INEQUALITY KILLS

Methodology note

OXFAM

1 METHODOLOGY ON BILLIONAIRE KILLER STATS

FACTS ABOUT THE TOP TEN RICHEST MEN

1. The world's 10 richest men more than doubled their fortunes, from $700bn to $1.5 trillion—at a rate of $15,000 per second, or $1.3bn per day—while the incomes of 99% of humanity are worse off because of COVID-19.
2. The 10 richest men own more wealth than the bottom 3.1 billion people (six times more, in fact).
3. If the top 10 billionaires spent a million dollars each a day, it would take them 414 years to spend their combined wealth.
4. If the top 10 billionaires sat on top of their combined wealth piled up in US dollar bills, they would reach almost halfway to the moon.
5. If the 10 richest men lost 99.999% of their combined wealth, they would still be richer than 99% of the world.
6. A 99% windfall tax on the COVID-19 wealth gains of the 10 richest men could pay for enough vaccines to vaccinate the entire world and fill financing gaps in climate measures, universal health and social protection, and efforts to address gender-based violence in over 80 countries, while still leaving these men $8bn better off than they were before the pandemic.

1. The wealth of the 10 richest men has doubled, while the incomes of 99% of humanity are worse off because of COVID-19.

The world's 10 richest men more than doubled their fortunes, from $700bn to $1.5 trillion—at a rate of $15,000 per second, or $1.3bn per day.

The development in billionaires' wealth is found in data from the Forbes Billionaires List.[1]

Forbes uses net wealth (assets minus debt) to calculate billionaires' fortunes. Our figures start on March 18, 2020, when the Forbes annual billionaires list was published, and run until November 30, 2021. The pandemic was declared on March 11, 2020.

Our figures are based on the 10 richest people on November 30, 2021, comparing them with the wealth of the same 10 people in March 2020 at the time of the Forbes annual list was released.

There has been inflation over this period, so we have used the US Consumer Price Index (CPI) to inflate the Forbes numbers from March 2020 in order to make them comparable with 2021 prices. This was done before subtracting the March numbers from the November numbers to see the change in wealth, thereby giving us wealth development in real terms. The CPI covers all urban consumers and is compiled as a US city average.[2]

The CPI for November 2021 had not been published when these numbers were calculated. We have used the latest available datapoint, which is October 2021.

Finally, all of the numbers are calculated as a percentage. The change in wealth (after inflating to 2021 prices) is divided by the March 2020 wealth figure, but in 2021 prices, thereby giving us the real percentage change without inflation. On November 30th, the total figure for the top 10 richest was $1,512.3bn. The total figure for March 2020, inflated to October 2021 prices, is $691.7bn, so the increase is 119%, or more than double.

This means that, as a group, the top 10 billionaires' net wealth has more than doubled. In this group, however, some of the billionaires will have seen real growth below 100%, and for others it will have been far higher than 100%. The number reported here is the total wealth of the top 10 billionaires.

Change in the wealth of the 10 richest men: March 18, 2020 to November 30, 2021

Rank	Name	Net wealth, $bn	March 18, 2020, $bn	Inflated 2021 October	Change, $bn	% change
1	Elon Musk	294.2	24.6	26.4	267.8	1016%
2	Jeff Bezos	202.6	113	121.1	81.5	67%
3	Bernard Arnault & family	187.7	76	81.4	106.3	130%
4	Bill Gates	137.4	98	105.0	32.4	31%
5	Larry Ellison	125.7	59	63.2	62.5	99%
6	Larry Page	122.8	50.9	54.5	68.3	125%
7	Sergey Brin	118.3	49.1	52.6	65.7	125%
8	Mark Zuckerberg	117.7	54.7	58.6	59.1	101%
9	Steve Ballmer	104.4	52.7	56.5	47.9	85%
10	Warren Buffett	101.5	67.5	72.3	29.2	40%
	Total	**1512.3**	**645.5**	**691.7**	**820.6**	**119%**

Source: Forbes Billionaires List. https://www.forbes.com/billionaires/.

Their fortunes have risen by $1.3bn a day, or $15,000 a second.

March 2020–November 2021		
Total increase, $bn	820.6bn	
Total days	621	
Amount per:	Number of:	Amount per: US$
day	621	1,321,416,732
hrs	14904	55,059,030.51
minutes	894240	917,650.51
seconds	53654400	15,294

Because of COVID-19, 99% of humanity are worse off than they would have been.

Figures produced by the World Bank look at the difference between the projected incomes in 2021 of each percentile pre-COVID, and their projected incomes taking the COVID-19 crisis into account. These figures show declines for all centiles in both 2020 and 2021.

