

**«INFECTIONS CONTROL IN A GLOBAL PERSPECTIVE»
SURVEILLANCE AND RESPONDING TO OUTBREAKS OF INFECTIOUS DISEASES
IN RESOURCE POOR SETTINGS**

THE MAJOR GLOBAL CHALLENGES

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Spec. Internal medicine and infectious diseases

Diploma course trop medicine/ public health experience



Epidemiology

- Surveillance - How to detect at an early stage
- Outbreak - how to respond timely and appropriately

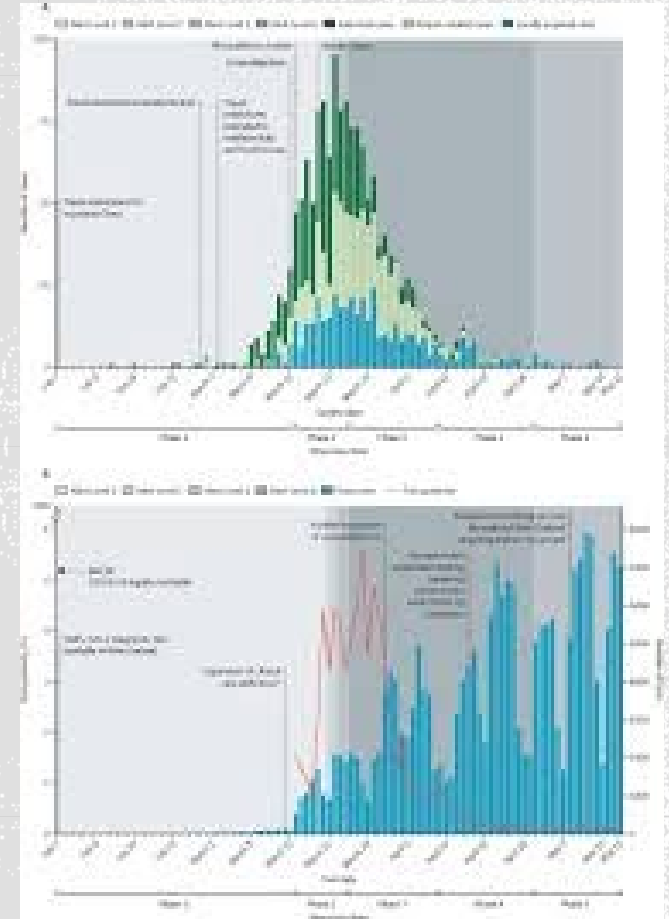
Context

- Why did this patient get this disease at this moment?
- Who else is at risk?
- How can we avoid more people getting sick

- A local outbreak
- The global issues
- Discussions on practical and ethical dilemmas and resource constraints

- And what is actually an epidemic – vs endemic?

WHAT THIS IS COURSE ABOUT?





An intro into some
global issues

Relevant in the
global picture
today



10 December 2015

WHO PUBLISHES LIST OF TOP EMERGING DISEASES LIKELY TO CAUSE MAJOR EPIDEMICS

Scientists and public health experts convened by WHO prioritize the top five to ten emerging pathogens likely to cause severe outbreaks in the near future, and for which few or no medical countermeasures exist.

- **WHO Blueprint for R&D preparedness for potential future outbreaks.**
 - Crimean Congo haemorrhagic fever,
 - Ebola virus disease and Marburg,
 - Lassa fever,
 - MERS and SARS coronavirus diseases,
 - Nipah
 - Rift Valley fever.
- This was just after the world had combatted the Ebola outbreak in West-Africa.



[WHO | WHO publishes list of top emerging diseases likely to cause major epidemics](#)



OSLO IN THE ERA OF THE CHOLERA



Sea men from ships with suspected sick people had to be in quarantine at Hovedøya – one of the island in the Oslo fjord.

There were several cholera outbreaks in Europe and Norway throughout 1800-hundreds.

1817

1833

1850

1853

Oslo had a major cholera outbreak in 1873.

This cholera station was built the year after - in 1874

<https://www.aftenposten.no/oslo/i/g7Aqq0/oslo-foer-i-koleraens-tid-matte-folk-i-karantene-paa-hovedoeya>



PREPARING FOR THE PREVIOUS EPIDEMIC?



The cholera outbreak in 1873 was the last cholera epidemic in Norway.

This place never served as a cholera lasaret, but after some years served as a TB hospital until 1930.

<https://www.aftenposten.no/oslo/i/g7Aqq0/oslo-foer-i-koleraens-tid-maatte-folk-i-karantene-paa-hovedoeya>



At present, the WHO R&D priority diseases are:

- COVID-19
- Crimean-Congo haemorrhagic fever
- Ebola virus disease and Marburg virus disease
- Lassa fever
- Middle East respiratory syndrome coronavirus (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS)
- Nipah and henipaviral diseases
- Rift Valley fever
- Zika
- “Disease X”* - *pathogen currently unknown*

WHO'S R&D BLUEPRINT

[Prioritizing diseases for research and development in emergency contexts \(who.int\)](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/prioritizing-diseases-for-research-and-development-in-emergency-contexts)

Priority diseases



Ebola virus disease



Lassa fever



Crimean-Congo haemorrhagic fever (CCHF)



Middle East respiratory syndrome coronavirus (MERS-CoV)



Nipah and henipaviral diseases



Rift Valley fever (RVF)

