Epidemiological and demographic drivers of need for palliative care

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Global Palliative Care and Pain Relief Research Hub Webinar

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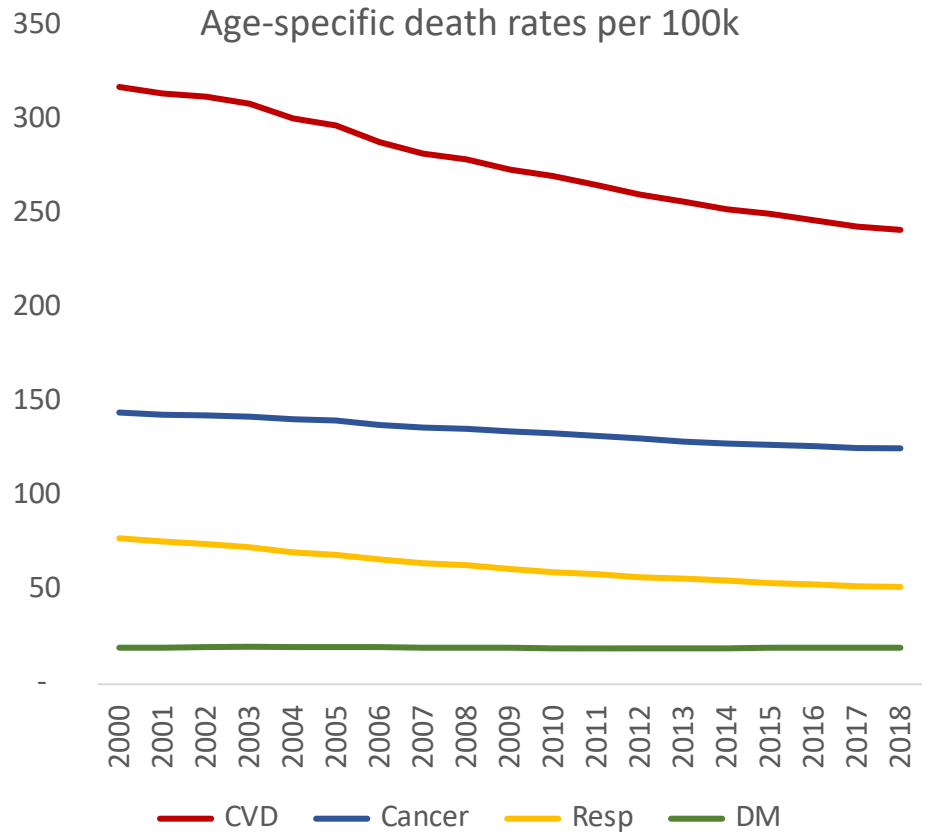
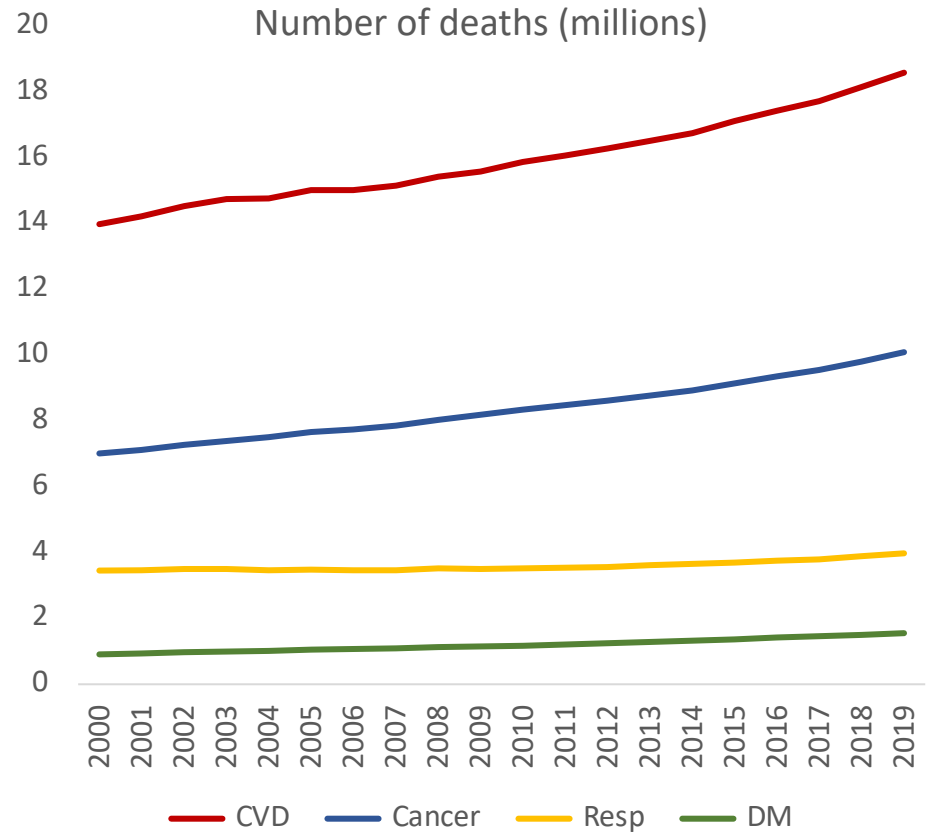
Two views of the same problem