In fact, the World Bank projections show that the top 1% of incomes have decreased as have those for the bottom 99% of humanity. However, we have discounted this decrease for top 1% as it is based on survey data, which, it is widely agreed, does not capture the incomes of the richest 1% well.[3] Additionally, the World Bank estimates use average growth projections for each household within a country, so their estimates do not account for within country distributional changes.

Data for this calculation was provided by the World Bank to Oxfam. It is the same data that was used for this blog: https://blogs.worldbank.org/opendata/covid-19-increasing-global-inequality

2. The top 10 billionaires own more wealth than the bottom 40% of humanity.

The total wealth of the top 10 billionaires is found in data from the daily Forbes list, downloaded on November 30, 2021.

The total wealth of the top 10 billionaires was $1,512bn on November 30, 2021.

According to Credit Suisse, the combined net wealth of the bottom 40% of the population (3.1 billion people) was $244bn as of December 2020 (in November 2021 prices).

Wealth bn USD	
Bottom 40% (Credit Suisse Dec.20)	230
Bottom 50% (Credit Suisse Dec.20)	3,194
Top 10 richest billionaires (Forbes oct.21)	1,512
Bottom 40% (OCT.21 prices)	**244**
Bottom 50% (OCT.21 prices)	**3,392**
Top 10 richest billionaires (Forbes November 21)	**1,512**

This means that the top 10 richest people have just over six times more wealth than the bottom 40%.

The net wealth data is presented in dollars as of the year and date it refers to. To compare both dates, we adjusted the net wealth of the bottom 40% to be expressed in November 2021 prices using the US CPI from the US Bureau of Labor Statistics as a deflator (see endnote 2).

3. If the top 10 billionaires spent a million dollars each a day, it would take them 414 years to spend their combined wealth.

The combined net wealth of the 10 richest men is $1.5123 trillion according to Forbes (November 30, 2021). 365 days multiplied by 10m ($1m a day each) is 3.65bn. 1.5123 trillion divided by 3.65bn is 414.

This killer fact of course makes no allowance for interest, which could mean they would take far longer to spend their fortunes in reality, and may find that even at $1m a day, their fortunes would still increase.

4. If the top 10 billionaires sat on top of their collective fortunes/combined wealth piled up in US dollar bills, they would reach almost halfway to the moon.

Methodology	The length of the wealth of the 10 richest billionaires stacked in $1 bills is the product of their wealth in US$ and the thickness of one US dollar bill. The thickness of a dollar bill is 0.0043 inches. The combined wealth of the 10 richest billionaires as of November 30, 2021 was $1,512.3bn.	
Calculations		
Wealth of the 10 richest billionaires (US$)	1,512,300,000,000	
Thickness of a dollar bill (inches)	0.0043	https://www.powerball.com/index.php/faq/question/whats-math-behind-how-tall-40-million-feature
Thickness of a dollar bill (km)	0.0000001092	
Total distance billionaire fortunes will reach, km	165,173	
Distance to space, km	100	https://www.livescience.com/32154-can-airplanes-fly-into-outer-space.html
Distance to the moon, km	382,500	Distance_to_the_Moon.pdf (nasa.gov)

5. If the 10 richest men lost 99.999% of their combined wealth, each of them would still be richer than 99% of the world.

The combined wealth of the richest 10 men is $1.5123 trillion (Forbes, November 30, 2021). If they lost 99.9993% of this wealth, they would still have $10.6m combined ($10,586,100).

To qualify as being in the top 1% you need to have over $1m in wealth.

To qualify as being in the bottom 99% of humanity you need to have under $1m in wealth.

According to Credit Suisse, the richest 1% have wealth over $1m;[4] therefore, if the 10 richest men lost 99.9993% of their wealth (rounded to 99.999% for simplicity), they would still have more wealth than 99% of humanity.

6. A 99% windfall tax on the COVID-19 wealth gains of the 10 richest men could pay to make enough vaccines for the entire world and fill financing gaps in climate measures, universal health and social protection, and efforts to combat gender-based violence in over 80 countries, while still leaving these 10 men $8bn better off than they were before the pandemic.

	$billions
Total wealth increase of ten richest	820.6
Revenue from 99% Windfall Tax	812.394
Remaining	8.206
Costings	
Enough vaccines produced for the world	27.8
Climate Adaptation	300
Universal Social Protection	440.8
Tackling Gender Based Violence	4.2
Total	**772.8**
Revenue from 99% tax	**812.394**
Remaining	**39.594**

The 10 richest men have seen their wealth increase by $820.6bn (see table in fact 1). A 99% windfall tax would generate $812.39bn.

