HARVARD T.H. CHAN
SCHOOL OF PUBLIC HEALTH
Department of Global Health and Population

SPSAS Epidemic Preparedness

São Paulo, Brazil - July 10-22, 2023

Covid-19 in Brazil

Social, environmental, demographic, political, and health systems aspects

MARCIA CASTRO

mcastro@hsph.harvard.edu

Lecture goal

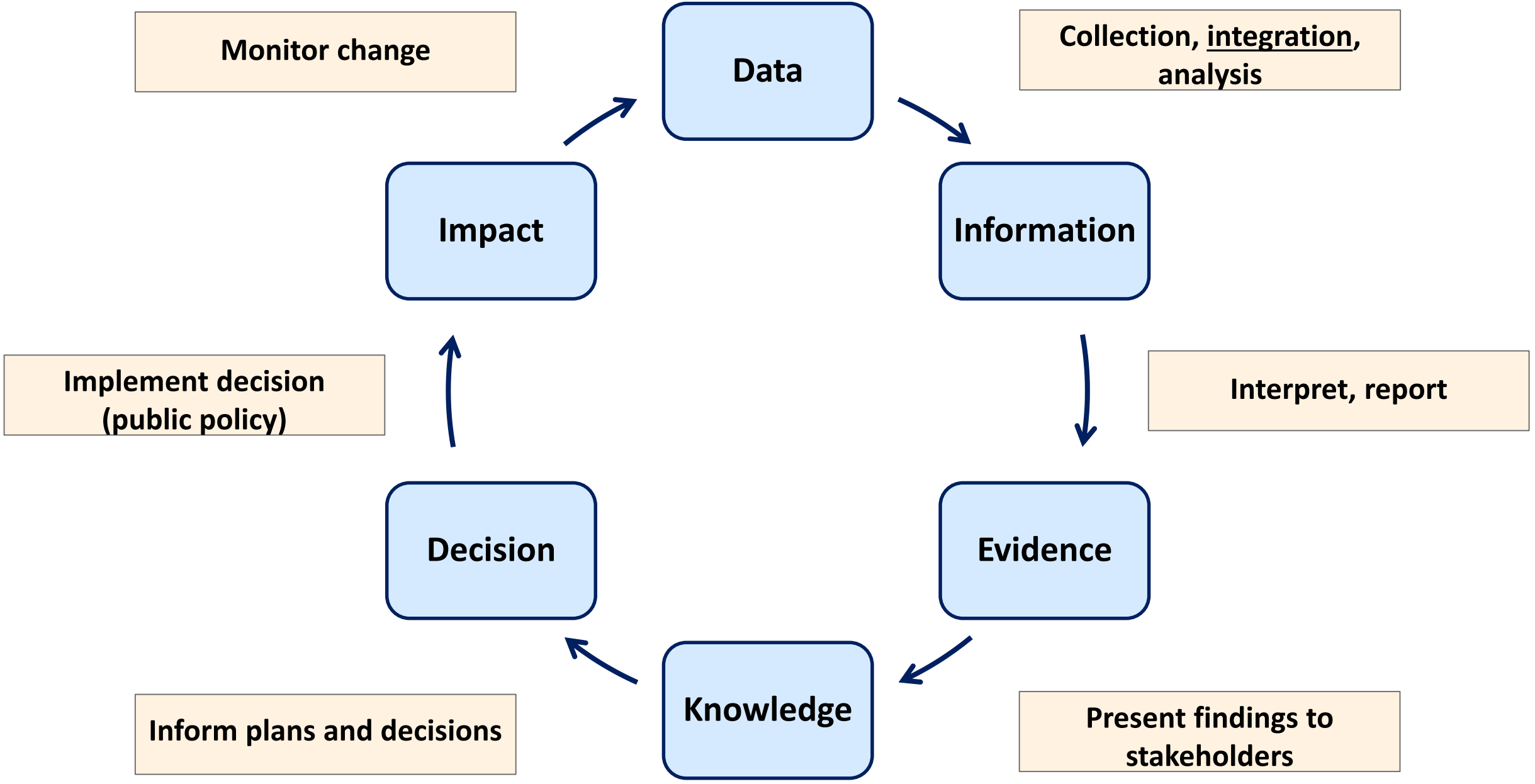
- Discuss data as an intervention and the human rights-based approach to data
- Present the case of Covid-19 in Brazil considering the social determinants of health framework

Outline

- Data for action
- Covid-19 in Brazil

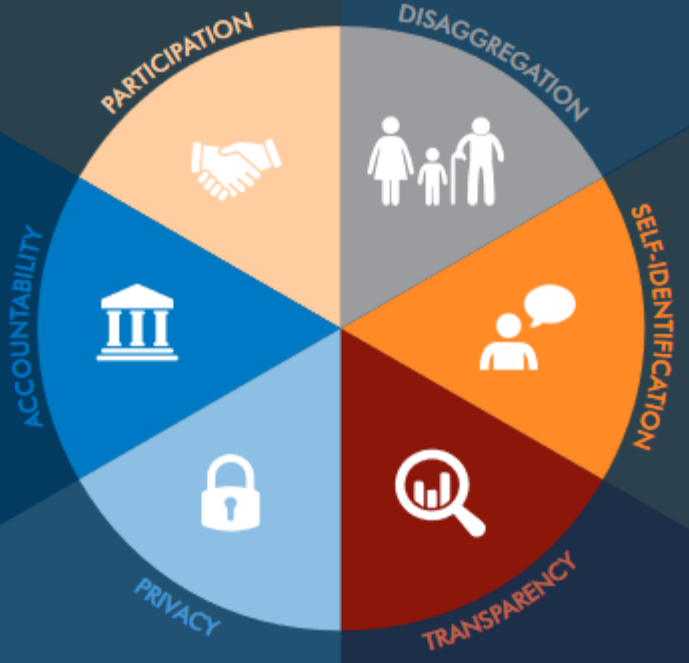
"What gets measured gets done"

Dr. Margaret Chan, Former Director-General of the World Health Organization


Monitor change
Data
Collection, integration, analysis
Impact
Information
Implement decision (public policy)
Interpret, report
Decision
Evidence
Inform plans and decisions
Knowledge
Present findings to stakeholders

A HUMAN RIGHTS-BASED APPROACH TO DATA

LEAVING NO ONE BEHIND IN THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT



UNITED NATIONS HUMAN RIGHTS
OFFICE OF THE HIGH COMMISSIONER

SUSTAINABLE DEVELOPMENT GOALS

" We can only monitor progress if we have data that is disaggregated by sex, age, race, ethnicity, income, migration status, disability and other characteristics relating to the grounds of discrimination prohibited by human rights law. Only if we track progress for different population groups, in all countries, can we ensure that no one is indeed being left behind."

Zeid Ra'ad Al Hussein
United Nations High Commissioner for Human Rights

DATA DISAGGREGATION

Disaggregation of data allows data users to compare population groups, and to understand the situations of specific groups. Disaggregation requires that data on relevant characteristics are collected

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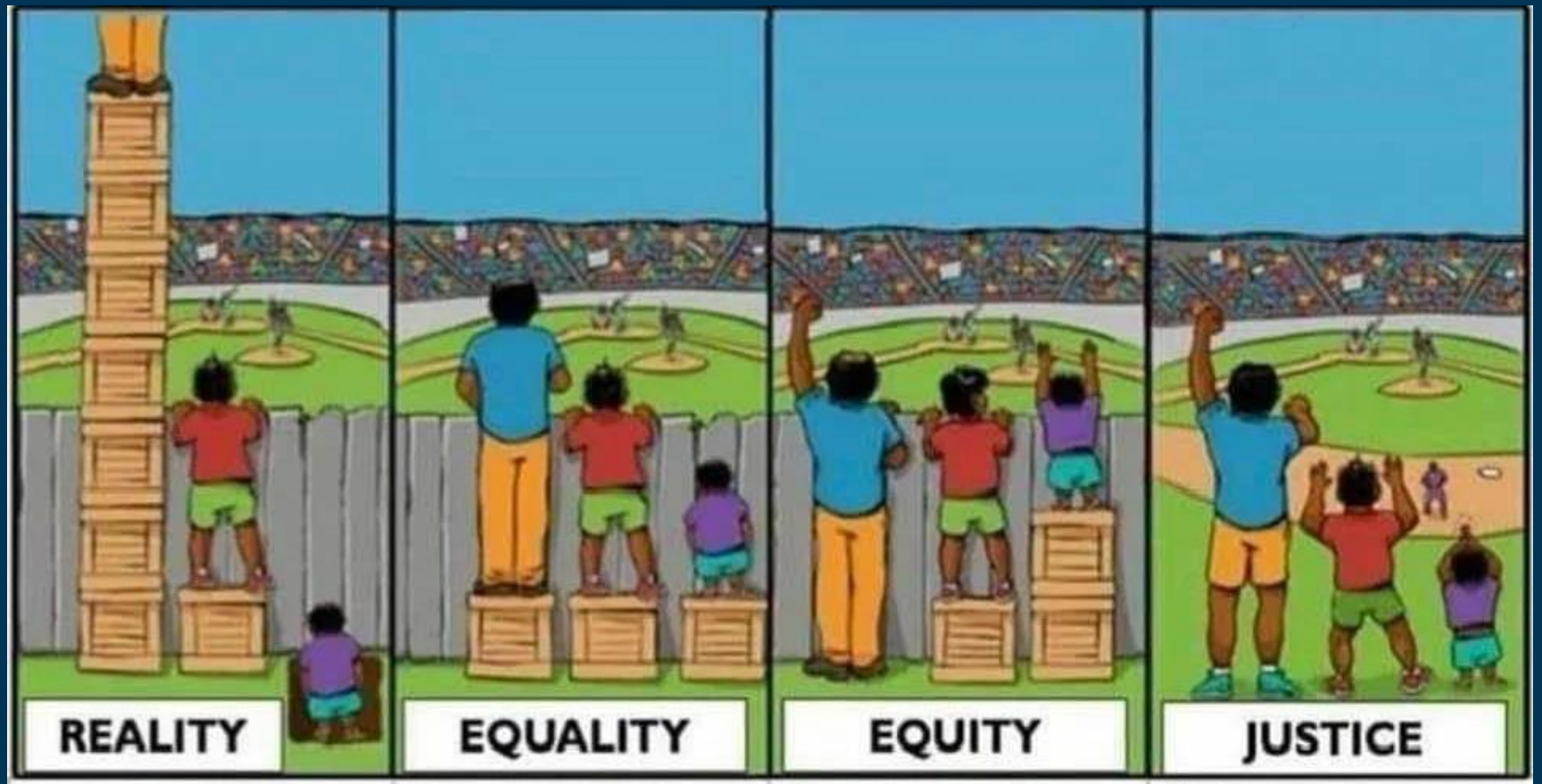


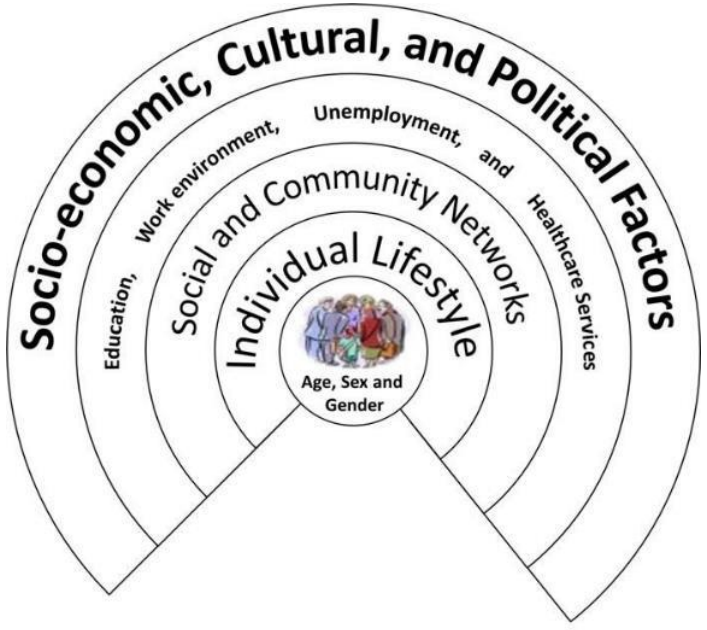
One gets more than is needed, while the other gets less than is needed. Thus, a huge disparity is created.	The assumption is that everyone benefits from the same supports. This is considered to be equal treatment.	Everyone gets the support they need, which produces equity.	All 3 can see the game without supports or accommodations because the cause(s) of the inequity was addressed. The systemic barrier has been removed.

Human rights-based approach to public health

COVID-19 & SOCIAL DETERMINANTS OF HEALTH

Not everyone has been affected equally by the pandemic. The social determinants of health affect not only who gets sick (pink) but everyone in the community during this unprecedented time.

The pandemic is exacerbating the impact of these inequities, particularly for communities who are already under-resourced and experiencing barriers.



