Halving premature death and improving quality of life at all ages
Ole F Norheim et al.
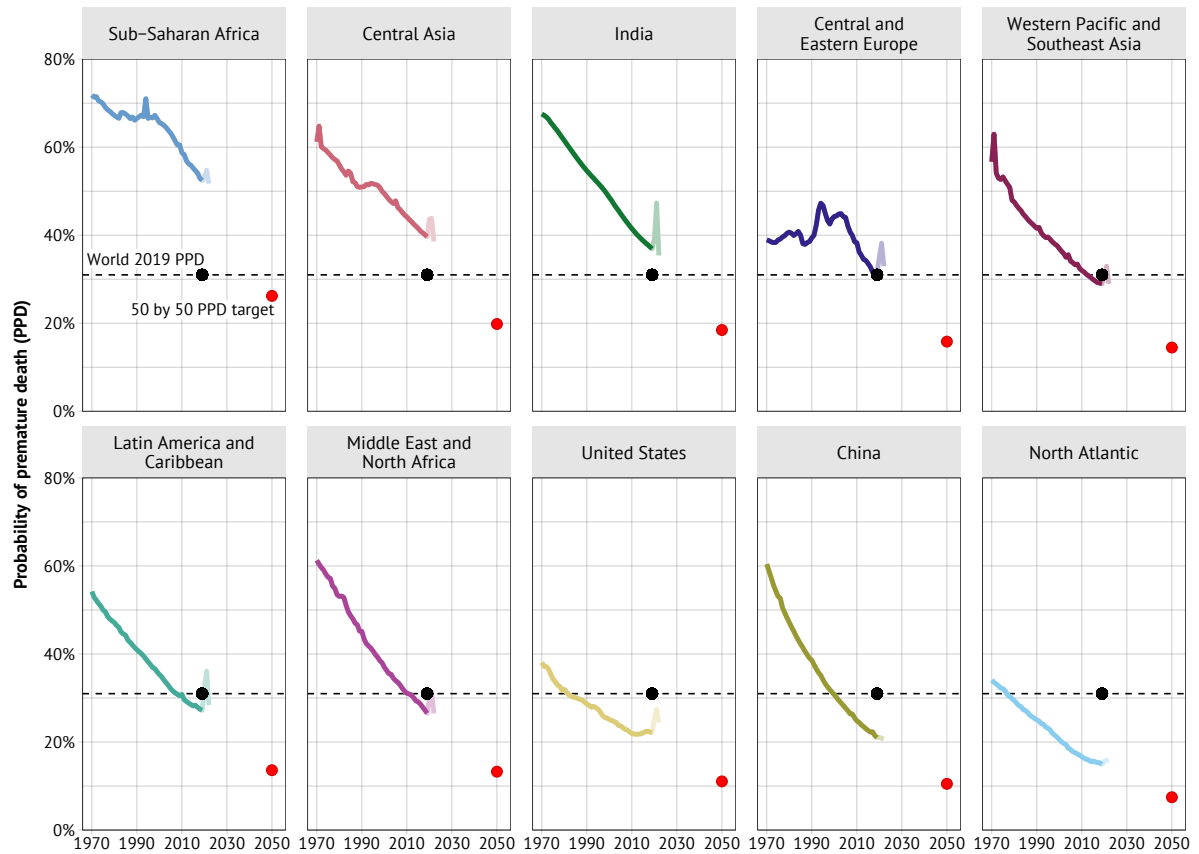
Figure and Tables

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Figure 1. Progress in probability of premature death (PPD) by CIH region, both sexes, 1970-2023.

Note: Pandemic years 2020-23 marked in lighter tone. The horizontal dashed line and black dot show PPD for the world in 2019. The red dot indicates halved region-specific PPD in year 2050 compared to 2019 (the baseline year). The North Atlantic region includes Western Europe and Canada. For China, the graph shows data for 1970-2020.