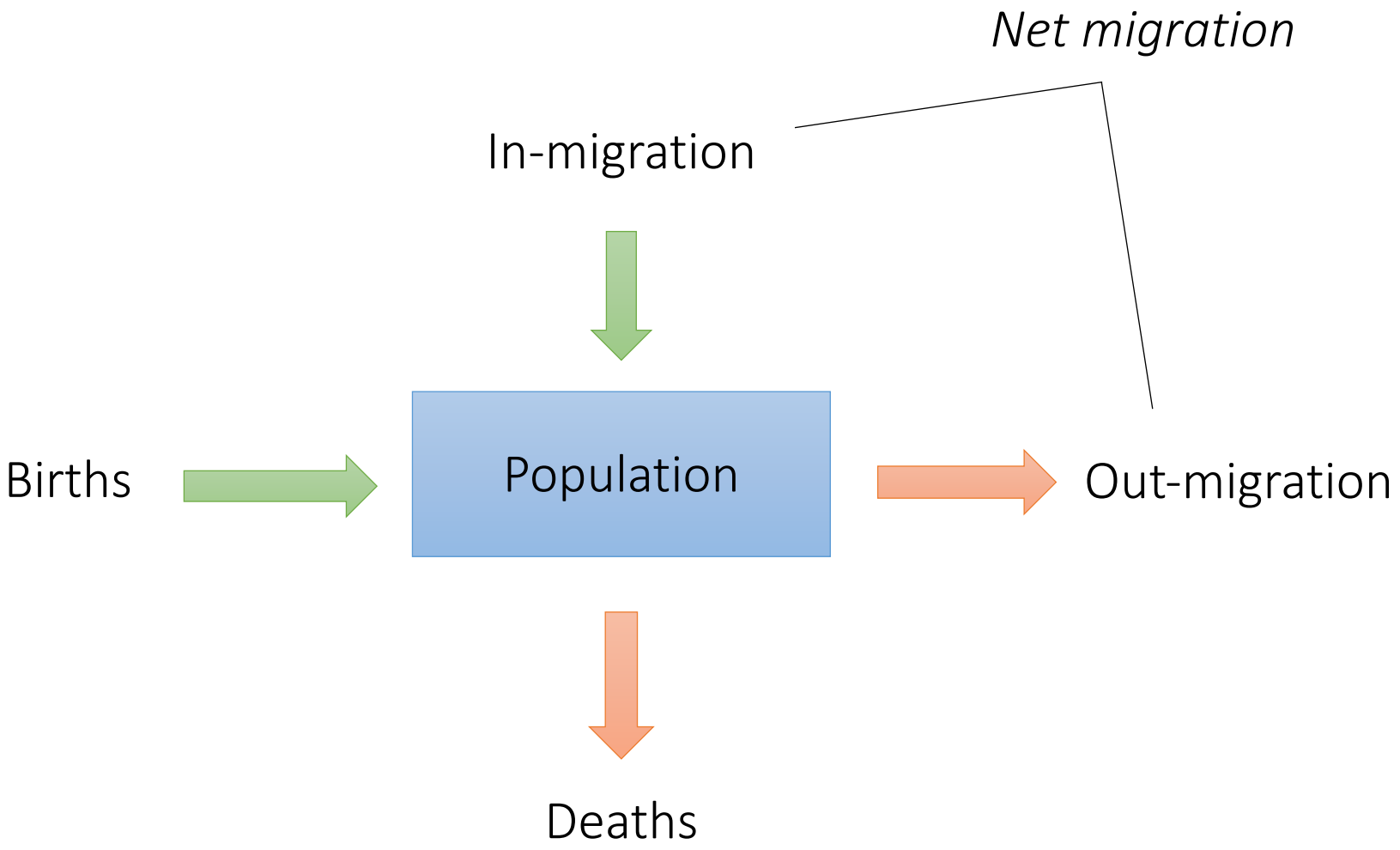
Epidemiologist



Policy maker



GBD 2019 study, Lancet 2020.



- Lower death rates = increase in size of population
- Lower birth rates = increase in median age of population

Population count = Births – Deaths + Net migration

	Total fertility rate			Total population (millions)			Median population age (years)			Median age at death (years)		
	2015	2035	AARC (%)	2015	2035	AARC (%)	2015	2035	AARC (%)	2015	2035	AARC (%)
World	2·7	2·3	−0·69	7400	8900	0·93	30	34	0·66	68	74	0·43
China	1·6	1·7	0·28	1400	1400	0·13	37	45	1·0	74	77	0·25
Eurasia and the Mediterranean	2·5	2·1	−0·74	1900	2300	0·93	28	33	0·81	67	72	0·37
India	2·4	2·0	−0·87	1300	1600	0·90	27	33	1·1	63	70	0·58
Latin America and the Caribbean	2·1	1·8	−0·70	600	710	0·80	29	36	1·1	68	75	0·51
Sub-Saharan Africa	4·9	3·7	−1·4	1000	1700	2·5	18	21	0·71	28	48	2·9
High-income countries	1·7	1·8	0·20	1200	1300	0·35	40	44	0·47	81	81	0·22
Fragile states	4·4	3·4	−1·3	500	780	2·2	19	23	0·80	34	56	2·5

Watkins DA, Lancet 2018.