COVID-19 vaccinations would cost $27.8bn. Experts from Imperial College London, working with Public Citizen, estimate the manufacturing costs of Pfizer's vaccine stands at just under $1.18 per shot.[5] There are 7,874,966,000 people on Earth according to the UN's 2021 medium variant population estimates.[6] The cost to vaccinate each person in the entire world would include two shots plus a booster.

The climate finance gap is estimated at $300bn. UNEP estimates the cost of adaptation in the low- and middle-income countries is around $70bn per year. By 2030, it will be around $140bn to 300bn per year. Studies estimate that annual loss and damage finance needs in low- and middle-income countries will reach $200–580bn by 2030.[7]

Universal social protection and healthcare would cost an estimated $440.8 bn. In 2020, the finance gap for achieving universal social protection coverage and healthcare for low- and lower- middle-income countries was $440.8bn. (See endnote 8 for the finance gap for achieving universal social protection coverage in 2020, in US$ billion and as a percentage of GDP (low- and middle-income countries only).[8]

The cost from 2020 to 2030 of ending gender-based violence in 132 priority countries is estimated at $42bn.[9]

Grand total: $772.8bn.

$39.6bn remaining.

2 FURTHER BILLIONAIRE FACTS

1. The increase in Jeff Bezos' fortune alone during COVID-19 could pay for enough vaccines to vaccinate the whole world.

Jeff Bezos has seen his fortune increase by $81.5bn during COVID-19 (see methodology for number 1 above).

COVID-19 vaccinations would cost $27.8bn. Experts from Imperial College London, working with Public Citizen, estimate the manufacturing costs of Pfizer's vaccine stands at just under $1.18 per shot (see endnote 4). There are 7,874,966,000 people on Earth according to the UN's 2021 medium variant population estimates (see endnote 5). The cost to vaccinate each person in the entire world would include two shots plus a booster.

2. A new billionaire is created every 26 hours.

The baseline is the number of billionaires at the time of the annual Forbes list release on March 18, 2020. At this point in time there were 2,095 billionaires according to Forbes. On November 30, 2021 this number had grown to 2,660 billionaires according to the latest data from Forbes, which means that 565 more people were billionaires in US dollars compared with March 2020. Forbes uses net wealth (which mean assets minus debt). To make the figures globally comparable between countries, the fortunes are expressed in US dollars at market exchange rates.

Every day has 24 hours. The number of days between March 18, 2020 and November 30, 2021, excluding the two publication days and only counting the days in between, amounts to 621 days. This multiplied by 24 hours amounts to 14,904 hours. If this is divided by 565 billionaires, it means that every 26th hour a new billionaire is created.

It must be emphasized that people have moved in and out of the list in this timespan, and it is not a stable number of billionaires to which new billionaires are simply added.

3. Billionaire wealth has grown more since COVID-19 began than it has in the last 14 years.

Forbes uses net wealth (assets minus debt). To make the figures globally comparable between countries, the fortunes are expressed in US dollars at market exchange rates.

We look at how the Forbes list of billionaires has developed and their total yearly combined wealth, and then subtract it from the same figure for the previous year. These yearly developments are compared with the growth during COVID-19. COVID-19 was declared a global pandemic on March 11, 2020, and Forbes published its annual list on March 18th. In our data, the timespan for COVID-19 ends with the latest datapoint from Forbes, which is November 30, 2021. In this timespan we calculate a total wealth increase using the yearly difference from March 2020 to March 2021, when the yearly 2021 numbers were published by Forbes. These numbers are added to the wealth development numbers for March 2021 to October 2021 and also from October 2021 to November 2021.

To analyze the real wealth growth of the billionaires we must adjust the timeseries wealth numbers to October 2021 prices. For this we have used the CPI for the US to inflate the Forbes numbers. Since the yearly Forbes lists are published in March, we have taken the CPI for March every year back to 2000. We have also adjusted the development from March 2021 to October 2021 using October 2021 CPI prices. However, since the November numbers for the CPI had not been published at the time of writing, we have also used October 2021 prices for the development from October 2021 to November 2021. The CPI covers all urban consumers and is compiled as a US city average.

The result of this is that total real growth in billionaire wealth from March 2020 to March 2021 was $5,090bn. For March 2021 to October 2021, real growth was $380bn. From October 2021 to November 2021, real development (in October 2021 prices) was a fall of $276bn. This adds up to COVID-19 real wealth development of $5,194bn. That is more than in the previous 14 years from 2007–2020 (with the periodization March–March for the yearly changes), when the total real growth in wealth was $4,910bn.