Figure 2: Age-specific mortality trends, both sexes, 1970-2019, 30 most populous countries.

The probability of dying over a particular age range in one particular calendar year is determined entirely by the average of the separate age-specific mortality rates within that age range in that one year. Hence, a sudden but transient mortality shock due to a war, natural disaster, or epidemic produces a transient high value that shows what would happen if, purely hypothetically, the age-specific mortality rates in that one calendar year were to persist indefinitely. (Source: UN Population Division estimates of age-specific death rates, in 5-year age groups, in each separate calendar year)

Panel A: Probability of a live-born infant dying between ages 0 and 14

Panel B: Probability of dying between ages 15 and 49, conditional on being alive at 15

Panel C: Probability of dying between ages 50 and 69, conditional on being alive at 50

Panel D: Probability of premature death (i.e., dying between ages 0 and 69)

Panel A: Probability of dying at ages 0-14 years (both sexes) at the age-specific mortality rates of 1970 to 2019.
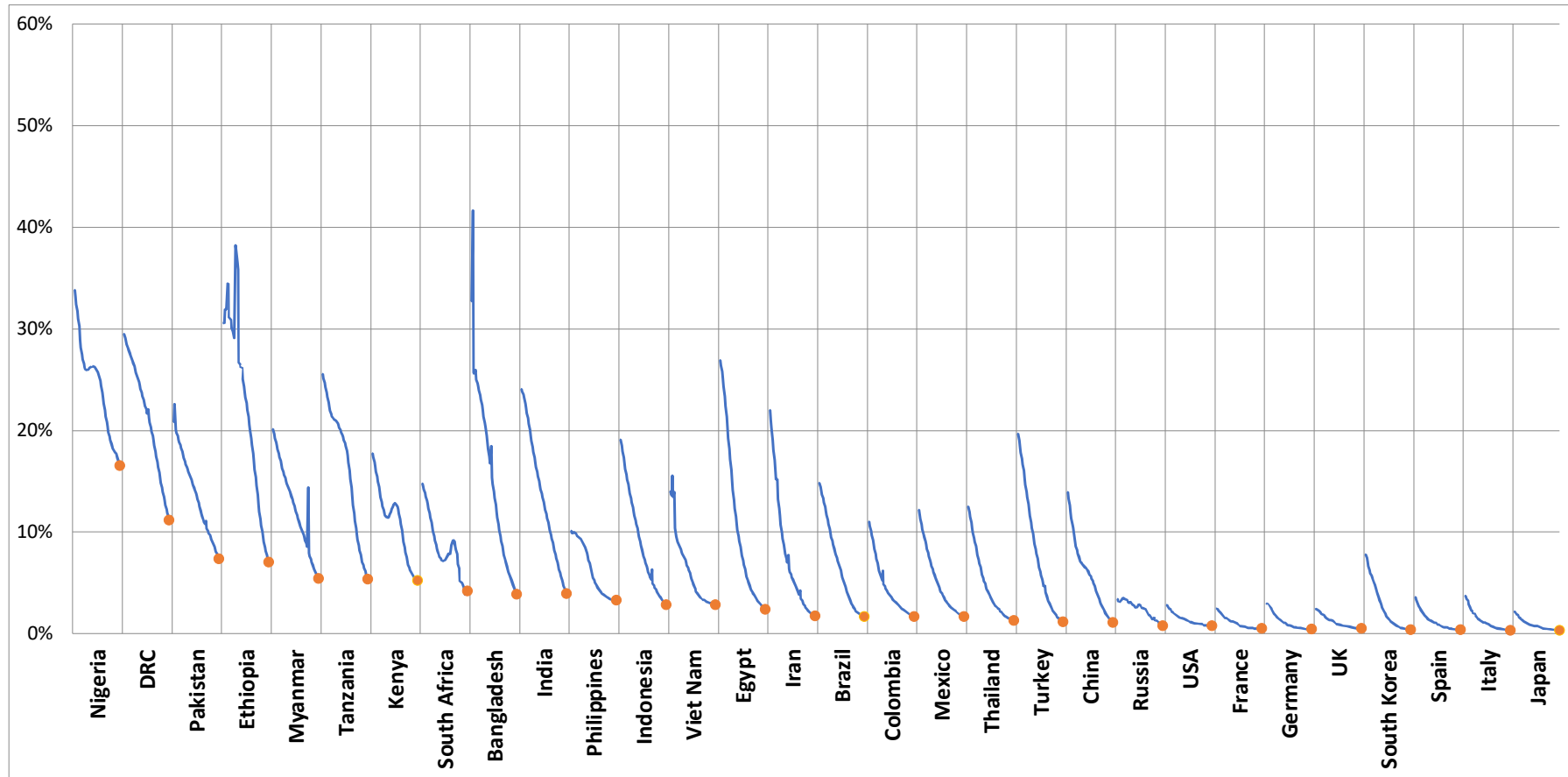
DRC = Democratic Republic of the Congo; USA = United States of America; UK = United Kingdom.

