

São Paulo, Brazil - July 10-22, 2023

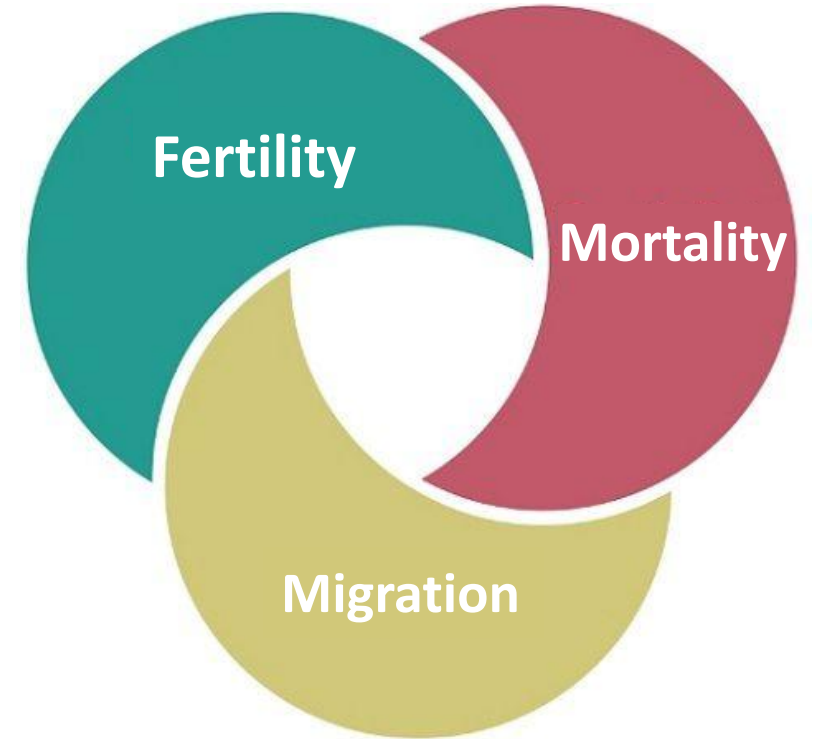


# Demographic Impacts of the Covid-19 Pandemic

**MARCIA CASTRO**

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# Demographic Components



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# Mortality

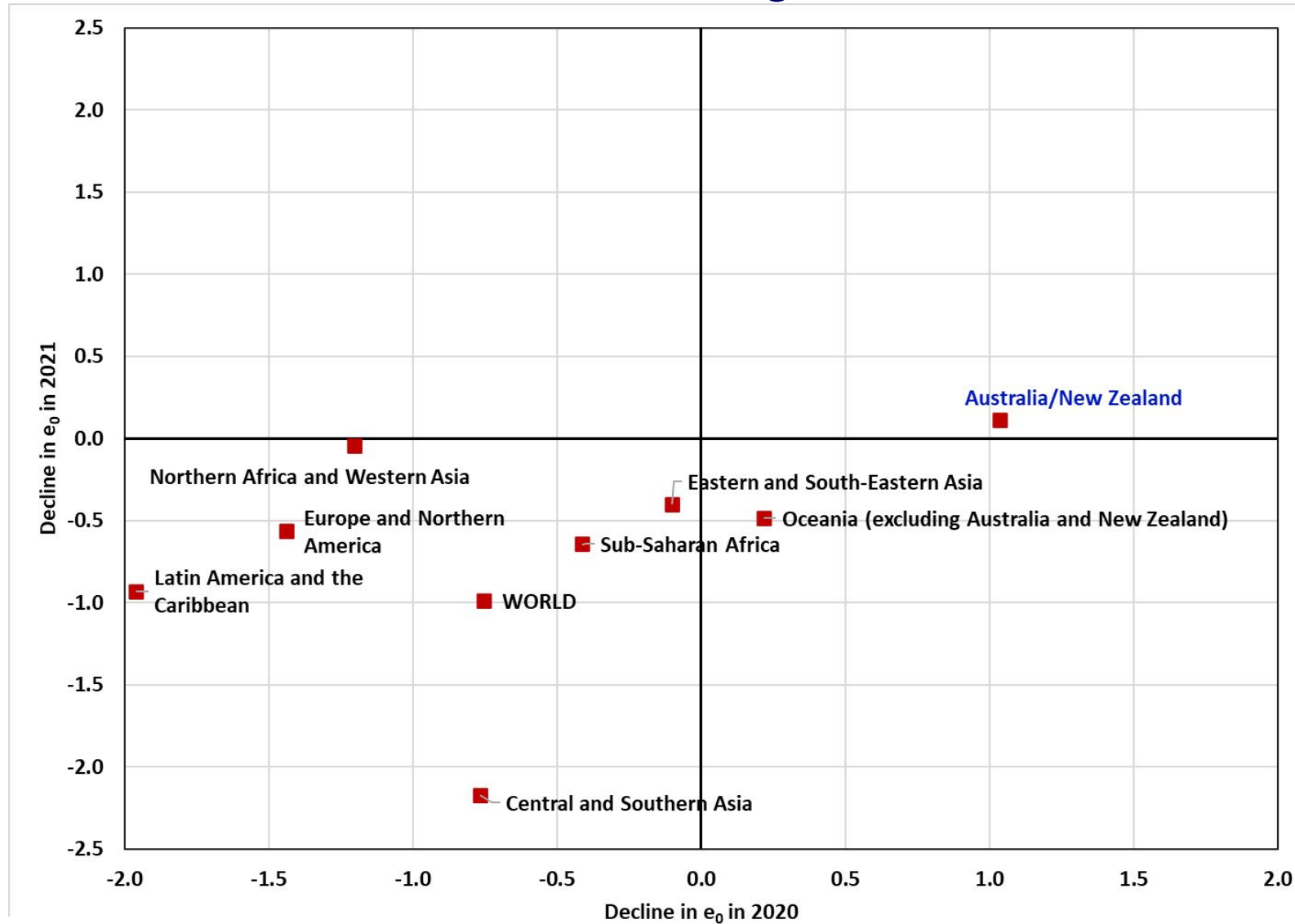
# Effects on Mortality

- Direct
- Indirect (people who died because of the pandemic context but not because of the disease)
- Competing Risks (people who would have died from a different cause in the same year but died of COVID-19)
  - Changes the pattern of other causes of death

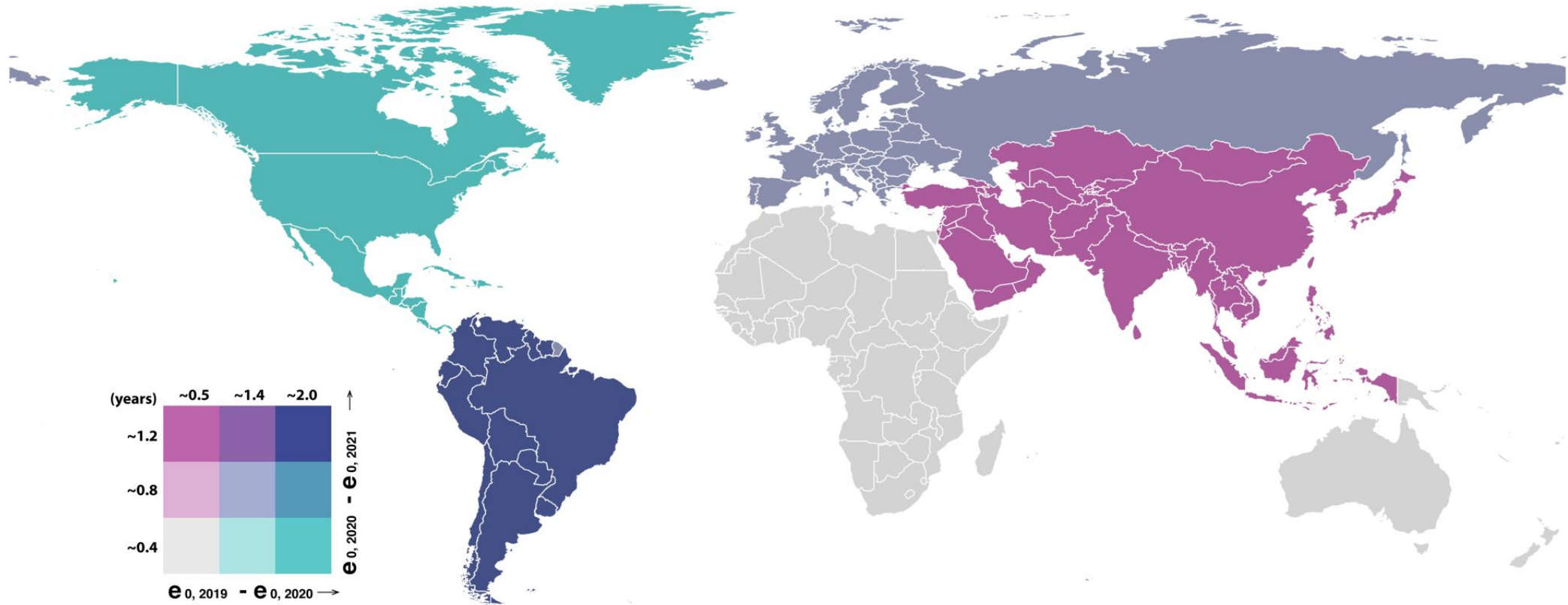
# Measurements of the effects

- Absolute
- Rates (standardized)
- Life expectancy
- Excess mortality
- Other causes

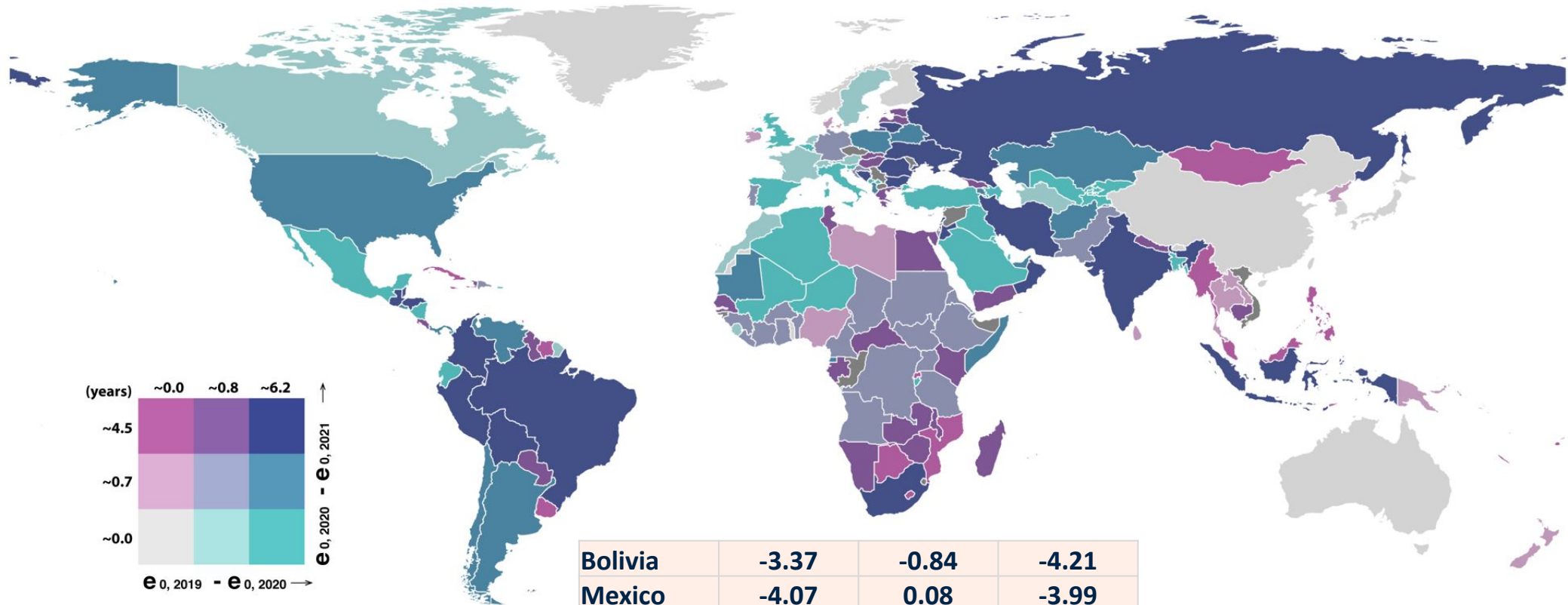
# Life expectancy at birth ( $e_0$ )



# Life expectancy at birth ( $e_0$ )

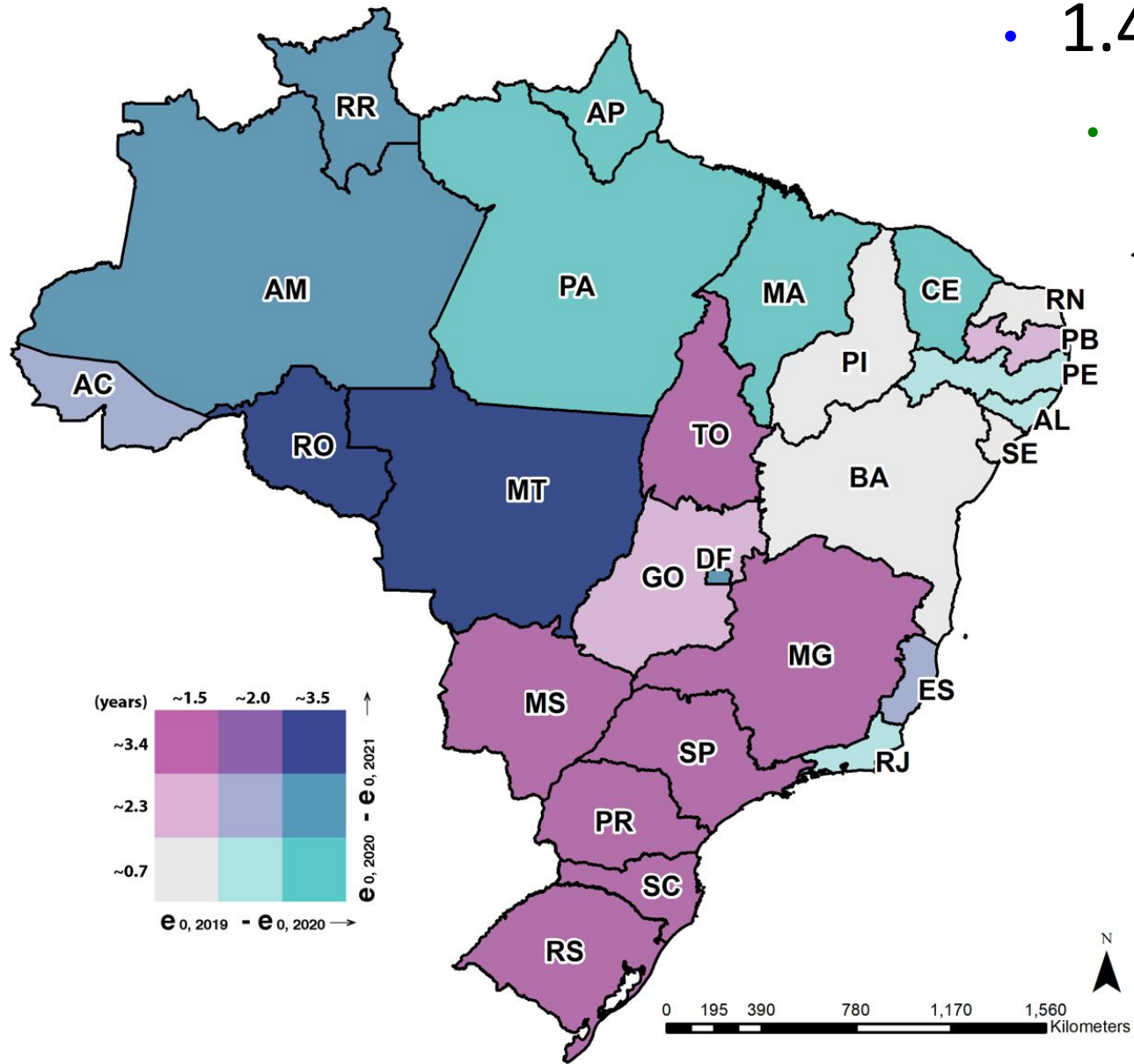


# Life expectancy at birth ( $e_0$ )



Bolivia	-3.37	-0.84	-4.21
Mexico	-4.07	0.08	-3.99
Cuba	-0.04	-3.88	-3.93
Colombia	-1.98	-1.94	-3.92
Guatemala	-1.33	-2.56	-3.89
Peru	-2.49	-1.29	-3.78
Ecuador	-5.14	1.52	-3.63