Billionaire wealth has grown more during Covid-19 than the total increase over the last 14 years.					
Year	Total number of billionaires	Total wealth, $bn (nominal)	Total wealth $bn (real)	New wealth, $bn (nominal)	New $bn (real)
March 2007	946	3,452	4,650	807	987
March 2008	1125	4,381	5,675	929	1,025
March 2009	793	2,415	3,140	- 1,966	- 2,535
March 2010	1011	3,568	4,534	1,153	1,394
March 2011	1206	4,500	5,570	932	1,035
March 2012	1226	4,600	5,546	100	- 23
March 2013	1426	5,400	6,416	- 800	870
March 2014	1645	6,400	7,491	1,000	1,075
March 2015	1826	7,100	8,317	700	825
March 2016	1810	6,300	7,317	800	- 1,000
March 2017	2043	7,670	8,702	1,370	1,384
March 2018	2208	9,100	10,086	1,430	1,384
March 2019	2153	8,700	9,466	- 400	- 620
March 2020	2095	8,000	8,573	- 700	- 894
March 2021	2755	13,084	13,663	5,084	5,090
Nov 2021	2660	13,766	13,766	- 276	- 276
				Total increase during COVID-19 (March 2020–Nov 30, 2021)	5,194
				14 years before total	4,910

4. Billionaire wealth has grown more since the pandemic began than it has since records began.

Forbes began publishing its annual billionaire list in 1987, when there were 140 billionaires, worth $295bn.

Forbes Billionaires List 1987–November 2021					
Year	Total number of billionaires	Total wealth, U$ bn	Real wealth, $bn (Oct 2021 Prices)	New wealth, $bn (nominal)	New real wealth, $bn (Oct 2021 Prices)
1987	140	295	728		
1988	191	338	802	43	75
1989	220	460	1,040	122	238
1990	265	570	1,225	110	185
1991	260	592	1,214	22	- 12
1992	275	601	1,192	8	- 21
1993	192	399	768	- 202	- 425
1994	342	765	1,438	367	670
1995	366	885	1,617	120	179
1996	422	1,049	1,863	163	246
1997	323	1,205	2,084	157	221
1998	308	1,289	2,199	84	115
1999	336	1,351	2,265	62	67
2000	360	1,473	2,380	122	115
2001	538	1,729	2,713	255	333
2002	497	1,544	2,389	- 184	- 325
2003	476	1,403	2,107	- 141	- 282
2004	587	1,917	2,830	514	722
2005	691	2,236	3,200	319	370
2006	793	2,646	3,662	409	463
2007	946	3,452	4,650	807	987
2008	1125	4,381	5,675	929	1,025
2009	793	2,415	3,140	- 1,966	- 2,535
2010	1011	3,568	4,534	1,153	1,394
2011	1206	4,500	5,570	932	1,035
2012	1226	4,600	5,546	100	- 23
2013	1426	5,400	6,416	800	870
2014	1645	6,400	7,491	1,000	1,075
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2016	1810	6,300	7,317	- 800	- 1,000
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2018	2208	9,100	10,086	1,430	1,384
2019	2153	8,700	9,466	- 400	- 620
2020	2095	8,000	8,573	- 700	- 894

2021	2755	13,084	13,663	5,084	5,090
Oct	2692	14,043	14,043	959	380
Nov	2660	13,766	13,766	- 276	- 276

5. Only 11% of billionaires are women, and only 13 out of 2,755 billionaires are Black. There are more billionaires called Jeff than there are Black billionaires.

Oxfam reviewed the Forbes list of 2,755 billionaires from 2021. We found that 304 billionaires were women, and that 14 were married couples. The remainder—2,437—are men.

Gender	Number	Percentage
Female	304	11.0
Male	2437	88.5
Male/female (married couples)	14	0.5
TOTAL	2755	100

Oxfam found that 13 out of 2,755 billionaires were Black.

There are 16 billionaires called Geoffrey or Jeff on the Forbes list.

6. 252 men have more wealth than all 1 billion women and girls in Africa and Latin America and the Caribbean combined.

The total net wealth of the African continent and Latin America and the Caribbean (LAC) can be found in the Credit Suisse *2021 Global Wealth Report*. The combined number for the end of 2020 is $15,818bn.

The wealth held by women in African and LAC is calculated using estimates from the Credit Suisse 2018 Global Wealth Report, for which an analysis on gender and regions was conducted. The estimates for the gender distribution of wealth in Africa were that women held between 20% (lower bound) and 30% (upper bound) of the total wealth in Africa. In LAC they were estimated to hold between 30% (lower bound) and 40% (upper bound). These are the latest estimates of the gender distribution of wealth from Credit Suisse.

We applied these estimates from 2018 to total 2020 net wealth, using the upper bound. This gave us a result of $5,832.60bn held by women. We then compared this with the latest list of billionaires from Forbes from November 30, 2021.

In order to harmonize price levels, the numbers from the Credit Suisse report in December 2020 are inflated using the CPI for the US.