Countries are ranked by probability of premature death (PPD) at the mortality rates of 2019.

Panel B: Probability of dying at ages 15-49 years (both sexes) at the age-specific mortality rates of 1970 to 2019.
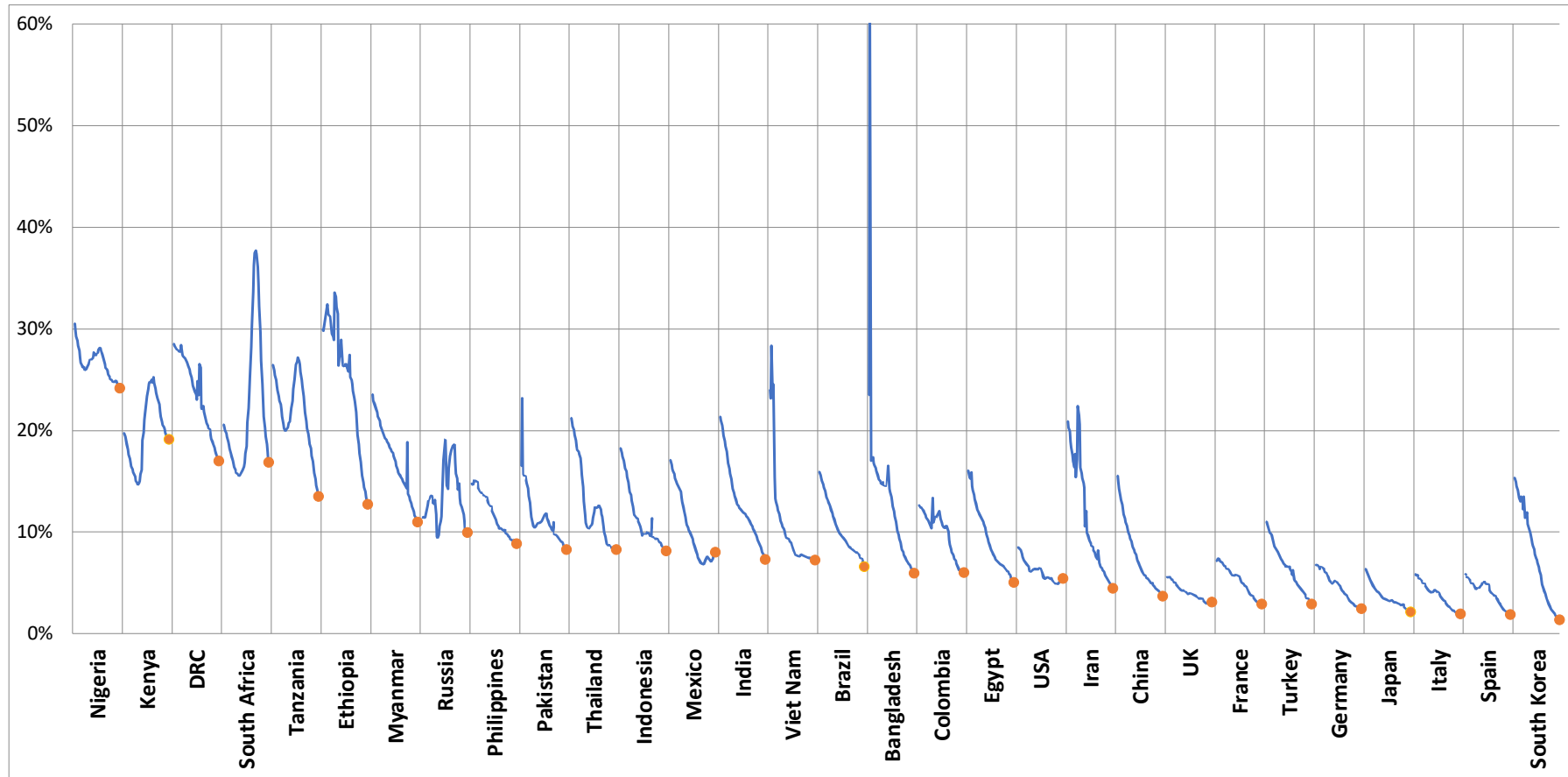
Panel C: Probability of dying at ages 50-69 years (both sexes) at the age-specific mortality rates of 1970 to 2019.
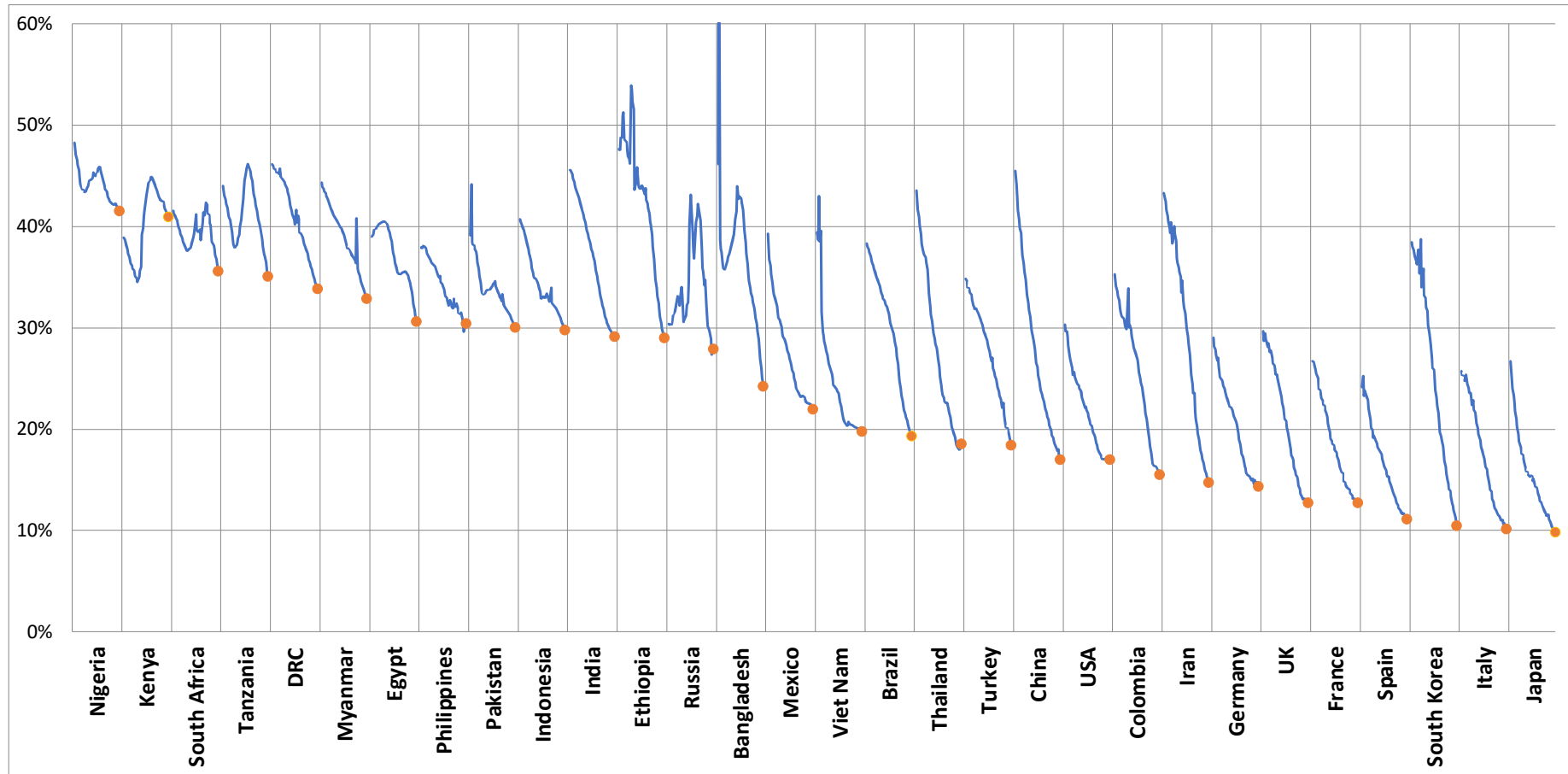