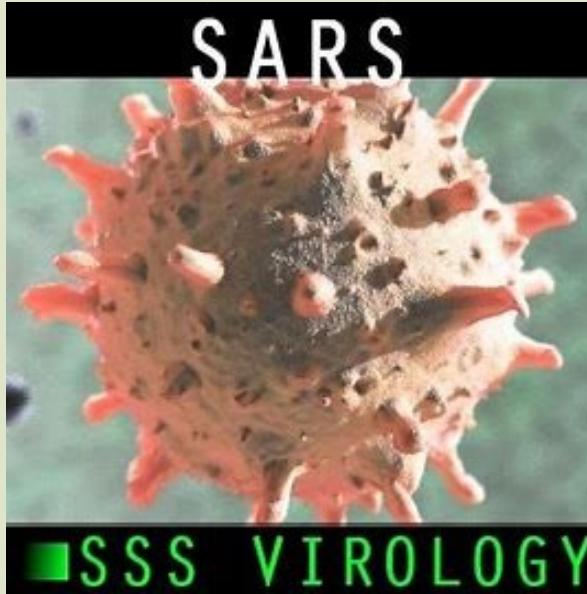
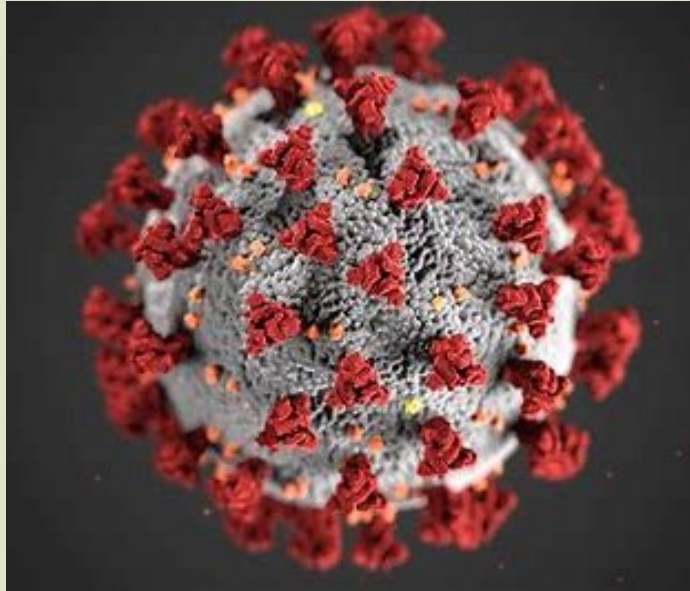


Zika



Coronavirus





**WE ARE LUCKY TO
HAVE GOT THE
COVID 19**

**– SARS WAS MUCH
MORE DEADLY AND
DANGEROUS.**

9 % MORTALITY



WHAT DID WE LEARN FROM THE SARS OUTBREAK?

- In November 2002, doctors in the Guangdong province of southeastern China began to see the first cases of what would become known as SARS, or severe acute respiratory syndrome.



[SARS: how a global epidemic was stopped \(nih.gov\)](#)

[WHO | Severe Acute Respiratory Syndrome \(SARS\) - multi-country outbreak - Update](#)

[SARS Pandemic: How the Virus Spread Around the World in 2003 - HISTORY](#)

[SARS | Basics Factsheet | CDC](#)



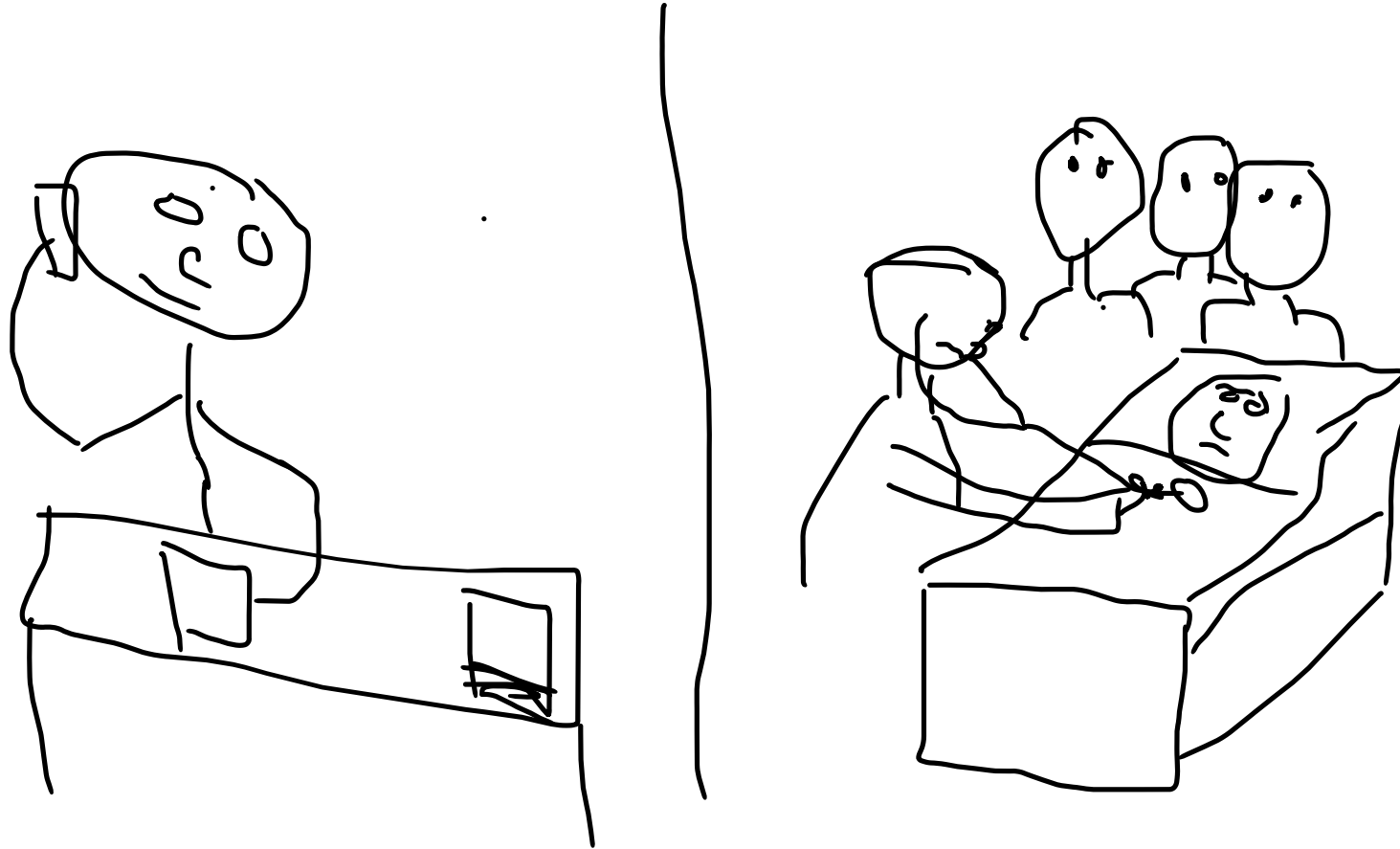
SARS – THE STORY

- SARS was first reported to WHO in Asia in February 2003.
- The reasons for the slow reporting of SARS are complicated.
 - Doctors had never seen the viral illness before - might be atypical pneumonia.
 - Nobody was aware of it, including probably people in Beijing,
 - Even after doctors began to realize that there was something new about the illnesses they were seeing, “it was kept locally for a while, which was one of the problems.”