The wealth held by African and LAC women in 2021 prices is $6,193.45bn. Compared with the Forbes list from November 30, 2021, the 252 richest male billionaires have a combined total wealth of $6,197.50bn.

Population data comes from the UN's Population Division, Department of Economic and Social Affairs.[10]

7. Twenty of the richest billionaires are estimated on average to be emitting as much as 8,000 times more carbon than each of the billion poorest people.

Analysis by Richard Wilk and Beatriz Barros of Indiana University finds that they contributed an average of about 8,190 tons of CO2 in 2018. Their analysis is based on a sample of 20 billionaires, whose consumption is public knowledge. Analysis by Lucas Chancel of the World Inequality Lab and Sciences Po) finds that around one billion individuals at the bottom end of the distribution emit less than one ton per person per year. Taken together, billionaires use around 8,000 times more than the carbon emissions of someone in the poorest billion people on Earth.[11]

3 POVERTY AND INEQUALITY KILLER FACTS

1. 163 million more people have been forced into poverty worldwide in 2021 because of COVID-19.

If inequality rises, it is likely that there will be as many people living in poverty in 2030 as there were in 2019. If inequality is reduced, 712 million people will be living on less than $5.50 a day by 2030.

Figures from the World Bank, shared with Oxfam, show that the pandemic has led to a sharp increase in poverty around the world. There are now 163 million more people living on less than $5.50 a day than there would have been if COVID-19 had not happened.

Year	Growth vintage	Poverty rate, % $5.50	Number of poor people, million $5.50
2020	Pre-COVID-19 projection	40.9	3169
2021	Pre-COVID-19 projection	40.0	3134
2020	COVID-19 projection	43.1	3338
2021	COVID-19 projection	42.1	3297

	Additional Number of Poor People	
	2020	**169**
	2021	**163**

The figures from the World Bank also show that if inequality continues to increase, there will be more people living on less than $5.50 a day in 2030 than there were in 2019 before COVID-19. Alternatively, if inequality is reduced, then by 2030, 712 million fewer people will be living on less than $5.50 a day.[12]

		Number of poor (millions) under $5.50
Year		COVID-19
2019		3,204
2030	Inequality increases	3,318
2030	Inequality decreases	2,492
	Difference	712

2. Tackling inequality could prevent the death of one person every four seconds.

This estimate is the lower bound of the sum of estimates of people dying from four inequality-related causes: access to healthcare, hunger, gender-based violence, and climate change.

Table 1: Inequality-related deaths per day (see Breakdown of Numbers section for sources)

	Lower bound	Upper bound	Inequality concept	Data coverage
Healthcare	15,342	15,342	International inequality in access to services	2016 data for 132 countries
Hunger	5,773	14,916	All hunger deaths reflect economic inequality	2020 data for 55 countries
Gender-based violence	203	4,685	All gender-based violence deaths reflect social inequality	2017 data for 93 countries
Climate change	0	633*	International inequality in access to services	2030 projection
TOTAL	**21,318**	**35,577**		

21,318 per day is 0.25 per second or one person every four seconds.

The upper bound involves double-counting across the four causes of death, so while it is legitimate to use the upper bound for each cause of death on its own, they should not be added up.

There are multiple forms of inequalities (e.g. economic vs. social, within-country vs. international) and each one contributes to deaths in multiple ways. This estimate only covers a subset of these multiple ways in which inequality kills. It is therefore an under-estimate (or lower bound) by design.

Each component is meant to cover the whole world; however, country coverage varies because some causes of death are not prevalent in some countries (e.g. hunger)

because there are limitations in the data. To the extent that country coverage is incomplete, the result is an underestimate. The estimate is meant to be current; however, the reference year varies due to data limitation.

BREAKDOWN OF NUMBERS

Health care

Source: M.E. Kruk, et al. (2018). *Mortality due to low-quality health systems in the universal health coverage era: a systematic analysis of amenable deaths in 137 countries. The Lancet*, Vol.392, Issue 10160. https://doi.org/10.1016/S0140-6736(18)31668-4

This article analyzes deaths caused by 61 medical conditions for which healthcare can reduce mortality in 137 low- and middle-income countries, compared with either 23 high-income countries or the four best-performing middle-income countries in 2016. It thus measures international inequality (i.e. differences between countries) in access to healthcare and quality of care. It also reflects within-country inequality, insofar as those people in a country that have the least access to healthcare tend to be poorer people. However, it does not capture deaths related to within-country inequality in high-income countries, even though there is considerable evidence that within-country inequality affects health outcomes.[13]

