it is most likely as of now that countries will reach an alternative epidemiological endpoint, where COVID-19 becomes endemic and **societies decide**—much as they have with respect to influenza and other diseases—that the ongoing burden of disease is low enough that COVID-19 **can be managed as a constant threat** rather than an exceptional one requiring society-defining interventions.



What does this mean?

- How many deaths will the country/population accept?
- It has been suggested that the same as influenza would be acceptable to many countries
- *In the United States, COVID-19 hospitalization and mortality rates in June and July were nearing the ten-year average rates for influenza but have since risen. Today, the burden of disease caused by COVID-19 in vaccinated people in the United States is similar to or lower than the average burden of influenza over the last decade, while the risks from COVID-19 to unvaccinated people are significantly higher .*
- <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/when-will-the-covid-19-pandemic-end>

How many COVID deaths are acceptable in a post-pandemic world?

Researchers say there is no universally agreed number of hospitalizations and deaths that societies will find acceptable. Annual deaths from diseases such as influenza — which before the pandemic killed between one-quarter of a million and half a million people each year globally — offer a barometer.

<https://www.nature.com/articles/d41586-021-01220-7>



Its being discussed?

- *Boris Johnson 'privately accepts' up to 50,000 annual Covid deaths as an acceptable level*
- *A cost-benefit analysis will have set the acceptable level of Covid-19 deaths before restrictions are reintroduced at around 1,000 deaths a week, two Government advisers have told i.*
- *The Government's cost-benefit analysis on Covid measures is believed to set not only the acceptable level of cost to save the life of a Covid patient at up to £30,000, but also how much each life lost costs the UK economy.*
- <https://inews.co.uk/news/boris-johnson-privately-accepts-up-to-50000-annual-covid-deaths-as-an-acceptable-level-1170069>

"While Covid-19 mRNA vaccines help protect people from getting infected and severely ill, the risk of breakthrough infections in fully vaccinated people is not completely eliminated"

<https://www.standard.co.uk/news/uk/pfizer-b969070.html>

**Caution NOT Fact
Checked – it is rumor
rather than evidence**



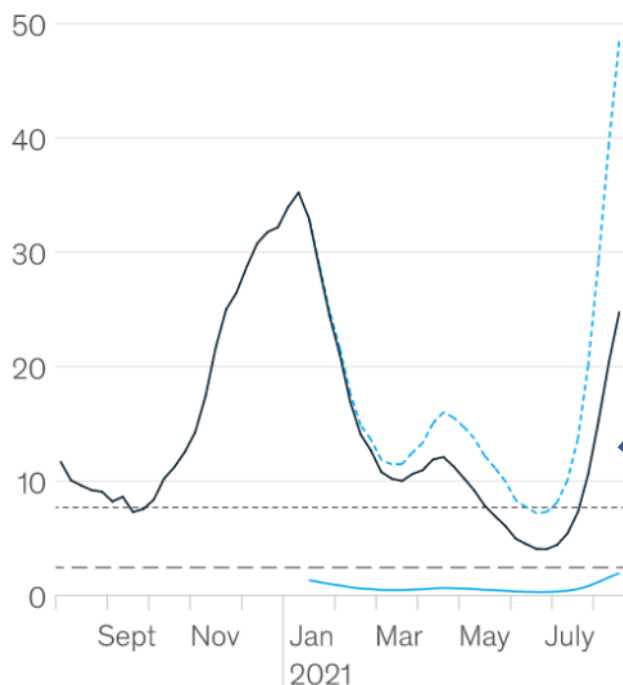
Influenza vs Covid Deaths

In the United States, incidence of COVID-19 cases in June and July was similar to long-term incidence of influenza cases, but now exceeds it.

Weekly incidence of COVID-19 and influenza cases,¹ rate per 100,000

— COVID-19, entire population - - - Influenza, 2010–19⁴
- - - COVID-19, unvaccinated population² - - - Influenza, 2010–19 peak⁴
— COVID-19, vaccinated population³

Hospitalizations



Deaths

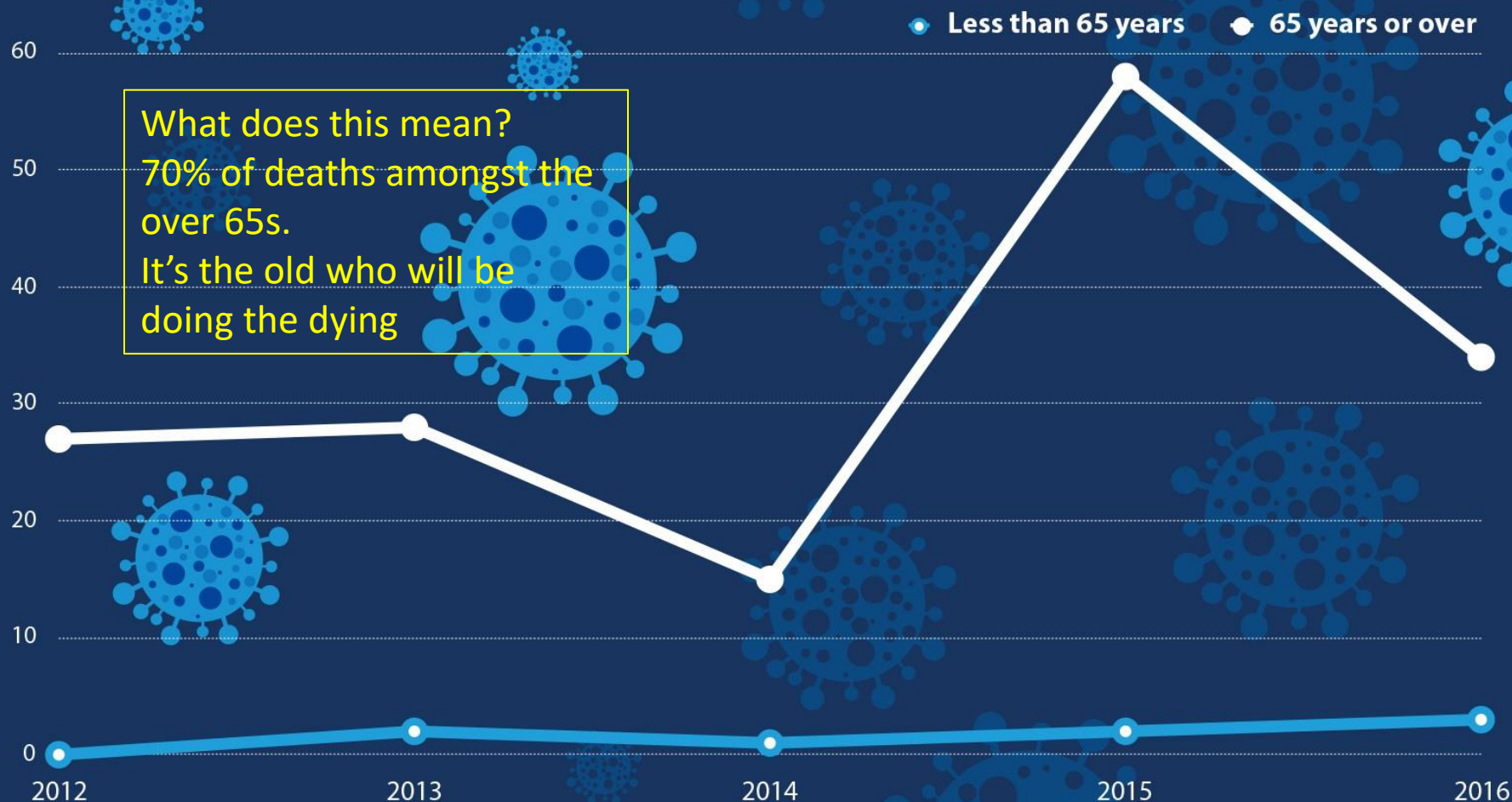


<https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/when-will-the-covid-19-pandemic-end>

Among unvaccinated people, hospitalization and mortality rates for COVID-19 significantly exceed long-term average rates for influenza.