- 1.4 yrs in 2020

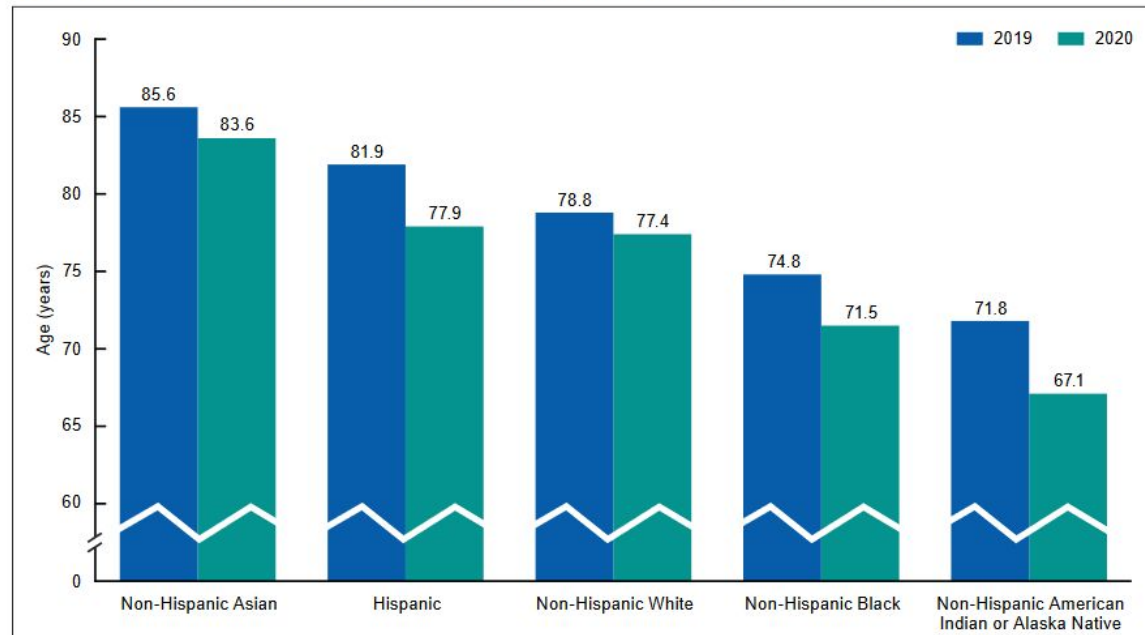
- AM – 3.5

- 1.8 yrs in 2021

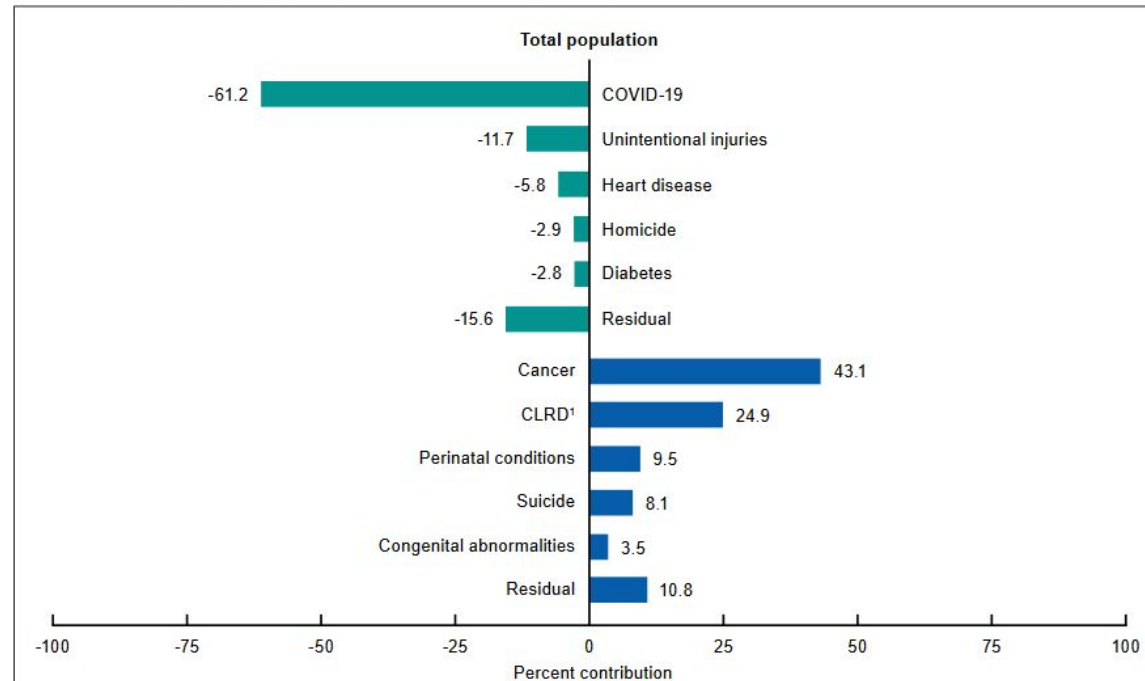
- PR – 3.9



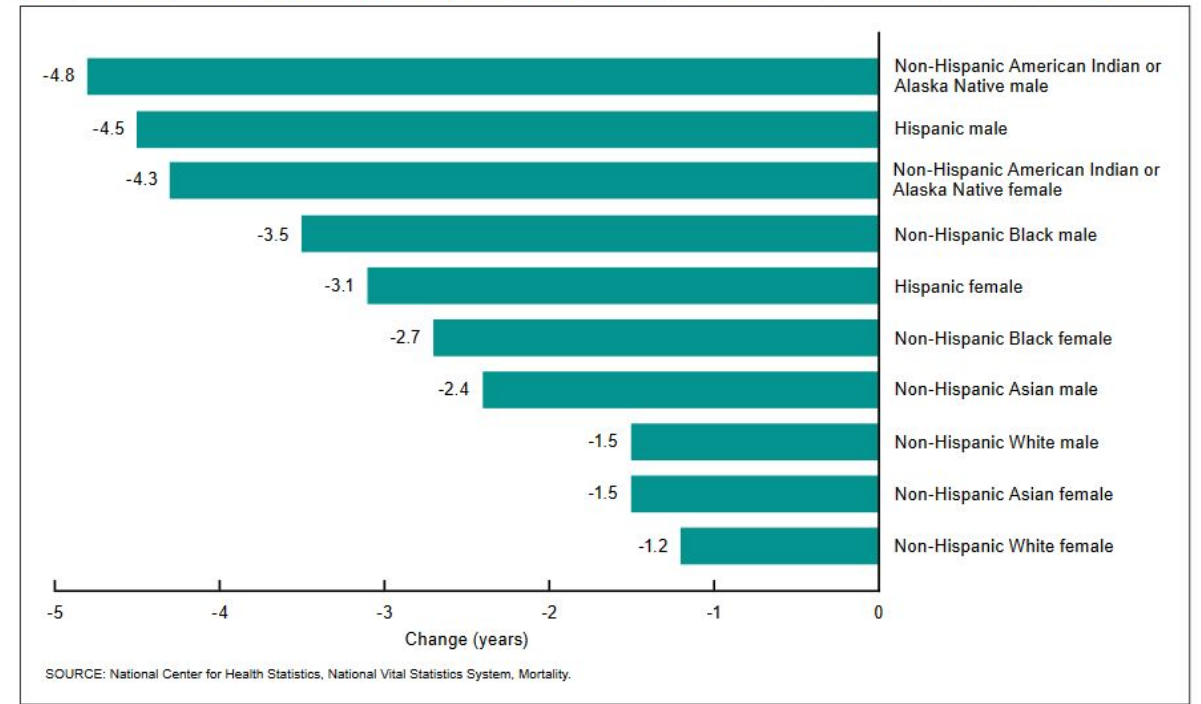
**Figure 2. Life expectancy at birth, by Hispanic origin and race: United States, 2019 and 2020**



**Figure 5. Percent contribution to change in life expectancy from 2019 to 2020, by cause of death and Hispanic origin and race: Total and non-Hispanic American Indian or Alaska Native populations**

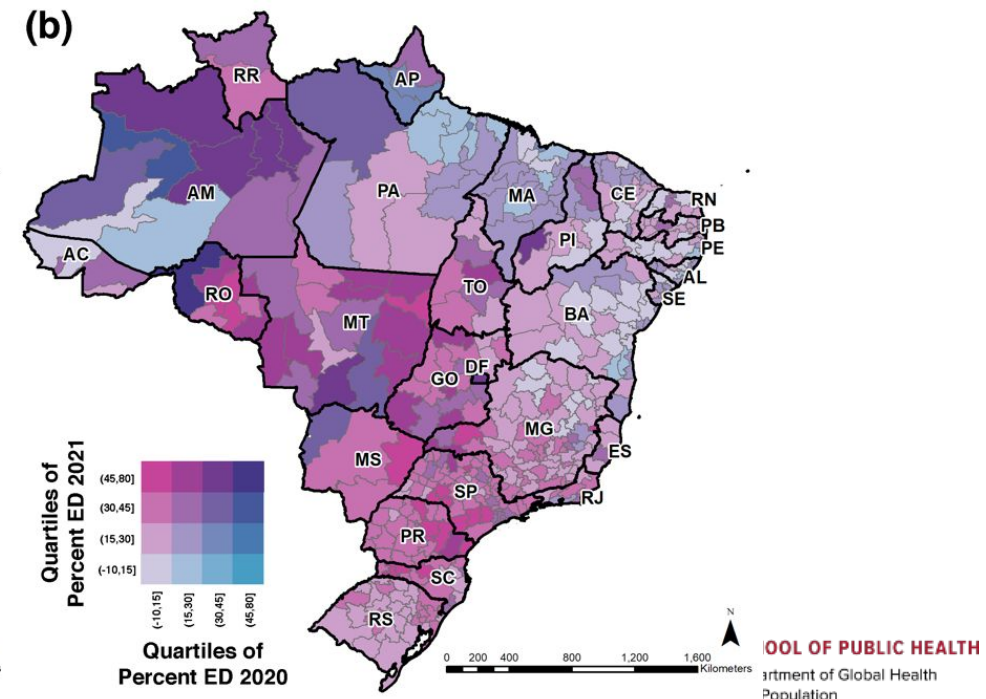
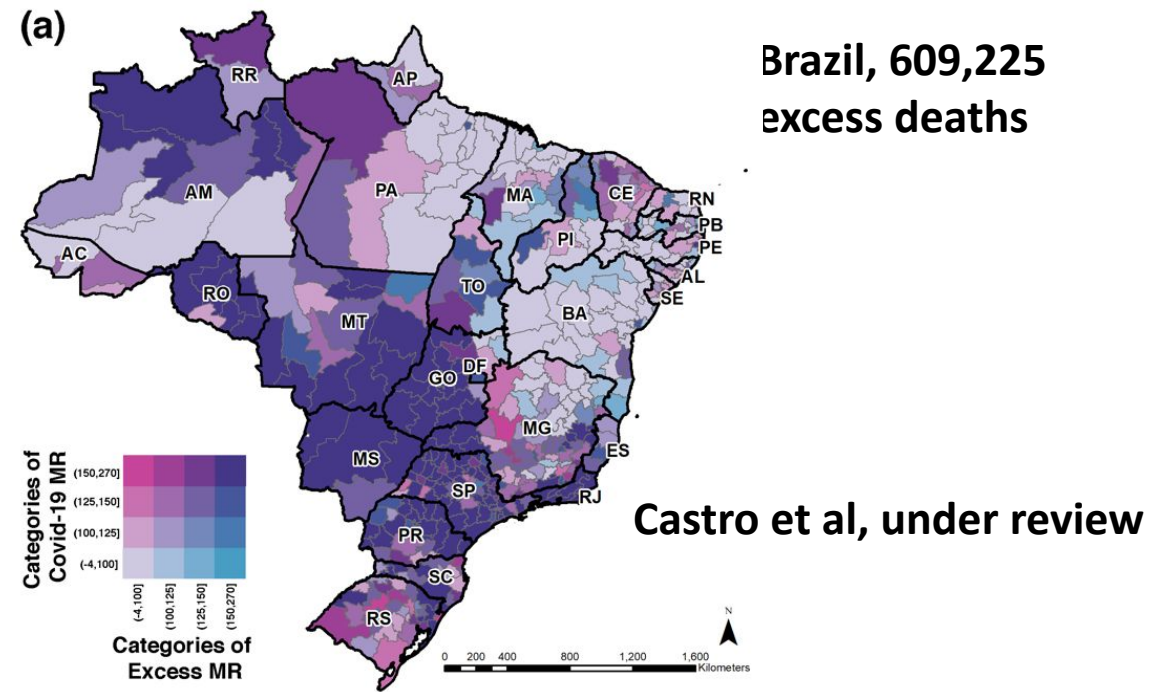
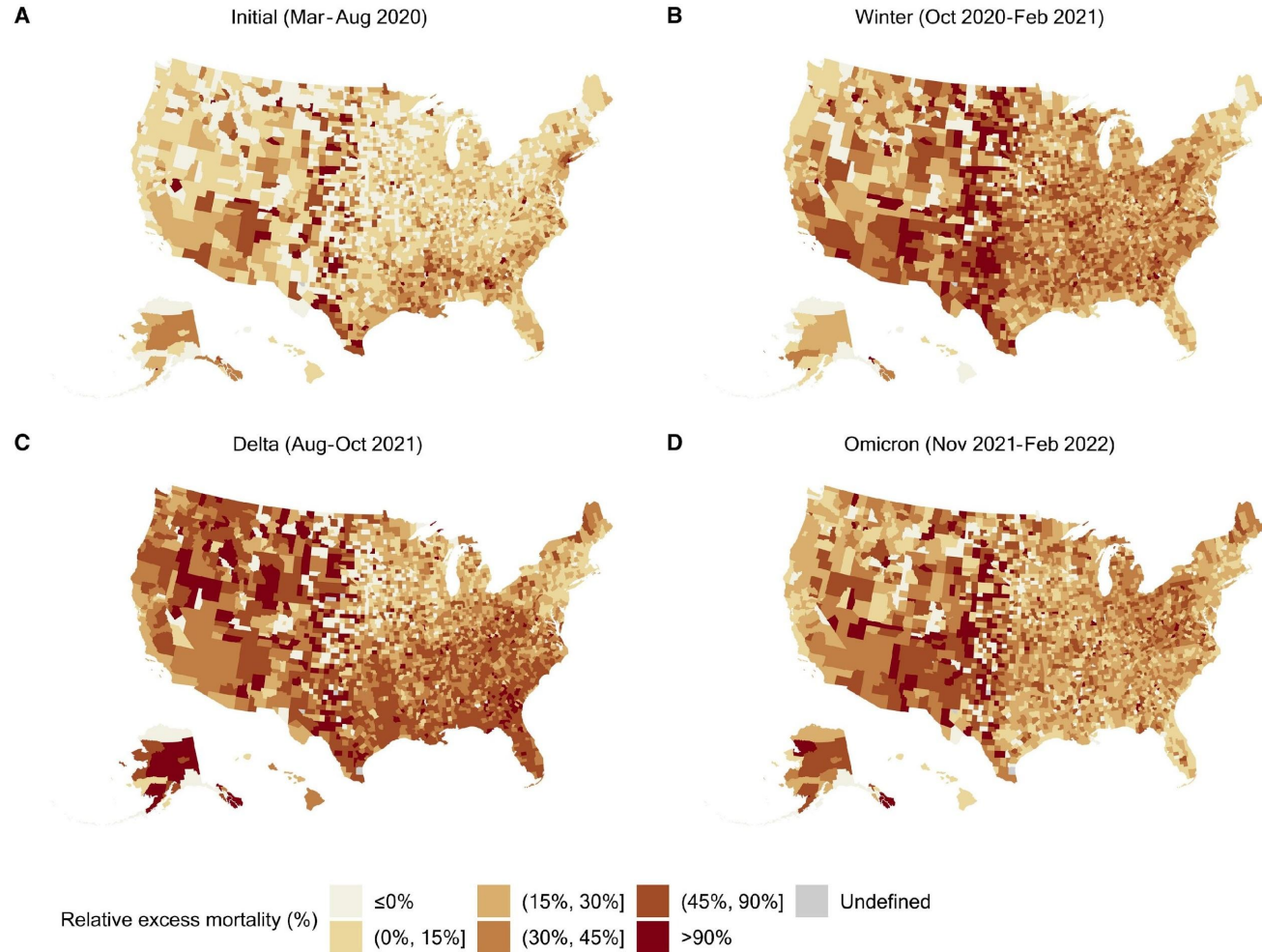