HANOI – VITENAM

DR. URBANI IN THE LOCAL WHO-OFFICE GOT A PHONECALL ON FEB 28. FROM ONE OF THE HOSPITALS IN TOWN. THEY WERE STRUGGELING WITH A PATIENT WITH A VERY SEREVE PNEUMONIA THAT WAS NOT IMPROVING



- The patient was a businessman that had traveled from US to Vietnam – he had had a stop over at Metropole hotel in Hong Kong.
- What nobody knew at that point, is that the disease already had spread to 5 countries.

Dr. Urbani went to the hospital to examine the patient.

He also noticed that several of the staff members also had cough.

The next day several of the staff members were admitted to the hospital with severe pneumonia.

At the same time Urbani had a report from the Chinese ministry of health that they had an outbreak of a new type of pneumonia – but they said that they had everything under control. – Later they revised that.

Urbani wondered could it be the same disease?

If so – how had this disease traveled from China to Vietnam?

Dr. Urbani went on to warn the regional WHO office.



AT METROPOLE HOTEL IN HONG KONG



1. Fish dealer in Guangdong, China



2. Medical Dr. From Guandong – traveling to Hong Kong



3. Business man traveling to Vietnam



4. Woman, 26 y old E. from Singapore



5. Old lady from Canada



6. Yong man from Hong Kong spent a few hours at the hotel

- Vietnam - 63 infected - 5 deaths
- Singapore - 238 infected - 33 deaths.
- Canada - 251 infected - 43 deaths.
- Hong Kong - 1.755 infected - 299 deaths
- China – 5.327 – 349 deaths

1. A doctor from det Guangdong province in China had treated a fish dealer that had this strange new pneumonia
2. He went to Hong Kong, to attend a wedding. As he arrived in Metrople hotel he started to feel sick.
3. He stayed at the same floor in the hotel as the businessman that traveled on to Vietnam.
4. A young woman from Singapore was in Hong Kong for the weekend, and got sick when she got back to Singapore.
5. An elderly woman that stayed at Metrople hotel traveled home ot Canada a few days later.
6. A 27 years young man from Hong kong, was just visiting a friend at the hotel for a few hours – he gave the start to the sars outbreak in Hong Kong.

Metrople hotel is the first well known mass spreading event in the SARS epidemic.



- Over the next several month:
- **8,096 people** contracted the new viral illness, leading to
- **774 deaths** in
- **26 countries.**

- **On March 15th – WHO sends out a global warning about the new disease and calls it SARS – a long side a warning against travels to the 5 affected countries**
- **In the beginning of April there were serious concerns around the world (including CDC in US) that they would not be able to stop the epidemic, and there was a great fear that it would become global.**
 - **Transmission outside of health care settings**
 - **Outbreak in a religious group in Canada**
 - **Outbreak in an estate building complex in Hong Kong – housing thousands of people.**
- **The turning point was when China decided to be open about their true figures on the disease.**

THE RESULT OF THIS MASS SPREADING EVENT

On March 29th Dr. Urbani – who first reported the outbreak internationally, dies – from SARS.



SARS: HOW A GLOBAL EPIDEMIC WAS STOPPED

- **Three take home messages:**

- **First: “transparency is the best policy”.**

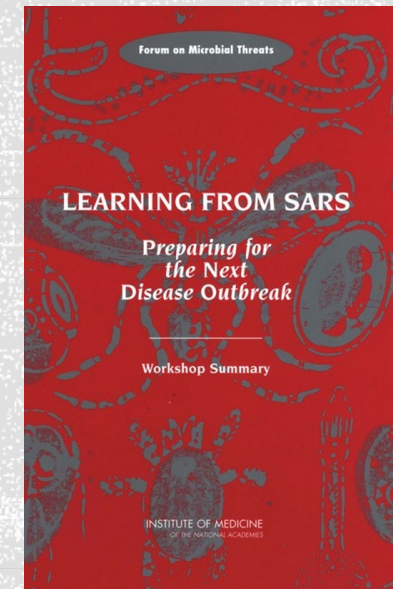
- “one nation’s weak response could endanger the world’s public health security.”

- **Second: “twenty-first century science played a relatively small role in controlling SARS; nineteenth-century techniques continued to prove their value”.**

- during the SARS outbreak in 2003 there was unprecedented collaboration among scientists and laboratories around the world to work together to identify the causative agent, map its genome and develop reliable diagnostic tests.

- **Third: “animal husbandry and marketing practices seriously affect human health”.**

Book published by the WHO Regional Office for the Western Pacific, edited by Dr. Shigeru Umi, who in 2003 was the director of the Division for Combating Communicable Disease in WPRO.



[SARS: how a global epidemic was stopped \(nih.gov\)](https://www.nih.gov/sars)



COVID 19

- Were we prepared when it all started?



- Did we have the global perspective and trust in each other that we needed?