FOOD SECURITY

Challenges going to the grocery store (single parent families with no child care, seniors living alone)

Ability to afford food (fixed income seniors, families on ODSP)

HOUSING

Space to adequately isolate

Paying rent & threat of eviction

Exposure to extreme heat

Lack of quiet places to study/work

ENVIRONMENT & SAFETY

Higher risk of exposure due to job type

Need for PPE (especially masks) and training

INCOME & JOB SECURITY

Fear of losing one's job

Loss of income from taking time off

CERB supports ending

Cost of additional expenses like WiFi & technology

ACCESS TO HEALTHCARE

Distrust of the healthcare system

Need for additional mental health supports during isolation

Lack of support for people who are undocumented

SOCIAL ISOLATION

Mental well-being during isolation

Increased stress and anxiety

Grief and loss (disproportionate # of deaths in this community)

Isolated from social supports who can help with childcare

Loss of in-person community services

CULTURE & LANGUAGE

Access to public health information in spoken language

Influence of cultural practices & customs

Cultural and religious centres closed or reduced capacity

TRANSPORTATION

Testing sites are too far for people without a vehicle

Fear of taking transit, crowded buses

Physical mobility barriers

HEALTH COMMONS SOLUTIONS LAB

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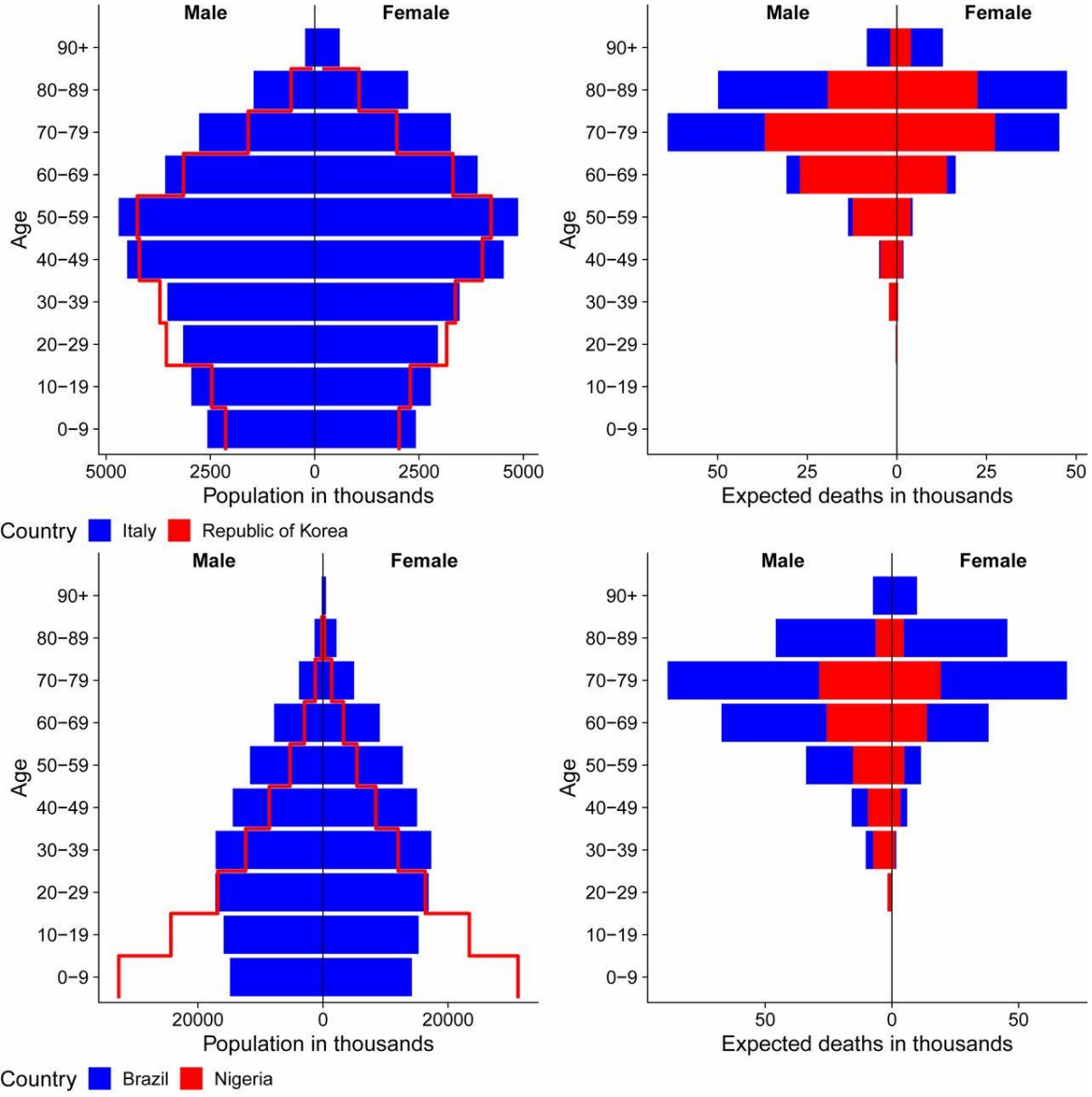
The problem of considering only one variable

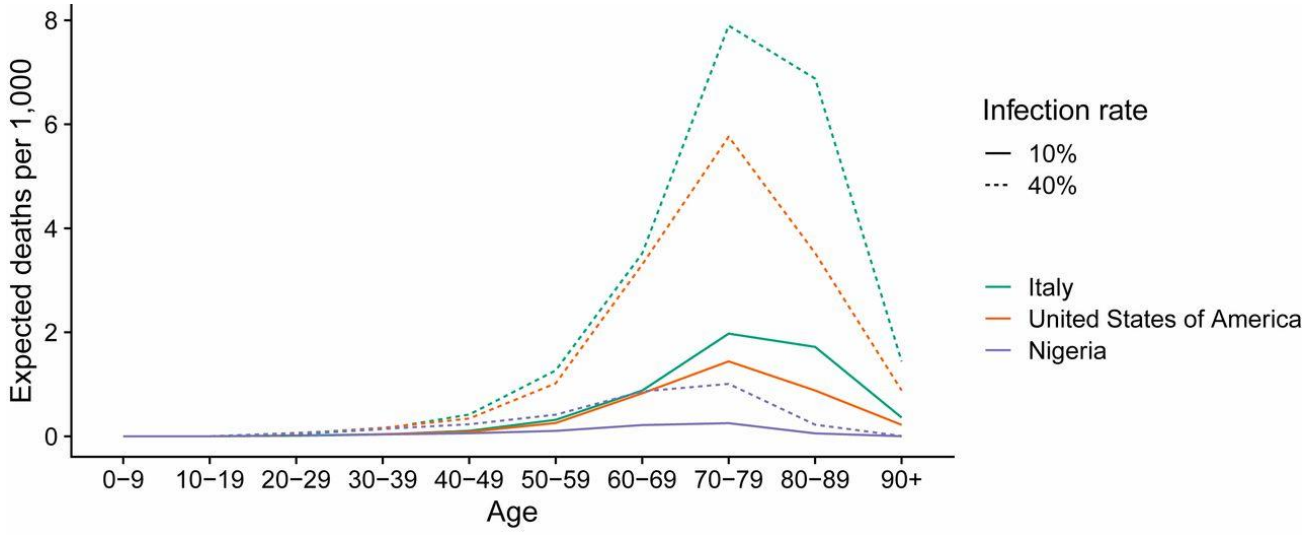
Age structure and expected COVID deaths - Nigeria and Brazil



Demographic science aids in understanding the spread and fatality rates of COVID-19

Jennifer Beam Dowd, Liliana Andriano, David M. Brazel, +4, and Melinda C. Mills Authors Info & Affiliations

Expected deaths by total population for Italy, the United States, and Nigeria, with different levels of population infection and current age-specific fatality rates from Italy



Dowd et al. PNAS 2020;117:18:9696-9698

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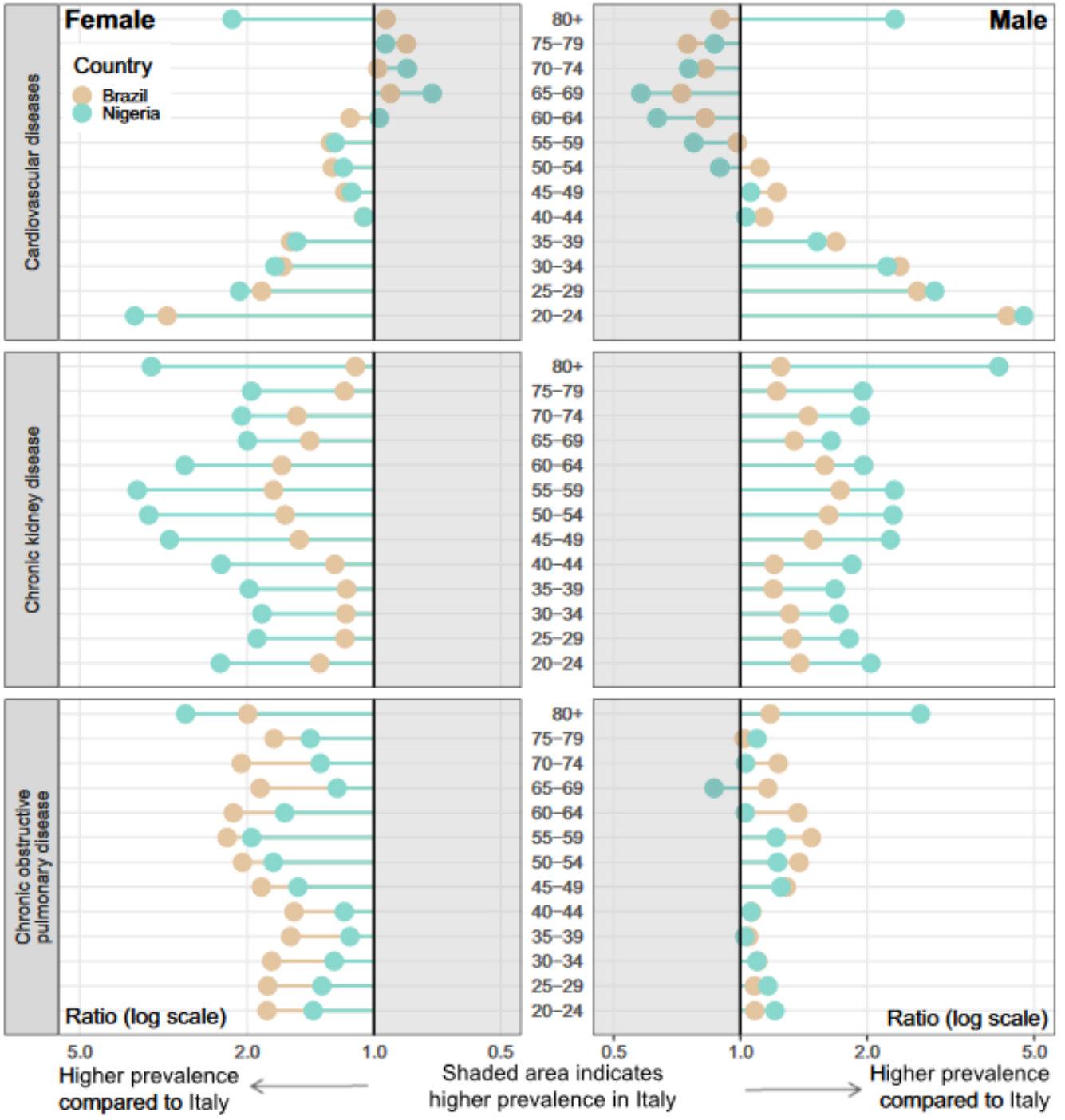
Besides population age structure, health and other demographic factors can contribute to understanding the COVID-19 burden

Marília R. Nepomuceno[a,1], Enrique Acosta[b,1], Diego Alburez-Gutierrez[c], José Manuel Aburto[d,e,f], Alain Gagnon[g,h], and Cássio M. Turra[i]

www.pnas.org/cgi/doi/10.1073/pnas.2008760117

"…the burden of chronic diseases has the potential to offset the possible benefits of younger populations with different epidemiological characteristics."

"Besides chronic diseases, other potential factors include population density, household size and composition, hygienic and sanitary conditions, access to healthcare services, case notification systems, migration and displacement patterns, interregional inequalities, labor-market structure, economic disparities and welfare programs, endemic and other epidemic diseases, early-life conditions, epigenetic mechanisms, and immunosenescence."