Panel D: Probability of premature death: probability of dying at ages 0-69 years (both sexes) at the age-specific mortality rates of 1970 to 2019.
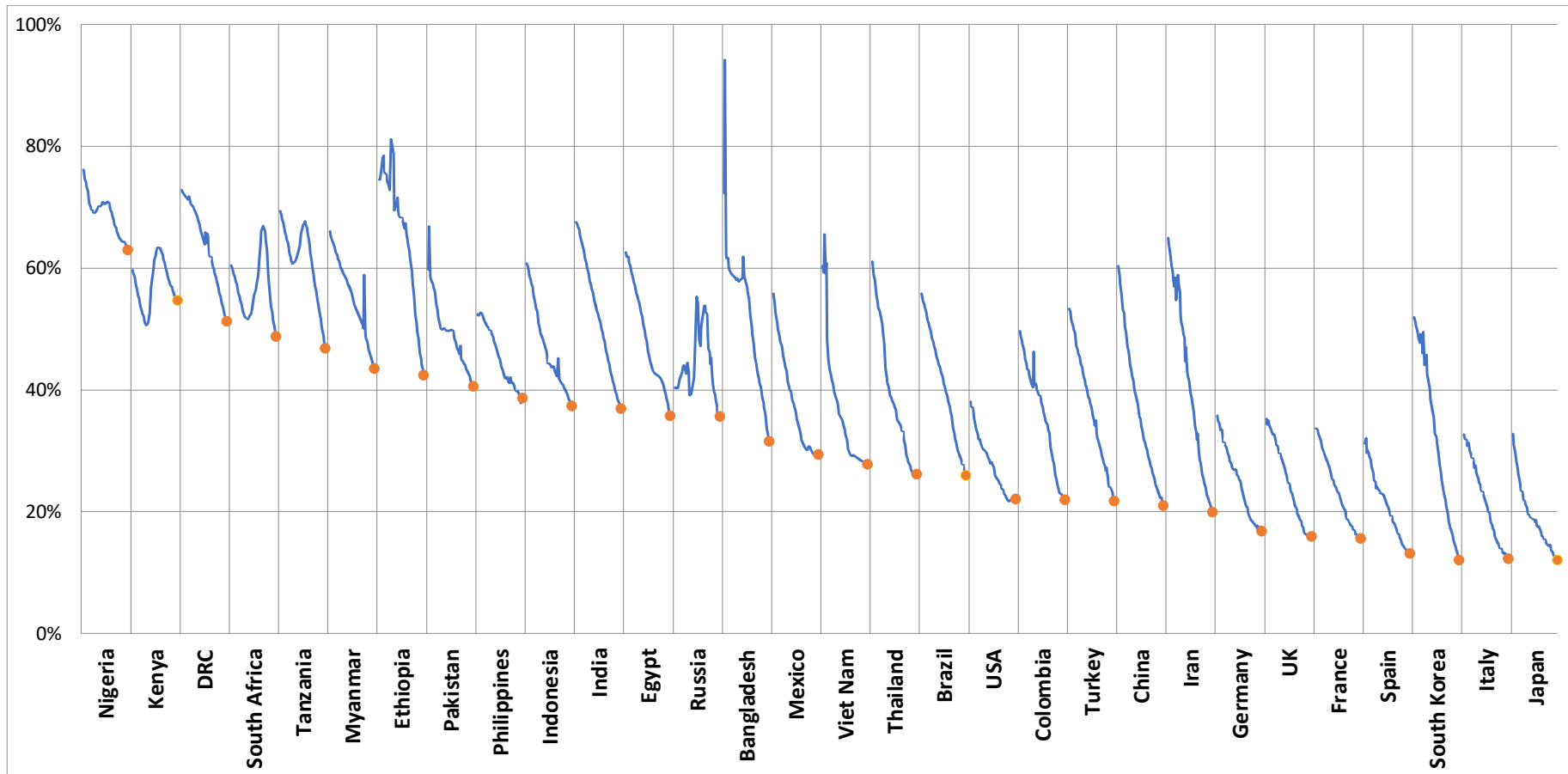