Standardised rate of deaths from influenza by age group in the EU

(number of deaths per million inhabitants)



The Threats are Real

- *"No country can end the #COVID19 pandemic in isolation from the rest of the world. And no country can protect the health of its own people without working to protect the health of all people"-*
- <https://www.livemint.com/news/world/when-will-the-covid-19-pandemic-end-what-who-chief-tedros-adhanom-adhanom-ghebreyesus-says-11635132411548.html>

German Minister warned that some 16 million Moderna doses could expire in the next few months if they are not used.

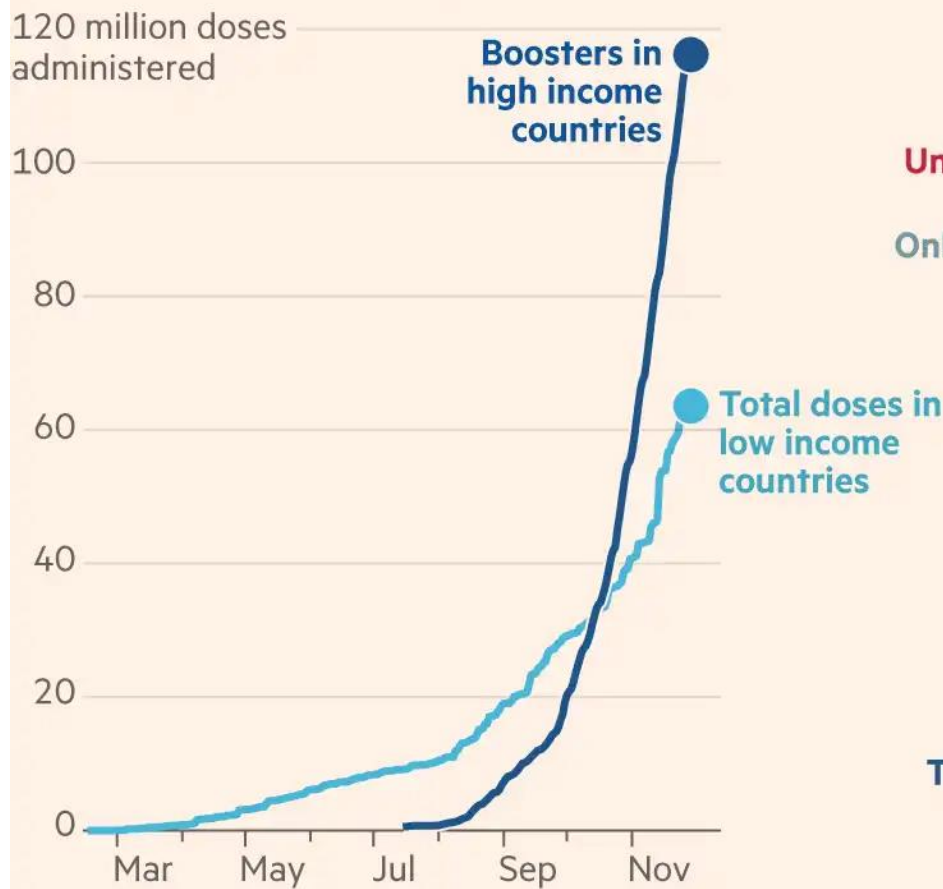
<https://www.bbc.com/news/world-europe-59378548>



(Pfizer CEO) *hasn't saved the world. He could have done it but he hasn't Winnie Byanyima, executive director of UNAIDS*

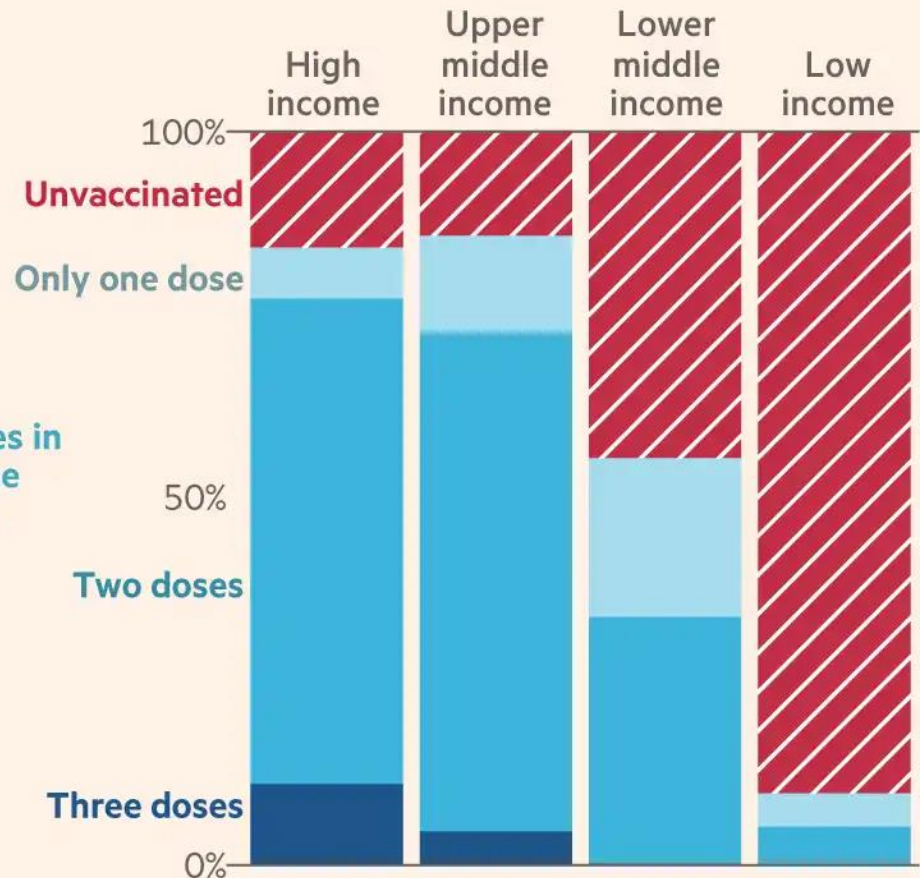
<https://www.ft.com/content/0cea5e3f-d4c4-4ee2-961a-3aa150f388ec>

Rich countries have given out far more boosters in four months than poor countries have given total doses all year...