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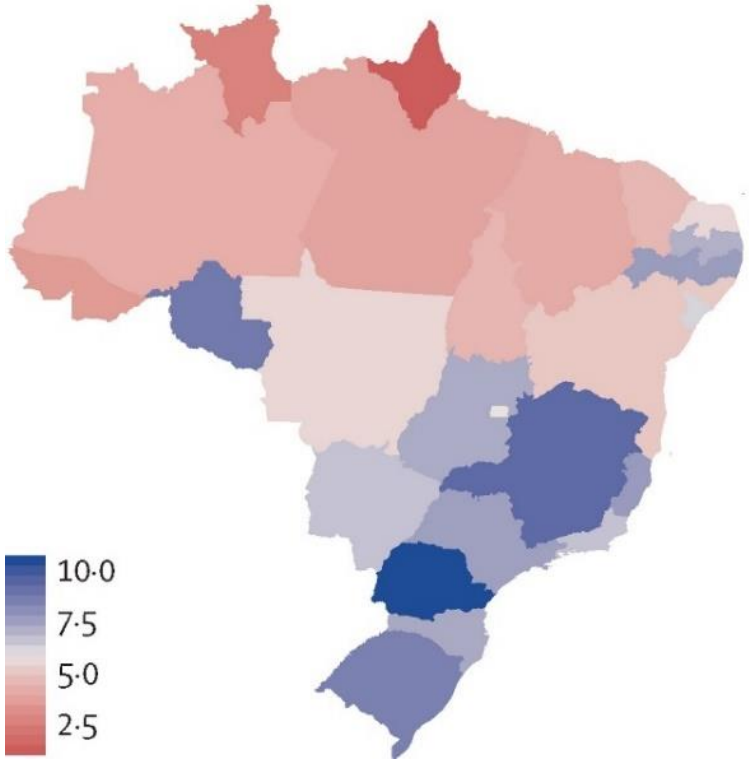
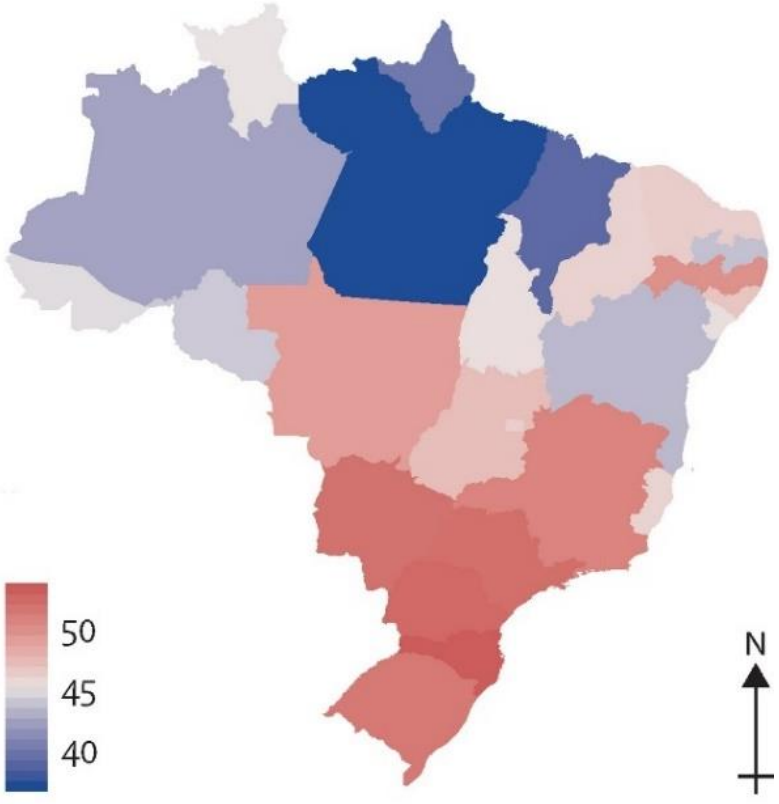
Effect of socioeconomic inequalities and vulnerabilities on health-system preparedness and response to COVID-19 in Brazil: a comprehensive analysis

Rudi Rocha, Rifat Atun, Adriano Massuda, Beatriz Rache, Paula Spinola, Letícia Nunes, Miguel Lago, Marcia C Castro

Adult ICU beds per 100 000 residents

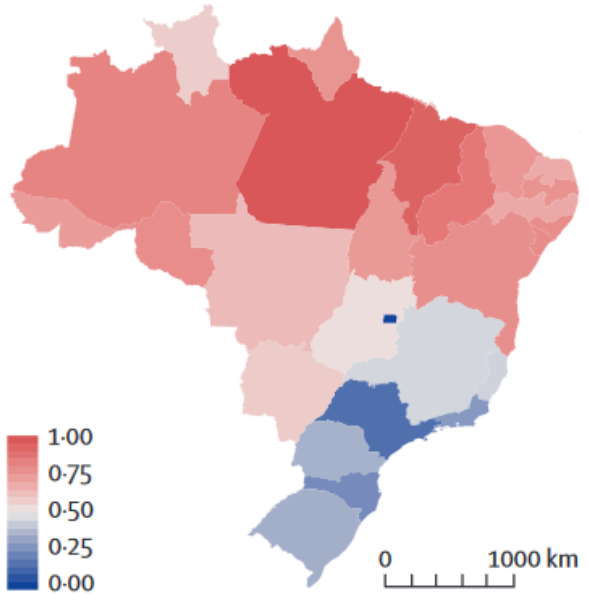


Proportion of population with health risk factors (%)



*"In Brazil, **existing socioeconomic inequalities, rather than age, health status, and other risk factors for COVID-19**, have affected the course of the epidemic, with a disproportionate adverse burden on states and municipalities with high socioeconomic vulnerability."*

Socioeconomic vulnerability index



The Lancet Global Health 2021 9e782-e792DOI: (10.1016/S2214-109X(21)00081-4)

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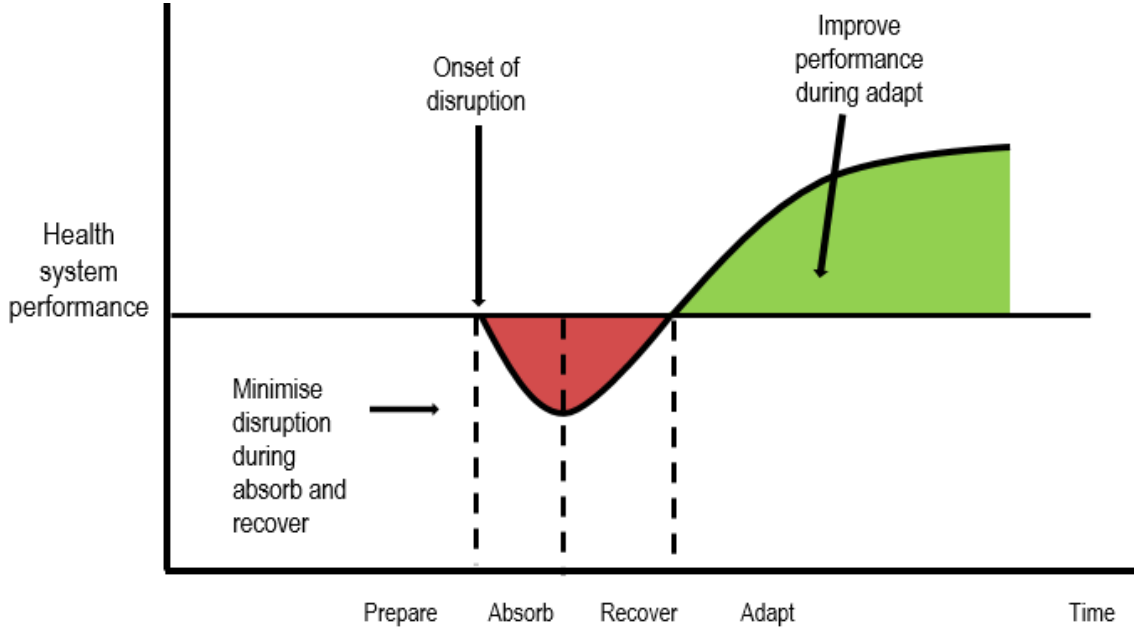
The importance of the health system

Health Systems

- Structure
- Governance
- Resources
- Resilience
  - *Resilient health systems plan and are ready for shocks, such as pandemics, economic crises or the effects of climate change. They are able to minimize the negative consequences of crises, recover as quickly as possible, and adapt to become better performing and more prepared.*



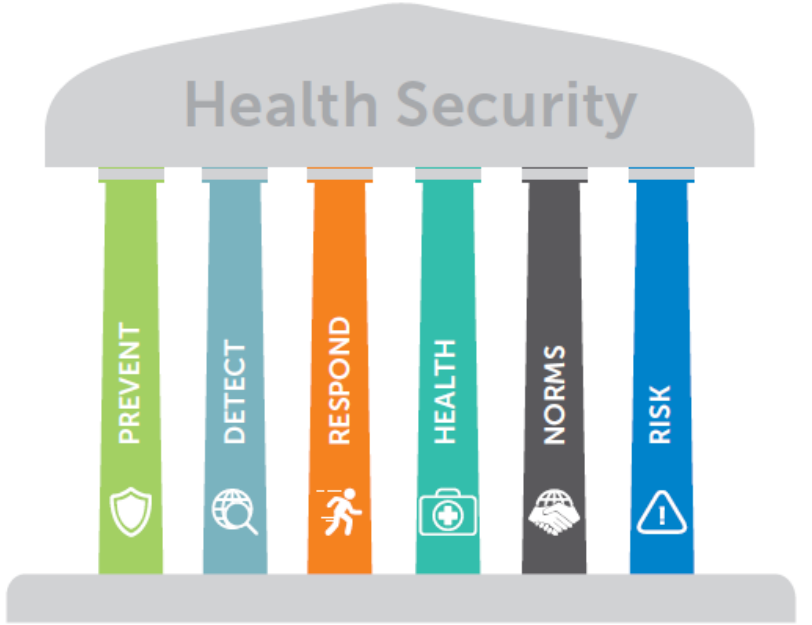
https://www.oecd.org/health/health-systems-resilience.htm

GHS INDEX
GLOBAL HEALTH SECURITY INDEX

2019

OVERALL SCORE			1. PREVENTION OF THE EMERGENCE OR RELEASE OF PATHOGENS			2. EARLY DETECTION & REPORTING FOR EPIDEMICS OF POTENTIAL INTERNATIONAL CONCERN			3. RAPID RESPONSE TO AND MITIGATION OF THE SPREAD OF AN EPIDEMIC		
Rank		Score	Rank		Score	Rank		Score	Rank		Score
1	United States	83.5	1	United States	83.1	1	United States	98.2	1	United Kingdom	91.9
2	United Kingdom	77.9	2	Sweden	81.1	2	Australia	97.3	2	United States	79.7
3	Netherlands	75.6	3	Thailand	75.7	2	Latvia	97.3	3	Switzerland	79.3
4	Australia	75.5	4	Netherlands	73.7	4	Canada	96.4	4	Netherlands	79.1
5	Canada	75.3	5	Denmark	72.9	5	South Korea	92.1	5	Thailand	78.6
6	Thailand	73.2	6	France	71.2	6	United Kingdom	87.3	6	South Korea	71.5
7	Sweden	72.1	7	Canada	70.0	7	Denmark	86.0	7	Finland	69.2
8	Denmark	70.4	8	Australia	68.9	7	Netherlands	86.0	8	Portugal	67.7
9	South Korea	70.2	9	Finland	68.5	7	Sweden	86.0	9	Brazil	67.1
10	Finland	68.7	10	United Kingdom	68.3	10	Germany	84.6	10	Australia	65.9
11	France	68.2	11	Norway	68.2	11	Spain	83.0	11	Singapore	64.6
12	Slovenia	67.2	12	Slovenia	67.0	12	Brazil	82.4	12	Slovenia	63.3
13	Switzerland	67.0	13	Germany	66.5	13	Lithuania	81.5	13	France	62.9
14	Germany	66.0	14	Ireland	63.9	13	South Africa	81.5	14	Sweden	62.8
15	Spain	65.9	15	Belgium	63.5	15	Thailand	81.0	15	Spain	61.9
16	Norway	64.6	16	Brazil	59.2	16	Italy	78.5	16	Malaysia	61.3
17	Latvia	62.9	17	Kazakhstan	58.8	17	Greece	78.4	17	Canada	60.7
18	Malaysia	62.2	18	Austria	57.4	18	Ireland	78.0	18	Chile	60.2
19	Belgium	61.0	19	South Korea	57.3	19	Estonia	77.6	19	Denmark	58.4
20	Portugal	60.3	20	Turkey	56.9	20	Mongolia	77.3	20	Norway	58.2
21	Japan	59.8	21	Armenia	56.7	21	France	75.3	21	New Zealand	58.1
22	Brazil	59.7	22	Hungary	56.4	22	Georgia	75.0	22	Madagascar	57.8
23	Ireland	59.0	23	Chile	56.2	23	Argentina	74.9	23	South Africa	57.7
24	Singapore	58.7	23	Singapore	56.2	24	Saudi Arabia	74.4	24	Micronesia	56.9
25	Argentina	58.6	25	Latvia	56.0	25	Albania	74.3	25	Uganda	56.5
26	Austria	58.5	26	Croatia	55.2	26	El Salvador	73.9	26	Armenia	55.5
27	Chile	58.3	27	New Zealand	55.0	27	Slovenia	73.7	27	Serbia	55.1
28	Mexico	57.6	28	Greece	54.2	28	Austria	73.2	28	Germany	54.8
29	Estonia	57.0	29	Ecuador	53.9	28	Malaysia	73.2	29	Latvia	54.7

PILLARS OF HEALTH SECURITY



The GHS Index is organized by six categories aimed at assessing country capability to prevent, detect, and respond to biological threats as well as factors that can hinder or enhance that capability such as health systems, norms, and risks.