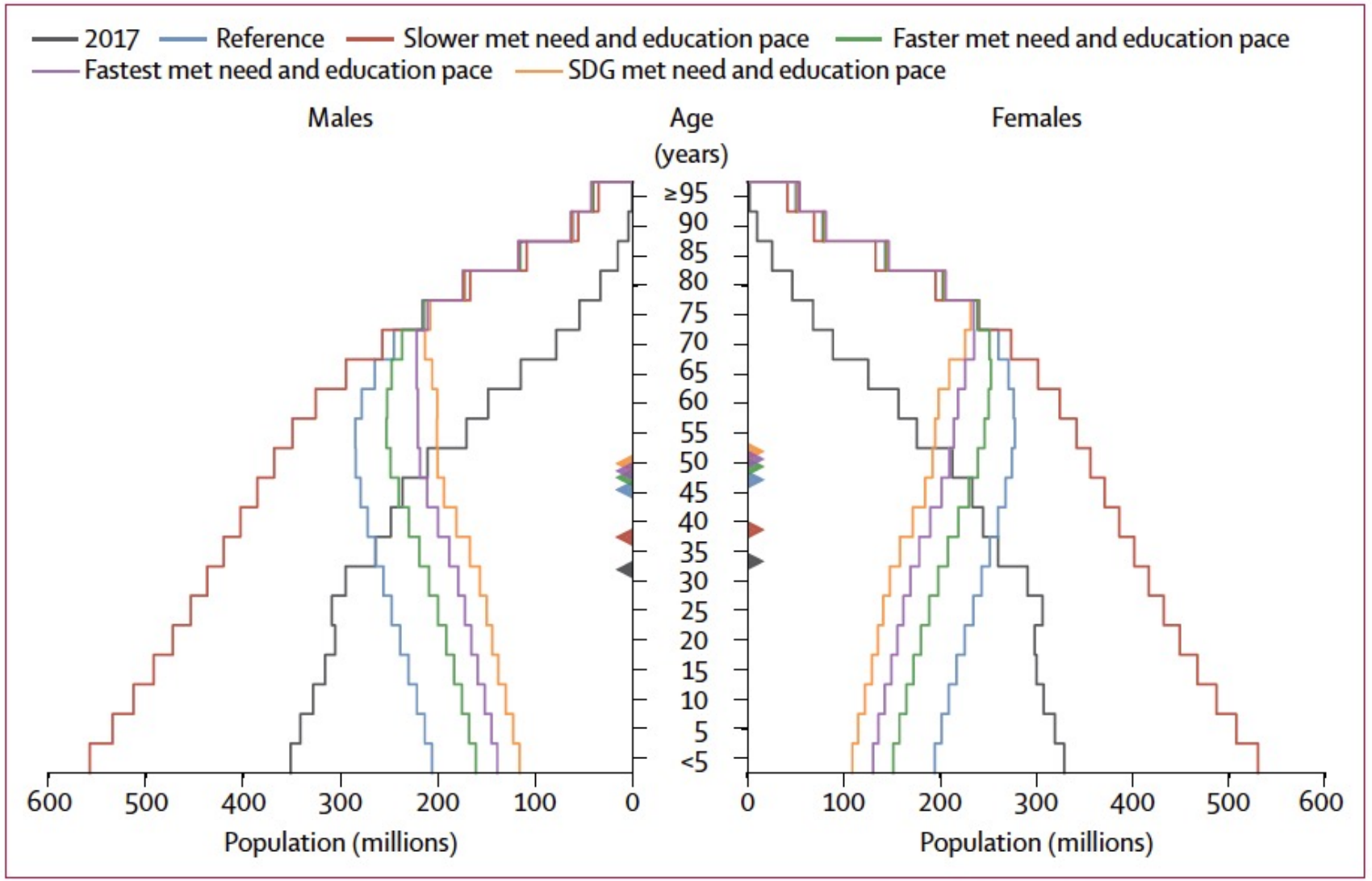
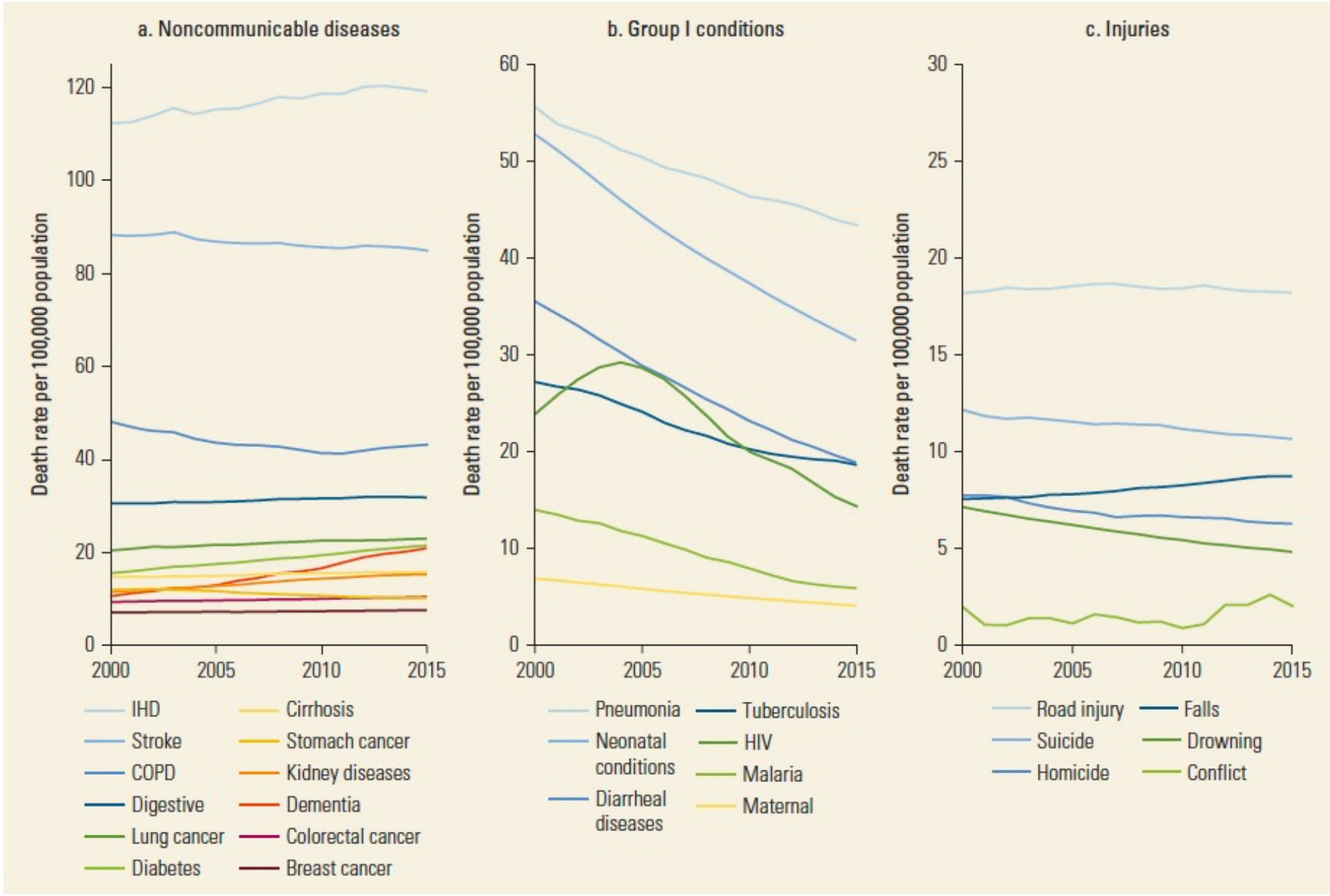