SIMILARITIES AND DIFFERENCES

BELONG TO SAME VIRUS FAMILY – CORONAVIRUSES

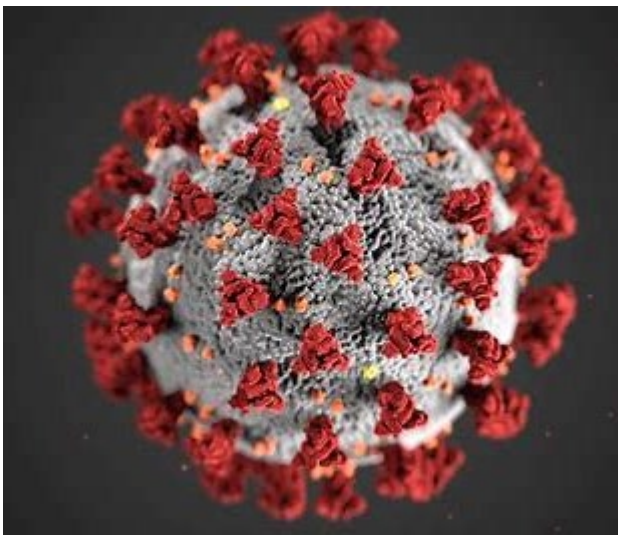
GENETICALLY VERY SIMILAR

SPREADS BY DROPLETS – TO A SMALLER EXTEND BY AIR

Covid 19

Mortality aprox 0,6 – 1 %

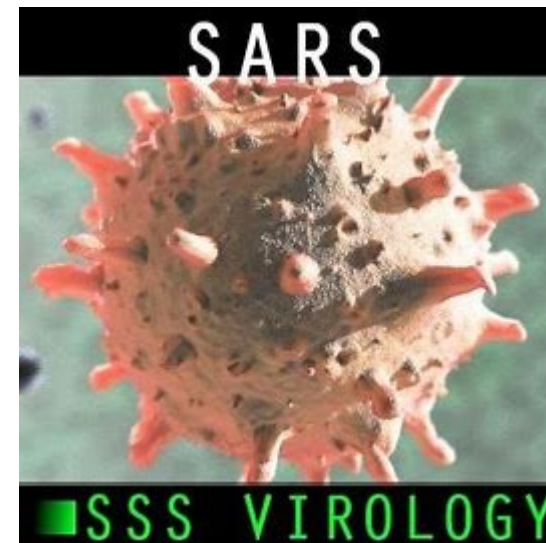
Many asymptomatic cases

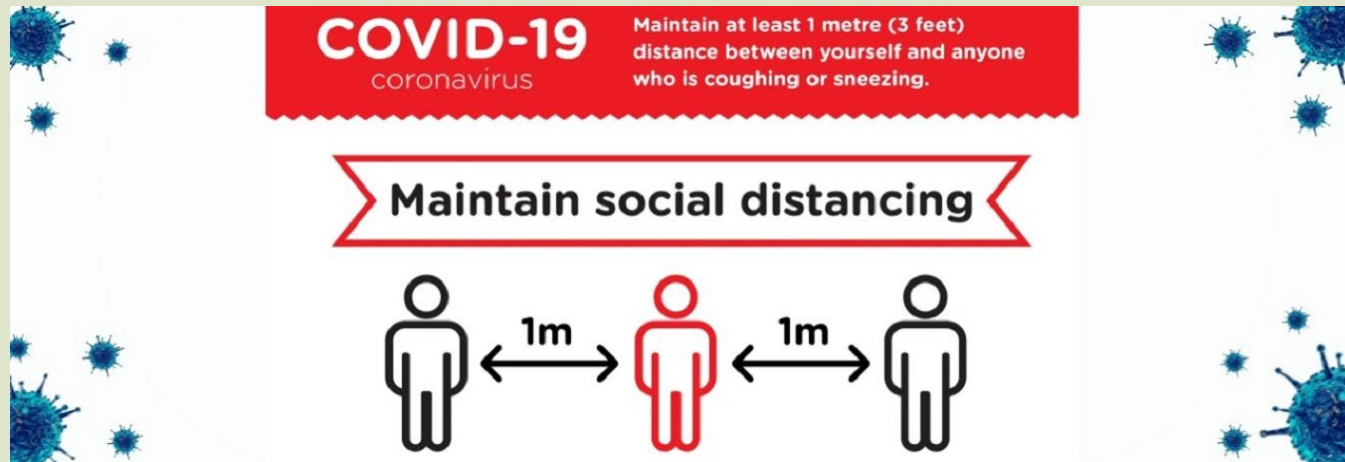


SARS

Mortality – recorded 9%

No known asymptomatic carriers





**DID WE RESPONDE
APPROPIATELY?**

**DID THE RESPONCE
ITSELF MAKE IT
WORSE FOR SOME
PEOPLE?**



ONE SIZE FITS ALL?

Cox Basar Bangladesh – more than one million Rohingya refugees

What infection prevention advises can we give this family?



- On March 24, 2020 Indian Prime Minister Narendra Modi announced a complete nationwide lockdown