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OVERALL SCORE

Rank	Country	Score
1	United States of America	75.9
2	Australia	71.1
3	Finland	70.9
4	Canada	69.8
5	Thailand	68.2
6	Slovenia	67.8
7	United Kingdom	67.2
8	Germany	65.5
9	South Korea	65.4
10	Sweden	64.9
11	Netherlands	64.7
12	Denmark	64.4
13	New Zealand	62.5
=14	France	61.9
=14	Latvia	61.9
16	Armenia	61.8
17	Spain	60.9
18	Japan	60.5
19	Norway	60.2
20	Bulgaria	59.9
21	Lithuania	59.5
22	Belgium	59.3
23	Switzerland	58.8
24	Singapore	57.4
25	Mexico	57.0

3. RAPID RESPONSE TO AND MITIGATION OF THE SPREAD OF AN EPIDEMIC

Rank	Country	Score
1	Finland	70.7
2	Thailand	67.3
3	United States of America	65.7
4	South Korea	65.0
5	Switzerland	64.9
=6	Mexico	64.8
=6	United Kingdom	64.8
8	Panama	63.5
9	South Africa	62.0
10	Australia	61.6
11	Malaysia	61.4
12	Singapore	61.3
13	Slovenia	59.9
=14	Chile	59.5
=14	Japan	59.5
16	Lithuania	58.7
17	Netherlands	58.2
18	Norway	57.5
=19	Armenia	56.3
=19	Brazil	56.3
=19	Germany	56.3
22	Estonia	56.2
23	Qatar	55.2
24	Spain	54.6
25	Suriname	54.5

2021 GHS INDEX
GLOBAL HEALTH SECURITY INDEX

The 2021 Global Health Security (GHS) Index finds that despite significant steps taken by countries to respond to the COVID-19 pandemic, all countries remain dangerously unprepared to meet future epidemic and pandemic threats.

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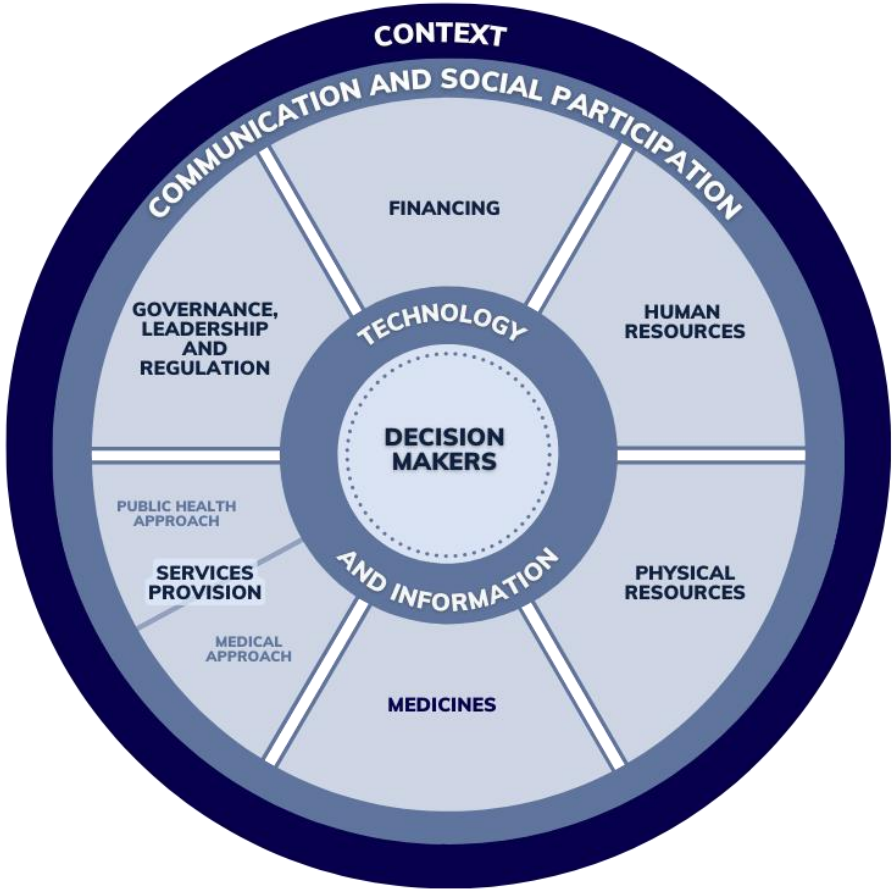
Health systems resilience: is it time to revisit resilience after COVID-19?

Marco Antonio Catussi Paschoalotto [a,b,*], Eduardo Alves Lazzari [a,b], Rudi Rocha [b], Adriano Massuda [b], Marcia C. Castro [c]

[a] David Rockefeller Center for Latin American Studies, Harvard University, USA
[b] Sao Paulo School of Business Administration, Fundação Getúlio Vargas, Brazil
[c] Harvard T.H. Chan School of Public Health, Harvard University, USA

Social Science & Medicine 320 (2023) 115716



"… system-based approach with technology and information systems playing an important role to connect the decision-makers with all the health system resilience dimension."

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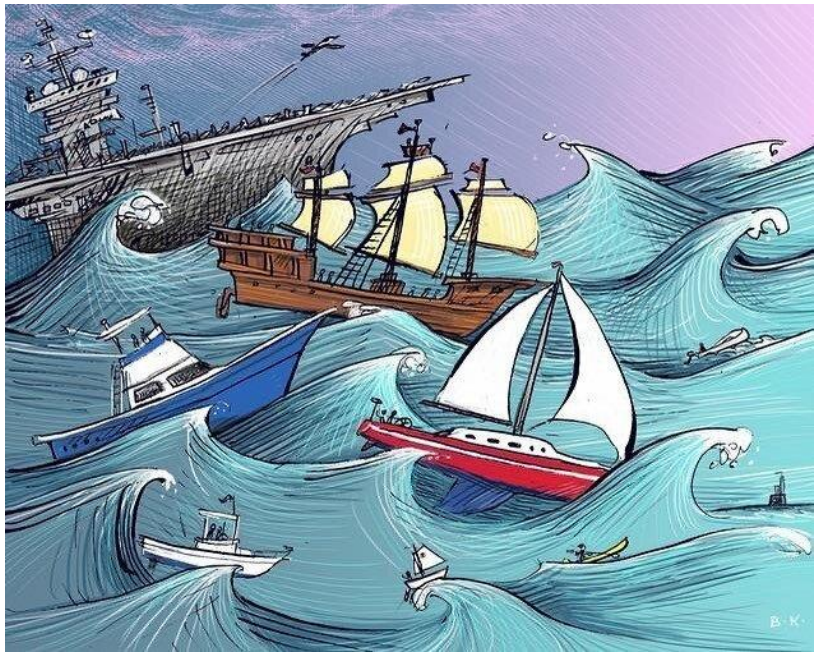
The case of Brazil

Health Systems in Brazil - SUS

- Universal Health System – Underfunded
  - Constitutional Amendment 95
    - SUS did not receive ~ US$ 12 billion between 2018 and 2022
- Rupture of the tripartite management
- Community-based primary care (FHS)
- Procurement of drugs, vaccines, insecticides
- Dismantling of the Ministry of Health´s technical capacities and technical committees
- No mass communication & Disinformation



“We are not all in the same boat. We are all in the same storm. Some of us are on super-yachts. Some have just one oar.’

Damian Barr

Writer & journalist

Brazilian mayor launches furious attack on 'stupid' Bolsonaro over coronavirus response

By **Nick Paton Walsh**, Jo Shelley, Eduardo Duwe and **Rob Picheta**, CNN

Updated 7:53 AM ET, Mon May 25, 2020

Bolsonaro calls coronavirus a 'little flu.' Inside Brazil's hospitals, doctors know the horrifying reality

By **Nick Paton Walsh**, Jo Shelley, Eduardo Duwe and **William Bonnett**, CNN

Updated 2:56 AM ET, Mon May 25, 2020

Mistrustful of state, Brazil slum hires own doctors to fight virus

Stephen Eisenhammer

Reuters

Sao Paolo, Brazil / Fri, April 3, 2020 / 03:05 am

A campaign banner reminds residents to wash their hands and to disinfect their homes to prevent the spread of COVID-19. Photo courtesy Mare Mobilization Front

STORIES FROM THE FIELD

Brazil's favelas organize to fight Covid-19

Brazil

In Brazil's Favelas, Organizing Is the Difference Between Life and Death

BY CECILIA TORNAGHI | MAY 19, 2020

The grassroots effort to battle hunger, fake news and COVID-19 itself.

Jefferson Borges, right, delivers food to a neighbor in Salvador, Bahia

Courtesy NordesteEuSou

Favela Communities in Rio Launch App to Combat Fake Covid-19 Information

Launched through a partnership between Voz das Comunidades and the US Consulate in Rio, the app helps disseminate useful information about the new coronavirus.

By **Lise Alves** - May 17, 2020

Paraisopolis, Sao Paulo's second largest favela, sits next door to one of the city's most affluent neighborhoods, Morumbi.

Photographer: Rodrigo Capote/Bloomberg

How One of Brazil's Largest Favelas Confronts Coronavirus

In a neighborhood where social distancing is almost impossible, Paraisopolis is using creativity and organization to combat the coronavirus.

By **Shannon Sims**

May 3, 2020, 12:01 AM EDT

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CENTRO DE ESTUDOS E PESQUISAS DE DIREITO SANITÁRIO – CEPEDISA

BRAZIL

THE TIMELINE OF THE FEDERAL GOVERNMENT'S STRATEGY TO SPREAD COVID-19

https://zenodo.org/record/5167005#.Y7X_GRXMK5c

HEALTH POLICY | VOLUME 4, 100086, DECEMBER 01, 2021

Punt Politics as Failure of Health System Stewardship: Evidence from the COVID-19 Pandemic Response in Brazil and Mexico

Felicia Marie Knaul • Michael Touchton • Héctor Arreola-Ornelas • Rifat Atun • Renzo JC Calderon Anyosa • Julio Frenk • et al. Show all authors

1.1. Punt Politics

"To punt" as an idiom has come to mean "to give up, to defer action, or to pass responsibility to someone else." As we apply it in this paper, punting refers to the deferment, either by omission (the result of a vacuum or ineptitude in national policy and leadership) or commission (deliberate obstruction of state and local responses based on partisan considerations), of national stewardship of health systems to sub-national governments.

thebmjopinion

The catastrophic Brazilian response to covid-19 may amount to a crime against humanity

April 5, 2021

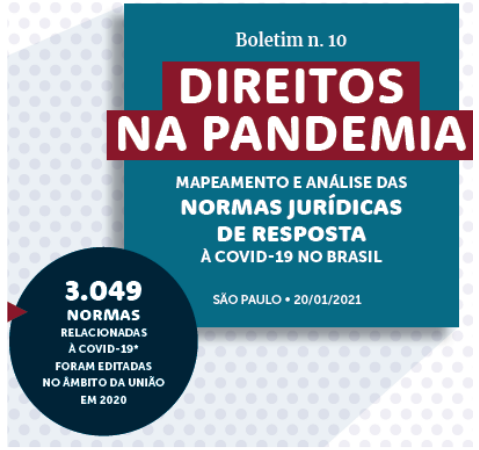
Cases of covid-19 are rising in Brazil, as the more transmissible P1 variant spreads across the country.