Figure 6: **Global population age structure in 2017 and in 2100 in the reference, slower, faster, fastest, and SDG pace scenarios**

Estimates for 2017 are from GBD 2017. Triangles indicate the mean age for each scenario. GBD=Global Burden of Diseases, Injuries, and Risk Factors Study. SDG=Sustainable Development Goal.

Vollset SE, Lancet 2020.

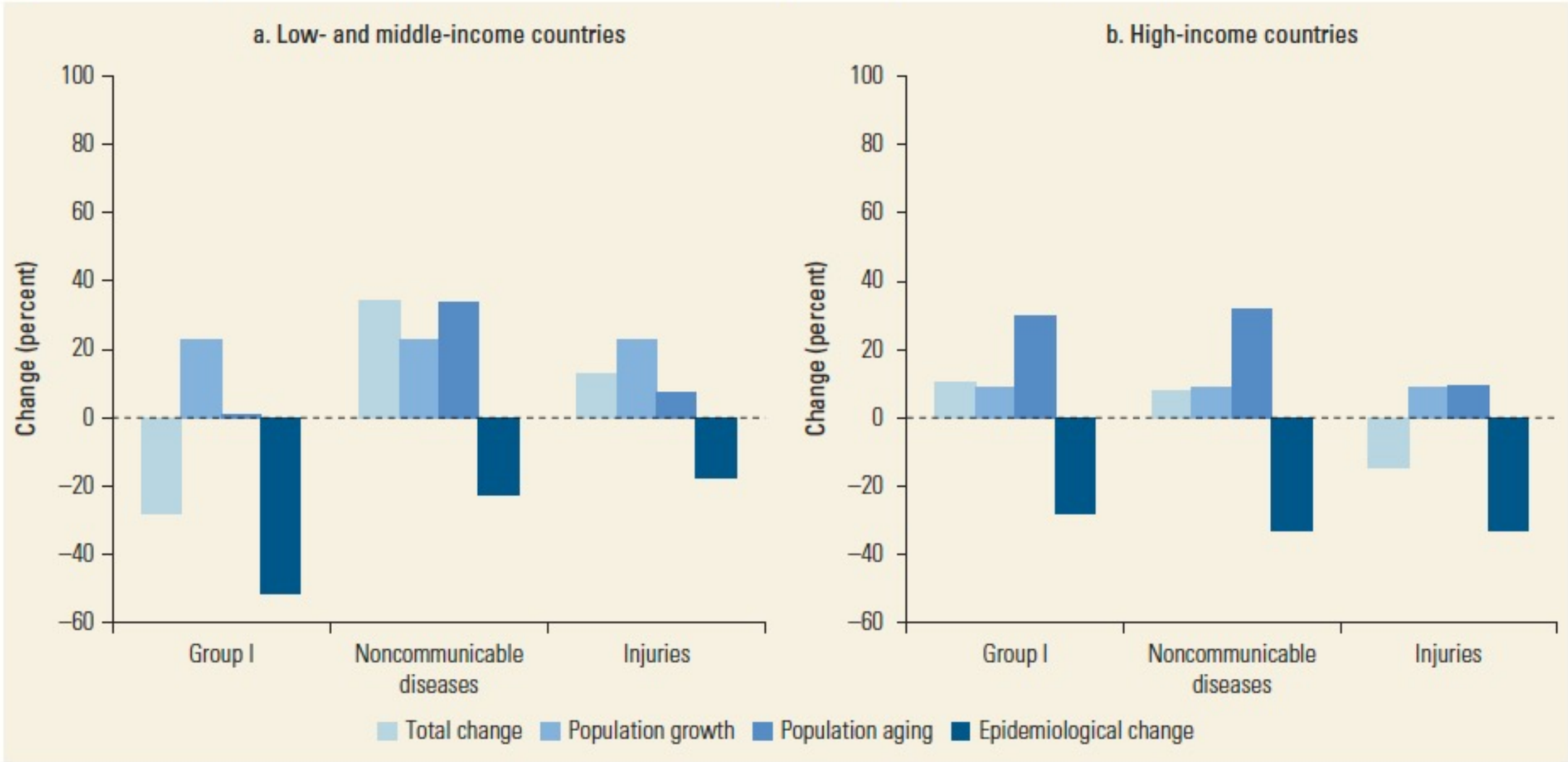
Figure 4.5 Trends in Global Mortality Rates for Selected Causes, 2000–15