- Social Distancing Is a Privilege

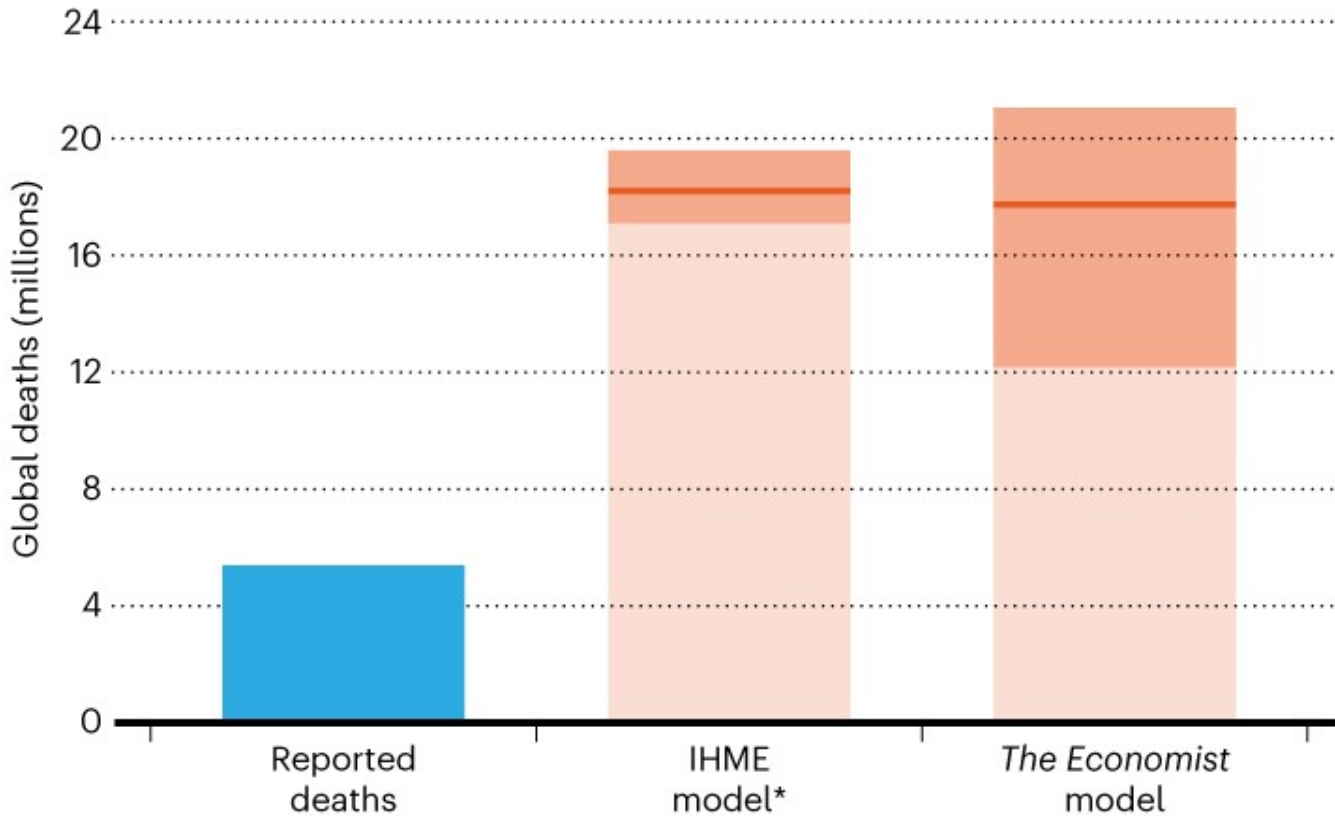
- For a daily laborer in Mumbai, staying home means “my children and my wife will die.”



COVID'S TRUE TOLL

The number of confirmed deaths (blue bar) caused by COVID-19 is far smaller than tallies of 'excess deaths' (pink bars), which are those above what is expected, during the pandemic.

— Excess deaths estimate ■ 95% confidence interval



[Estimating excess mortality due to the COVID-19 pandemic: a systematic analysis of COVID-19-related mortality, 2020–21 - The Lancet](#)

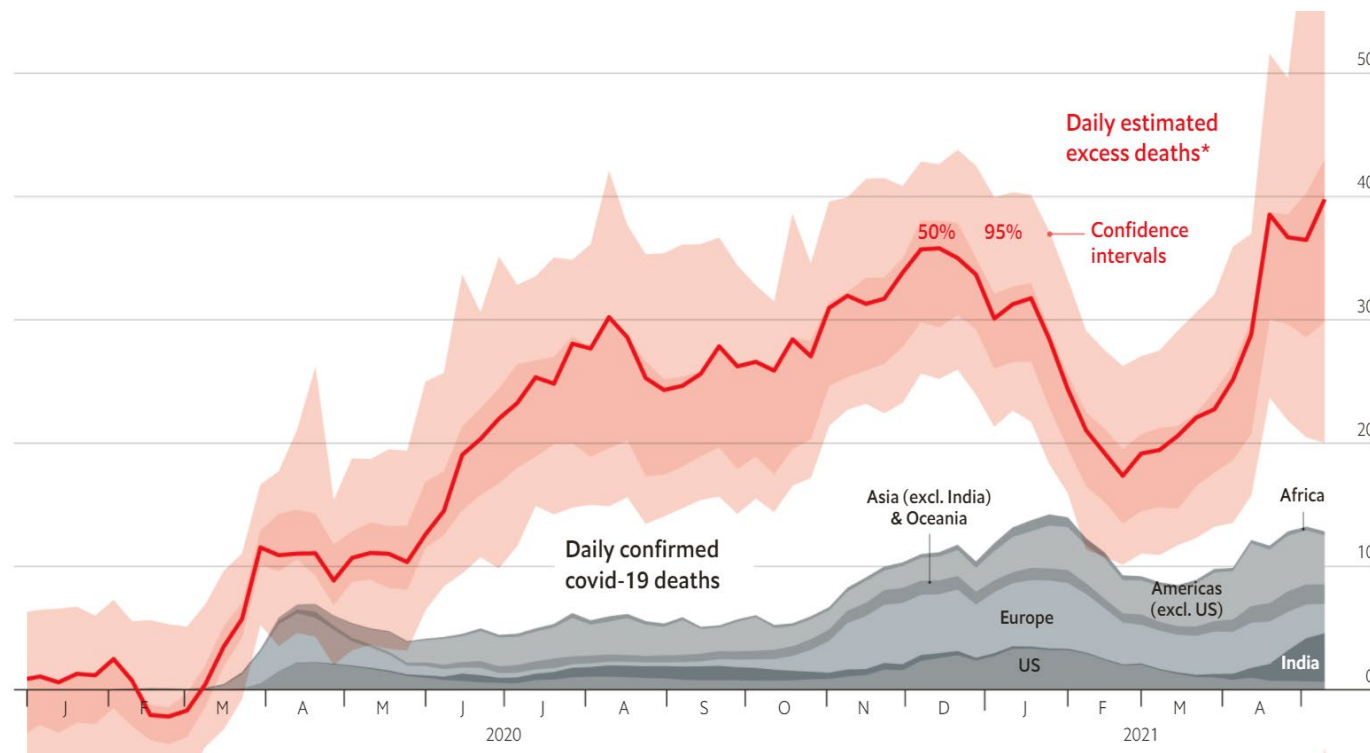
[COVID's true death toll: much higher than official records \(nature.com\)](#)

Health Metrics and Evaluation (IHME)



Grey – registered Covid deaths

- Expected death rate – the 0-line
- Pink – 50% and 95% confidence interval



7-13 MILLION EXCESS DEATHS DURING THE PANDEMIC

Sources: Johns Hopkins University CSSE;