Crimes against humanity in Brazil's covid-19 response—a lesson to us all

For the sake of ideology, hundreds of thousands of avoidable deaths occurred, write Deisy Ventura and colleagues

Deisy Ventura, [1] Fernando Aith, [2] Rossana Reis[3]

the bmj | BMJ 2021;375:n2625 | doi: 10.1136/bmj.n2625



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Final report from Senate probe on pandemic lists 80 charges

The committee suggests President Bolsonaro be charged over nine crimes

Published in 27/10/2021 - 11:45 By Karine Melo, Heloisa Cristaldo - Brasília

- **Bolsonaro was charged with nine crimes:**
  - Epidemic resulting in death
  - Infraction of preventive sanitary measure
  - Charlatanism
  - Incitement to crime
  - Forgery of private documents
  - Irregular employment of public funds
  - Malfeasance
  - Crimes against humanity
  - Violation of social rights and incompatibility with the dignity, honor, and decorum of the presidency

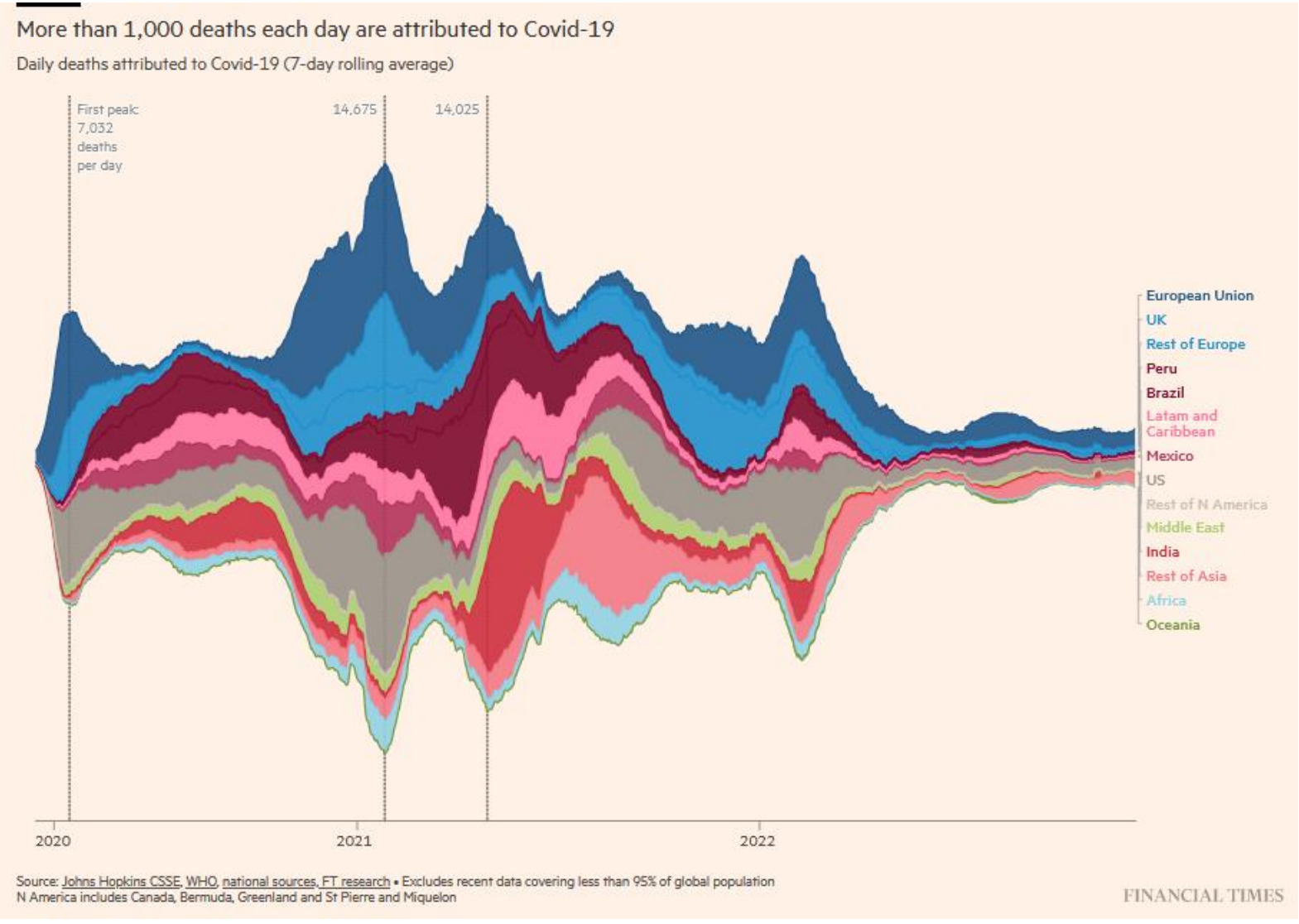
HEALTH AND SCIENCE

South America is a ‘new epicenter’ of the coronavirus pandemic, WHO says

PUBLISHED FRI, MAY 22 2020•1:10 PM EDT | UPDATED FRI, MAY 22 2020•2:41 PM EDT

William Feuer
@WILLFOIA

SHARE



As of 07/07

37,682,660 cases

704,159 deaths

- 2nd highest in the world
- 10% of total deaths in the world - Brazil shares only 2.6% of the world’s population

Disparities early in the pandemic

WORLD NEWS MAY 1, 2020 / 6:13 AM / 24 DAYS AGO

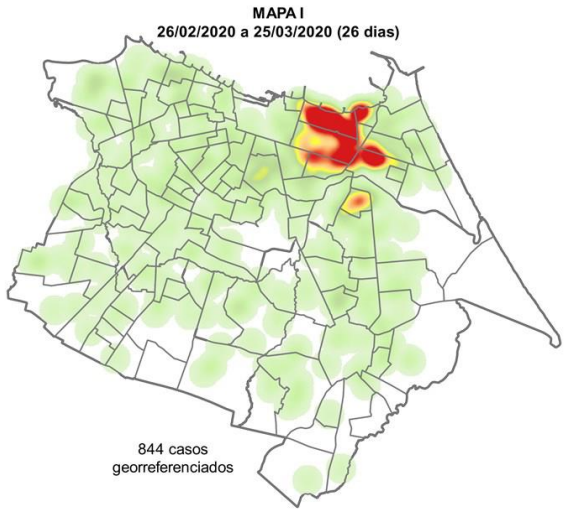
Imported by the rich, coronavirus now devastating Brazil's poor

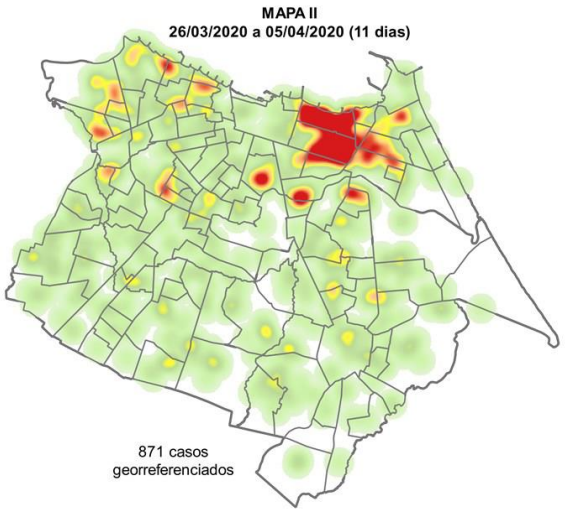
Gram Slattery, Stephen Eisenhammer, Amanda Perobelli 5 MIN READ

RIO DE JANEIRO/SAO PAULO (Reuters) - Imported by the Brazilian elite vacationing in Europe, the new coronavirus is now ravaging the country's poor, ripping through tightly-packed neighborhoods where the disease is harder to control.

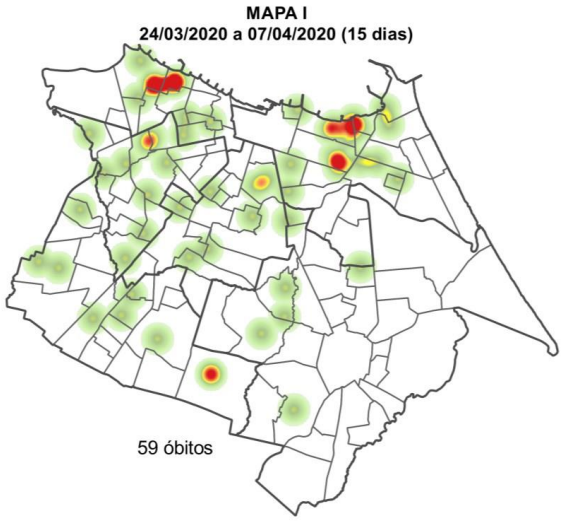
Example: Fortaleza, 5th largest city

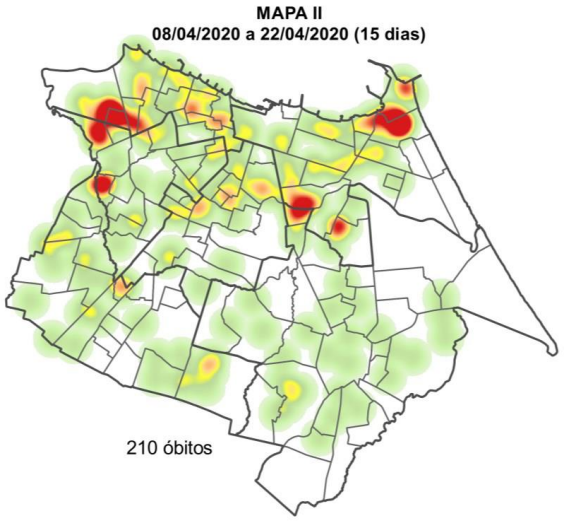
Cases





Deaths



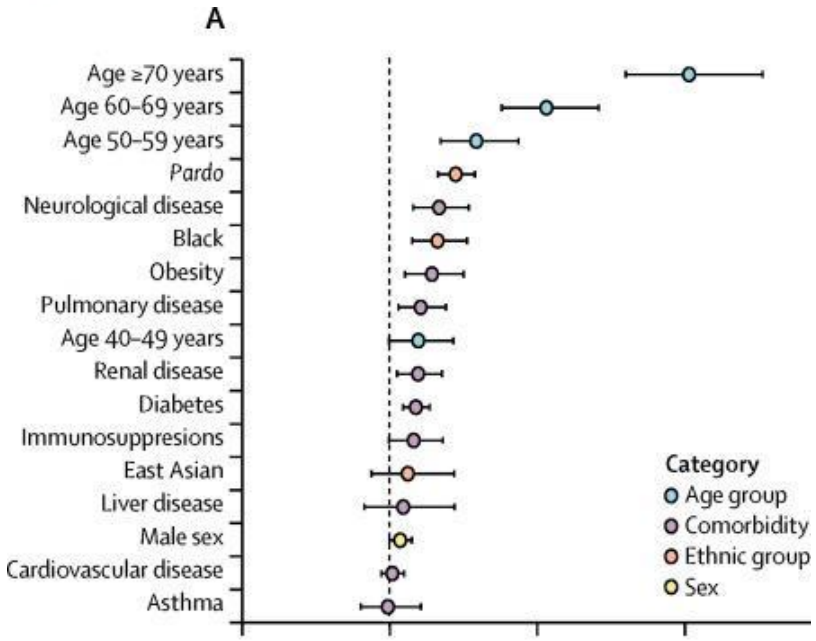


Racial disparities

Structural racism – in the form of high-risk working conditions, unequal access to health and worse housing conditions – is a major factor shaping Brazil's COVID-19 pandemic

Ethnic and regional variations in hospital mortality from COVID-19 in Brazil: a cross-sectional observational study

Pedro Baqui, Ioana Bica*, Valerio Marra, Ari Ercole, Mihaela van der Schaar*



Interpretation We found evidence of two distinct but associated effects: increased mortality in the north region (regional effect) and in the *Pardo* and Black populations (ethnicity effect). We speculate that the regional effect is driven by increasing comorbidity burden in regions with lower levels of socioeconomic development. The ethnicity effect might be related to differences in susceptibility to COVID-19 and access to health care (including intensive care) across ethnicities. Our analysis supports an urgent effort on the part of Brazilian authorities to consider how the national response to COVID-19 can better protect *Pardo* and Black Brazilians, as well as the population of poorer states, from their higher risk of dying of COVID-19.

Black Brazilians with COVID-19 who were admitted to hospital had significantly higher risk of mortality (hazard ratio [HR] 1·45, 95% CI 1·33–1·58 for *Pardo* Brazilians; 1·32, 1·15–1·52 for Black Brazilians).
Pardo ethnicity was the second most important risk factor (after age) for death.