...exacerbating stark inequalities in vaccine coverage

Share of population aged 12+ by vaccination status and country's income level



Sources: FT analysis of Our World in Data; UN population division
© FT

<https://www.ft.com/content/0cea5e3f-d4c4-4ee2-961a-3aa150f388ec>

Why Have we failed to vaccinate the world?

- COVAX – failed to provide the vaccines (only now starting to arrive in volume)
- Rich countries will not fund and will still not share vaccines – even the ones they can't use
- Vaccine Complacency: Low Income Countries still do not recognize the planning and infrastructure needed for mass vaccination
- Vaccine hesitancy: Massive misinformation and distrust of all government programs
- WHO failed to provide leadership and stress the need for low income countries to manage logistics and practicalities

Blair blames continuation of the pandemic on a failure to coordinate global vaccination campaign

Speaking to BBC Radio 4, former Prime Minister Tony Blair condemned the failure to coordinate vaccination campaigns on a global scale, rather than on a national one.

<https://www.politics.co.uk/news-in-brief/blair-blames-continuation-of-the-pandemic-on-a-failure-to-coordinate-global-vaccination-campaign/>



TONY BLAIR | COMMENT

Tony Blair: Africa has Covid vaccines at last; now it needs help to use them

Tony Blair | Saturday December 04 2021, 6.00pm GMT, The Sunday Times

<https://www.thetimes.co.uk/article/tony-blair-africa-has-covid-vaccines-at-last-now-it-needs-help-to-use-them-6mkzdmnn8>

Provide the vaccines (for free); Provide the logistics (for free); provide and pay for the medical staff; Inform and encourage the population.

What do the countries do themselves ?

Covax

CEPI



- ‘A coalition of the dysfunctional’ – (*President Macron ?*)
- *COVAX has been created to maximise our chances of successfully developing COVID-19 vaccines and manufacture them in the quantities needed to end this crisis.*
- *The principal role of the COVAX Facility is to maximise the chances of people in participating countries getting access to COVID-19 vaccines as quickly, fairly and safely as possible*
- <https://www.gavi.org/vaccineswork/covax-explained>
- 3 Main parts
 - Covax Facility - Investment to encourage manufacturers
 - Self Financing countries – provide a global mechanism to buy vaccines
 - AMC - The primary focus of the Gavi COVAX AMC is to ensure that the 92 middle- and lower-income countries that cannot fully afford to pay for COVID-19 vaccines themselves get equal access to COVID-19 vaccines as higher-income self-financing countries and at the same time.



Covax Failure

- ‘Naively ambitious’: How COVAX failed on its promise to vaccinate the world
- *In many cases, COVAX officials wouldn't even answer the phone or respond to emails from top diplomats when asked what was happening.*
- *The first 18 months have not gone as hoped. As richer countries roll out booster shots, 98% of people in low-income countries remain unvaccinated. COVAX, described as “naively ambitious” by one expert, has contributed less than 5% of the all vaccines administered globally and recently announced it would miss its 2 billion target for 2021*
- *COVAX has delivered only 300 million vaccines so far, yet plans show that it now intends to distribute a massive 1.1 billion vaccines in the next three months. Some officials in poorer countries fear that the abrupt surge could overwhelm their health systems and lead to much-needed vaccines going to waste.*
- <https://www.statnews.com/2021/10/08/how-covax-failed-on-its-promise-to-vaccinate-the-world/>

As of February 8, fewer than
100 doses
have been administered in low income countries.

COVAX was created to respond to this with the goal of distributing 2 billion doses of a safe and effective COVID-19 vaccine to the most vulnerable by the end of 2021.

SOURCE: GPEI, "COVAX and the United States" February 17, 2021.

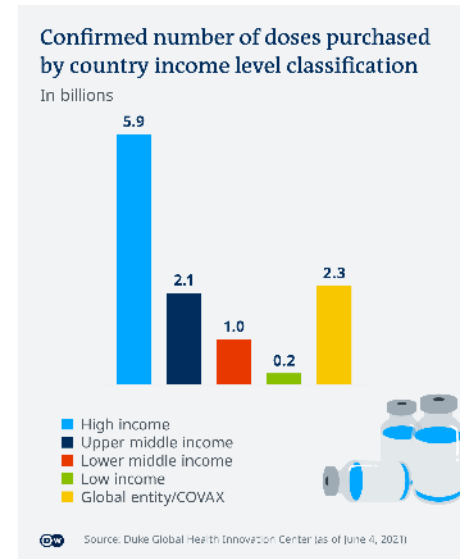
KFF



Cannot Deliver

The best laid plans..

- But in March, disaster struck. India suffered a sudden, devastating Covid-19 wave, and the country imposed a de facto ban on vaccine exports. Gavi announced that COVAX would face delays on up to 90 million doses during March and April.
- As one logistics expert said: *“Because of COVAX’s decision to put all their eggs into one basket, people did die.”*
- So far, the AMC has raised about US\$ 700 million of the initial seed capital target of US\$ 2 billion that is needed by the end of 2020
- *“You can’t charity your way out of a pandemic.”*
- KATE ELDER, SENIOR VACCINES POLICY ADVISER AT MSF’S ACCESS CAMPAIGN



A Day Late and a Dollar Short

- Stymied by events in India and short on vaccines, in May 2021, COVAX tried a new tactic. Wealthy countries had bought far more vaccines than needed. Even accounting for booster shots, one internal COVAX document noted these countries would likely have between 1 billion and 5 billion doses to redistribute — mostly from the U.S. and EU. “The time to donate excess doses,” UNICEF implored, “is NOW.”
- But countries were slow to take up the call, even as they continued to make their own deals. The U.S. promised 200 million doses by the end of the year, but missed its first target. In September, U.S. president Joe Biden announced a further 500 million doses would be donated to developing countries in 2022.
- In total, wealthy countries had pledged to donate 785 million doses to COVAX as of Sept. 24. But just 18% have arrived.
- <https://www.statnews.com/2021/10/08/how-covax-failed-on-its-promise-to-vaccinate-the-world/>



As of 29 October 2021...bring the remaining funding gap for 2021 to **USD 15.9 billion.**

<https://www.who.int/publications/m/item/access-to-covid-19-tools-tracker>

Ultimately, donations have not made up for COVAX's shortfall. By early October, COVAX had shipped only 330 million of its 2 billion planned doses, 40% of which were donated

COVAX Was a Great Idea, But Is Now 500 Million Doses Short of Its Vaccine Distribution Goals

Low Income Country Vaccination Complacency

- Too many countries think they know how to run a mass population, vaccination program

Epitomized by:

- *What is so special about Covid 19 vaccine that we need all this planning ?*
- *We have been operating successful vaccine programs for many years*
- *– we know how to do it !*