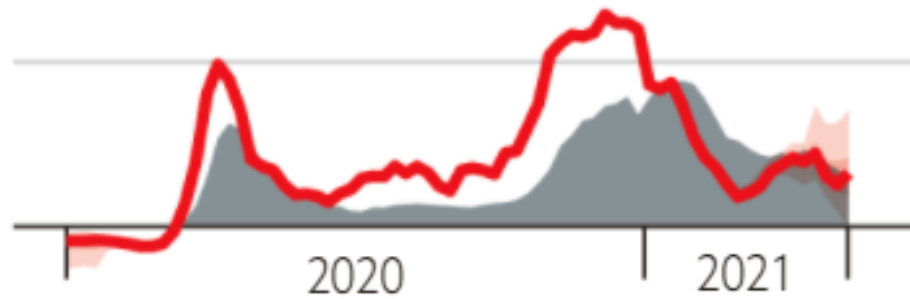
[There have been 7m-13m excess deaths worldwide during the pandemic | The Economist](#)

[How we estimated the true death toll of the pandemic | The Economist](#)

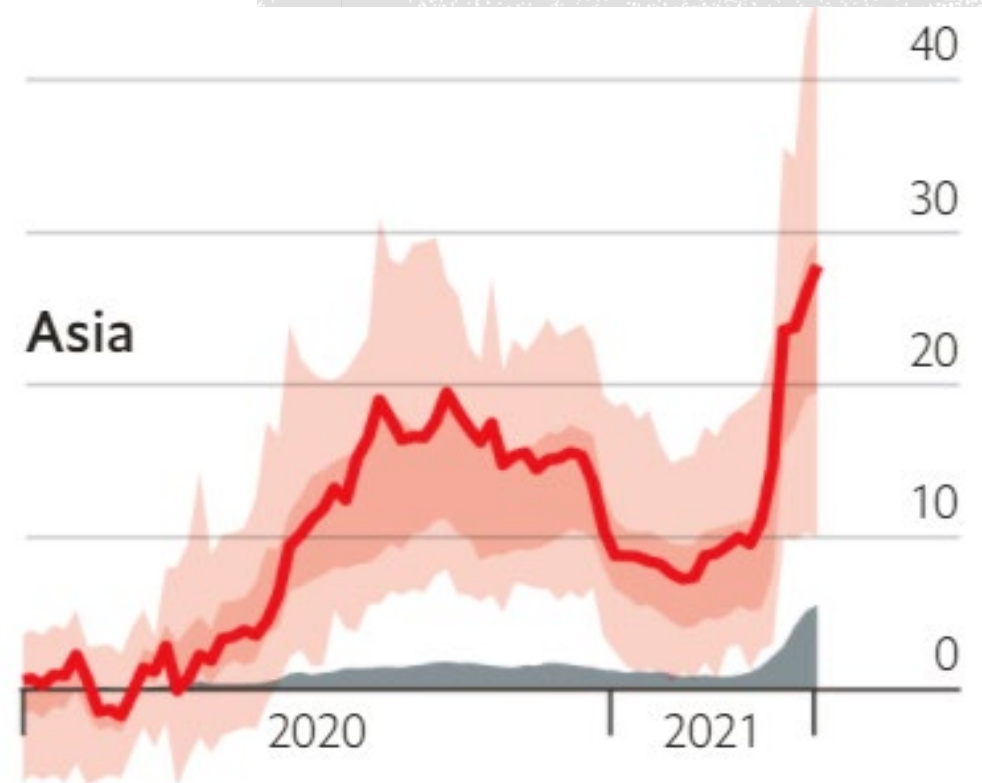
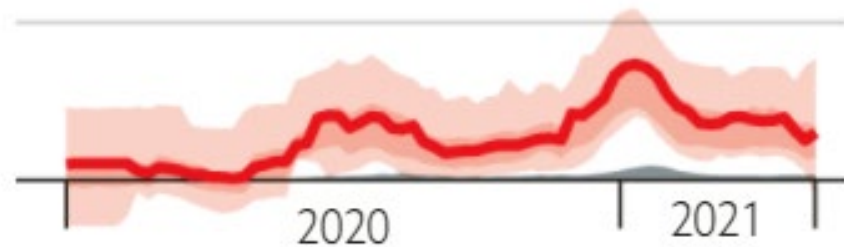
[Coronavirus Pandemic \(COVID-19\) - Statistics and Research - Our World in Data](#)



Europe, United States, Canada & Oceania



Africa



*Deaths relative to expected deaths in normal years

[There have been 7m-13m excess deaths worldwide during the pandemic | The Economist](#)