Table 2: Excess deaths in low- and middle-income countries

	Reference group 1:23 high-income countries	Reference group 2: the four best-performing middle-income countries
Deaths caused by the 61 medical conditions in the 137 low- and middle-income countries	19,300,000	
Of which: Excess deaths compared with the reference group (taking into account sex and age differences)	15,600,000	
Of which: Excess deaths due to a higher proportion of sick people (attributable to poor public health interventions)	7,000,000	
And: Excess deaths due to higher mortality among sick people (attributable to poor health care systems)	8,600,000	**5,600,000**
Of which: Excess deaths due to non-utilization of healthcare (attributable to lack of access to healthcare)	3,600,000	2,400,000
And: Excess deaths attributable to poor quality healthcare	5,000,000	3,200,000

Source: Extracted from M.E. Kruk, et al. (2018). *Mortality due to low-quality health systems in the universal health coverage era: a systematic analysis of amenable deaths in 137 countries. The Lancet*, Vol.392, Issue 10160. https://doi.org/10.1016/S0140-6736(18)31668-4

We use the second reference group. The rationale is that providing everyone with healthcare services equivalent to those available in the four best-performing middle-income countries should be affordable in a more equal world. These four countries are Chile, China, Costa Rica, and Cuba. Their average GDP per capita was $11,227 in 2020,

which happens to be close to the global average of $10,909, according to the World Bank.[14]

This data is for 2016. In the past five years, the world's population has increased, which should have increased the number of deaths. Up until 2017 official monitoring data suggested a universal but slow trend towards improved health service coverage across all countries,[15] but equivalent data is not available beyond this date to assess whether this trend has continued and what impact it may have had on the number of deaths. A number of studies suggest significant disruption to key health services in many countries as a result of the pandemic, including setbacks across important universal health coverage indicators such as childhood immunizations and sexual and reproductive health services.[16] It is impossible to know the net effect, as the 2018 study we used as a source has not been updated. COVID-19 deaths are of course excluded as the data precedes the pandemic.

In summary, in 2016, 5,600,000 people died in low- and middle-income countries owing to either a lack of access to healthcare or low-quality healthcare, which is 15,342 a day.

Hunger

Sources:

- Oxfam. (July 9, 2021). *The Hunger Virus* Multiplies*: Deadly recipe of conflict, COVID-19, and climate accelerate world hunger*. https://bit.ly/3nDf7BA
- Global Network Against Food Crises and Food Security Information Network. (2021). *2021 Global Report on Food Crises: Joint analysis for better decisions*. Food Security Information Network. https://bit.ly/3xlO3fe
- The Integrated Food Security Phase Classification (IPC) Global Partners. (2021). *Technical Manual Version 3.1: Evidence and Standards for Better Food Security and Nutrition Decisions*. https://bit.ly/3HKSwLl

The Integrated Food Security Phase Classification (IPC) (https://www.ipcinfo.org/) is an initiative to improve food security and nutrition analysis and decision-making. Food security agencies, including governments, use the IPC classification and analytical approach to measure the severity and magnitude of acute and chronic food insecurity and acute malnutrition in a country. Oxfam is a global partner of IPC. IPC enables the classification of populations at the sub-national level into one of five phases of food insecurity according to a range of criteria. The five phases of food insecurity are: none/minimal (IPC Phase 1); stressed (IPC Phase 2); crisis (IPC Phase 3); emergency (IPC Phase 4); and catastrophe/famine (IPC Phase 5). One of the criteria is the crude mortality rate: each phase has a higher cut-off rate than the previous one (with the exception of the first two). The data covers 55 countries, leaving out a number of countries where hunger is known to be pervasive, such that the data provided here is an underestimate.[17]

Oxfam has applied the IPC crude death rate cut-offs for IPC Phase 3, 4, and 5 (between 0.5 and 1 death per 10,000 people per day, between 1 and 2 deaths per 10,000 people per day, and over 2 deaths per 10,000 per day, respectively) to the number of people living in areas classified at each of these phases in 2020, according to the *2021 Global Report on Food Crises* (127 million, 28 million, and 133,000, respectively). To get to excess death rates, we subtracted the normal death rate of 0.22 deaths per 10,000 people per day, which is the average crude death rate for low-income countries according to the World Bank.[18] This yields between 5,773 and 14,916 deaths per day.

The world produces more than enough food to ensure no one dies of hunger. It is the unequal distribution of food, rather than the overall lack of food, that leads to deaths from hunger. Our assumption here is that in a more equal world, where both food and incomes were more fairly distributed, deaths from hunger could be largely eliminated.

Gender-based violence

Sources:

- United Nations Office on Drugs and Crime. (2019). *Global Study on Homicide: Gender-related killings of women and girls*. https://bit.ly/3xdKvK9

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- Rockey, J. (2021). *Female Genital Mutilation Deaths: Methodology and Data Appendix*. Unpublished (available upon request).