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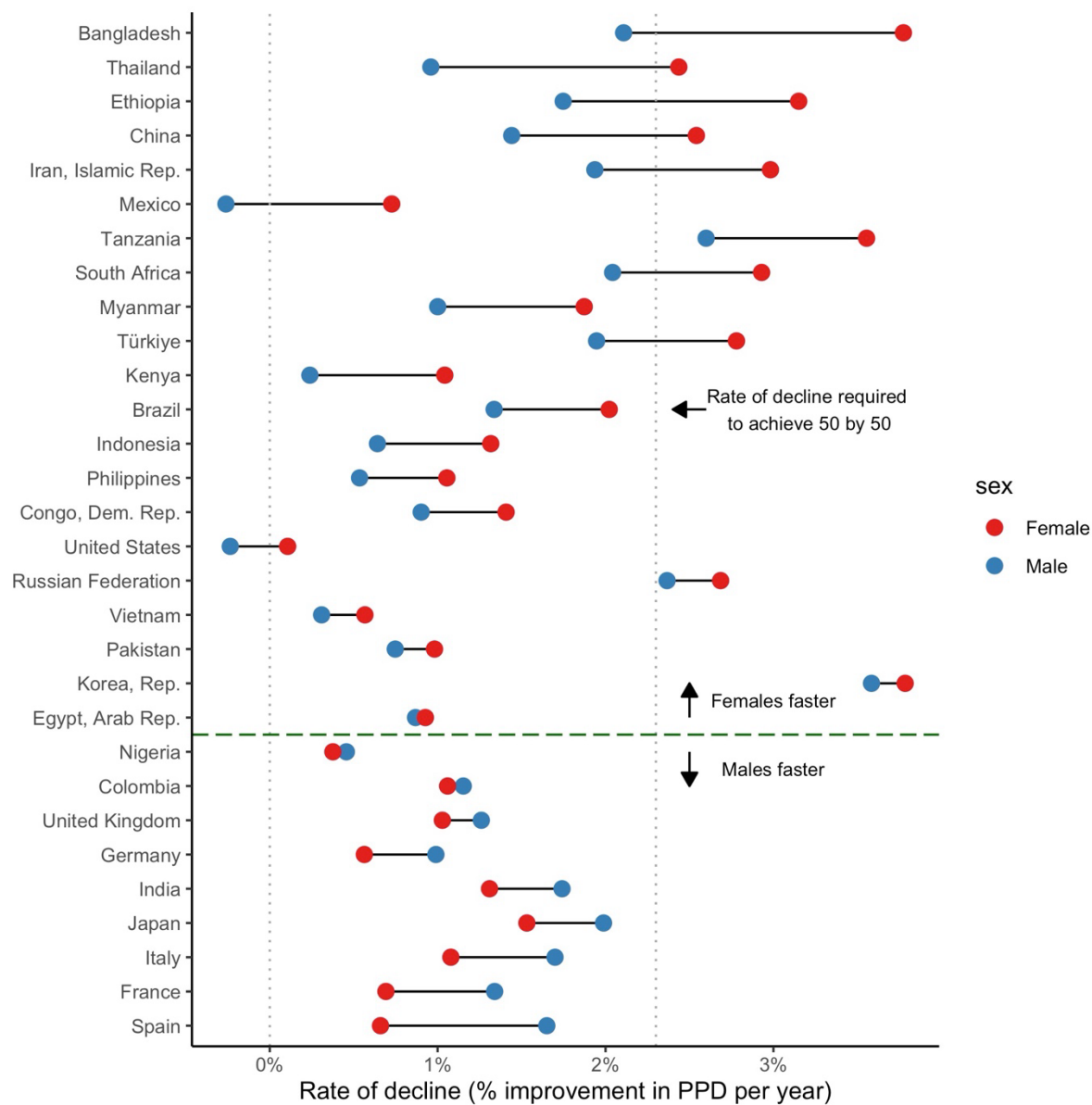
Figure 4. United States versus Germany and UK country progress in PPD and average rates of improvement, 1970-2019, and by decade.