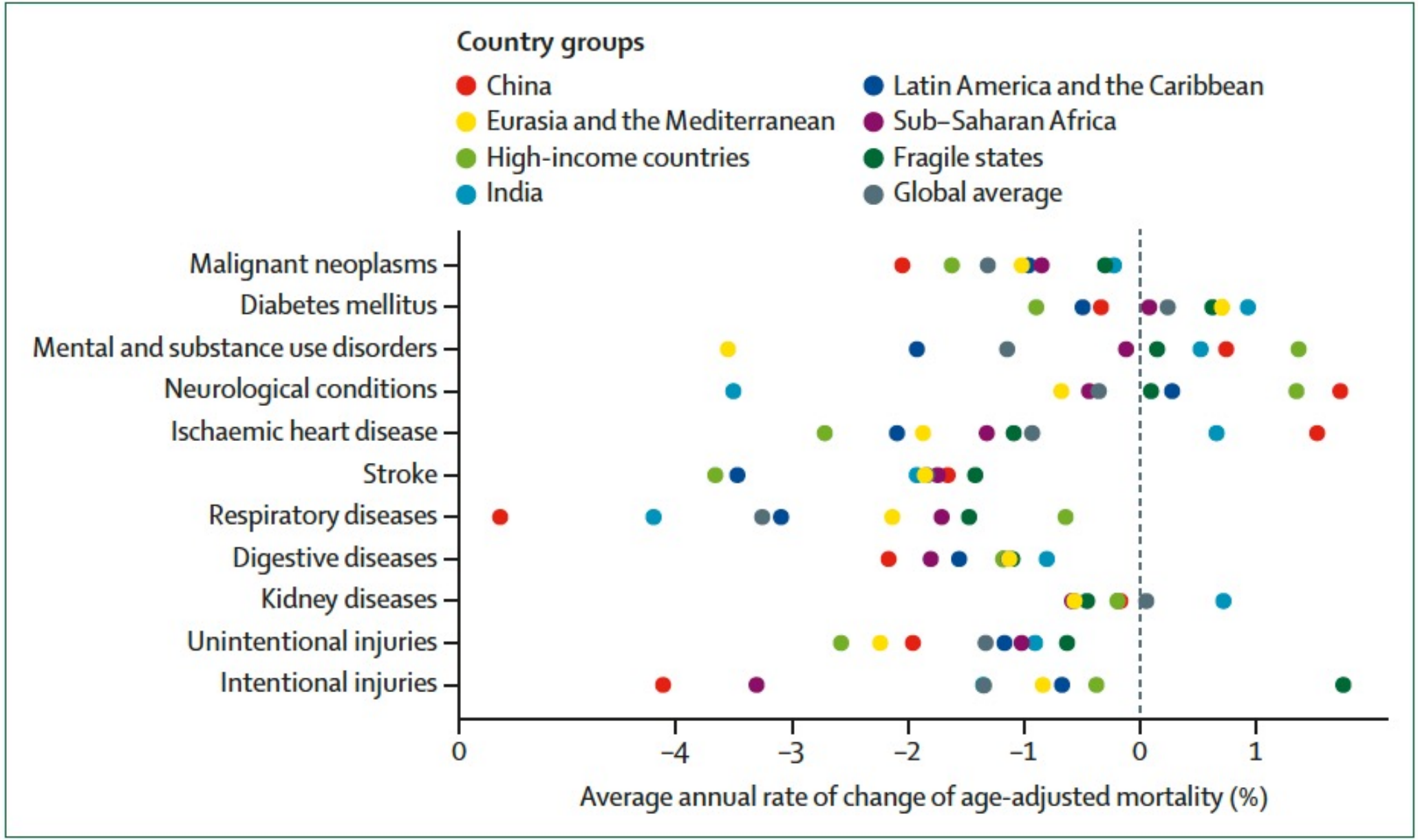
Note: COPD = chronic obstructive pulmonary disease; HIV = human immunodeficiency virus; IHD = ischemic heart disease.