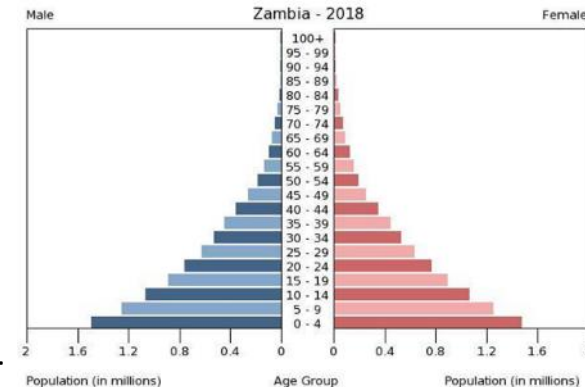
What's so Special about Covid vaccination? - Simply:

- The sheer SCALE of operations that will be required
- Most EPI programs are focused on newborns and infants – crudely, around 3.5% of the population
- COVID 19 Vaccine will need to reach at least 30% of the population in the first year

TEN TIMES GREATER VOLUME
And on to targets beyond 60%
of the population

EPI SCHEDULE IN PAKISTAN		
At Birth	---	OPV, BCG
6 Weeks	---	OPV, Pentavalent, PCV
10 Weeks	---	OPV, Pentavalent, PCV
14 Weeks	---	OPV, Pentavalent, PCV
9 Months	---	Measles
12 Months	---	Hepatitis A, Chicken pox
15 Months	---	PCV
18 Months	---	OPV + Hepatitis A
> 2 Years	---	Typhoid
4-5 Years	---	OPV + Chicken Pox + DPT
10 Years	---	TT (Tetanus Toxoid)

SAM RESEARCH FACILITY



10x

Impact of Lack of Preparation

white haired, old, Professors have been trying to spread the word...

- Last month, for example, Malawi incinerated **19,610 expired doses of the AstraZeneca vaccine** to assure Malawians that the government was not using unsafe vaccines. Uptake of COVID-19 vaccines has been generally low in Malawi. Of the 102,000 vaccine doses that the country received from the African Union's Africa Vaccination Acquisition Task Team in March, only 80% were used.
- Similarly, South Sudan recently announced that it would be **destroying 60,000 doses of the vaccine** because it was unable to use them before the expiry date of 13 April. Dr. Anthony Garang, leader of the South Sudan Doctor's Union, attributes the low uptake to misinformation. "People were misinformed by social media and unreliable sources," he explained.
- The Democratic Republic of the Congo (DRC), another conflict-ridden but resource-rich country, has also announced that it **cannot use most of the 1.7 million doses of the AstraZeneca vaccine** it received under the COVAX scheme, which are set to expire on 24 June
- **However, even if vaccines are made widely available, African countries still face infrastructure and public perception challenges that will need to be overcome for national roll-out plans to be effective.**
- <https://www.one.org/africa/blog/vaccine-rollout-hesitancy-africa/>



What Does This Mean?

- The THREAT of more Covid variants will remain high until there is a high level of global herd immunity either through vaccination or having contracted the disease.

(Coronavirus variant fear sparks Africa travel curbs. One expert described the variant, known as B.1.1.529, as "the worst one we've seen so far", and there is concern it has the potential to evade immunity. BBC 26 Nov 21)

- Low income country vaccination programs are progressing only very slowly
- All predictions of a return to normality should be tempered by the **threat of potential future variants**

Africa is set to miss the urgent global goal of vaccinating the most vulnerable 10% of every country's population against COVID-19 by the end of September. Forty-two of Africa's 54 nations—nearly 80%—are set to miss the target if the current pace of vaccine deliveries and vaccinations hold, new data from the World Health Organization (WHO) shows.

<https://www.africanews.com/2021/09/02/coronavirus-eight-in-10-african-countries-to-miss-crucial-covid-19-vaccination-goal/>

As Christopher Martin, a professor of public health at West Virginia University, explains it, these undervaccinated pockets create more opportunity for the virus to mutate.

"Large numbers of unvaccinated people do make variants more likely," he says.

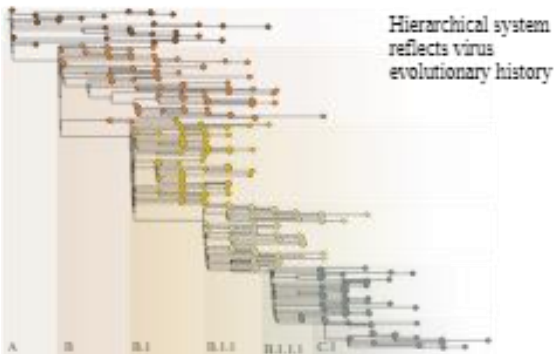
<https://www.bloomberg.com/news/newsletters/2021-09-05/the-unvaccinated-are-a-risk-to-all-of-us>

Currently designated Variants of Concern (VOCs)[†]:

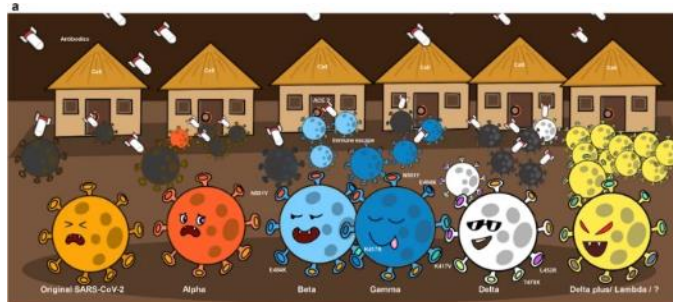
WHO label	Pango lineage*	GISAID clade	Nextstrain clade	Additional amino acid changes monitored°	Earliest documented samples	Date of designation
Alpha	B.1.1.7	GRY	20I (V1)	+S:484K +S:452R	United Kingdom, Sep-2020	18-Dec-2020
Beta	B.1.351	GH/501Y.V2	20H (V2)	+S:L18F	South Africa, May-2020	18-Dec-2020
Gamma	P.1	GR/501Y.V3	20J (V3)	+S:681H	Brazil, Nov-2020	11-Jan-2021
Delta	B.1.617.2	G/478K.V1	21A, 21I, 21J	+S:417N +S:484K	India, Oct-2020	VOI: 4-Apr-2021 VOC: 11-May-2021
Omicron*	B.1.1.529	GR/484A	21K	-	Multiple countries, Nov-2021	VUM: 24-Nov-2021 VOC: 26-Nov-2021

- Includes all descendent lineages. See the cov-lineages.org and the [Pango network](https://pango.network) websites for