**Figure 4. Change in life expectancy at birth, by Hispanic origin and race and sex: United States, from 2019 to 2020**



SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

# Excess Mortality

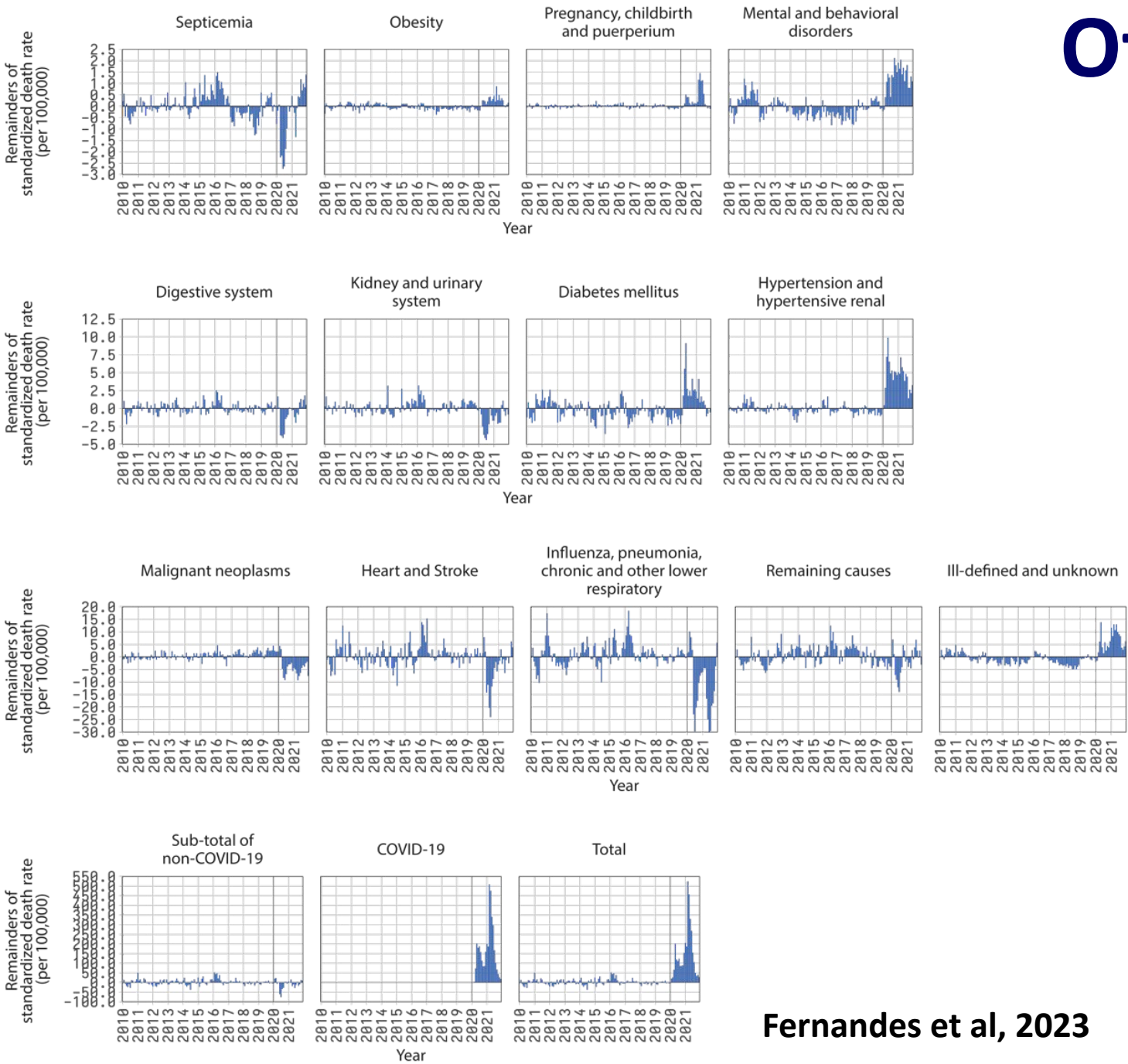


**1,179,024 excess deaths occurred during the first 2 years of the pandemic**

Fig. 1. Relative excess mortality across U.S. counties during four mortality peaks, March 2020 to February 2022.

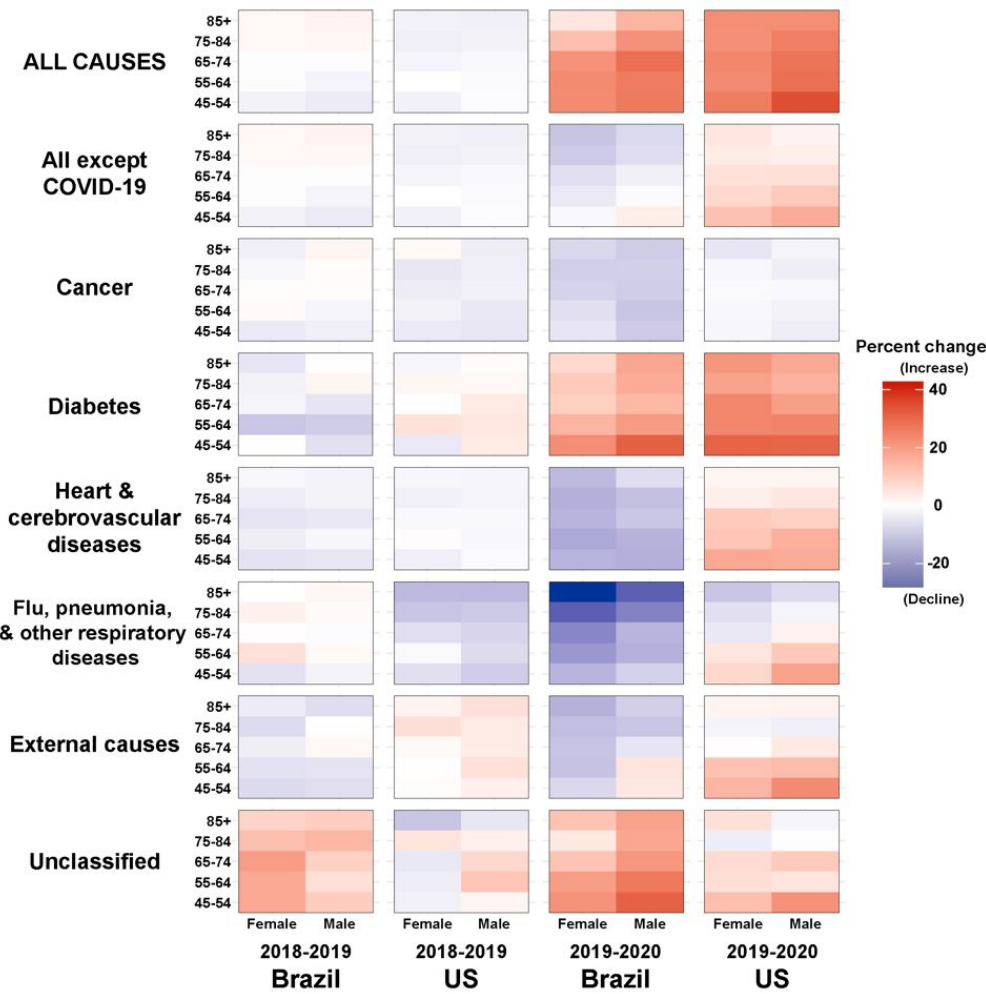
<https://www.science.org/doi/full/10.1126/sciadv.adf9742>

# Other causes of death



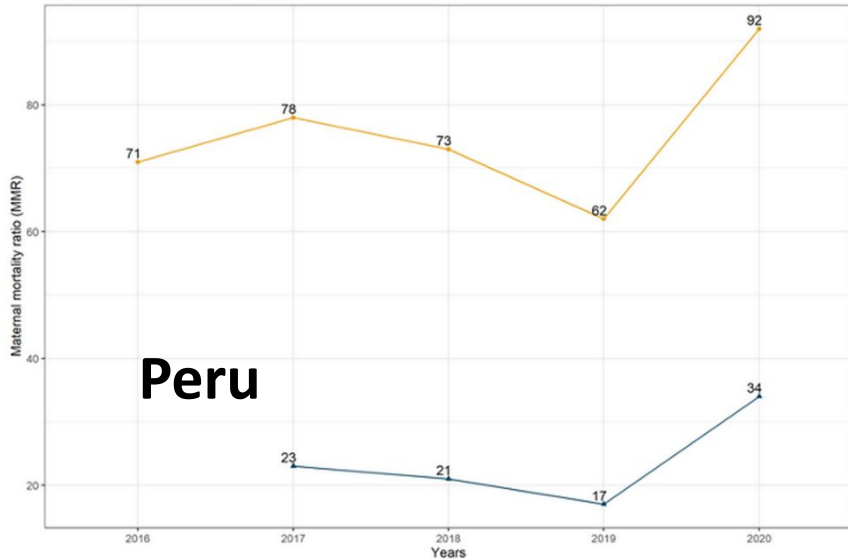
Fernandes et al, 2023

Castro et al, 2023



# Maternal Mortality

Maternal mortality ratio (MMR) in Perú 2016-2017 per 100,000 live births  
Per 100,000 live births, from 2017 to 2020\*



Source  
— MeH-DGE  
— SINADEF

## Brazil

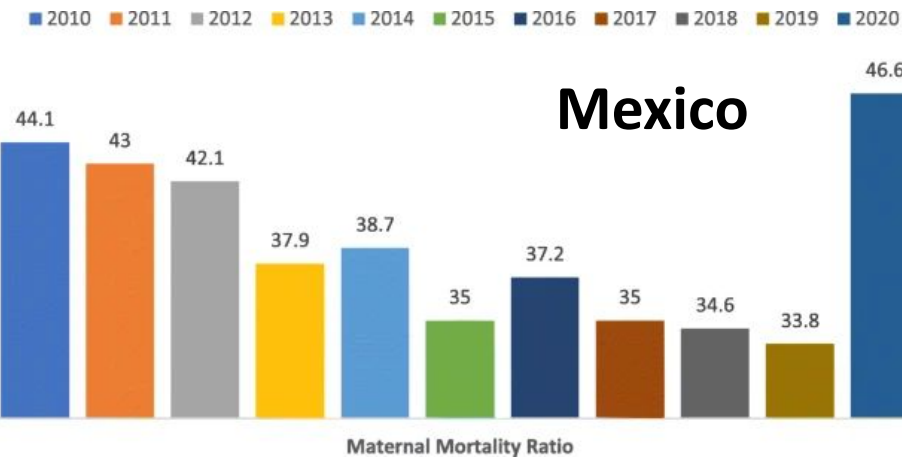


Fonte: SIM (Sistema de Informação sobre Mortalidade), Ministério da Saúde. Reunidos pelo Observatório Obstétrico Brasileiro \*Dados não consolidados (preliminares)

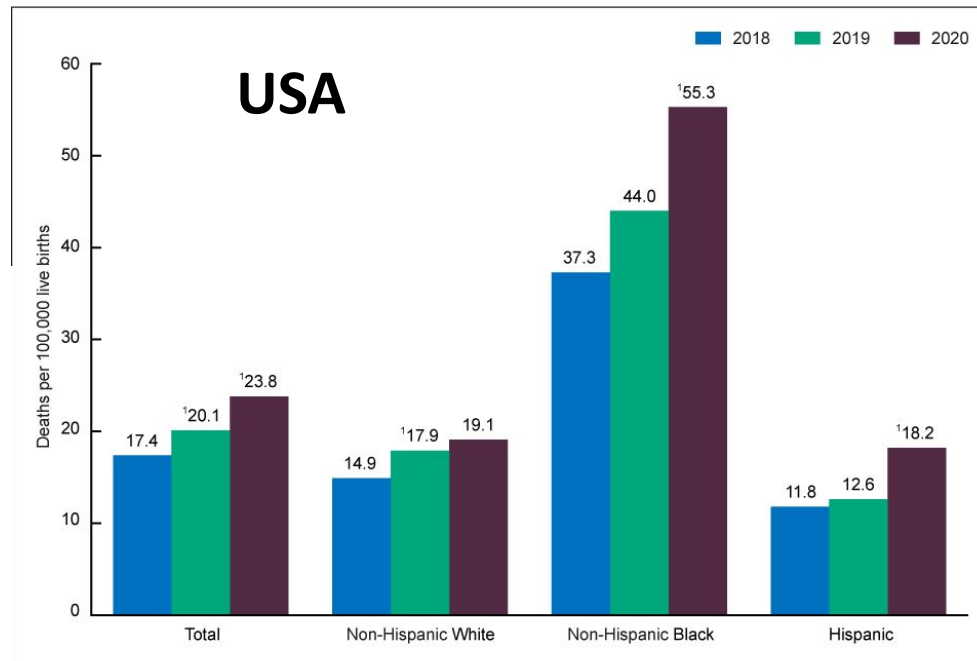


## Peru

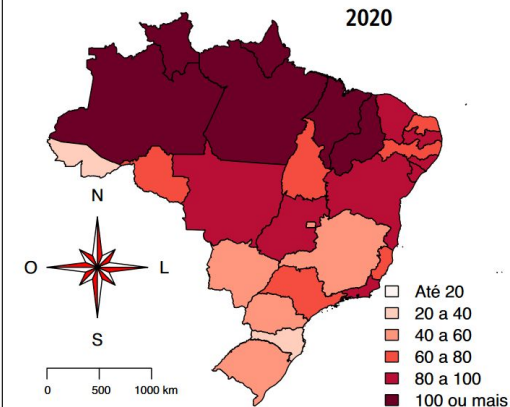
## Mexico



## USA



\*Statistically significant increase in rate from previous year ( $p < 0.05$ ).  
NOTE: Race groups are single race.  
SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