Almost one in three women around the world has suffered from gender-based violence (not including sexual harassment).[19] Here we are counting only the number of deaths resulting from gender-based violence (i.e. people dying because of their gender). According to research carried out by the UN, about 30,000 women, and about 6,585 men, were killed by their intimate partners worldwide in 2017. All of them can be considered victims of gender-based violence, which itself reflects gender inequality, and we include that number in the lower bound for our estimate of gender inequality-related deaths.

Another 20,000 women were killed by family members other than their intimate partners worldwide in 2017, and another 37,000 women by people other than family members. Both of these figures include femicides (the killing of women on account of their gender), but also murders unrelated to gender, and we do not know what portion of the total these make up, so we have not included these deaths in the lower bound. Some murders of family members also go unreported. The figure of 36,585 also excludes the murders of LGBTQIA+ people, so for this reason is again likely to be a conservative estimate.

Moreover, murder is only one cause of gender inequality-related deaths. Suicides, neglect, and discrimination in healthcare systems, education, or the workplace are other possible causes, further suggesting that our estimate is a conservative one.

Rockey (2021) estimates that about 37,530 women die each year as a result of female genital mutilation. This study uses UN demographic data as well as USAID micro-survey data about the prevalence of female genital mutilation by age groups for 15 African countries. It relies on a regression analysis with the female mortality rate by country, year and age group as a dependent variable, and the prevalence of female genital mutilation as well as male mortality and country and year fixed effects as independent variables.

Lower limit calculation:

- 36,585 victims of murders by intimate partners (UN Women).
- 37,530 deaths resulting from female genital mutilation (Rockey).
- Subtotal of 74,115 deaths a year or 203 a day.

Bongaarts and Guilmoto (2015) analyzed patterns in mortality rates by gender and age worldwide compared with a reference group of 93 countries that excludes countries known for acute gender discrimination. They estimate that there were as many as 1.66 million excess female deaths in the world in 2010, and projected that number to be 1.71 million in 2020. That is in addition to the 1.5 million sex-selective abortions of female fetuses that year. The combination of excess female mortality and sex-selective abortions over the years results in there being 142.6 million missing women worldwide.

Upper limit calculation:

- 1.71 million or 4,685 a day.

However, while legitimate to be used on its own, this number probably overlaps a lot with our estimates of deaths due to lack of access to quality healthcare and hunger. Hence we add up the lower-bound estimates of deaths of each cause for our aggregate estimate of inequality-related deaths.

Climate change

Source:

- World Health Organization. (2014). *Quantitative Risk Assessment of the effects of climate change on selected causes of deaths, 2030s and 2050s*. https://www.who.int/publications/i/item/9789241507691

- Bressler, R.D. (2021). *The Mortality Cost of Carbon. Nature Communications*. https://www.nature.com/articles/s41467-021-24487-w

"Climate change is the biggest global health threat of the 21st century," asserted a 2009 report for the Global Health Commission.[20] Climate change kills mainly by increasing hunger and the prevalence and mortality of disease, not to mention the threats of economic collapse, mass migrations, and conflict.[21]

A WHO study carried out in 2014 projected that climate change would kill 241,227 people a year worldwide by around 2030, through increases in only five causes of death (so it is an underestimate): malnutrition, malaria, dengue, diarrheal disease, and heat.

Table 3 shows that these deaths are very much skewed toward low- and middle-income countries that have not contributed much to climate change (at least until recently).[22] (Heat-related deaths may be an exception to this imbalance, but it may be due to under-reporting of heat-related deaths in low- and middle-income countries.[23]) That is the big climate divide and demonstrates the impact of global inequality on climate deaths. We therefore count all deaths in low- and middle-income countries (231,168 a year or 633 per day) as inequality-related climate deaths. We acknowledge that this is an imperfect measure, as it does not allow for the impact of within-country inequality, and by the same token does not count any deaths of poor people in rich nations because of climate change. Sadly, data for such analysis is not available.