Mathers CD, World Bank 2018.

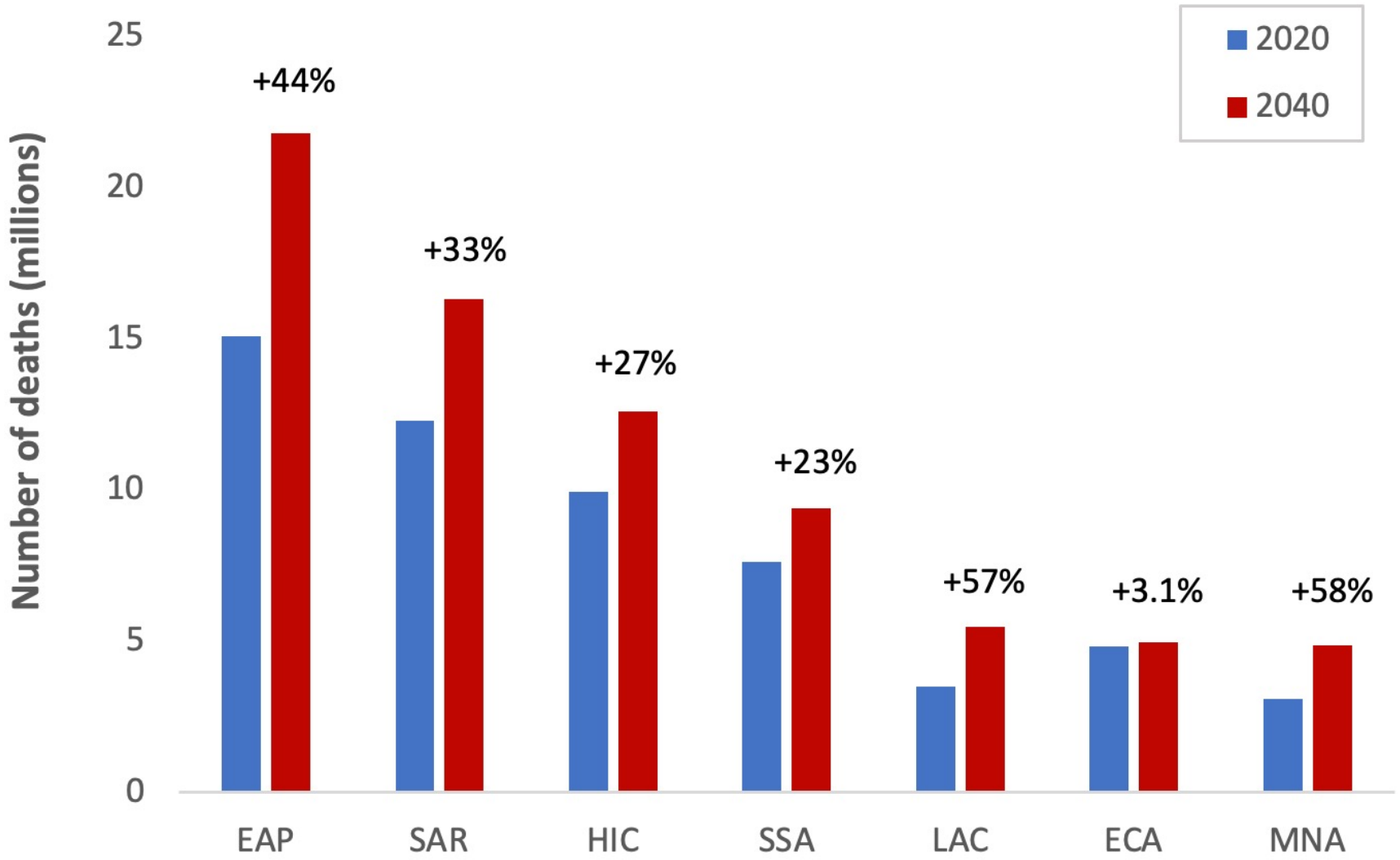
Figure 4.6 Decomposition of Changes in Annual Number of Deaths, by Country Income Group and Major Cause, 2000–15