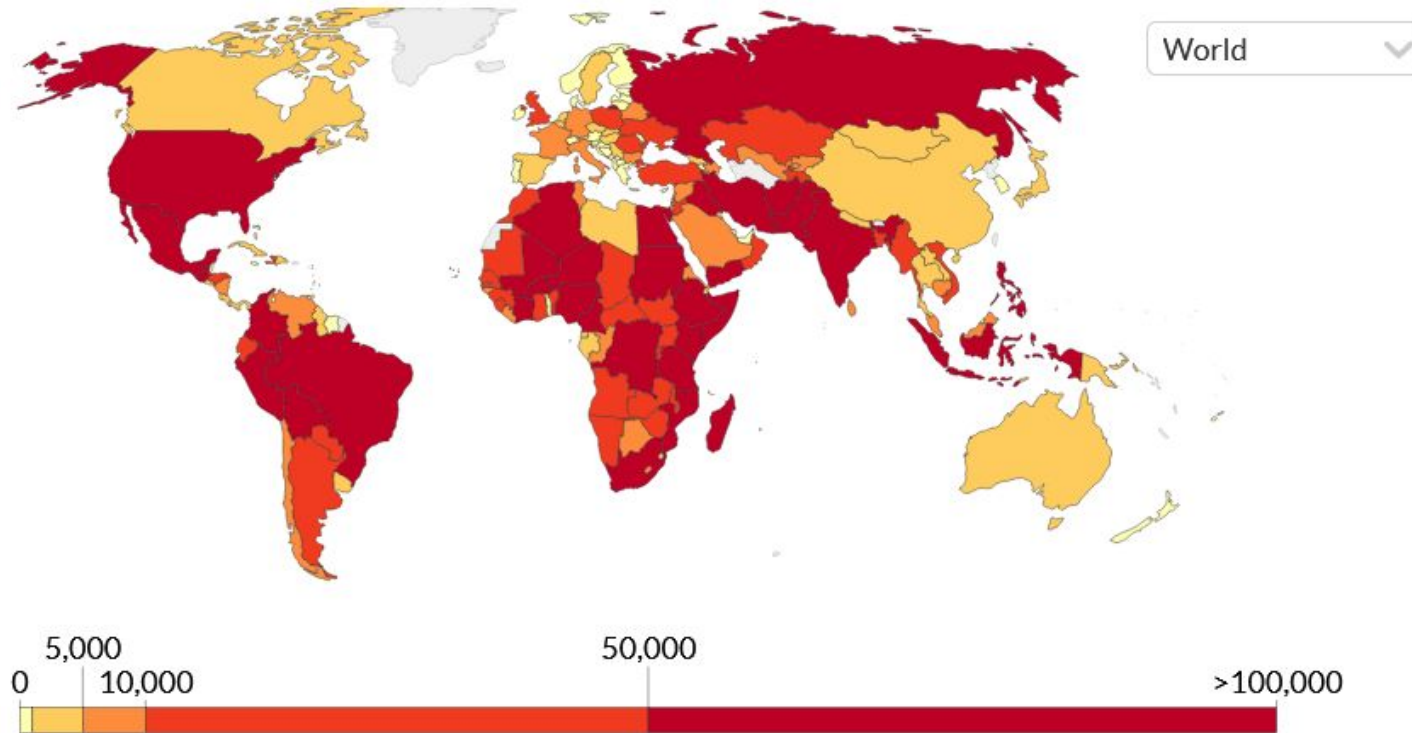


# Orphanhood

Orphanhood, Dec 28, 2022

Modeled estimates

**7,7 million children affected**



Source: Hillis, Unwin, Chen et al, The Lancet (2021)  
imperialcollegelondon.github.io/orphanhood\_trends/ • Powered by ourworldindata.org

[https://imperialcollegelondon.github.io/orphanhood\\_calculator/#/country/African](https://imperialcollegelondon.github.io/orphanhood_calculator/#/country/African)

## Americas

Orphanhood estimates:

**1,056,600**

(death of one or both parents)



Estimates of loss of primary caregiver:

**1,147,300**

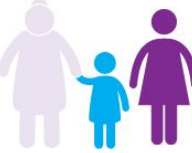
(death of one or both parents or death of custodial grandparents)



Estimates of children losing primary or secondary caregivers:

**1,524,800**

(death of one or both parents, death of custodial grandparents, and/or death of other co-residing grandparents)

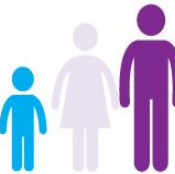


## African

Orphanhood estimates:

**2,189,600**

(death of one or both parents)



Estimates of loss of primary caregiver:

**2,306,800**

(death of one or both parents or death of custodial grandparents)



Estimates of children losing primary or secondary caregivers:

**2,600,500**

(death of one or both parents, death of custodial grandparents, and/or death of other co-residing grandparents)

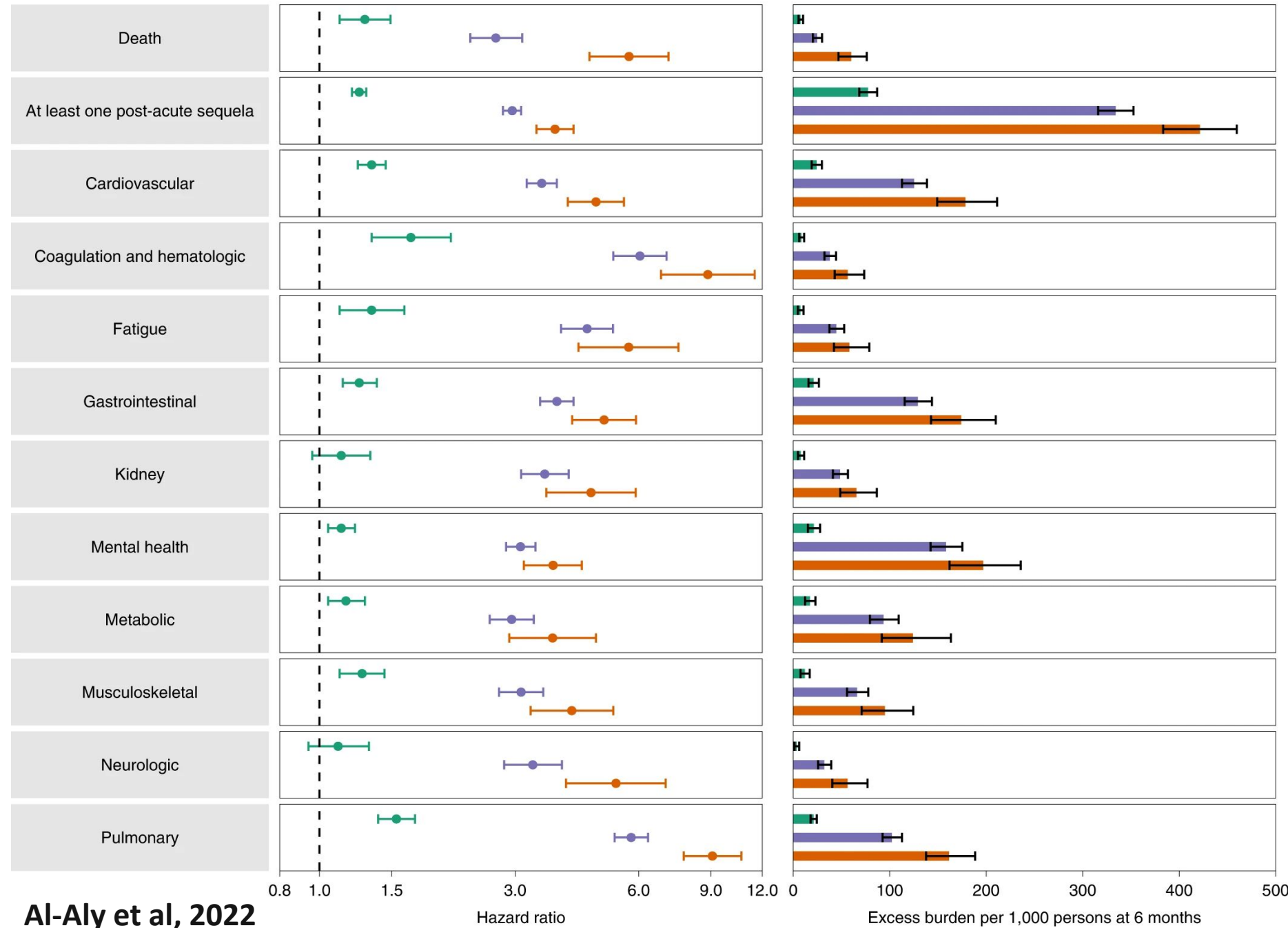


# Long COVID

Risk and 6-month excess burden of death, at least one post-acute sequela, by organ system.

Adjusted HRs (dots), 95% CIs (error bars), estimated excess burden (bars), and 95% CIs (error bars).

Burdens are presented per 1,000 persons at 6 months of follow-up

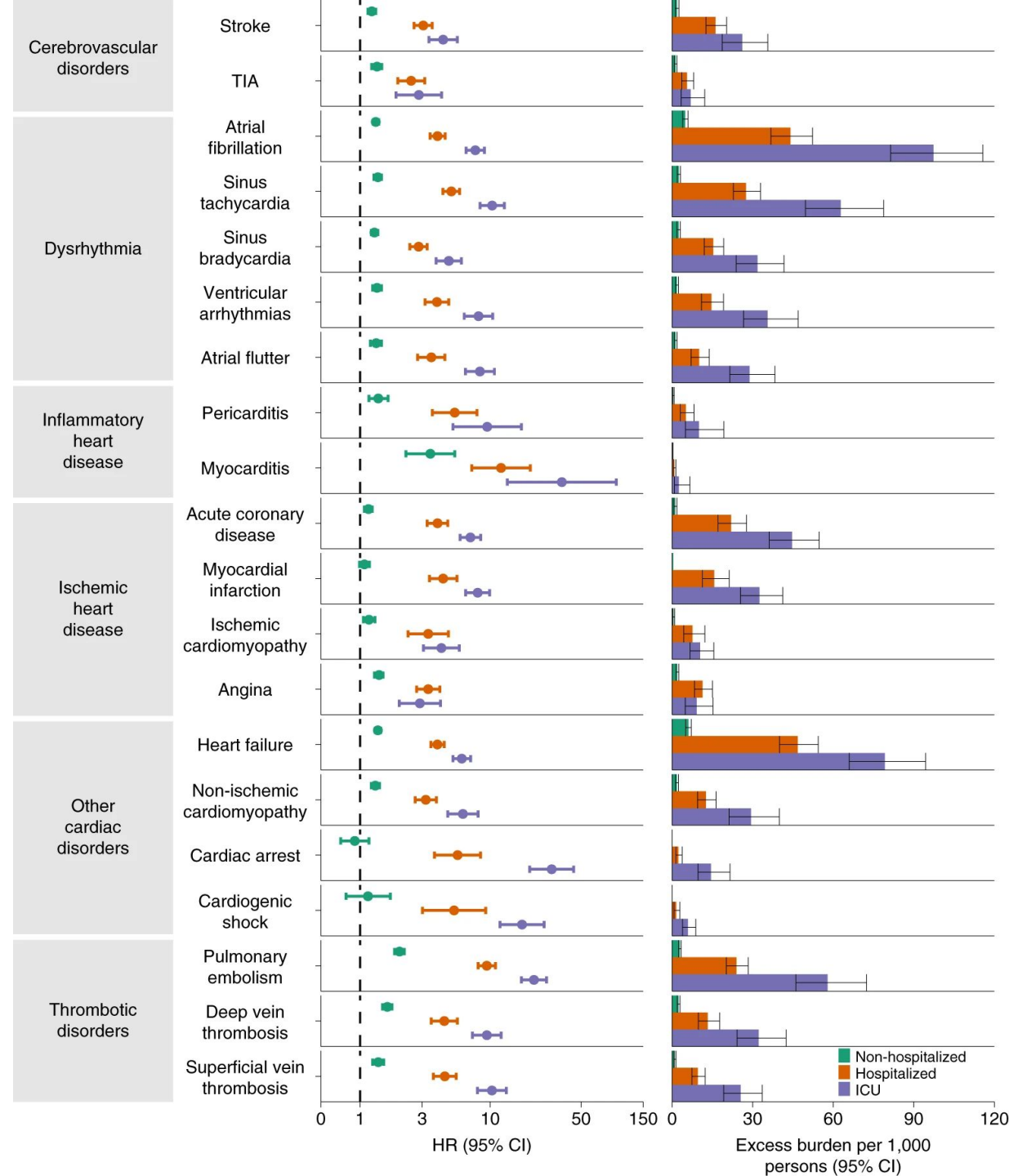
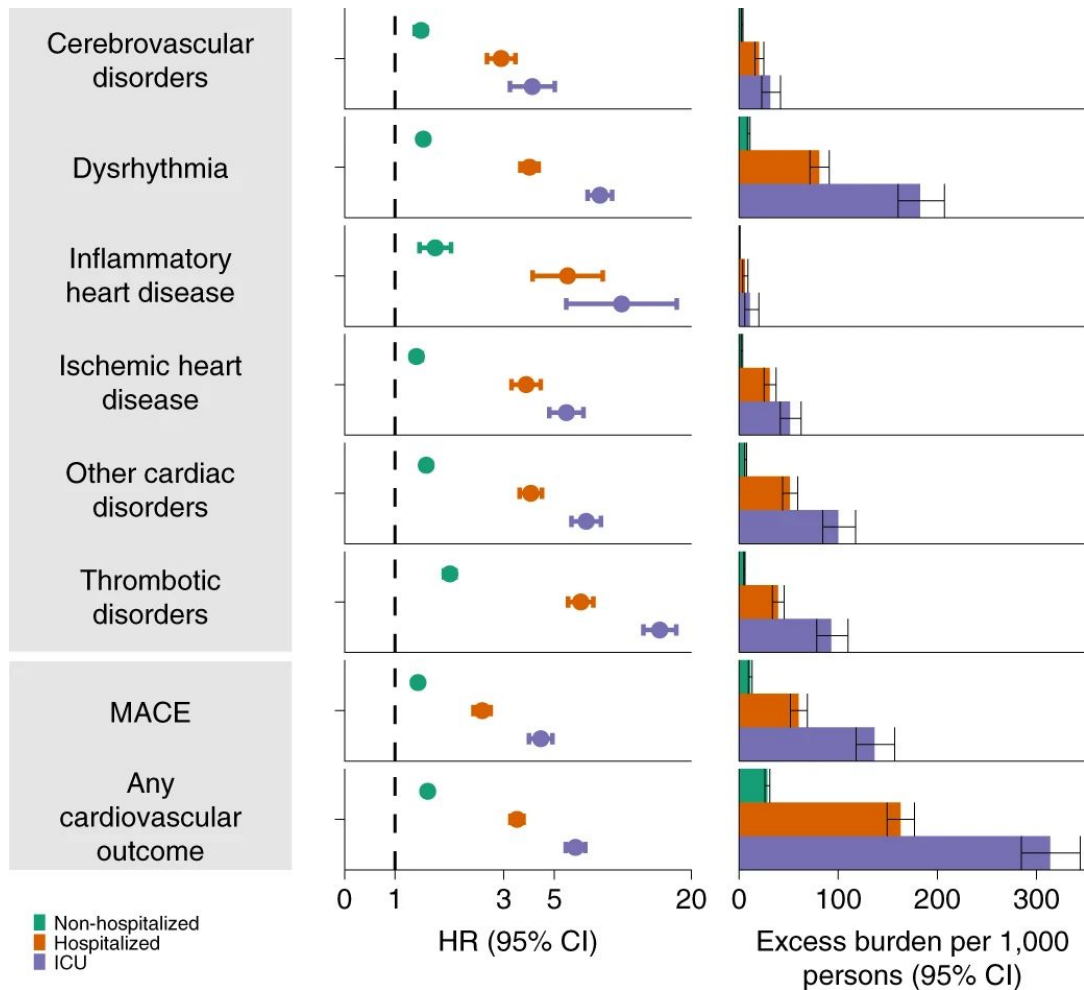