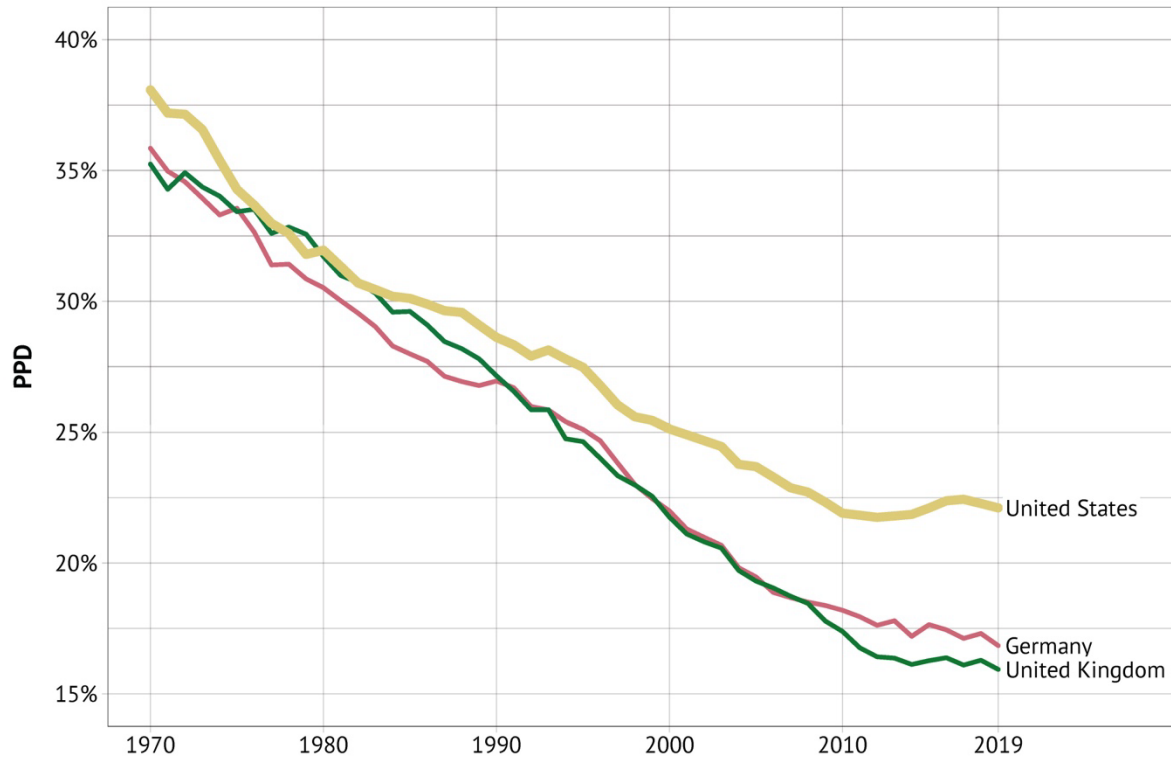
Average annual rate of improvement in reducing PPD by decade (% per year)				
1970–1980	1980–1990	1990–2000	2000–2010	2010–2019