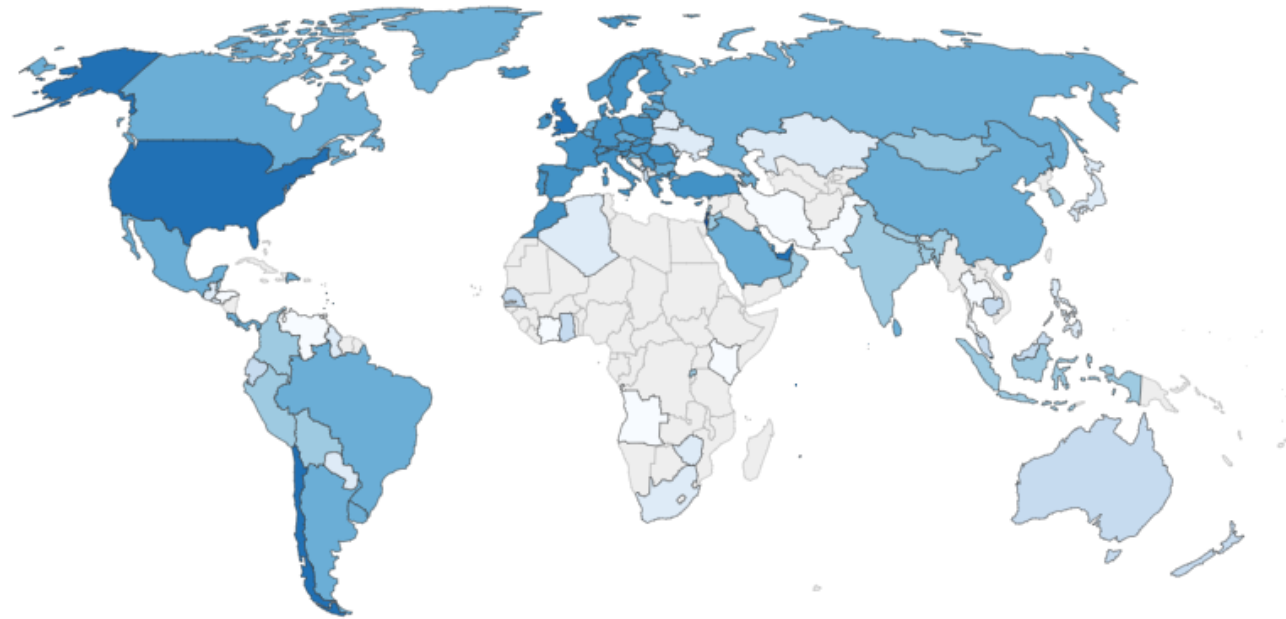


Cumulative COVID-19 vaccination doses administered per 100 people, Mar 13, 2021

Our World
in Data

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).

World



Source: Official data collated by Our World in Data - Last updated 14 March, 10:14 (London time)

CC BY

▶ Dec 13, 2020



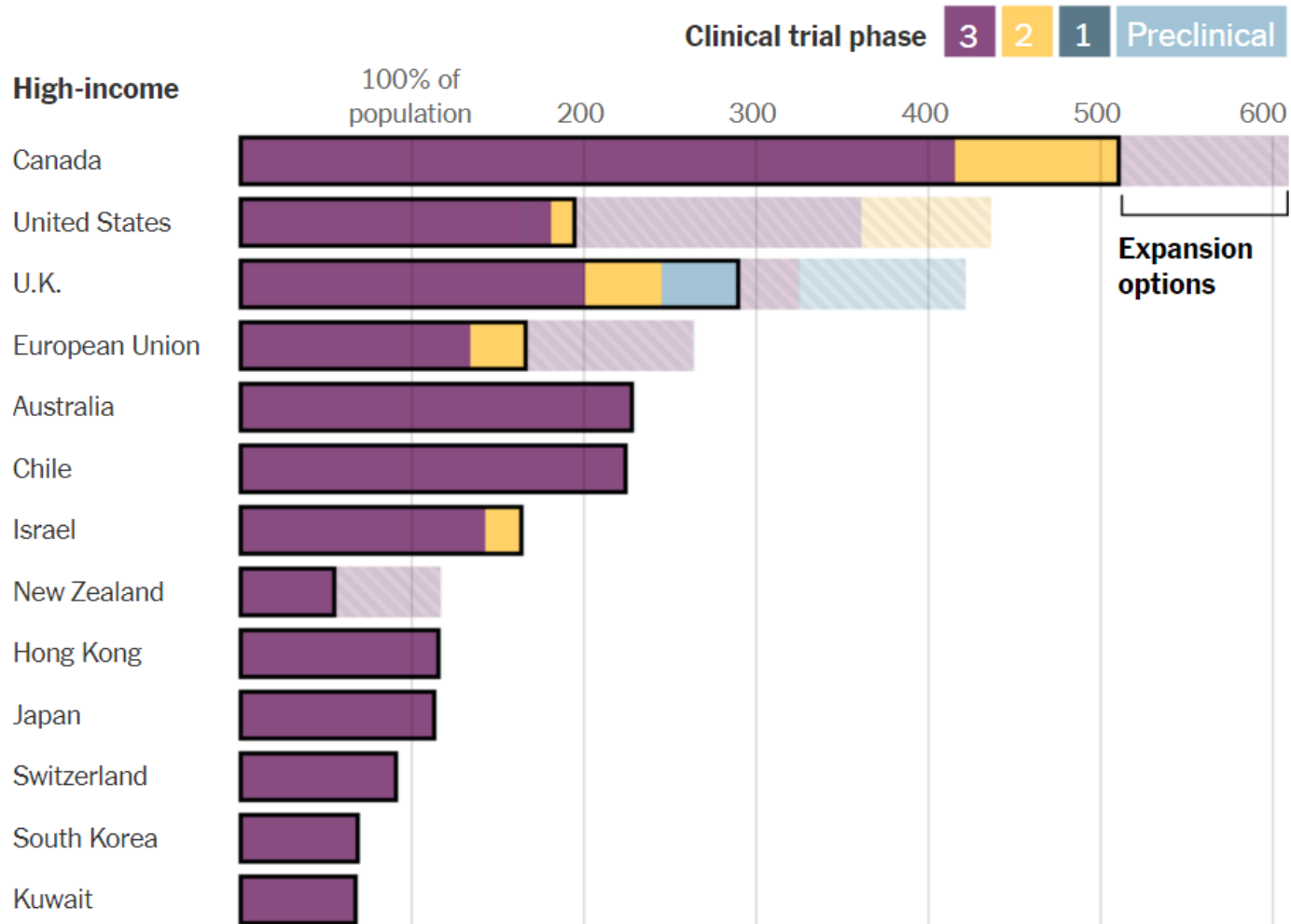
○ Mar 13, 2021

MAP OVER VACCINE COVERAGE IN THE WORLD

[Coronavirus \(COVID-19\)
Vaccinations - Statistics and
Research - Our World in Data](#)



Vaccine preorders as a percentage of population



VACCINE PREORDERS



Workers packing the Covishield coronavirus vaccine at the Serum Institute of India in Pune last month. Credit...Atul Loke for The New York Times

[With First Dibs on Vaccines, Rich Countries Have 'Cleared the Shelves' - The New York Times \(nytimes.com\)](https://www.nytimes.com/2020/12/16/health/covid-19-vaccine-preorders.html)



69 million children in the world are not in school.

- Closed schools for a long period of time.
 - 40 % of children in East- and southern Africa are not in school.
- The most vulnerable children have often had the longest period of closed schools. These children don't ever make it back to school.....
- They are in the streets working. Is that good infection prevention?