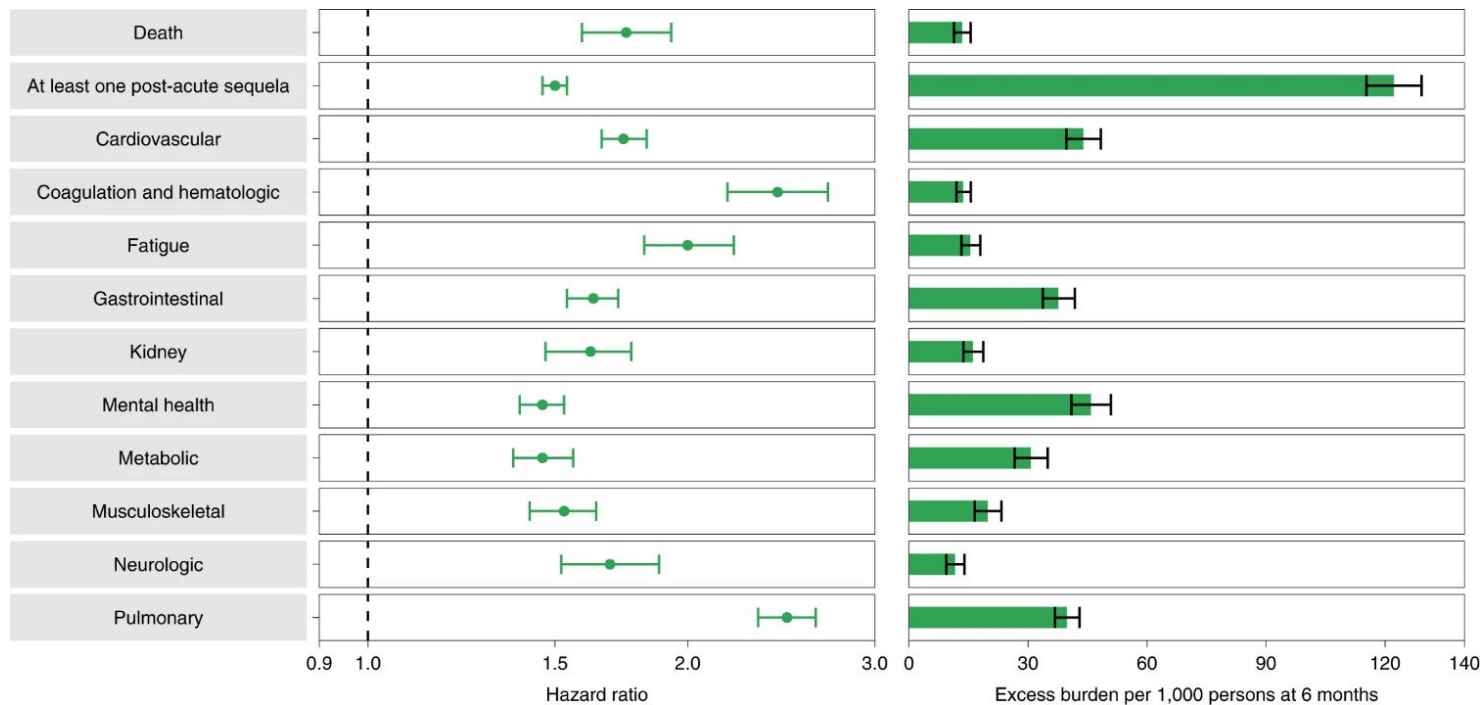
OPEN

# Long-term cardiovascular outcomes of COVID-19

Yan Xie<sup>1,2,3</sup>, Evan Xu<sup>1,4</sup>, Benjamin Bowe<sup>1,2</sup> and Ziyad Al-Aly<sup>1,2,5,6,7</sup>✉



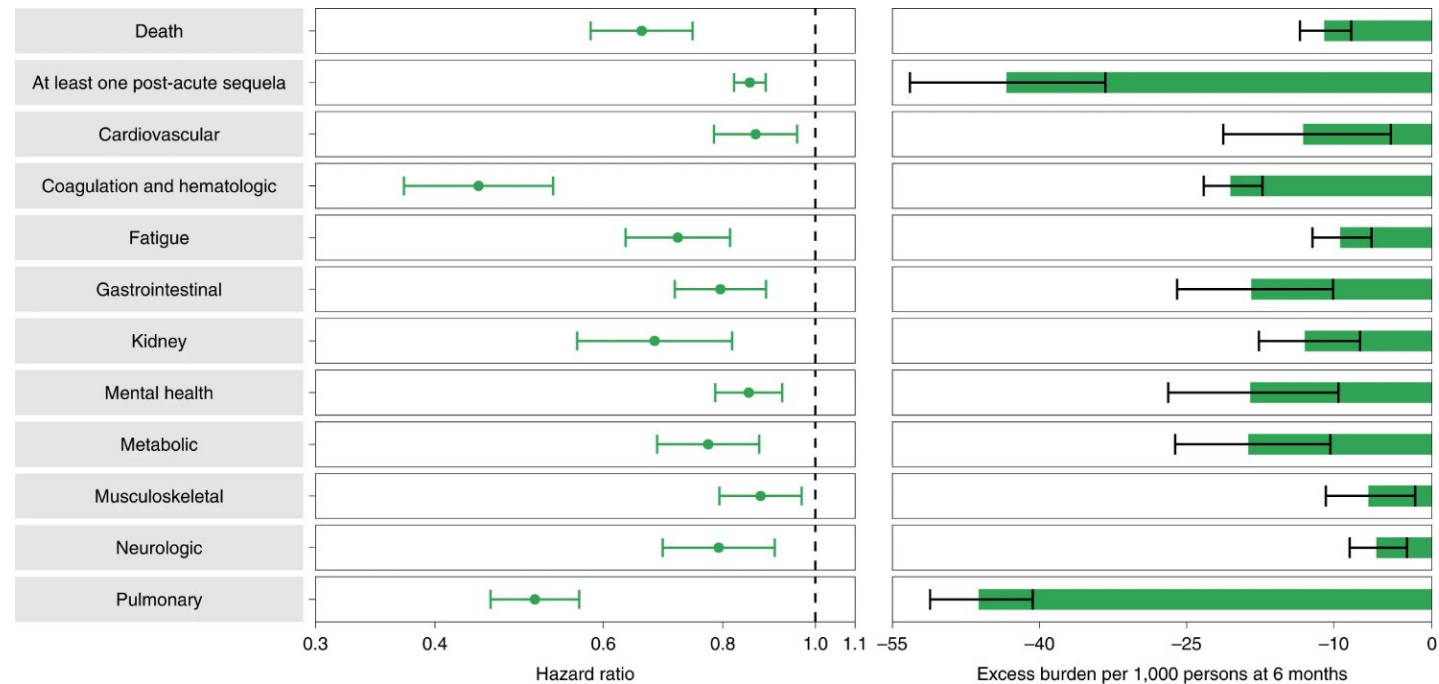




Risk and 6-month excess burden of post-acute sequelae in people with BTI compared to the contemporary control group

**Long COVID after breakthrough SARS-CoV-2 infection**  
 Ziyad Al-Aly , Benjamin Bowe & Yan Xie  
*Nature Medicine* 28, 1461–1467 (2022) | [Cite this article](#)

Risk and 6-month excess burden of post-acute sequelae in people with BTI compared to those with SARS-CoV-2 infection without prior vaccination



# Short x Long term

Table II.3

Assumptions used to estimate the number of years to pre-pandemic mortality levels

<i>Change in life expectancy at birth in 2020 compared to 2018-2019 baseline</i>	<i>Change in life expectancy at birth in 2021 compared to 2018-2019 baseline</i>	<i>COVID-19 vaccine coverage (1 or more doses) as of mid-May 2022</i>	<i>Number of years to return to pre-pandemic levels</i>	<i>Assumed year to return to pre-pandemic levels</i>
Decline	More Decline	Less than 25 %	3	2025
Decline	More Decline	25-49 %	2	2024
Decline	More Decline	50 % or more	1	2023
Decline	Decline	Less than 25 %	2	2024
Decline	Decline	25-49 %	1	2023
Decline	Decline	50 % or more	0	2022
Decline	Partial recovery	Less than 25 %	2	2024
Decline	Partial recovery	25-49 %	1	2023
Decline	Partial recovery	50 % or more	0	2022
Decline	Recovery		0	2022
No Decline	Decline	Less than 25 %	2	2024
No Decline	Decline	25-49 %	1	2023
No Decline	Decline	50 % or more	0	2022
No Decline	No Decline		0	2022

# Rupture of Services

Diabetes Research and Clinical Practice  
Volume 166, August 2020, 108304

**The impact of COVID-19 on people with diabetes in Brazil**

Mark Thomaz Ugliara Barone <sup>a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z</sup>, Simone Bega Harnik <sup>e</sup>, Patrícia Vieira de Luca <sup>c, f</sup>, Bruna Letícia de Souza Lima <sup>b, c</sup>, Ronaldo José Pineda Wieselberg <sup>a, b, c, d</sup>, Belinda Ngongo <sup>g</sup>, Hermelinda Cordeiro Pedrosa <sup>d, h</sup>, Augusto Pimazoni-Netto <sup>d, i</sup>, Denise Reis Franco <sup>b, d</sup>, Maria de Fatima Marinho de Souza <sup>c, j</sup>, Deborah Carvalho Malta <sup>k</sup>, Viviana Giampaoli <sup>e</sup>

Seminars in Oncology  
Volume 48, Issue 2, April 2021, Pages 156-159

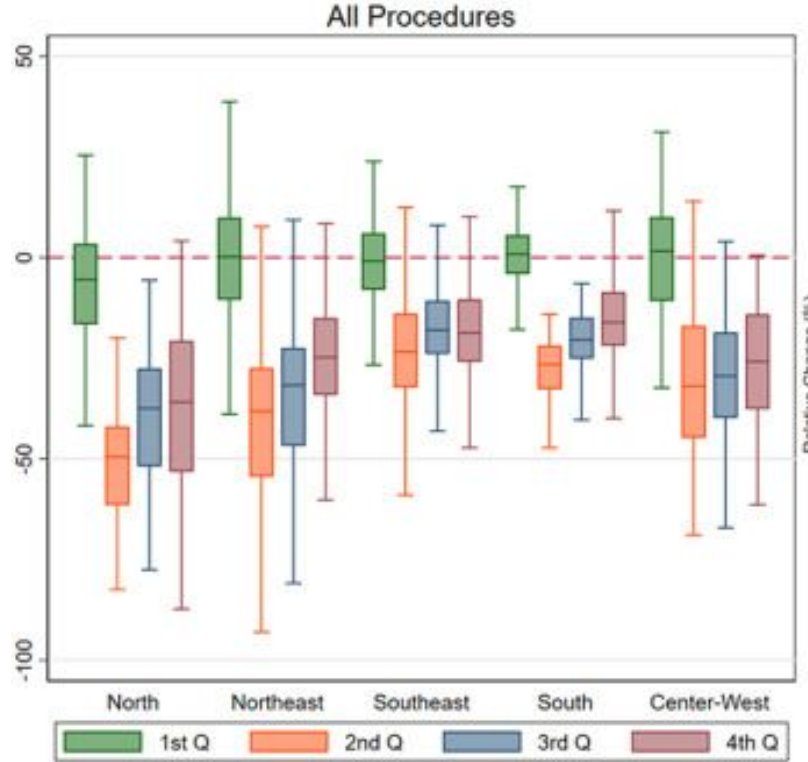
**Cancer diagnosis in Brazil in the COVID-19 era**

Nelson Pereira Marques <sup>a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z</sup>, Denise Maria M. Silveira <sup>b</sup>, Nádia Carolina Teixeira Marques <sup>c, d</sup>, Daniella Reis Barbosa Martelli <sup>b, e</sup>, Eduardo A. Oliveira <sup>e, f</sup>, Hercílio Martelli-Júnior <sup>b, d</sup>

HOME / ARCHIVES / VOL. 10 NO. 5 (2023): MAY 2023 / Original Research Articles

## Impact of delay due to the first wave of the COVID-19 pandemic on elective surgical patients in a tertiary care center: a prospective observational study

and Population



All procedures underwent reduction:

- Screenings (-42.6%)
- Diagnostic procedures (-28.9%)
- Low and medium complexity surgeries (-59.7%)
- High complexity surgeries (-27.9%)
- Transplants (-44.7%)

<https://doi.org/10.1016/j.lana.2022.100222>

**4 in 10 U.S. adults**  
reported avoiding medical care because of concerns related to COVID-19\*

Delaying or avoiding urgent or emergency care was more common among:

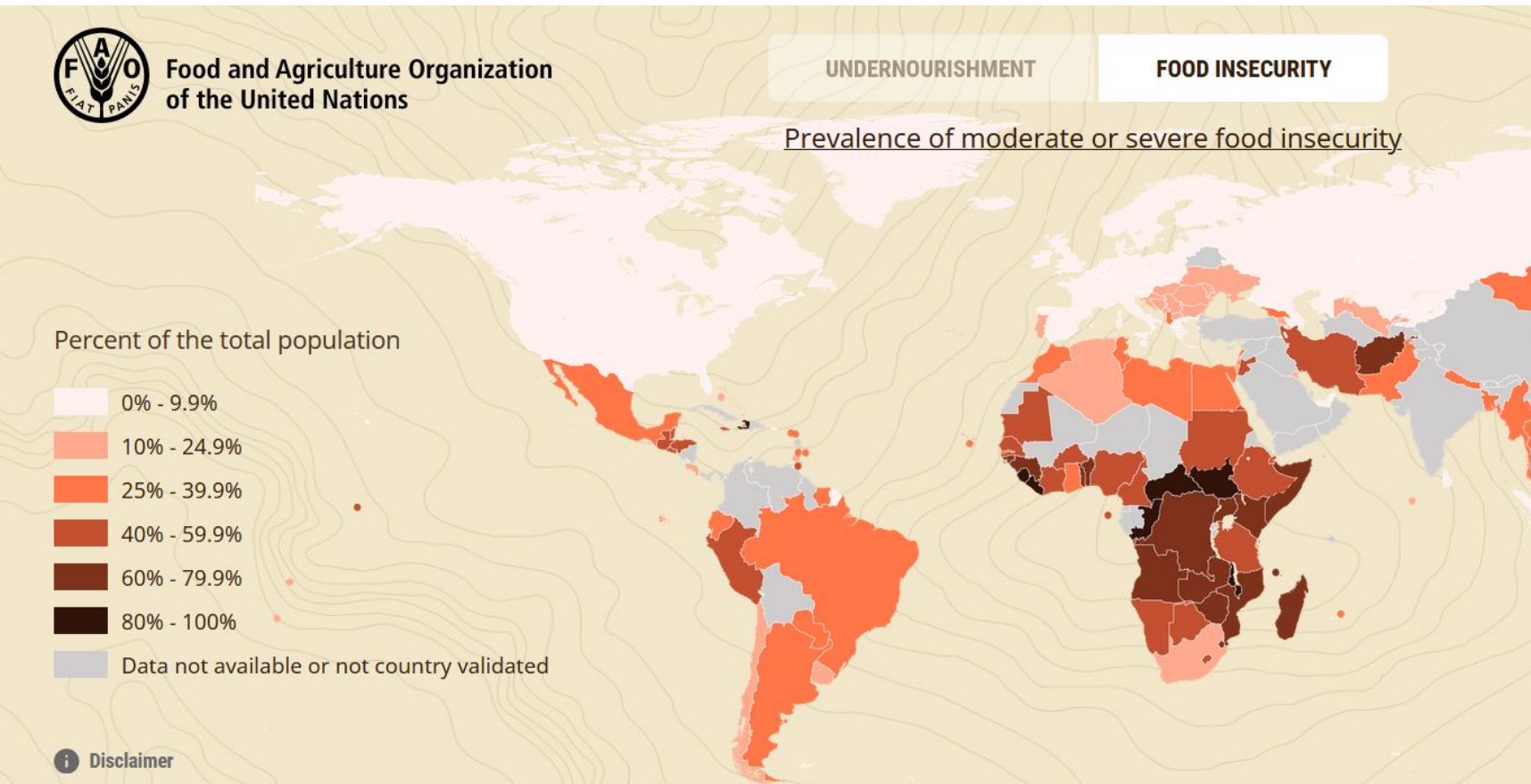
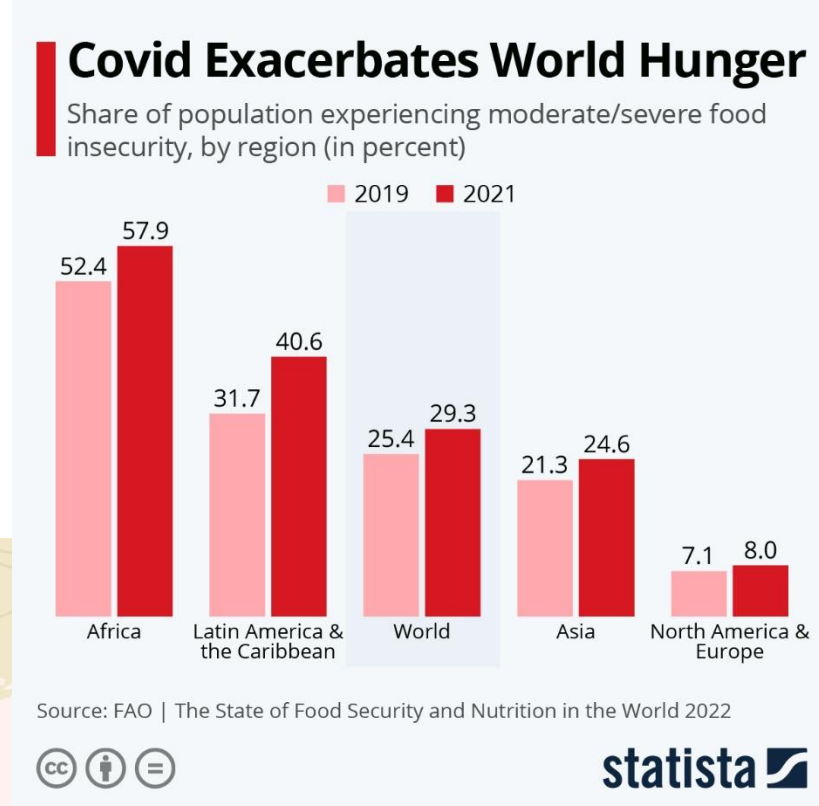
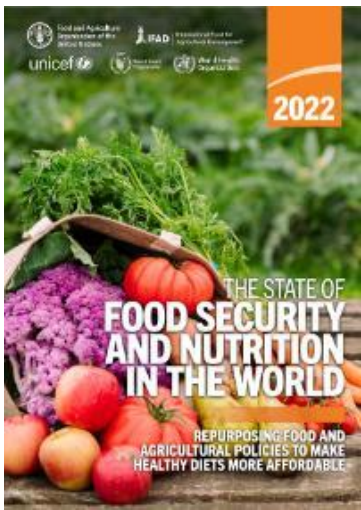
- People with disabilities
- People with two or more underlying conditions

**Telehealth may help people get the care they need**

Even during the COVID-19 pandemic, people who experience a medical emergency should seek care **without delay**

\*Web-based survey of a representative sample of U.S. adults aged ≥18 years during June 24–30, 2020

CDC.GOV bit.ly/MMWR91020 MMWR



The pandemic has put the **mental health of children and young people** in Latin America and the Caribbean **at risk.**

#OnMyMIND

unicef   
for every child

**Anxiety and depression** account for half of the mental disorders among **adolescents** in the region.

#OnMyMIND

unicef   
for every child

**27% of young people felt anxiety** during the pandemic in Latin America and the Caribbean.

(UReport Survey)

#OnMyMIND

unicef   
for every child

**15% of children and adolescents** are living with a diagnosed mental disorder.

#OnMyMIND

unicef   
for every child

**10 adolescents die each day by suicide.**

Suicide is the third cause of death among adolescents aged 15-19 in the region.

#OnMyMIND

unicef   
for every child

Governments in the region **only spend around 1.8** per cent of public expenditure on **mental health.**

#OnMyMIND

unicef   
for every child

 **HARVARD**  
**T.H. CHAN**

**SCHOOL OF PUBLIC HEALTH**  
Department of Global Health and Population

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# Fertility

# The COVID-19 pandemic and human fertility

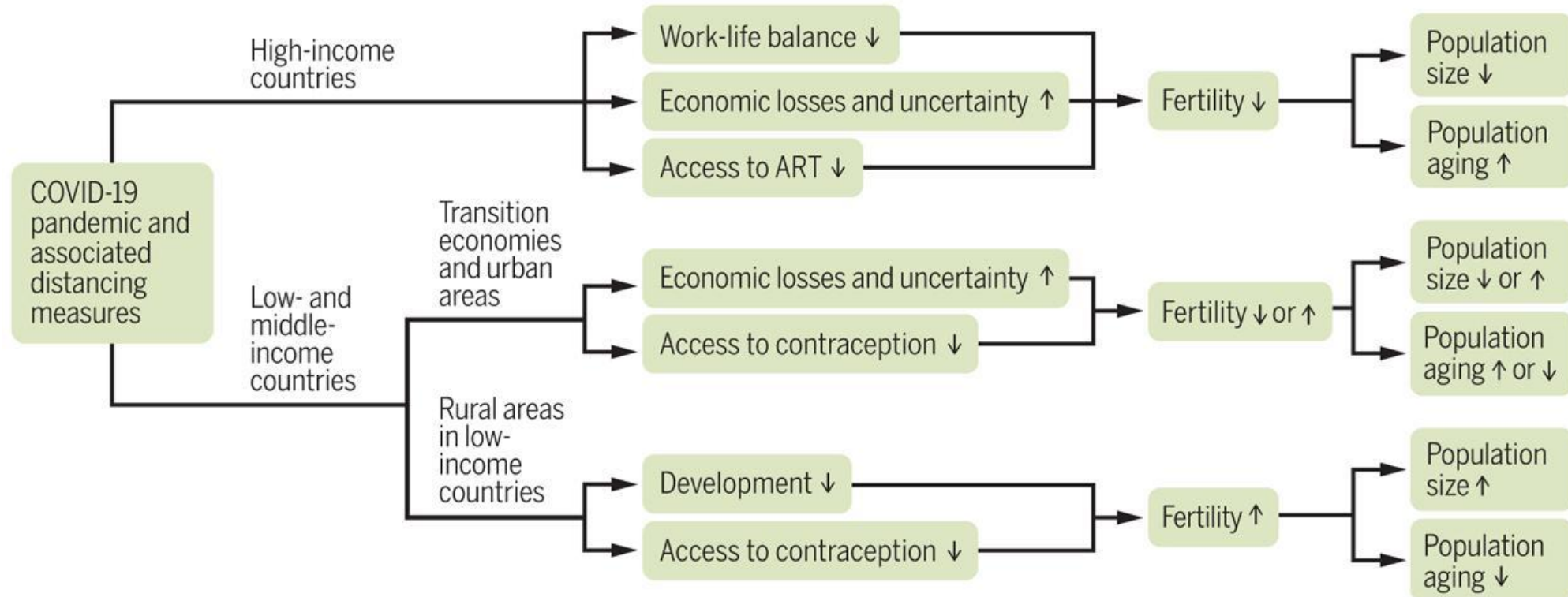
Birth trends in response to the pandemic will vary according to socioeconomic conditions

By A. Aassve<sup>1,2</sup>, N. Cavalli<sup>2,3,4</sup>, L. Mencarini<sup>2,5</sup>,  
S. Plach<sup>2</sup>, M. Livi Bacci<sup>6,7</sup>

SCIENCE • 24 Jul 2020 • Vol 369, Issue 6502 • pp. 370-371

## Possible post-pandemic fertility trajectories according to regional income level

The social measures aimed at reducing coronavirus disease 2019 (COVID-19) infection may be expected to have different effects on fertility, depending on societies' development and stage of the demographic transition, and ultimately, on population density and age distribution. ART, assisted reproductive technology.

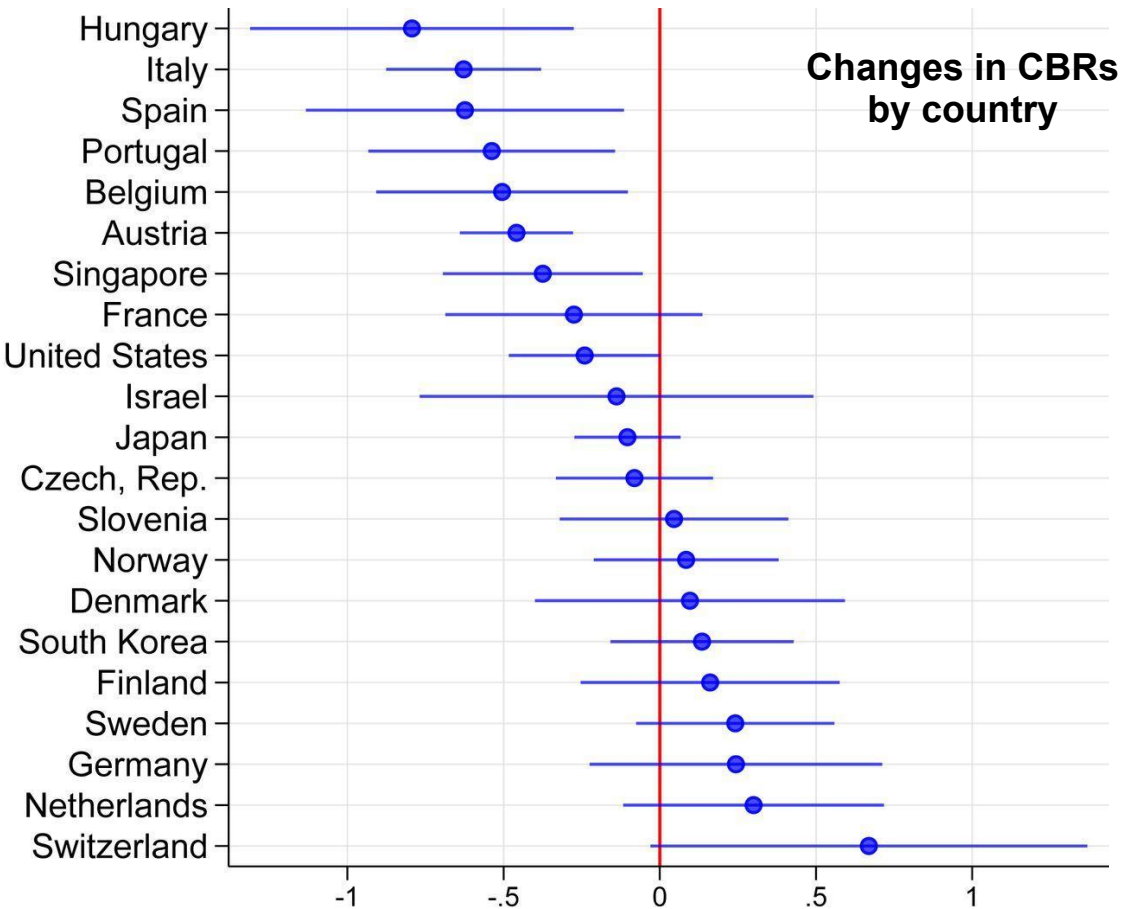


# Early assessment of the relationship between the COVID-19 pandemic and births in high-income countries

Arnstein Aassve, Nicolò Cavalli, Letizia Mencarini, Samuel Plach, and Seth Sanders

+ See all authors and affiliations

PNAS September 7, 2021 118 (36) e2105709118; <https://doi.org/10.1073/pnas.2105709118>



Aassve et al. PNAS 2021;118:36:e2105709118

# How will the COVID-19 pandemic affect births?

## Technical Brief



21 December 2021

Overall, based on available data, changes in births associated with COVID-19 appear to be temporary. Also, delays in birth registrations may have occurred in some countries during imposed lockdowns - requiring longer-term tracking to affirm the fuller picture of how COVID-19 has affected fertility