	1970–1980	1980–1990	1990–2000	2000–2010	2010–2019
United States	1.7	1.1	1.3	1.4	+ 0.1
Average of Germany and the United Kingdom	1.3	1.4	2.1	2.0	0.9

Table 1: Probability of premature death (PPD) in 2019 and average annualized rate of improvement in 2010-2019 in CIH regions and for the World, both sexes combined. Regions are ranked by level of PPD.

Region	PPD	Rate of Improvement
Sub-Saharan Africa	52%	1.2%
Central Asia	40%	1.2%
India	37%	1.3%
Central and Eastern Europe	32%	2.1%
Western Pacific and Southeast Asia	29%	1.1%
Latin America and Caribbean	27%	1.4%
Middle East and North Africa	26%	1.7%
United States	22%	+0.1%
China	21%	1.8%
North Atlantic (Western Europe and Canada)	15%	1.2%
World	31%	1.3%

Table 2: Level of PPD in 2019, average annual rate of improvement in 2010-19, and implied rate of change by 2050 (if this rate of improvement is sustained) in the 30 most populous countries. Ranked according to rate of improvement in 2010-19.

Country	PPD in 2019	Rate of improvement in 2010-19	Implied reduction in PPD in 2050, compared to 2019 level
Countries with rates of improvement better than 2.2%			
Republic of Korea	12%	3.9%	71%
Bangladesh	32%	2.8%	58%
Russia	36%	2.7%	57%
Ethiopia	42%	2.4%	52%
Iran	20%	2.4%	52%
South Africa	49%	2.4%	53%
Türkiye	22%	2.3%	52%
Countries with rates of improvement between 1.0 and 2.2%			
China	21%	1.9%	44%
Japan	12%	1.9%	44%
United Republic of Tanzania	47%	1.9%	44%
Brazil	26%	1.6%	40%
Egypt	36%	1.6%	40%
Colombia	22%	1.5%	38%
Italy	12%	1.5%	37%
Spain	13%	1.4%	35%
India	37%	1.3%	33%
France	16%	1.2%	32%
Myanmar	44%	1.2%	31%
DRC	51%	1.1%	29%
Indonesia	37%	1.0%	27%
United Kingdom	16%	1.0%	26%
Countries with rates of improvement below 1.0%			

Germany	17%	0.9%	23%
Pakistan	41%	0.9%	25%
Thailand	26%	0.8%	21%
Kenya	55%	0.6%	17%
Philippines	39%	0.5%	16%
Mexico	29%	0.4%	13%
Viet Nam	28%	0.4%	10%
Nigeria	63%	0.3%	9%
United States of America	22%	0.1%	+3%
World	**31%**	**1.3%**	**33%**

PPD = probability of premature death