CLOSED SCHOOLS

[Repeated school closures due to COVID-19 leading to learning loss and widening inequities in South Asia, UNICEF research shows](#)

[40 per cent of children in Eastern and Southern Africa are not in school \(unicef.org\) 27.07.21](#)

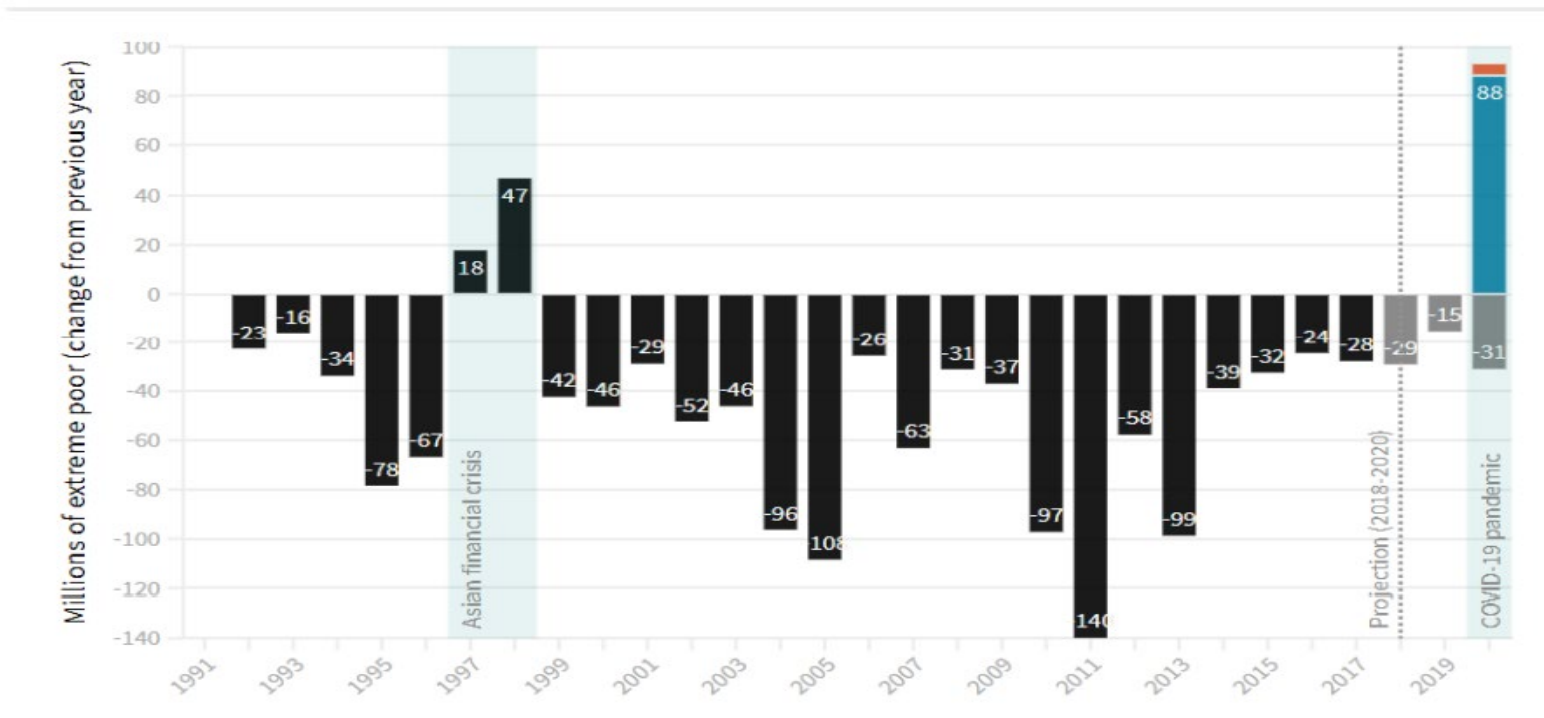


UNITED NATIONS DEVELOPMENT PROGRAMME - Human Development Reports

«Covid-19 have reversed progress in many countries. We still don't know the scale of the effect for the pandemic».

- 1,3 billion people live in extreme poverty at the end of 2020.
 - 119 - 124 million more poor people during 2020.

Figure 1: Annual change in the number of extreme poor (in million), 1992-2020



INCREASED POVERTY

[Nye FN-tall: 1,3 milliarder svært fattige i verden \(bistandsaktuelt.no\)](https://www.bistandsaktuelt.no)

[The 2021 Global Multidimensional Poverty Index \(MPI\) | Human Development Reports \(undp.org\)](https://www.undp.org)

[Mahler Paper.pdf \(un.org\)](https://www.un.org)

Definition:

«**multidimensional poverty**» Looks at access to health care, education, access to good housing, electricity, clean water and sanitation. More accurate measure for extreme poverty than living for less than 1,9 dollars a day. utgangspunkt i fattige mennesker



RISING PRICES

- Global food prices rose 'sharply' during 2021 - UN
- Crude oil prices increased in 2021 as global crude oil demand outpaced supply - U.S. Energy Information Administration
- Soaring fertilizer prices add to inflationary pressures and food security concerns – World Bank



[Global food prices rose 'sharply' during 2021 | UN News](#)

[Crude oil prices increased in 2021 as global crude oil demand outpaced supply - Today in Energy - U.S. Energy Information Administration \(EIA\)](#)

[Soaring fertilizer prices add to inflationary pressures and food security concerns \(worldbank.org\)](#)

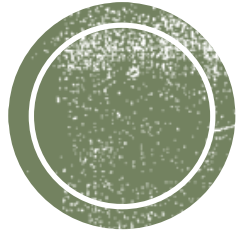


THE WAY FORWARD?

«Be sure to wash your hands and all will be well!»

Poor handling of the pandemic:

- Uneven access to vaccines and health care
- Covid 19 have broken down already fragile health systems
- Rupture of routine vaccination programs
- Increasing vaccine hesitancy



Risk of new pandemics?

Climate changes.

Increased uneven distribution of wealth – increased poverty – risk of war and instability.

- More refugees: 82 million
(42 million i 2012)