### The impact of COVID-19 vaccines on fertility-A systematic review and meta-analysis

D. Zaçe<sup>a,b,\*</sup>, E. La Gatta<sup>a</sup>, L. Petrella<sup>a</sup>, M.L. Di Pietro<sup>a</sup>

Vaccine 40 (2022) 6023–6034

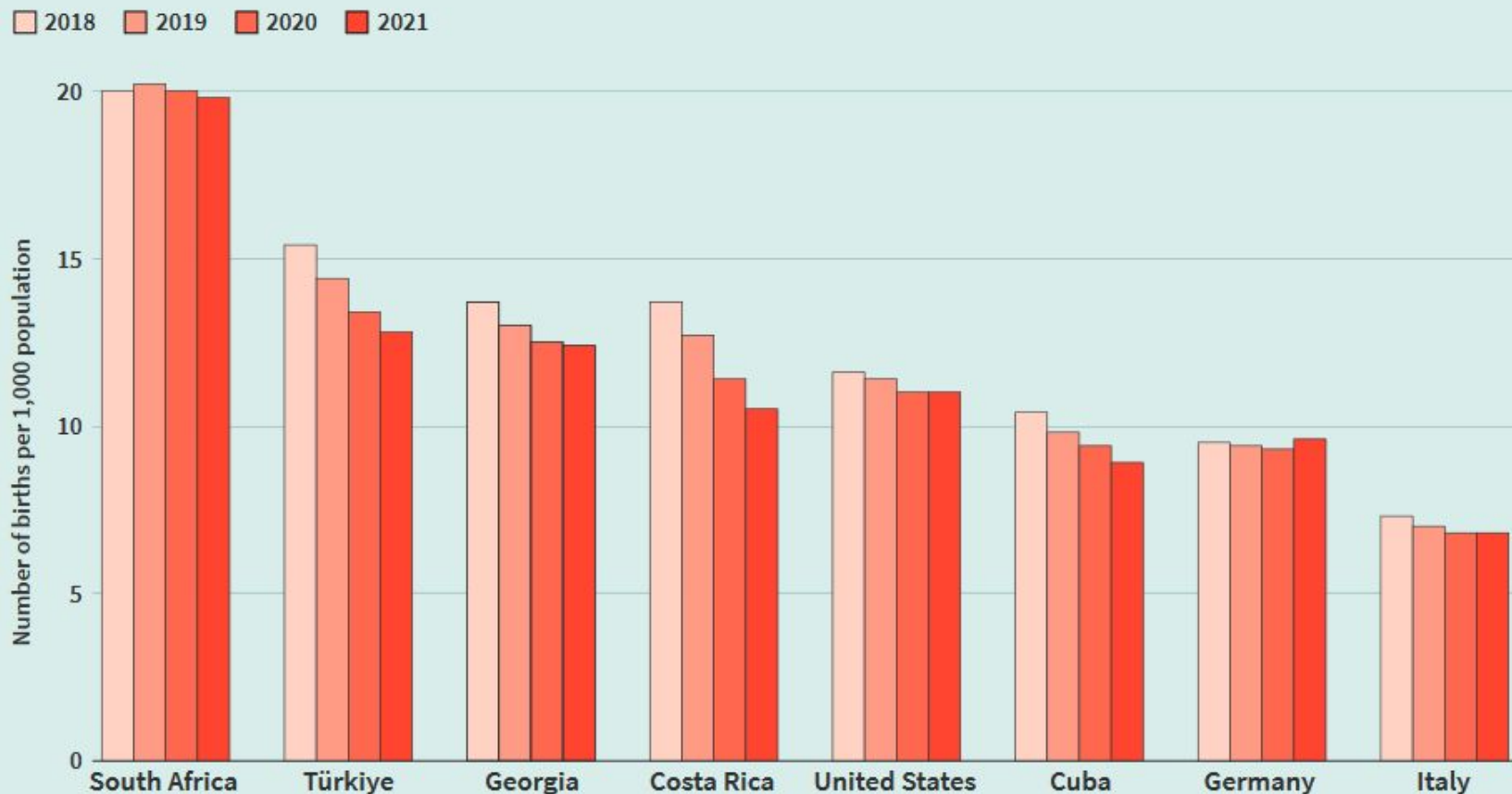
Based on the studies published so far, there is no scientific proof of any association between COVID-19 vaccines and fertility impairment in men or women.



# Pandemic Effects on Fertility Are Largely Limited

High-income countries like Germany and the United States mostly saw small declines in births in 2020 that rebounded or stabilized in 2021. Low- and middle-income countries such as Costa Rica and Türkiye continued to see births decline, following pre-pandemic trends. These data suggest the pandemic's impact on fertility has generally been limited and temporary.

## Births per 1,000 Population, 2018-2021



Source: National Statistical Offices from listed countries.

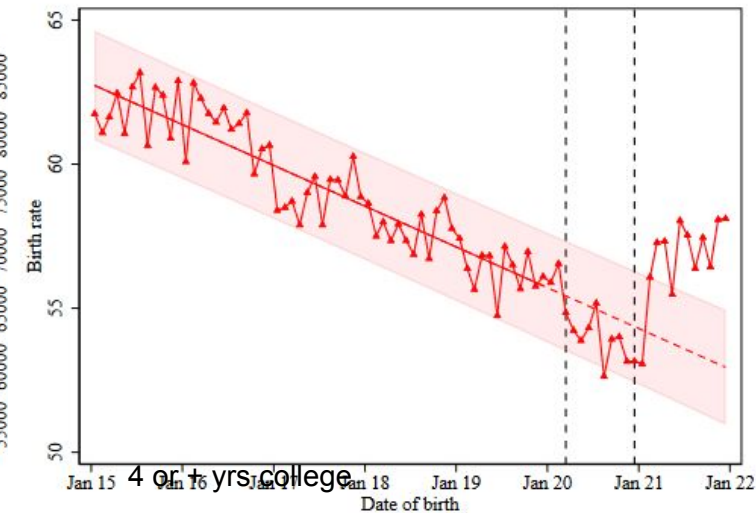
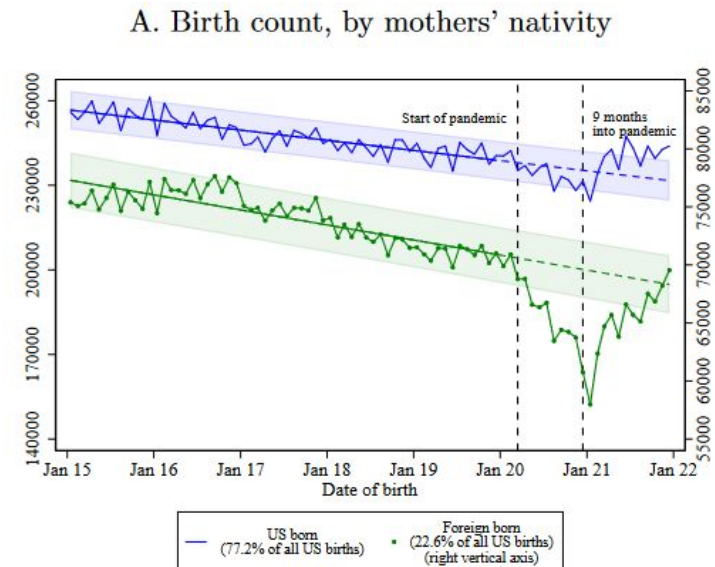
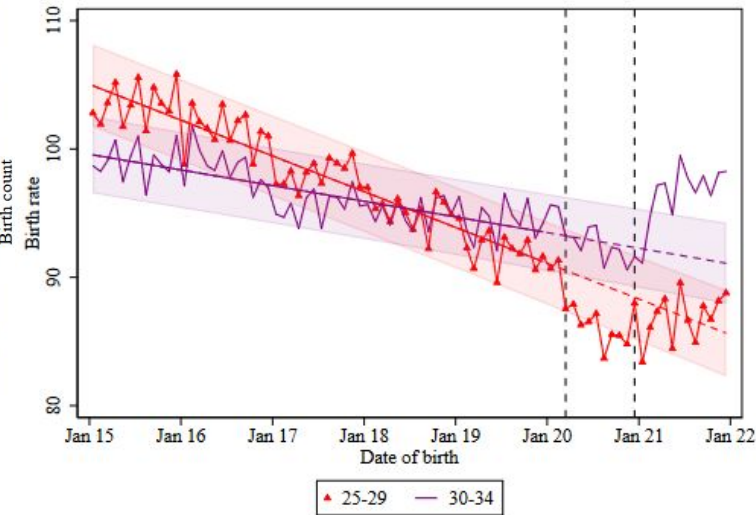
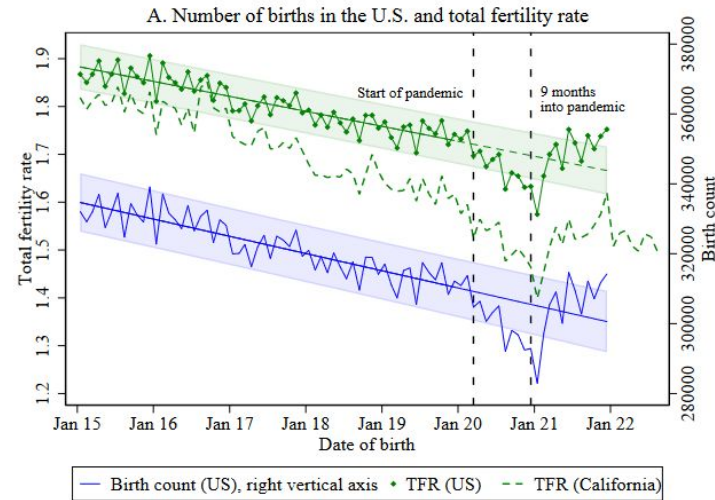
# THE COVID-19 BABY BUMP: THE UNEXPECTED INCREASE IN U.S. FERTILITY RATES IN RESPONSE TO THE PANDEMIC

NBER WP 30569

Martha J. Bailey  
Janet Currie  
Hannes Schwandt

October 2022

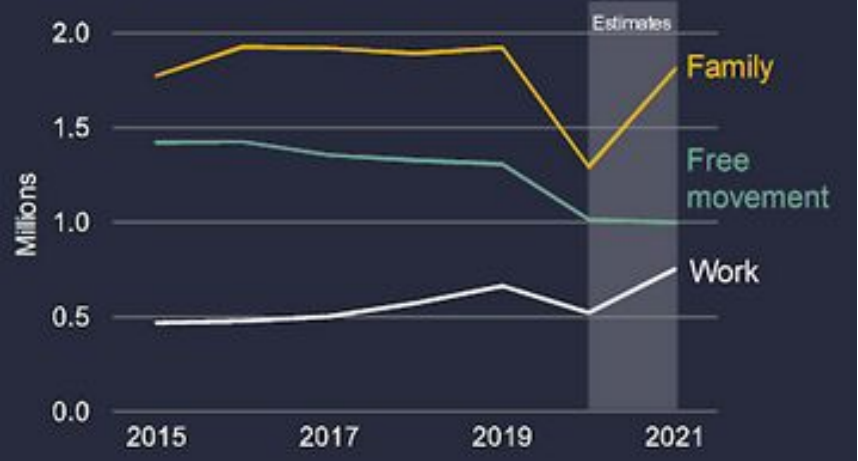
- Although fertility declined in 2020, declines appear to reflect reductions in travel
  - Childbearing in the U.S. among foreign-born mothers declined immediately after lockdowns—9 months too soon to reflect the pandemic’s effects on conceptions
- Small “baby bump” among U.S.-born mothers
  - 1<sup>st</sup> major reversal in declining U.S. fertility since 2007 and was most pronounced for first births and women <25, which suggests the pandemic led some women to start their families earlier
  - >25, the baby bump was also pronounced for women ages 30-34 and women with a college education, who were more likely to benefit from working from home



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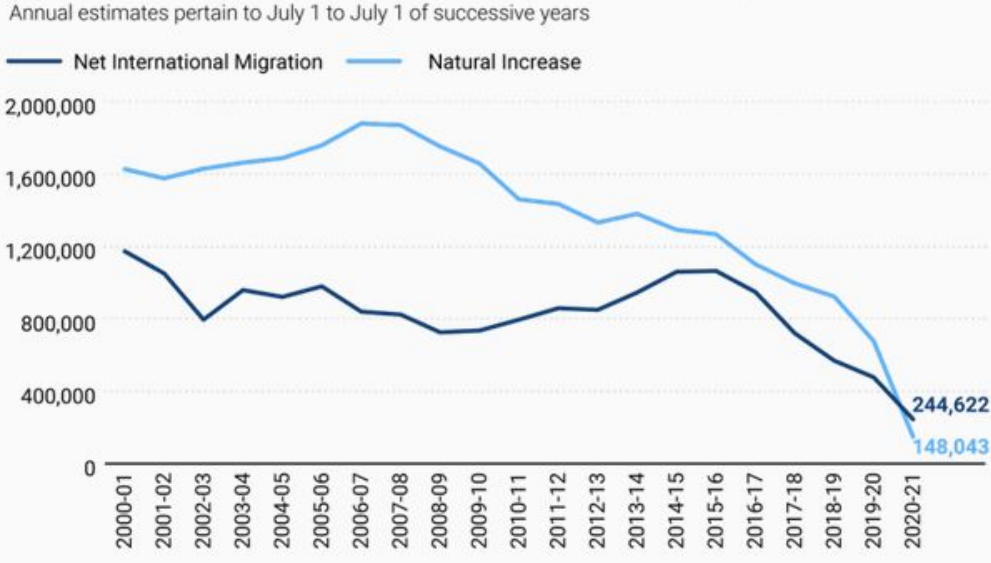
# Migration

# Migration flows across OECD countries have partially bounced back



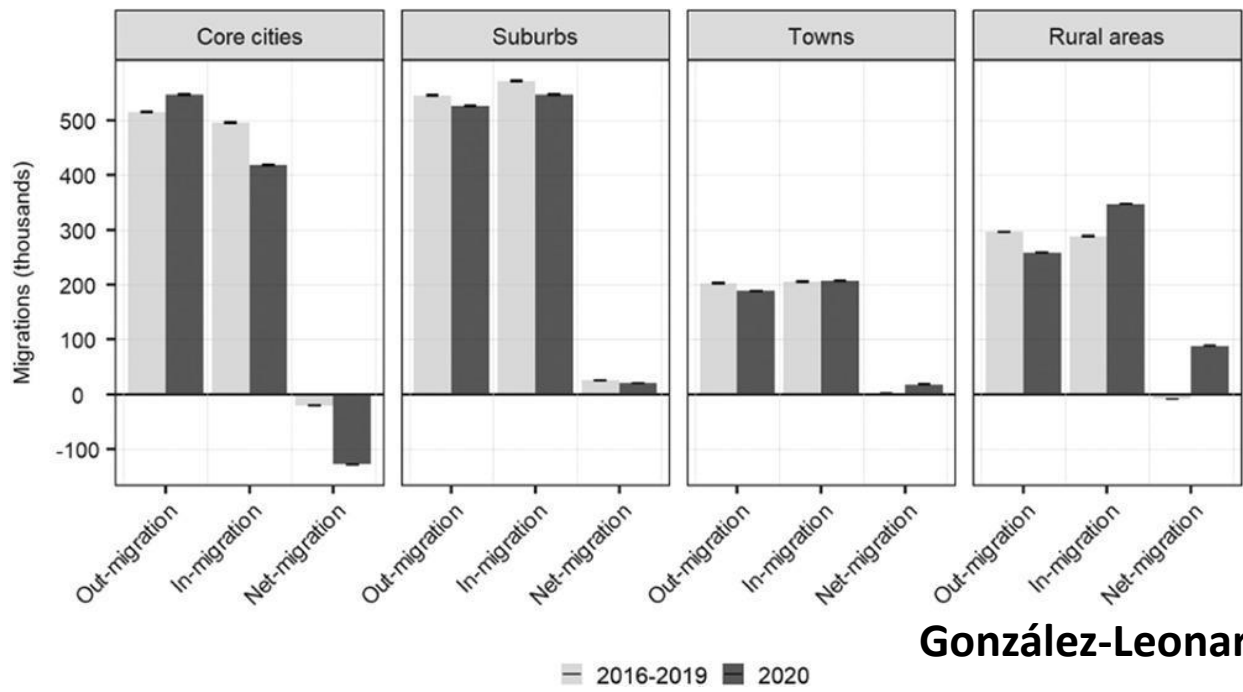
Permanent migration to OECD countries increased in 2021 relative to 2020 by approximately 22%, with family migrants representing 38% of the total.