<https://www.who.int/en/activities/tracking-SARS-CoV-2-variants/>

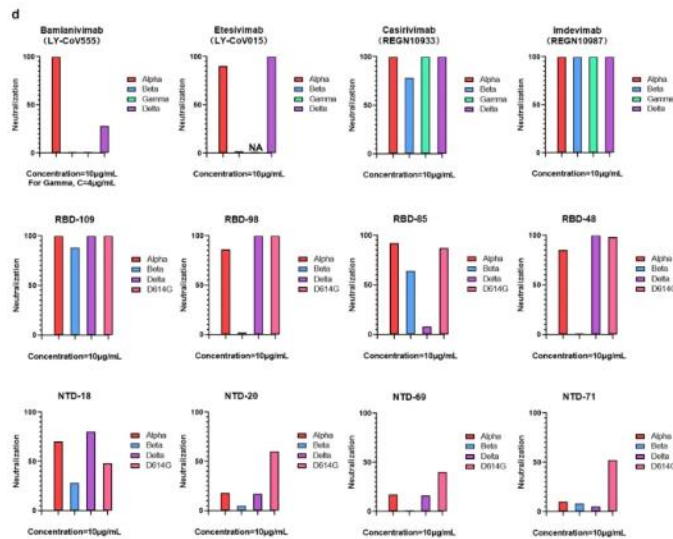
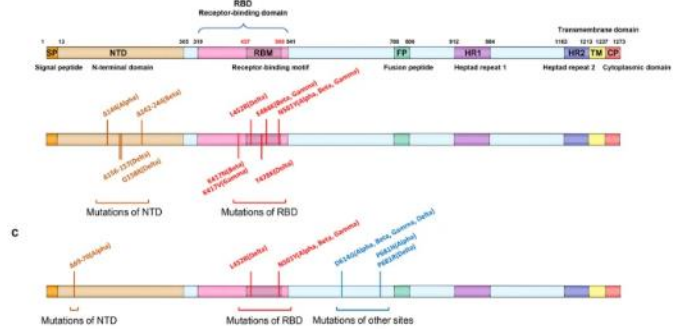


<https://www.nature.com/articles/s41392-021-00767-1>



b

SARS-CoV-2 Spike (S)

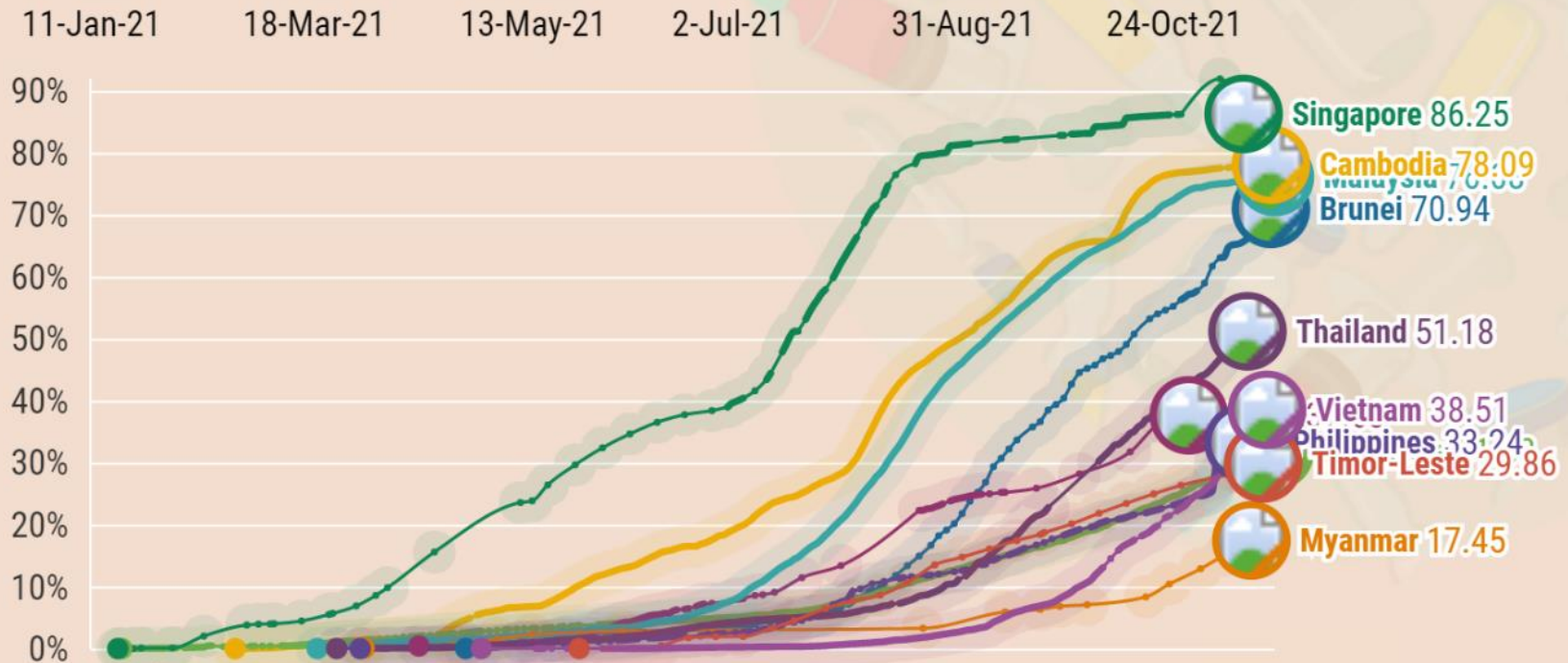


Share of population fully vaccinated vs COVID-19

This equals the share of people who have received all doses prescribed by the vaccination protocol as of Nov 19