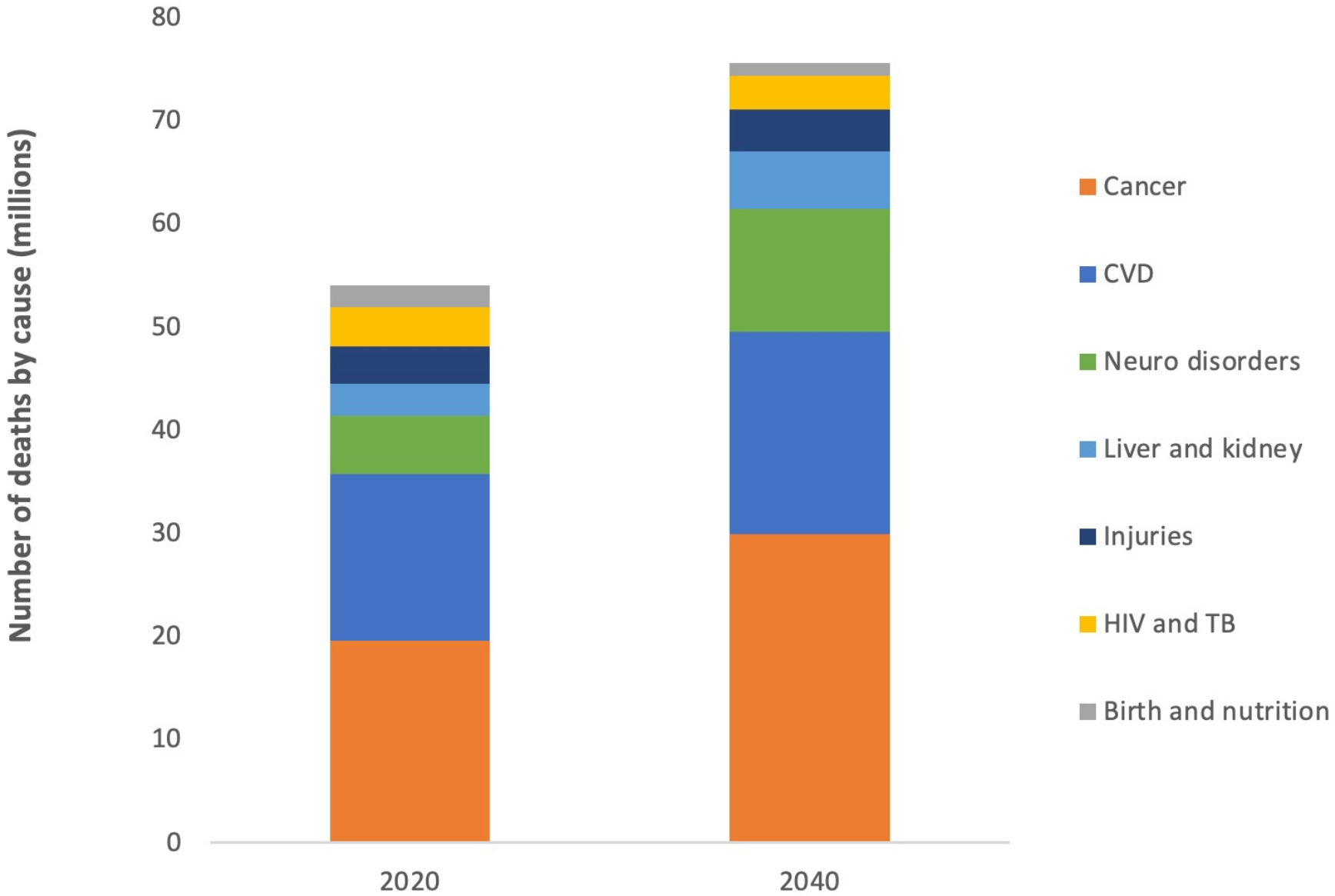
ibid.



Watkins DA, Lancet 2018.



GBD Foresight Study (GBD 2016 Study), Lancet 2017.


Number of deaths by cause (millions)
80
70
60
50
40
30
20
10
0
2020
2040
Cancer
CVD
Neuro disorders
Liver and kidney
Injuries
HIV and TB
Birth and nutrition

ibid.

Key messages

1. All-cause mortality will increase by ~35% from 2020 to 2040
   - Population growth in lower-income settings (progress on child mortality)
   - Population aging in higher-income settings (progress on fertility reduction)
   - Worsening epi trends for some causes (e.g., diabetes, neuro, kidney diseases)
2. Demand for palliative care will continue to increase
   - Lower age-specific mortality → increased share of need from non-decedents
   - Guesstimated 40% growth in need for palliative care from 2020 to 2040
   - Highest growth rates in MICs, then HICs, then LICs
   - Cancer, CVD, and neuro disorders will account for ~80% of need by 2040

Thank you

Follow-up questions: davidaw@uw.edu

Serious Health-Related Suffering, Avoidable Mortality and the Unmet Need for Palliative Care

Associated Faculty
Xiaoxiao Jiang Kwete, Afsan Bhadelia, Héctor Arreola-Ornelas, Oscar Méndez-Carniado, William E. Rosa, Felicia Marie Knaul

The Global Palliative Care and Pain Relief Research Hub
WEBINAR SERIES

June 23, 2022

Aim

Present empirical evidence on SHS associated deaths due to avoidable causes that are receptive to health system improvements

Methodological Comparison: Previous versus Current Approaches on Avoidable Mortality

	Nolte & McKee 2004 and Others	Knaul 2018	This Paper
Condition list	Pre-determined based on expert opinion of "avoid-ability"	All cancer subtypes	All SHS conditions
Deaths included	All deaths of those conditions or a pre-determined proportion of certain conditions	A subset of deaths from cancers, the proportion is determined by empirical data	A subset of deaths from SHS conditions, the proportion is determined by empirical data
Factors for determining proportion of deaths being avoidable	N/A	Age of death	Age specific mortality rate
Age group covered	All age groups	Above a certain age	All age groups below 70

Limitations

1. Issue of precision in disease coding
2. Weak correlation with health care inputs
3. Weak implications of the trends in avoidable mortality
4. Arbitrary selection of avoidable conditions
5. Failure to capture changing reality of **avoidable versus not amenable**
6. Lack of clarity between preventable and amenable

Nolte et al 2004; Carr-Hill et al 1987; Mackenbach et al 2013

Methodological Details

1. Acquire age-specific mortality and population data: We used age specific mortality rates from the IHME for all 21 conditions included in SHS database, which separated the age distribution into the following groups: 0-19, 20-49, 50-69 and 70+. The database is updated to 2019.