**Figure 1. Annual net international migration and natural increase, 2000 to 2021**



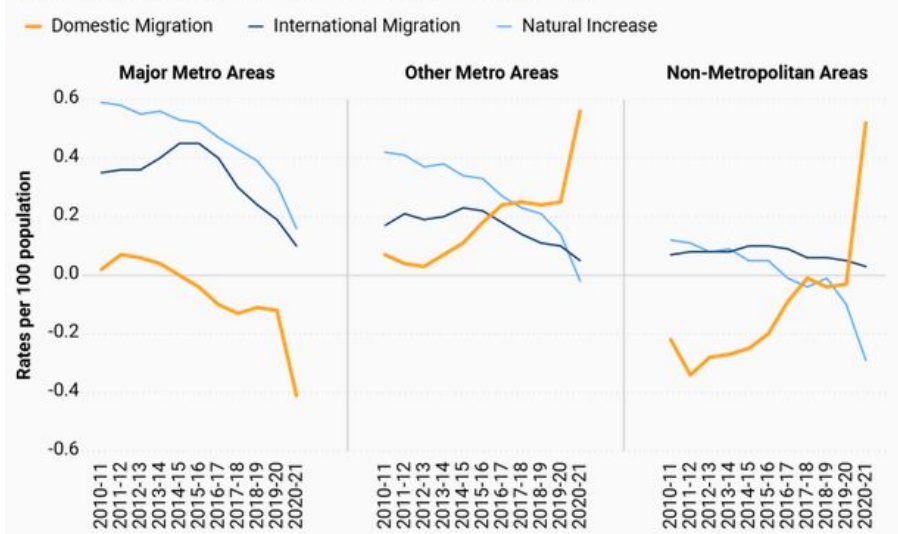
Source: William H. Frey analysis of US Census Bureau estimates released December 21, 2021

Spain

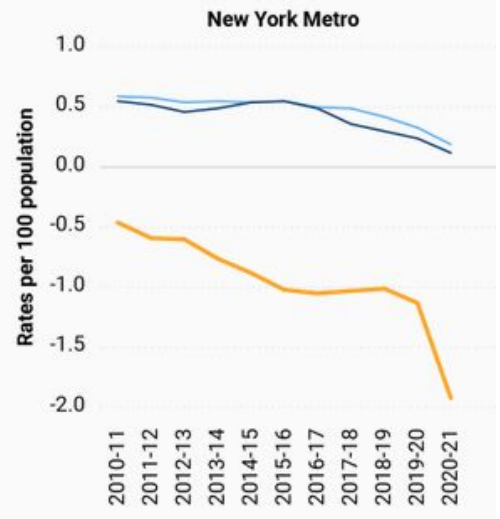


González-Leonardo et al, 2022

**Figure 3. Annual net domestic migration, international migration, and natural increase, 2010 to 2021. Metropolitan and non-metropolitan areas.**

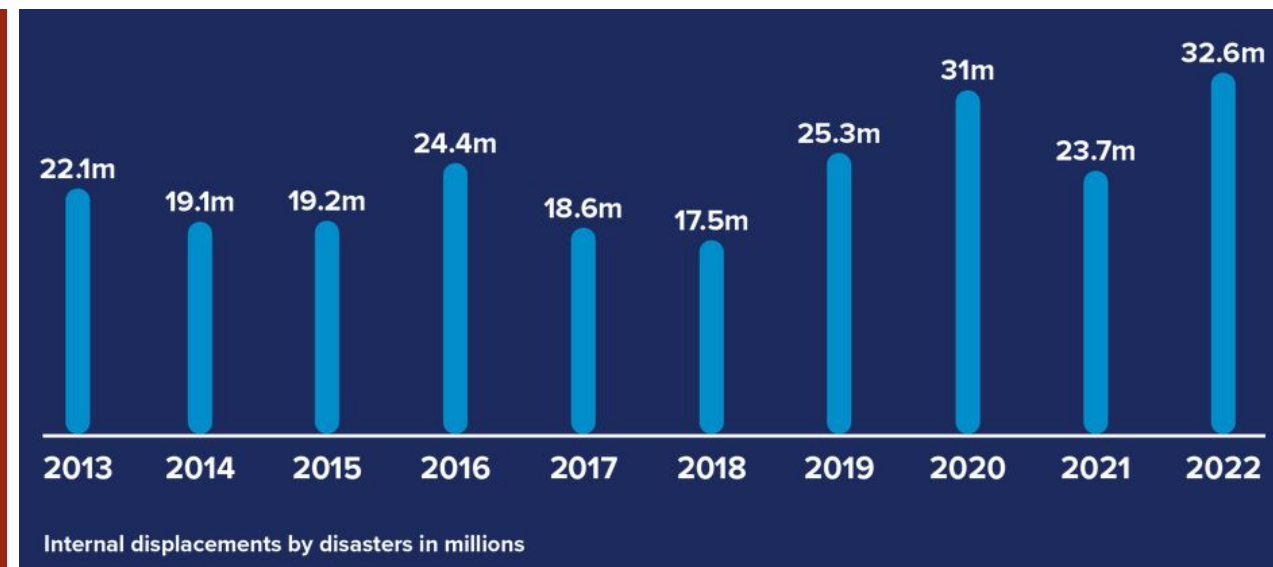
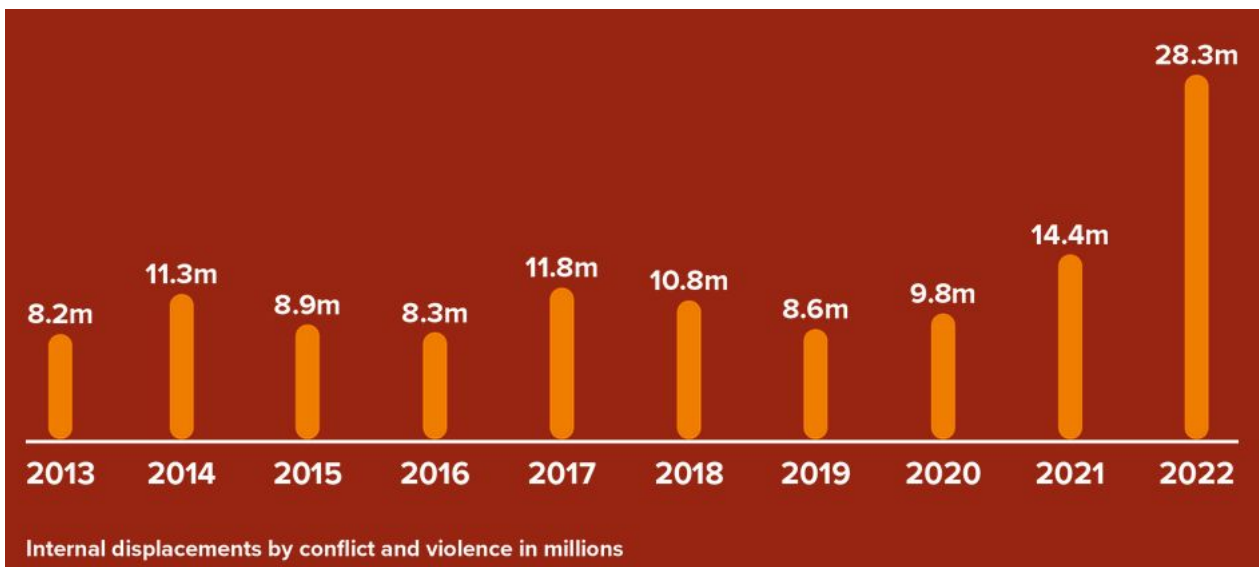


Source: William H. Frey analysis of US Census Bureau estimates released March 24, 2022



60.9 mill internal displacements in 2022, 60% more than in 2021 and the highest figure ever

A record **32.6 million** were associated with disasters and **28.3 million** with **conflict and violence**



### Highest figure in a decade

Conflict and violence displacements in 2022 were **3x higher** than the annual average of the past ten years

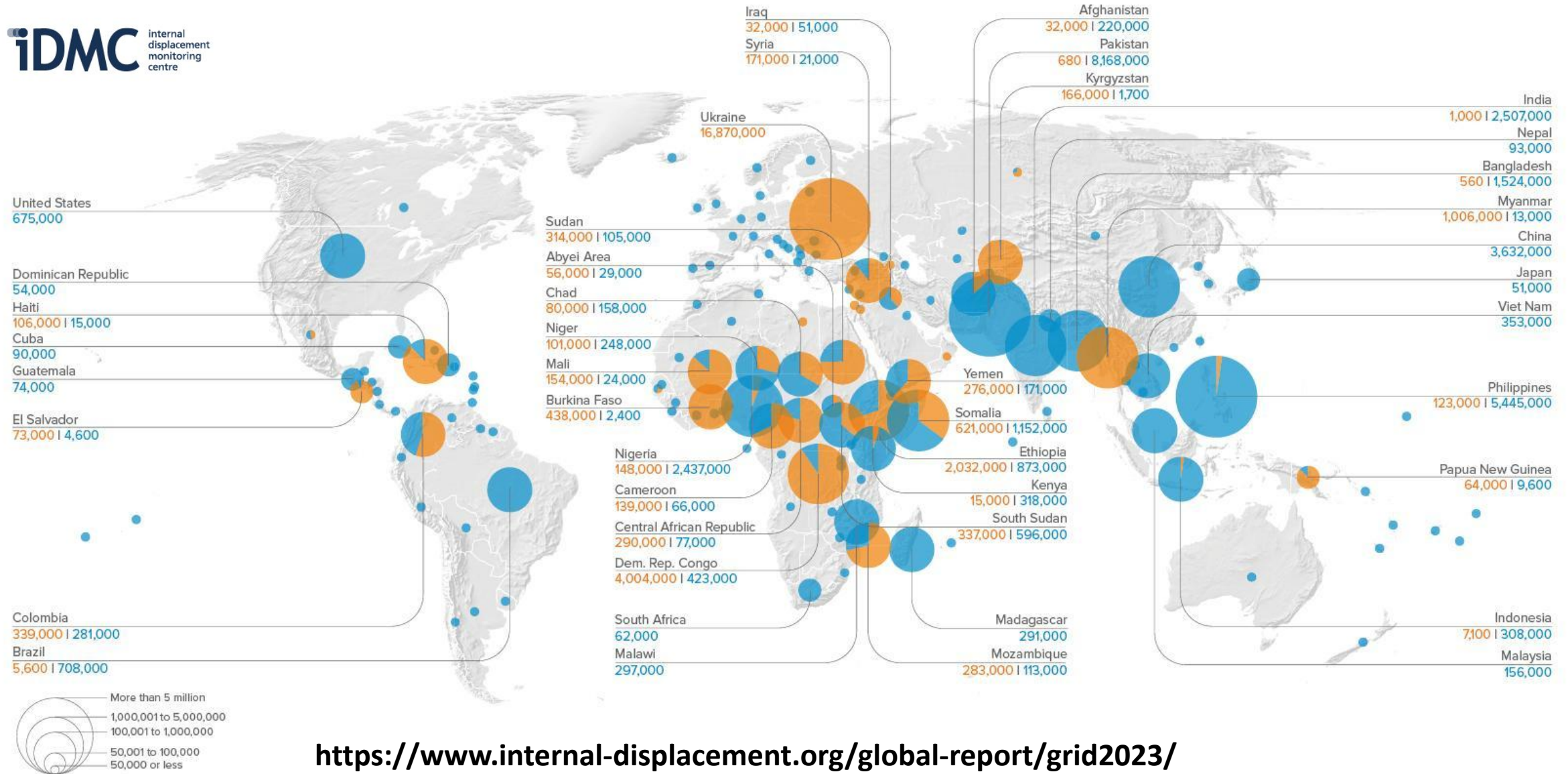


### Highest figure in a decade

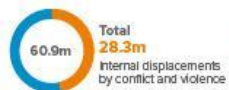
Disaster displacements in 2022 were **41% higher** than the annual average of the past 10 years

# Internal displacements by conflict and disaster in 2022

**IDMC** internal displacement monitoring centre

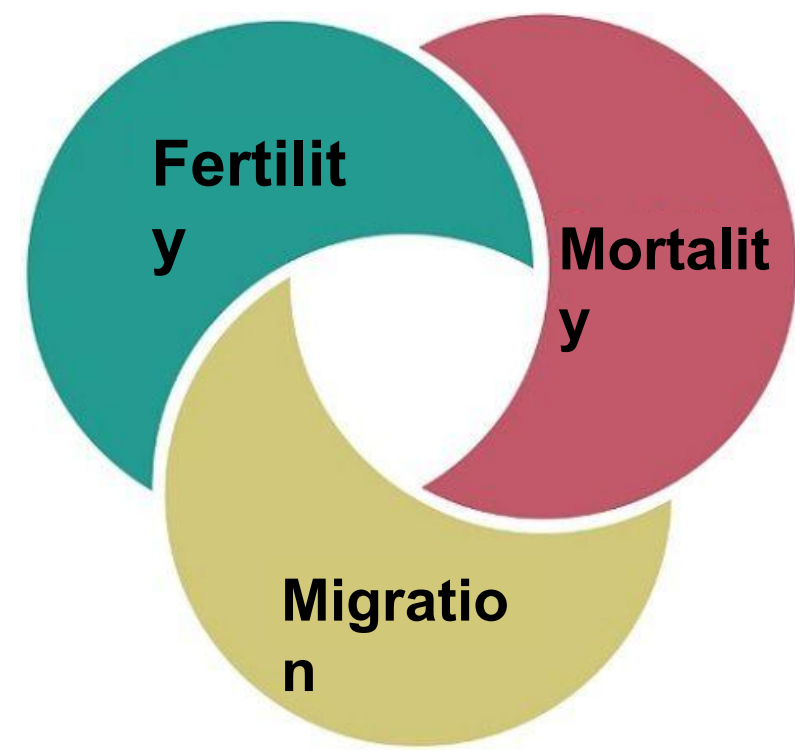


<https://www.internal-displacement.org/global-report/grid2023/>



**32.6m**  
Internal displacements  
by disasters





# Thank you