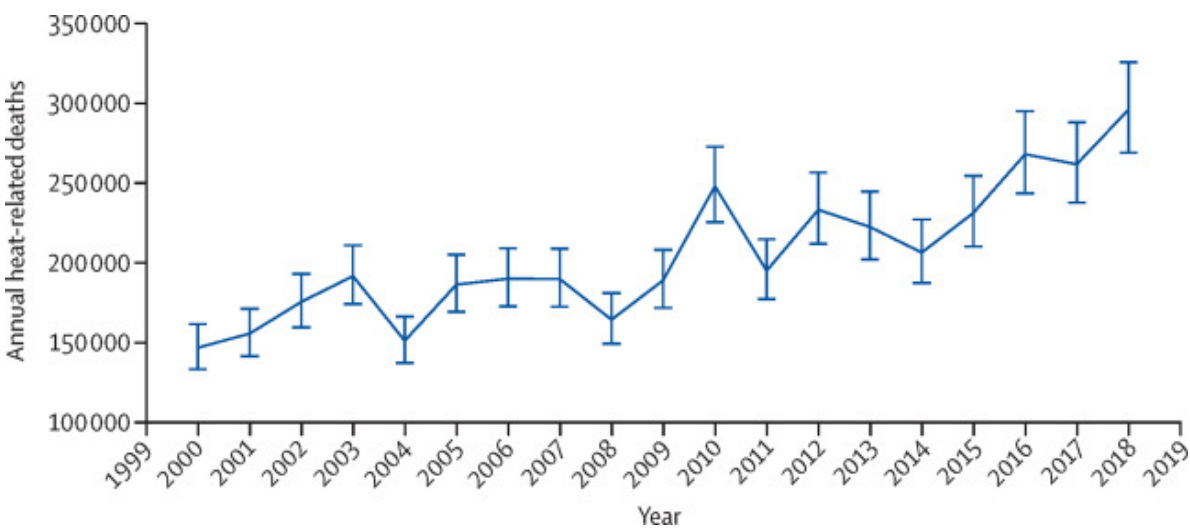**Table 3: Additional deaths attributable to climate change, 2030**

	Low- and middle-income countries	High-income countries	Total
Hunger	95,176		95,176
Malaria	60,091	-	60,091
Dengue	258		258
Diarrhea	48,105	9	48,114

Heat	27,538	10,050	37,588
Total	231,168	10,059	241,227

We consider the 231,168 deaths a year as the upper bound of inequality-related climate deaths because they are a projection for 2030, which was nine years away at the time of writing. There is, however, some evidence that deaths attributable to climate change have been accumulating at a faster rate than predicted by the WHO study in 2014. Bressler (2021), who focuses on heat deaths alone, estimates them at 65,836 for 2020, which is almost double what the WHO (2014) predicted for 2030. The Lancet Countdown monitors heat deaths, which have been climbing steeply in the past few years.[24] Figure 1 includes all heat deaths, not just those attributable to climate change, but the growth is indicative of climate change, and rapid growth after the WHO (2014) paper was published is apparent. Indeed, another recent study estimates that 37% of heat deaths between 1991 and 2018 can be attributed to climate change.[25]

Figure 1: Heat deaths worldwide

Another reason to consider the 231,168 deaths as an upper bound is that, to the extent that these deaths have already materialized sooner than 2030, the bulk of them are caused by malnutrition and disease, which are already captured by the healthcare and hunger components of the overall "inequality kills one person every four seconds" estimate. That said, the health component does not capture increasing incidence of disease, but rather deaths due to lack of access to quality healthcare (in other words, weak health adaptation to climate change). The main adaptation for reducing heat deaths is air conditioning, not healthcare, so there is no concern of double-counting for those deaths.

WHO (2014) does not capture other ways in which climate change kills, including weather-related disasters such as storms, floods, wildfires, or landslides. These natural disasters affect millions of people every year, but kill relatively few. Better disaster management has reduced the death toll of all climatological, meteorological, and hydrological disasters to 185,000 over the past decade, or 50 a day.[26] Although climate change increases the frequency and severity of such disasters, that figure does not

isolate the impact of climate change—it includes deaths from disasters that would have occurred in the absence of climate change. Moreover, only a fraction of these deaths could be attributed to inequality. A recent study does show that both international (as measured by GDP per capita) and within-country (Gini coefficient of income) inequality significantly increase the number of people affected by natural disasters.[27] However, that paper does not quantify how many natural disaster deaths are linked to inequality.

We have not been able to determine a lower bound for inequality-related climate deaths. In any case, such a lower bound would be negligible relative to the other causes of inequality-related deaths, given that the upper bound is a mere 633 deaths per day compared with 35,577 total inequality-related deaths a day.

This does not mean that climate change is not already a major driver of mortality—it is a driver of future mortality. There is a long time-lag between greenhouse gas emissions and deaths, and the relationship between the two is not linear. Bressler (2021) estimates that a total of 83 million people could die as a result of extreme temperatures during the remainder of this century under his baseline scenario. He estimates that 89% of these deaths would be prevented if emissions were reduced to his optimal scenario. He also concludes that increasing 2020 emissions by the equivalent of the lifetime greenhouse gas emissions of 3.5 Americans would kill one person between 2020 and 2100. Another way to put it is that the 2020 emissions of just 273 Americans would kill one person during the remainder of this century.

NOTES

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