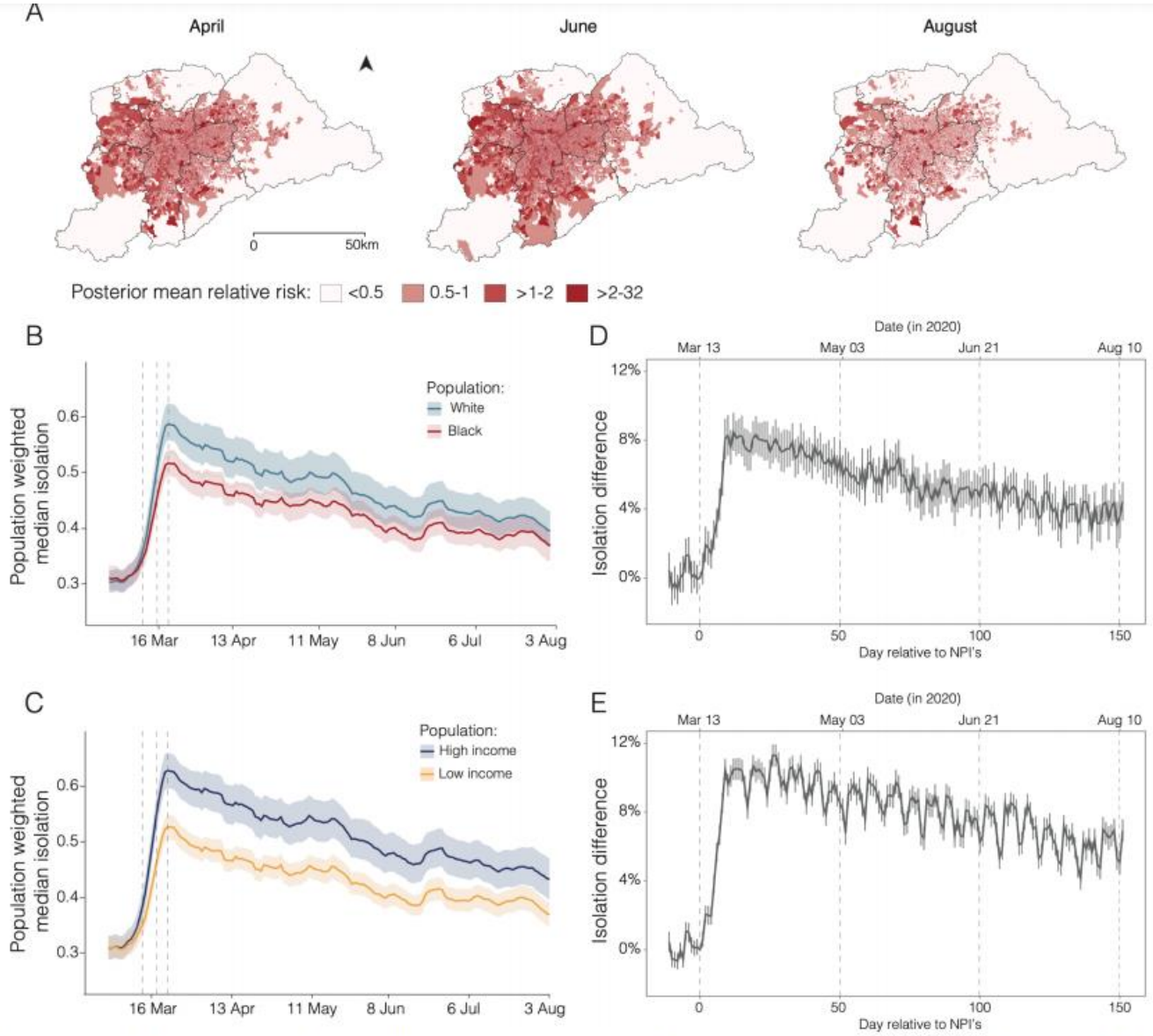


Figure 4 Differential risk based on varying ability to self-isolate in the Região Metropolitana de São Paulo (RMSP). (A) Relative risk of severe acute respiratory infection (SARI) hospitalisation for the RMSP. (B) Seven-day moving average of daily isolation levels by race. (C) Seven-day moving average of daily isolation levels by income. (D) Difference in daily social isolation by race after the introduction of non-pharmaceutical intervention (NPI). (E) Difference in daily social isolation by income after the introduction of NPIs. In panels (B) and (C), solid lines show population-weighted median isolation levels and shaded areas show population-weighted IQR (25%–75%). Dashed vertical lines indicate the dates of NPIs that enabled school closure (13 March was the state NPI) and non-essential activities (18 and 22 March, municipal and state NPIs, respectively).

Li et al, 2021
https://gh.bmj.com/content/bmjgh/6/4/e004959.full.pdf

Indigenous Peoples

Under-Reporting of COVID-19 Cases Among Indigenous Peoples in Brazil: A New Expression of Old Inequalities

Martha Fellows[1], Valéria Paye[2], Ane Alencar[1], Mário Nicácio[2], Isabel Castro[1], Maria Emília Coelho[2,3], Camila V. J. Silva[1,4], Matheus Bandeira[1], Reinaldo Lourival[5,6] and Paulo Cesar Basta[7]*

[1] Amazon Environmental Research Institute, Brasilia, Brazil, [2] Coordination of the Indigenous Organizations of the Brazilian Amazon, Manaus, Brazil, [3] University of Brasilia, Latin American Studies, Brasilia, Brazil, [4] Lancaster Environment Centre, Lancaster, United Kingdom, [5] Nature and Culture International, Brasilia, Brazil, [6] International Institute of Education of Brazil, Brasilia, Brazil, [7] National School of Public Health, Oswaldo Cruz Foundation, Rio de Janeiro, Brazil

Results: MOH registered 22,127 cases and 330 deaths, while COIAB's survey recorded 25,356 confirmed cases and 670 deaths, indicating an under-reporting of 14 and 103%, respectively. Likewise, the incidence and mortality rates were 136 and 110% higher among Indigenous when compared with the national average. In terms of mortality, the most critical DSEIs were *Alto Rio Solimões*, *Cuiabá*, *Xavante*, *Vilhena* and *Kaiapó do Pará*. The GLM model reveals a direct correlation between deforestation, land grabbing and mining, and the incidence of cases among the Indigenous.

Covid deaths of Yanomami children fuel fears for Brazil's indigenous groups

Health ministry sends team to investigate 'concerning' virus cases in Yanomami territory near Venezuelan border

Flávia Milhorance in Rio de Janeiro
05:00 Mon February 8, 2021

SARS-CoV-2 antibody prevalence in Brazil: results from two successive nationwide serological household surveys

Pedro C Hallal, Fernando P Hartwig, Bernardo L Horta, Mariângela F Silveira, Claudio J Struchiner, Luís P Vidaletti, Nelson A Neumann, Lucia C Pellanda, Odir A Dellagostin, Marcelo N Burattini, Gabriel D Victora, Ana M B Menezes, Fernando C Barros, Aluísio J D Barros, Cesar G Victora

The poorest areas of Brazil, particularly the Amazon River basin, were the first to present high prevalence of antibodies against SARS-CoV-2, by contrast with the initially low prevalence observed in the southern and centre-western regions. Our geographical-level and individual-level analyses showed remarkable inequality in the prevalence of infection, with poverty and Indígeno ethnicity driving the progression of the pandemic in the country. The controversial handling of the epidemic by the federal government is likely to have contributed to the rapid spread of COVID-19 in the country's most susceptible populations.

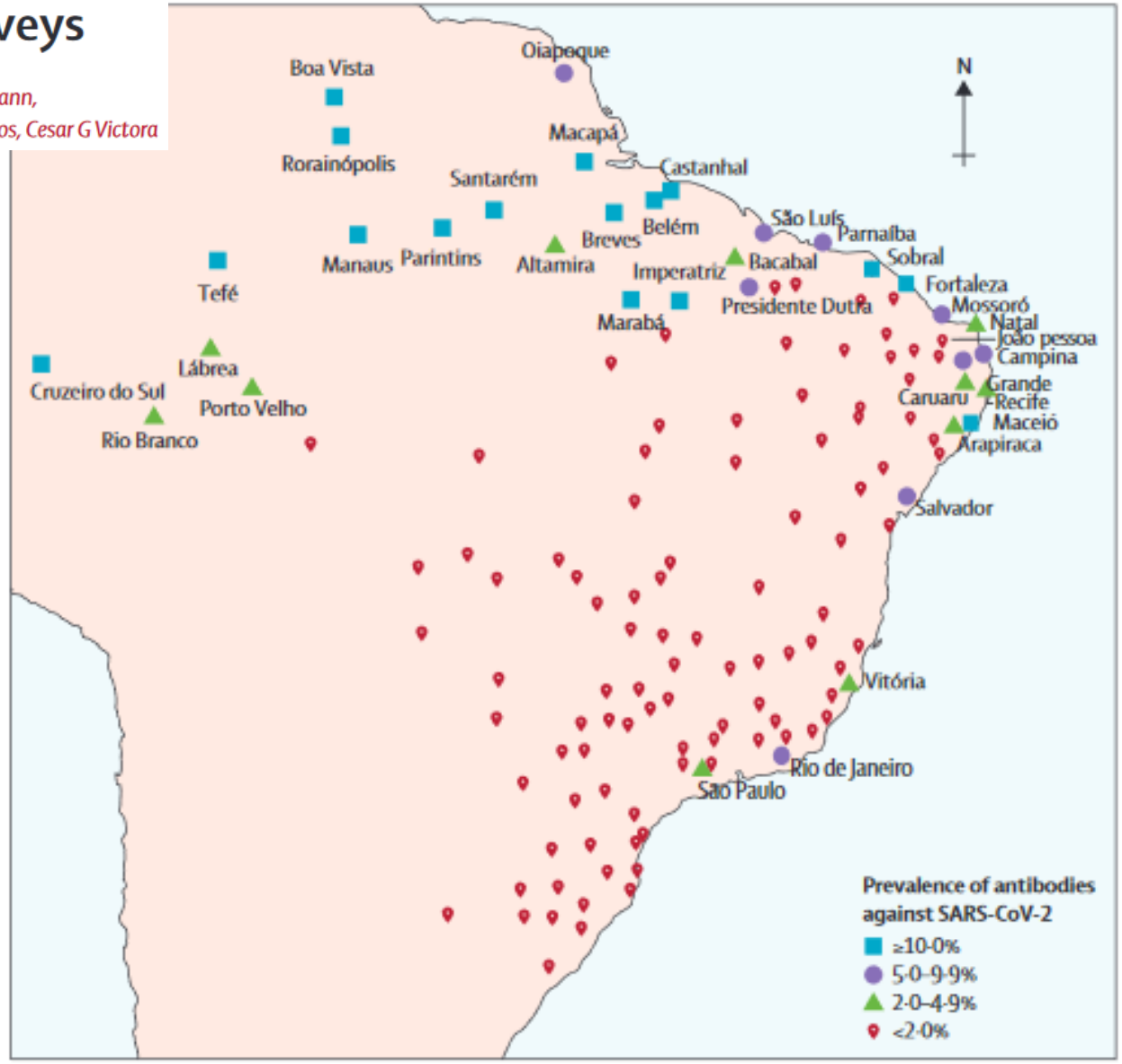


Figure 1: **Location of the 133 sentinel cities in Brazil**
Figures shows cities with prevalence of 5% or higher for antibodies against SARS-CoV-2 in the second survey. SARS-CoV-2=severe acute respiratory syndrome coronavirus 2.

HARVARD T.H. CHAN
SCHOOL OF PUBLIC HEALTH
Department of Global Health and Population

Brazil: Lack of oxygen to treat patients in Manaus

January 15, 2021, Index Number: AMR 19/3539/2021

Government admits it knew of lack of oxygen eight days before collapse in Manaus

Attorney General told the Supreme Court that he was notified by suppliers on January 8th, claims to have done his best

From the newsroom
Translated by: Ítalo Piva

Brasil de Fato | São Paulo | 19 de Janeiro de 2021 às 15:21

Americas

The arduous path for oxygen to reach the sick in one of Brazil's most remote regions

By Júlia Ledur

Feb. 11, 2021

Contents lists available at ScienceDirect

EClinicalMedicine

journal homepage: https://www.journals.elsevier.com/eclinicalmedicine

- Until June 12, 2021
  - ~63 thousand lives saved (people 60+, not including health care professionals)

Estimating the early impact of vaccination against COVID-19 on deaths among elderly people in Brazil: Analyses of routinely-collected data on vaccine coverage and mortality

Prof Cesar Victora[a,b,*], Prof Marcia C Castro[b], Susie Gurzenda[b], Arnaldo C Medeiros[c], Giovanny V A França[c], Prof Aluisio J D Barros[a]

~104,000 hospitalizations could have been averted if vaccination had started earlier

~47 thousand lives could have been saved had the Brazilian government started the vaccination program earlier