Replay

All

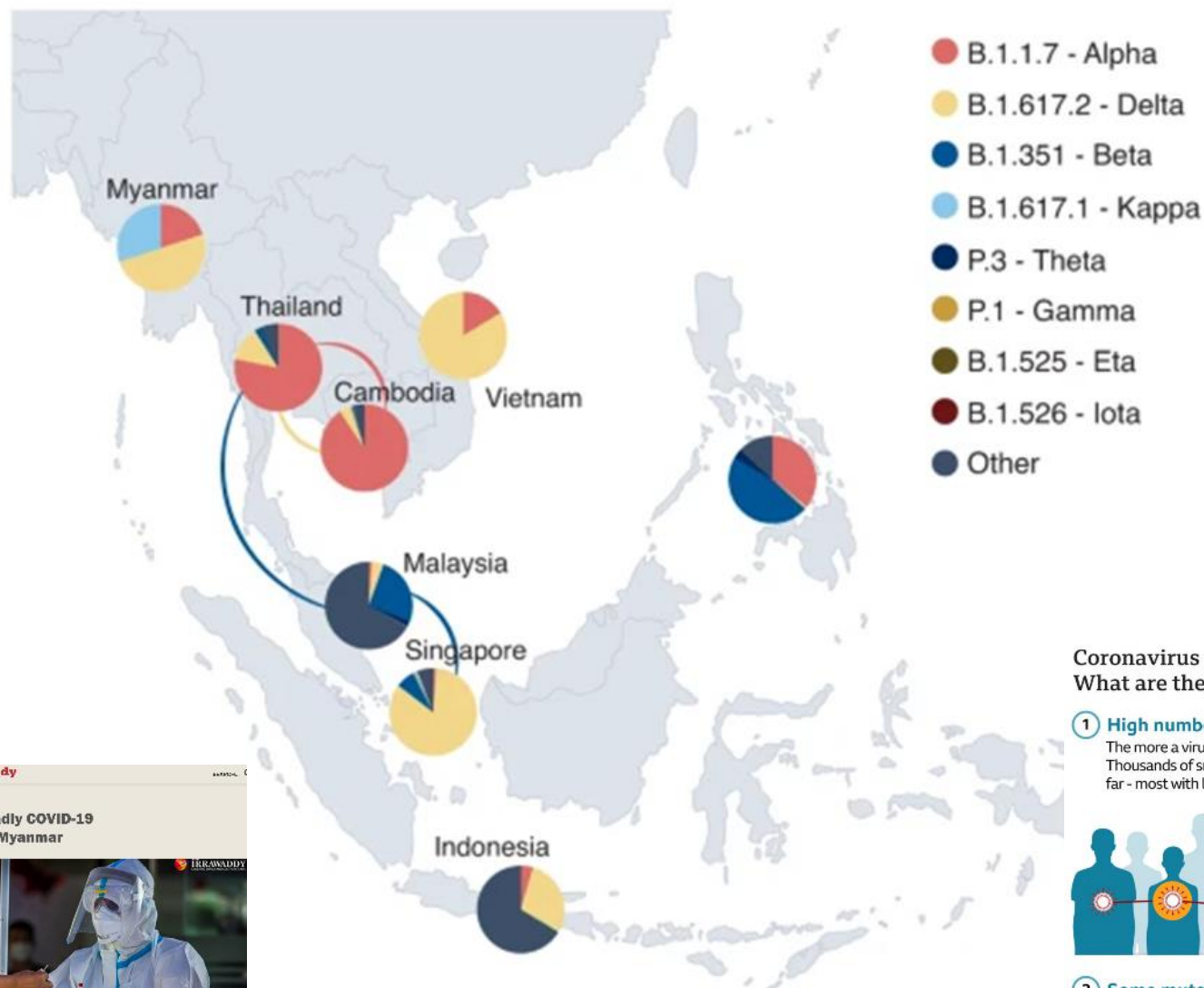


Source: [Our World in Data](#) • Created by Yvonne T. Chua

reportingasean.
VOICES AND VIEWS FROM WITHIN

<https://www.reportingasean.net/in-numbers-covid-19-vaccination-in-southeast-asia/>

b



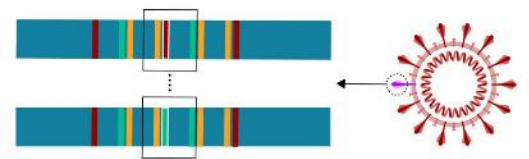
Coronavirus variants: What are they and how do they happen?

- 1 High numbers of cases increase risk of mutations
- The more a virus spreads, the more chance it has to mutate. Thousands of small changes have been seen in coronavirus so far - most with little impact.



- 2 Some mutations lead to new variants

Every so often, a virus changes in a way that helps it survive. Scientists are particularly concerned about changes to the spike protein - the part that helps it enter human cells.

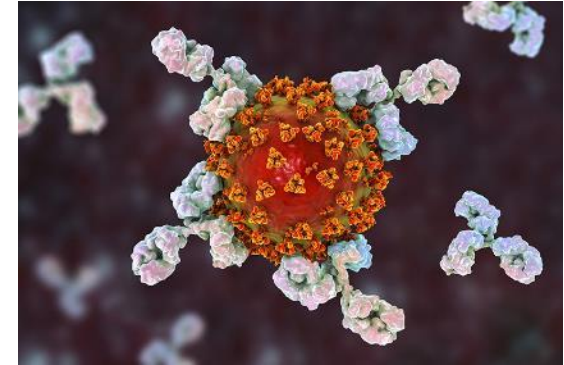


<https://www.nature.com/articles/s41591-021-01471-x>

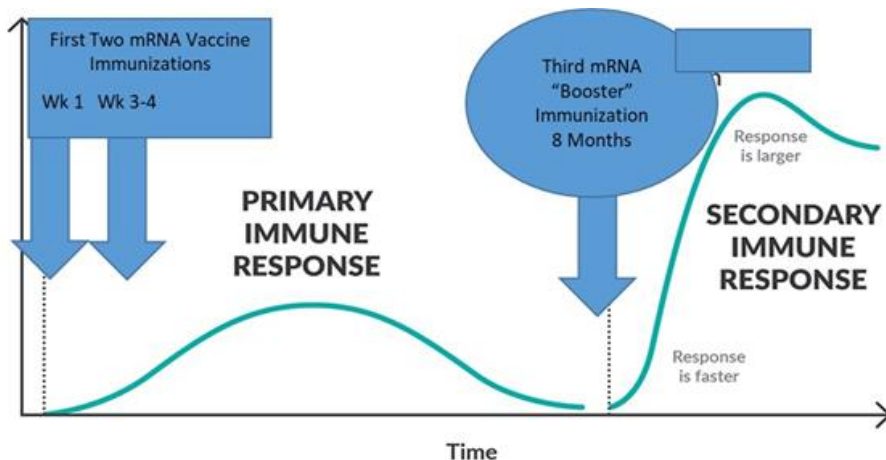
Waning Immunity

- COVID vaccine immunity is waning — how much does that matter?
- On the basis of published results from vaccine trials and other data sources, they estimated that people immunized against COVID-19 would lose approximately half of their defensive antibodies every 108 days or so. As a result, vaccines that initially offered, say, 90% protection against mild cases of disease might only be 70% effective after 6 or 7 months

- <https://www.nature.com/articles/d41586-021-02532-4>



For those vaccinated against COVID-19, antibody levels eventually wane, but this is not the whole story. Credit: Kateryna Kon/Science Photo Library



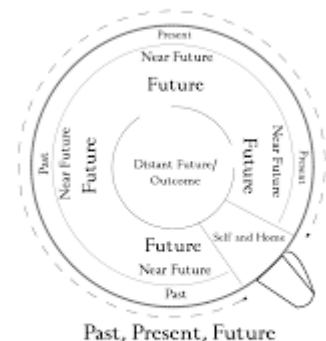
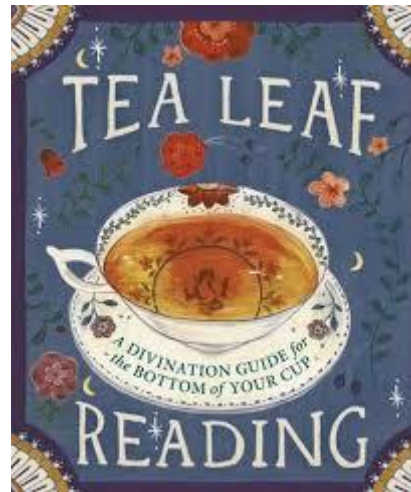
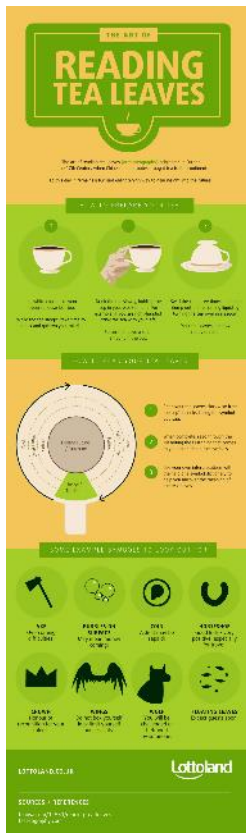
In case it's helpful or illustrative, I modified a graph to explain the rationale for the third "booster" mRNA immunization

https://twitter.com/PeterHotez?ref_src=twsrc%5Etfw%7Ctwcamp%5Etweetembed%7Ctwterm%5E1428100925982445568%7Ctwgr%5E%7Ctwcon%5Es1_%ref_url=https%3A%2F%2Fwww.nytimes.com%2F2021%2F08%2F19%2Fopinion%2F-covid-booster-delta-end.html

When Does it End?