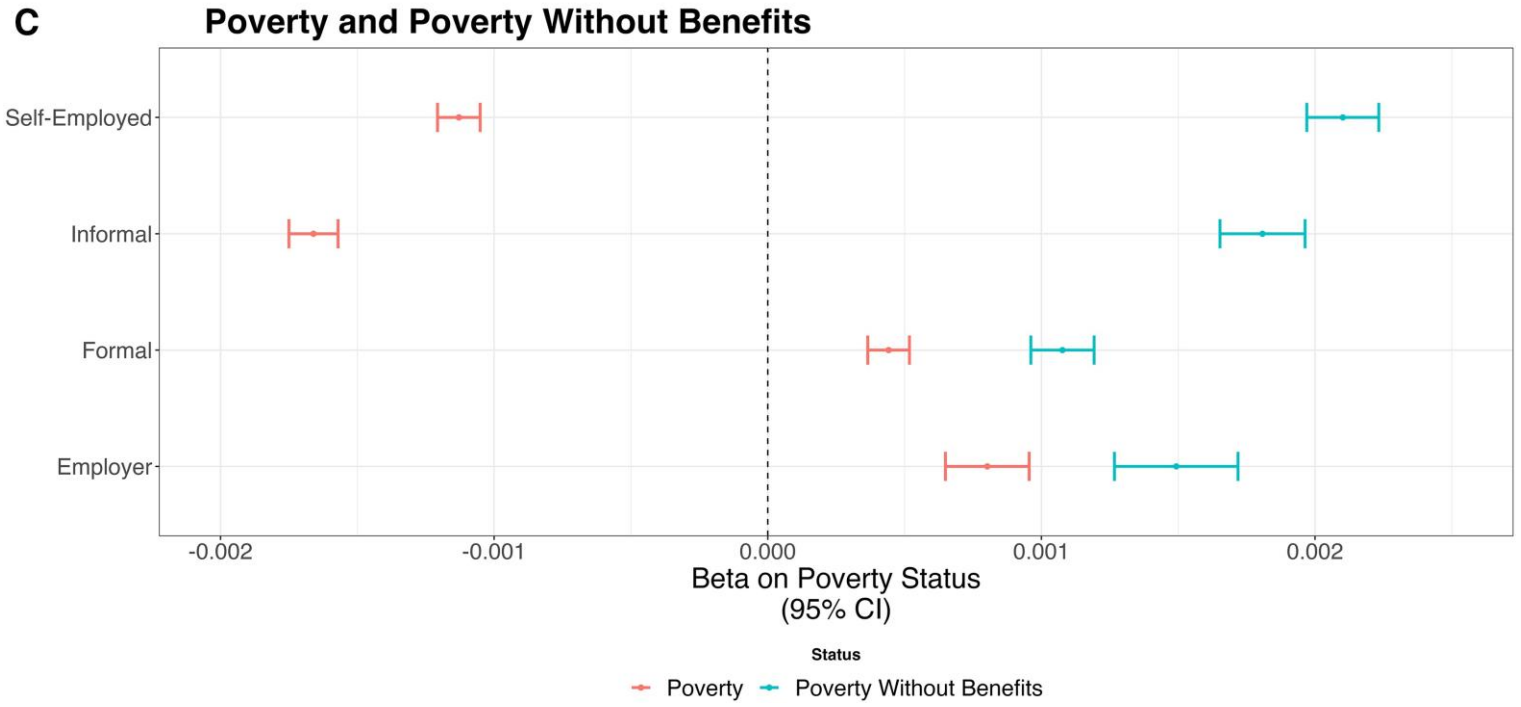
Estimating the impact of implementation and timing of the COVID-19 vaccination programme in Brazil: A counterfactual analysis

Leonardo Souto Ferreira,[a,b] Flavia Maria Darcie Marquitti,[b,c,] Rafael Lopes Paixão da Silva,[a,b] Marcelo Eduardo Borges,[b] Marcelo Ferreira da Costa Gomes,[b,d] Oswaldo Gonçalves Cruz,[b,d] Roberto André Kraenkel,[a,b] Renato Mendes Coutinho,[b,e] Paulo Inácio Prado,[b,f] and Leonardo Soares Bastos[b,d]*

Social determinants of health in Brazil during the COVID-19 pandemic: strengths and limitations of emergency responses

Eduardo A Lazzari ✉, Marco A C Paschoalotto, Adriano Massuda, Rudi Rocha, Marcia C Castro Author Notes

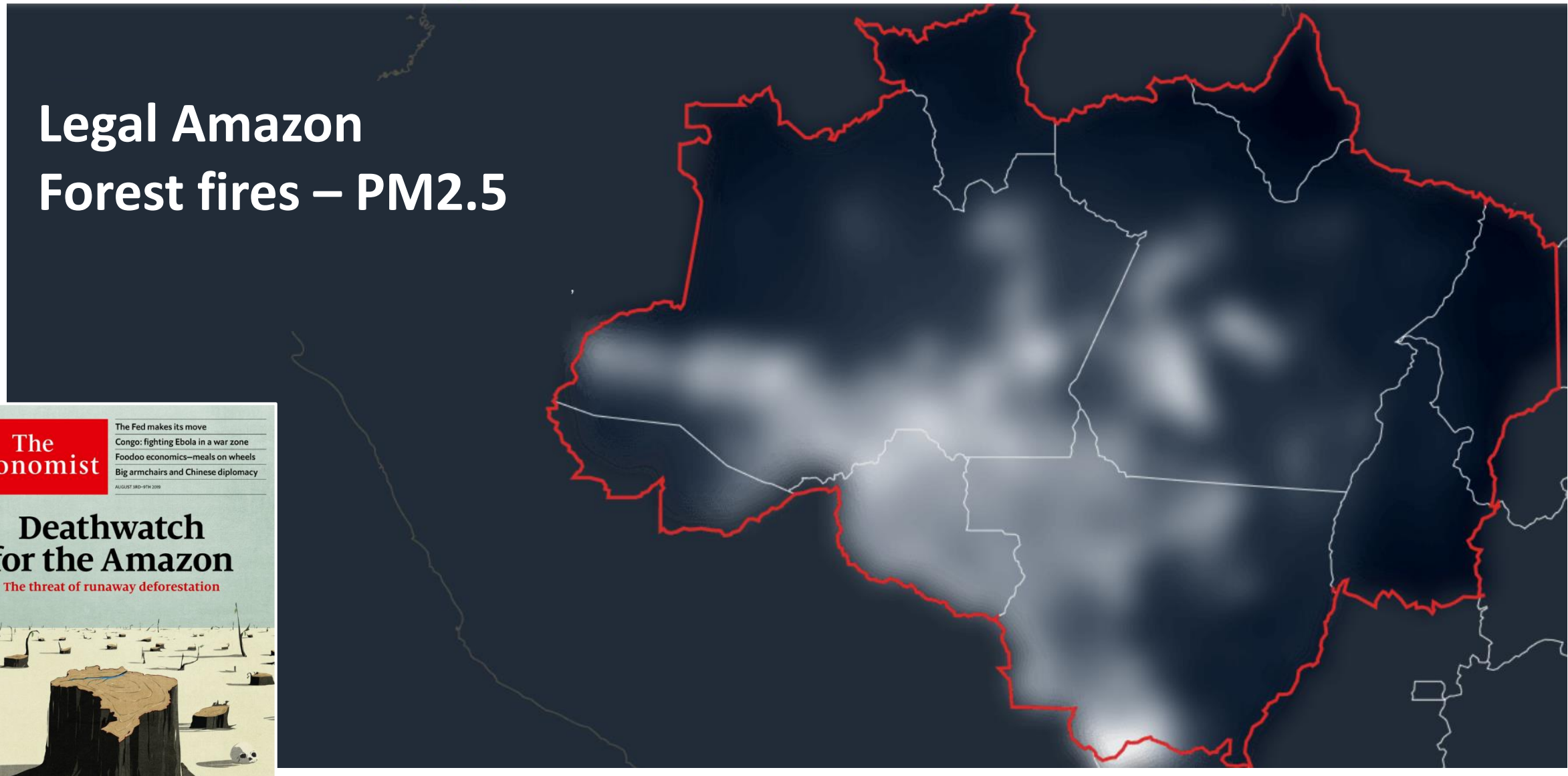
Health Affairs Scholar, Volume 1, Issue 1, July 2023, qxad014, https://doi.org/10.1093/haschl/qxad014



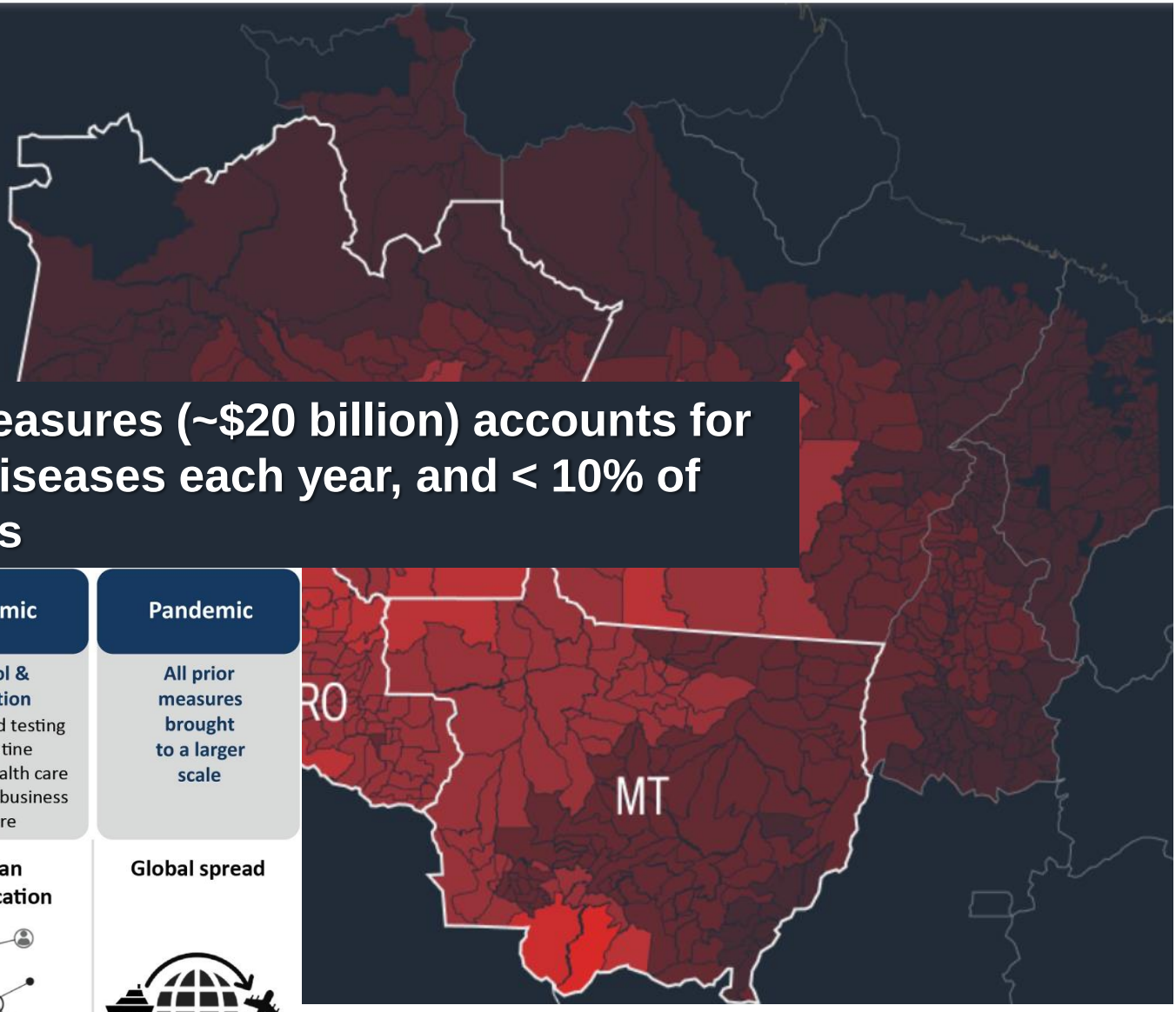
After 5 initial payments of US$120 between Apr-Aug 2020, the amount was reduced by half and paid from Sep-Dec 2020

Reinstated in April 2021, with a value varying according to household composition (monthly average of US$50) and limited to 1 person per household (instead of 2, as initially designed)