There is NO scientific information/data to guide us
So, Time to Read the Tea Leaves

‘Gypsy Rose Lee’ Barraclough
summarizes some predications for the
future – all of which are low on ‘when’



WHO Perspective



- "The pandemic will end when the world chooses to end it. It is in our hands. We have all the tools we need: effective public health tools and effective medical tools. But the world has not used those tools well. With almost 50,000 deaths a week, the pandemic is far from over," Dr Tedros said on Sunday, in his address to the World Health Summit in Berlin.

**When will the
Covid-19
pandemic end?
What WHO chief
Tedros Adhanom
Adhanom
Ghebreyesus
says**

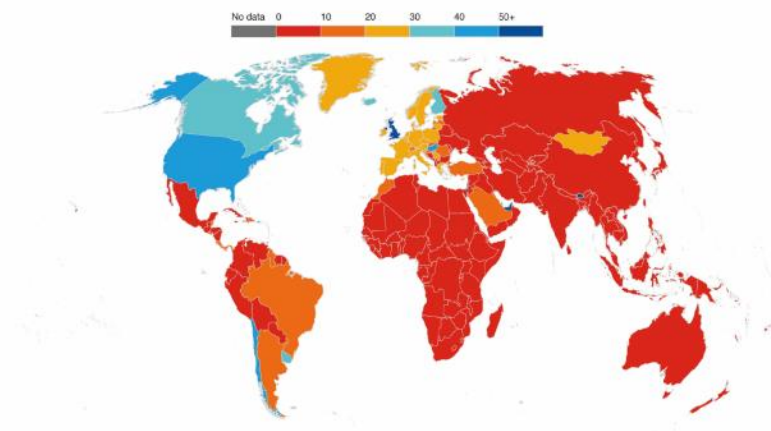
- <https://www.livemint.com/news/world/when-will-the-covid-19-pandemic-end-what-who-chief-tedros-adhanom-adhanom-ghebreyesus-says-11635132411548.html>



A Serious Point Amongst the Naivety

The vaccination gap

(share vaccinated as of end-April 2021, % of total population, at least one dose)



Source: Authors' calculations. See IMF Staff Discussion Note 21/4, May 2021.

Note: Country borders or names do not necessarily reflect the IMF's official position.

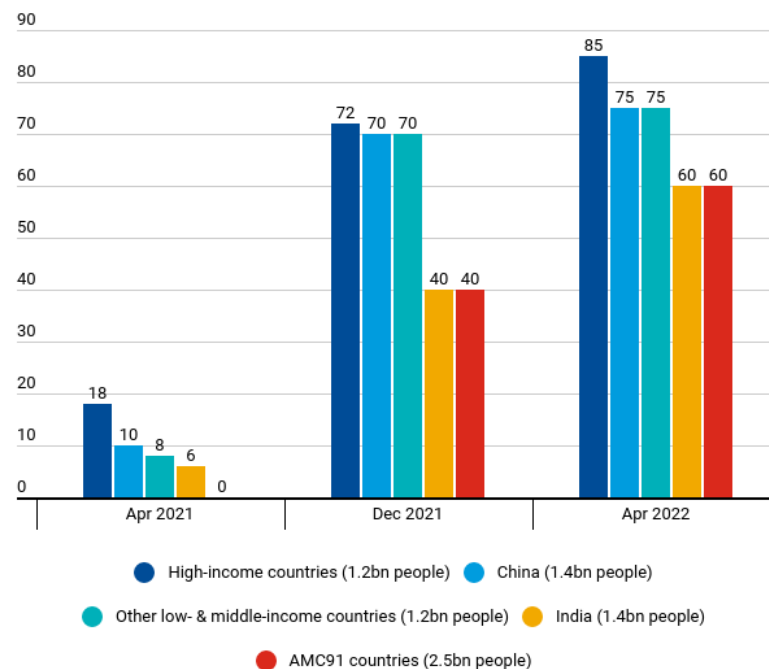
INTERNATIONAL MONETARY FUND

<https://blogs.imf.org/2021/05/21/a-proposal-to-end-the-covid-19-pandemic/>

Closing the gap

Grants and donations could ensure that at least 40 percent of people in all countries are vaccinated by year's end, and 60 percent in the first half of 2022.

(scenario with pre-purchases by COVAX + India and donations by HICs, effective vaccine coverage, percent)



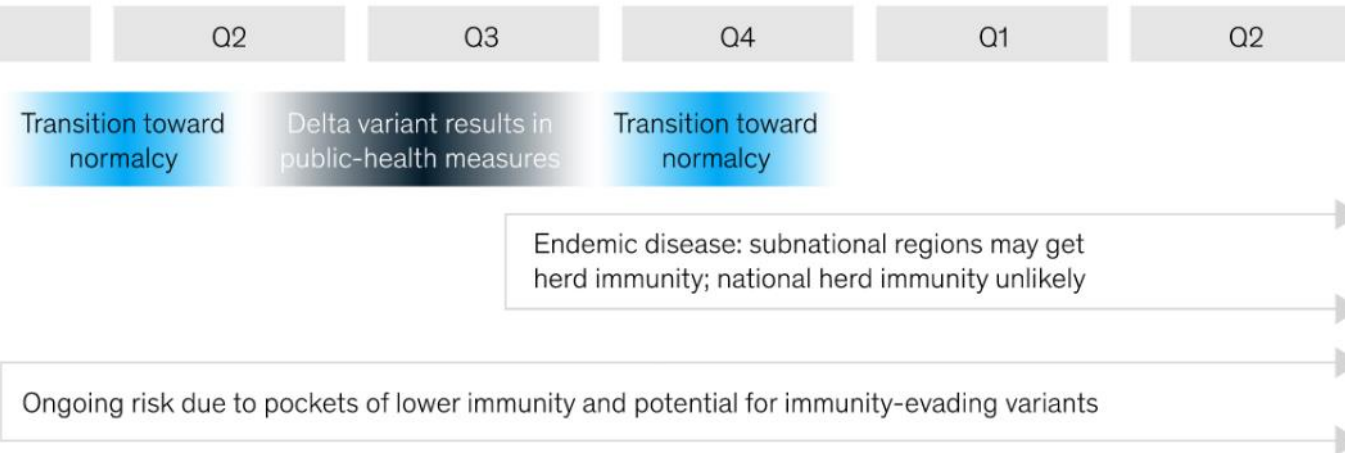
Source: Authors' calculations. See IMF Staff Discussion Note 21/4, May 2021.

Note: AMC91 stands for the group of 91 low- and middle-income countries (excl. India) that are eligible to access the COVAX AMC facility. Other LMIC refers to the group of low- and middle-income countries excluding India, China, and AMC91 countries. HIC refers to high-income countries as per World Bank income classifications. The bars report the fraction of population fully vaccinated within the country group, under different scenarios. The effective rate of vaccination coverage is depicted for April 2021, equivalent to total doses per 100 divided by 2.