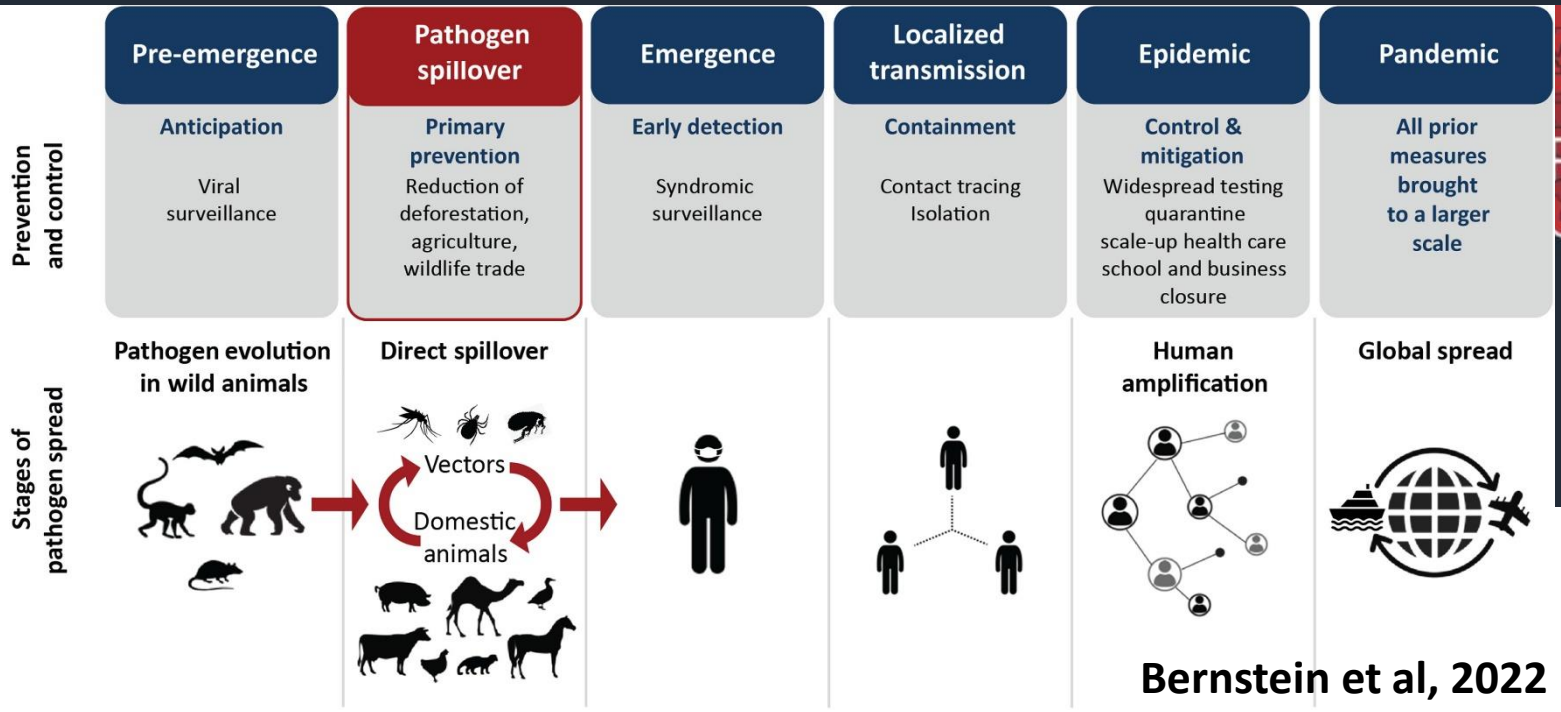
Legal Amazon
Forest fires – PM2.5



PM2.5: 18% increase in severe cases & 24% in hospitalizations in 2020 (AM, AC, RO, MT, PA)



The annual cost of three primary prevention measures (~$20 billion) accounts for <5% of the cost of lives lost due to infectious diseases each year, and < 10% of the economic cost, not counting the co-benefits



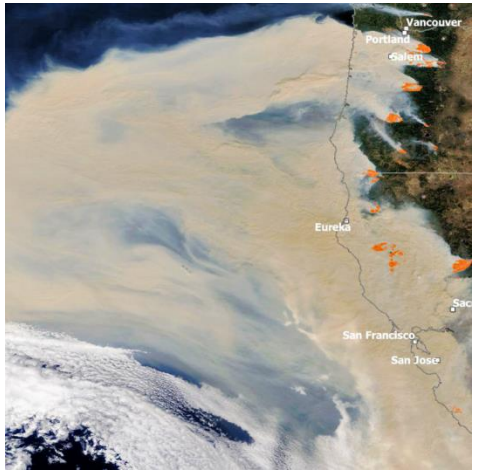
Bernstein et al, 2022

SCIENCE ADVANCES | RESEARCH ARTICLE

CORONAVIRUS

Excess of COVID-19 cases and deaths due to fine particulate matter exposure during the 2020 wildfires in the United States

Xiaodan Zhou [1†], Kevin Josey [2†], Leila Kamareddine [2], Miah C. Caine [3], Tianjia Liu [4], Loretta J. Mickley [3], Matthew Cooper [5], Francesca Dominici [2,6*]



We adjusted for several time-varying confounding factors (e.g., weather, seasonality, long-term trends, mobility, and population size). We found strong evidence that wildfires amplified the effect of short-term exposure to $PM_{2.5}$ on COVID-19 cases and deaths, although with substantial heterogeneity across counties.

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH
Department of Global Health and Population

Syndemic

"The will and commitment to find and use this knowledge at local, national, and international levels are what is most sorely needed to ensure a just and healthier future."

The emergence & overlap of the COVID-19 pandemic with a continued rise in chronic conditions such as obesity and diabetes & with added environmental risks such as air pollution, have exacerbated the coronavirus death toll

Panel 3: Why syndemics emerge

- Changing political and economic conditions
- Shifting ecological and environmental conditions
- Altering demographics and changing social behaviours
- Rapidly developing technology
- Expanding patterns of globalisations
- Ongoing microbial adaptation
- Breakdown of public health protective measures

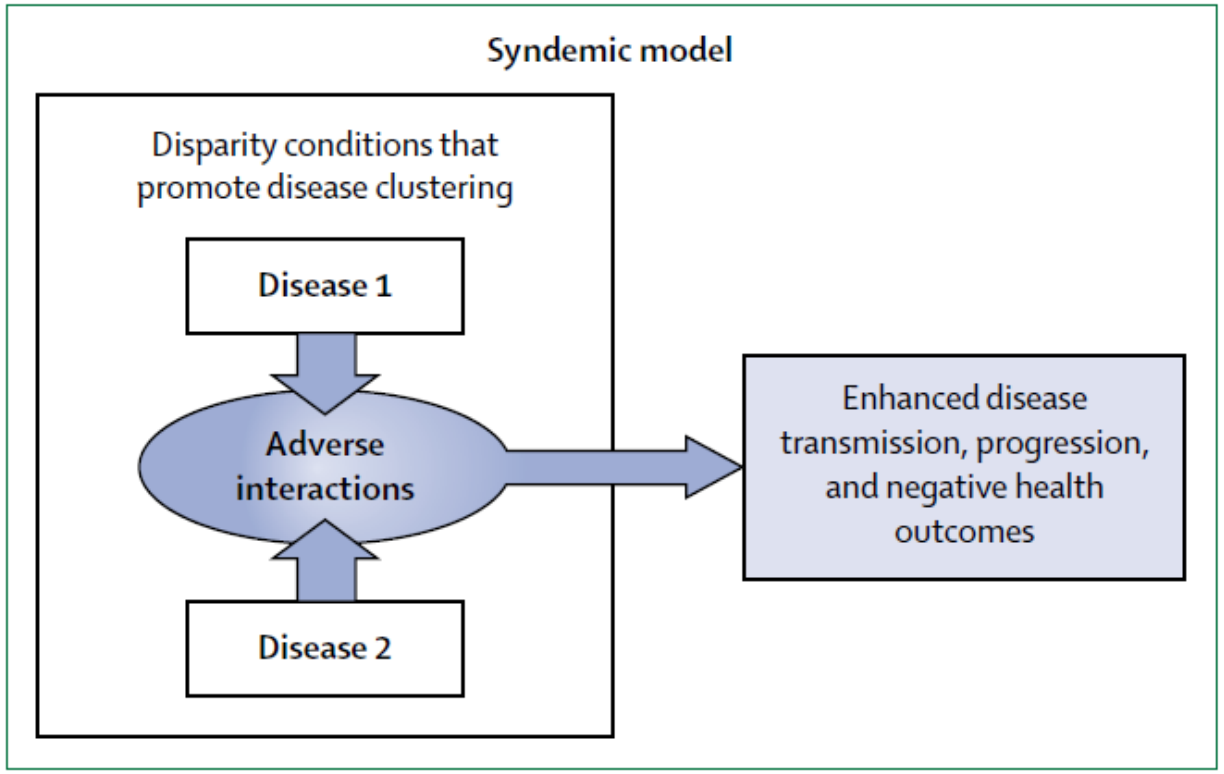


Figure: Model of a syndemic

Singer et al, 2017

Trust!

Trust made the difference for democracies in COVID-19

Thomas J Bollyky • Olivia Angelino • Simon Wigley • Joseph L Dieleman

Published: August 27, 2022 • DOI: https://doi.org/10.1016/S0140-6736(22)01532-X

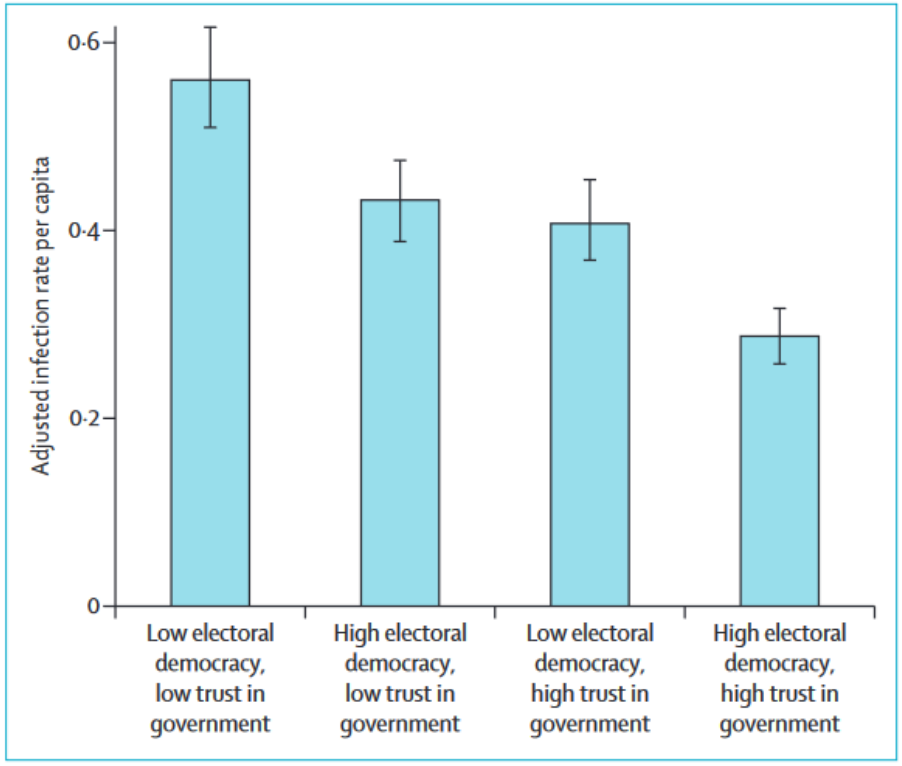


Figure: **Adjusted SARS-CoV-2 infection rate given low and high levels of electoral democracy and trust in government, from Jan 1, 2020, to Sept 30, 2021**

Covid-19: Trust in government and other people linked with lower infection rate and higher vaccination uptake

BMJ 2022 ; 376 doi: https://doi.org/10.1136/bmj.o292 (Published 02 February 2022)
Cite this as: *BMJ* 2022;376:o292

ARTICLES | VOLUME 399, ISSUE 10334, P1489-1512, APRIL 16, 2022

Pandemic preparedness and COVID-19: an exploratory analysis of infection and fatality rates, and contextual factors associated with preparedness in 177 countries, from Jan 1, 2020, to Sept 30, 2021

COVID-19 National Preparedness Collaborators

Open Access • Published: February 01, 2022 • DOI: https://doi.org/10.1016/S0140-6736(22)00172-6 •

Measures of trust in the government and interpersonal trust, as well as less government corruption, had larger, statistically significant associations with lower standardised infection rates. High levels of government and interpersonal trust, as well as less government corruption, were also associated with higher COVID-19 vaccine coverage among middle-income and high-income countries where vaccine availability was more widespread, and lower corruption was associated with greater reductions in mobility.

“The reason for collecting, analyzing, and disseminating information on a disease is to control that disease.

Collection and analysis should not be allowed to consume resources if action does not follow.”

William Foege, 1976

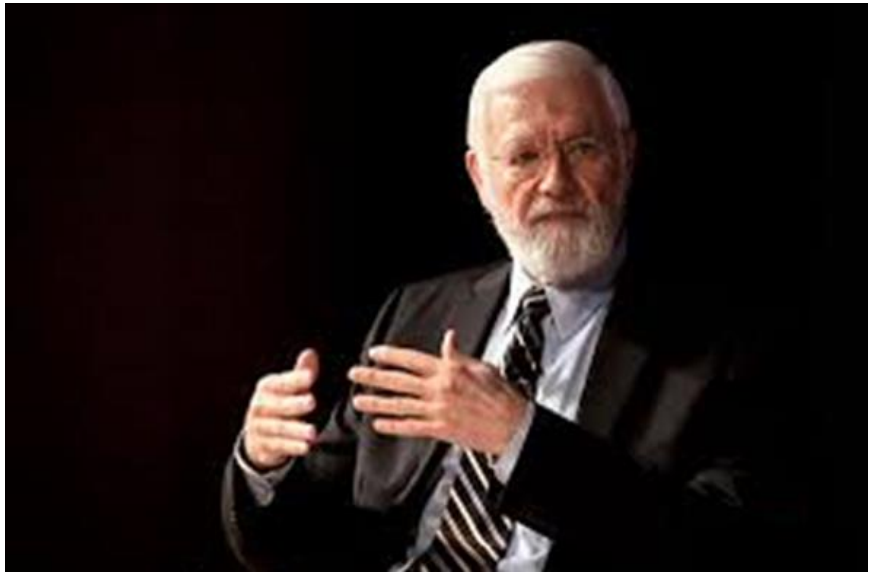


Photo: Kay Hinton, Emory University

Thank you