INTERNATIONAL MONETARY FUND

Some countries could resume a transition to normalcy and begin managing COVID-19 as an endemic disease after the recent wave of Delta-variant cases.

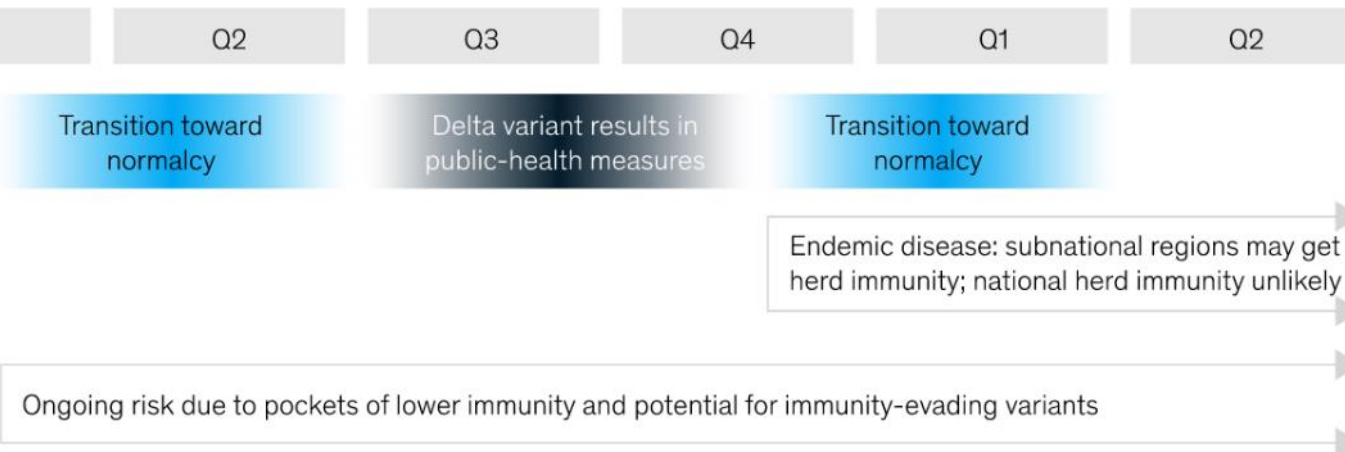
UK COVID-19 disease pattern



118 deaths
per day
December

*What the
'Experts' say*

US COVID-19 disease pattern



895 deaths
per day
November

Predictions - USA

- “I think at this point, it’s hard to predict anything,” Dr. Vidya Mony, pediatric infectious diseases specialist at Santa Clara Valley Medical Center in San Jose, California, told Healthline.
- “By definition, this is an infectious disease that is spread worldwide,” Mony said. “Unless we are able to vaccinate the entire world, it is quite possible that we will continue to have variants and continue to have transmission.”
- Health officials and other experts have predicted that the pandemic will improve significantly by sometime next year.
- <https://www.healthline.com/health-news/will-the-pandemic-really-end-next-year-what-experts-think#The-bottom-line>

**Predictions is
No one can
predict**

Not only can no one predict the future, we don't understand the present – and there isn't even any certainty about the past.

Harry Browne

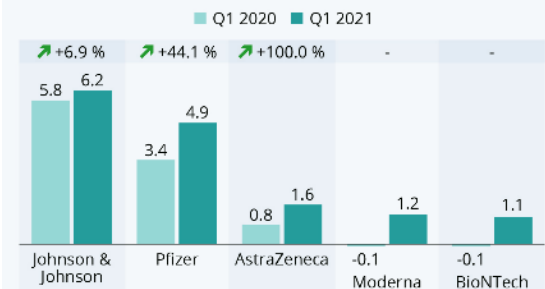
Predictions – Vaccine Manufacturers

- Top brass at Moderna and AstraZeneca have recently offered rosy predictions about what's in store for the coronavirus.
- *"If you look at the industry-wide expansion of production capacities over the past six months, enough doses should be available by the middle of next year so that everyone on this Earth can be vaccinated," Stéphane Bancel, the CEO of Moderna, told the Swiss newspaper the Neue Zürcher Zeitung, Reuters reported Thursday.*
- *Those who do not get vaccinated will immunize themselves naturally, because the Delta variant is so contagious," Bancel added. "In this way we will end up in a situation similar to that of the flu. You can either get vaccinated and have a good winter. Or you don't do it and risk getting sick and possibly even ending up in hospital."*
- In response to a question about when the pandemic would end, Bancel replied, *"As of today, in a year, I assume."*
- <https://www.businessinsider.com/covid-19-pandemic-end-next-year-vaccine-makers-say-2021-9>



COVID-19 Vaccines Lift Pharma Company Profits

Net income/profit of selected pharma companies in Q1 2021 and Q1 2020 (in billion U.S. dollars)



Astrazeneca/BioNTech declare profits, not net income.

Source: Company reports



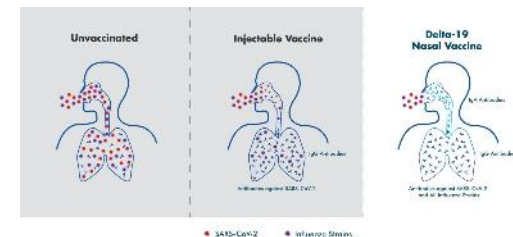
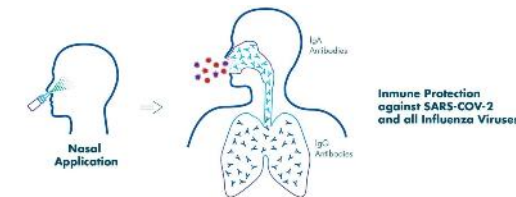
statista

Prof. Andy's Predictions

- Like old soldiers – it will never die – just slowly fade away
- Globally 2024 Normalcy achieved
- High Income Countries: Q1, 2022, Normalcy achieved
- Concomitant COVID-19 and Influenza Vaccination Tested Against Twin-demic
- *The first clinical trial to assess concomitant administration of any vaccine with either an adenoviral vector or mRNA COVID-19 vaccine found the combination with influenza vaccine is safe, produces immunogenicity associated with separate vaccination, and supports the combination as an efficient intervention against the possible "twindemic."*
- <https://www.contagionlive.com/view/concomitant-covid-19-and-influenza-vaccination-tested-against-twindemic>
- *We're developing Delta-19 to address the double disease threat of Covid-19 and influenza, including shifted seasonal influenza strains and emerging strains with pandemic potential*
- *Scientists predict that SARS-CoV-2, the virus that causes Covid-19, is here to stay. Because SARS-CoV-2 is so widespread, it is unlikely to be eliminated globally. Instead, SARS-CoV-2 is expected to become endemic and adopt a seasonal pattern of annual epidemics, much like influenza.*
- <https://vivaldibiosciences.com/delta19>



Moderna working on combination COVID-19 vaccine booster and flu shot



Thank You