2. Calculate Age-specific mortality rate for each age group, each condition and in each country:

$$ASMR_{(\text{age group i, condition j, country k})} = \frac{\text{Death Number}_{(\text{age group i, condition j, country k})}}{\text{Population}_{(\text{age group i, condition j, country k})}}$$

3. Define the age-specific mortality rate of two "best scenarios" - ASMRbest : the social justice scenario and the feasibility scenario;

4. Calculate the death that would have occurred if "the best scenario" were to happen in each country:

$$\text{Counterfactual Death Number} = \text{Population}_{(\text{agi, condition j, country k})} \times \text{ASMRbest}_{(\text{agi, condition j, country k})}$$

3. Calculate avoidable mortality:

$$\text{Avoidable Mortality}_{(\text{agi, condition j, country k})} = \text{Death Number}_{(\text{agi, condition j, country k})} - \text{Counterfactual Death Number}$$

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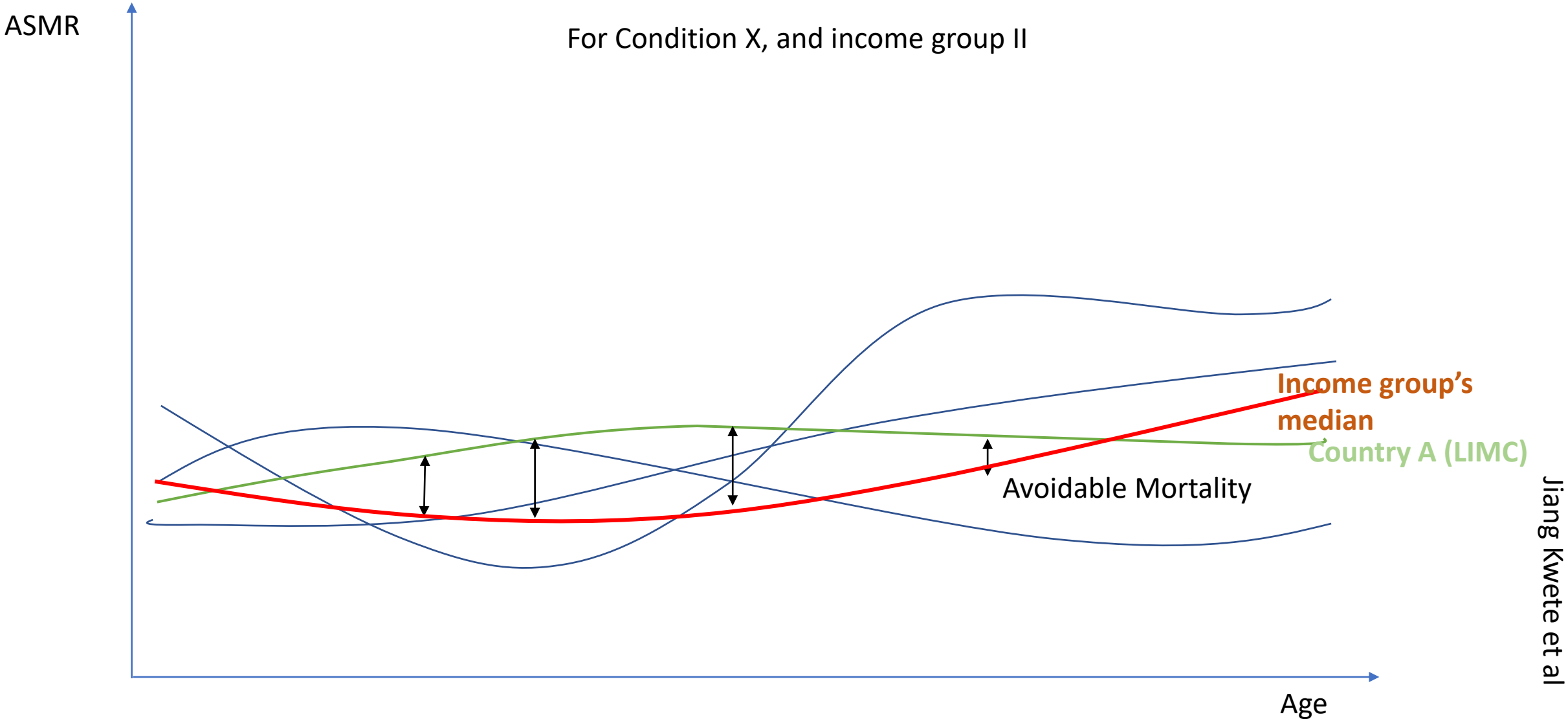
Feasibility Scenario:
"Best Case Scenario" Defined as Median of Each Income Group



Social Justice Scenario:
"Best Case Scenario" Defined as Median of High-Income Countries

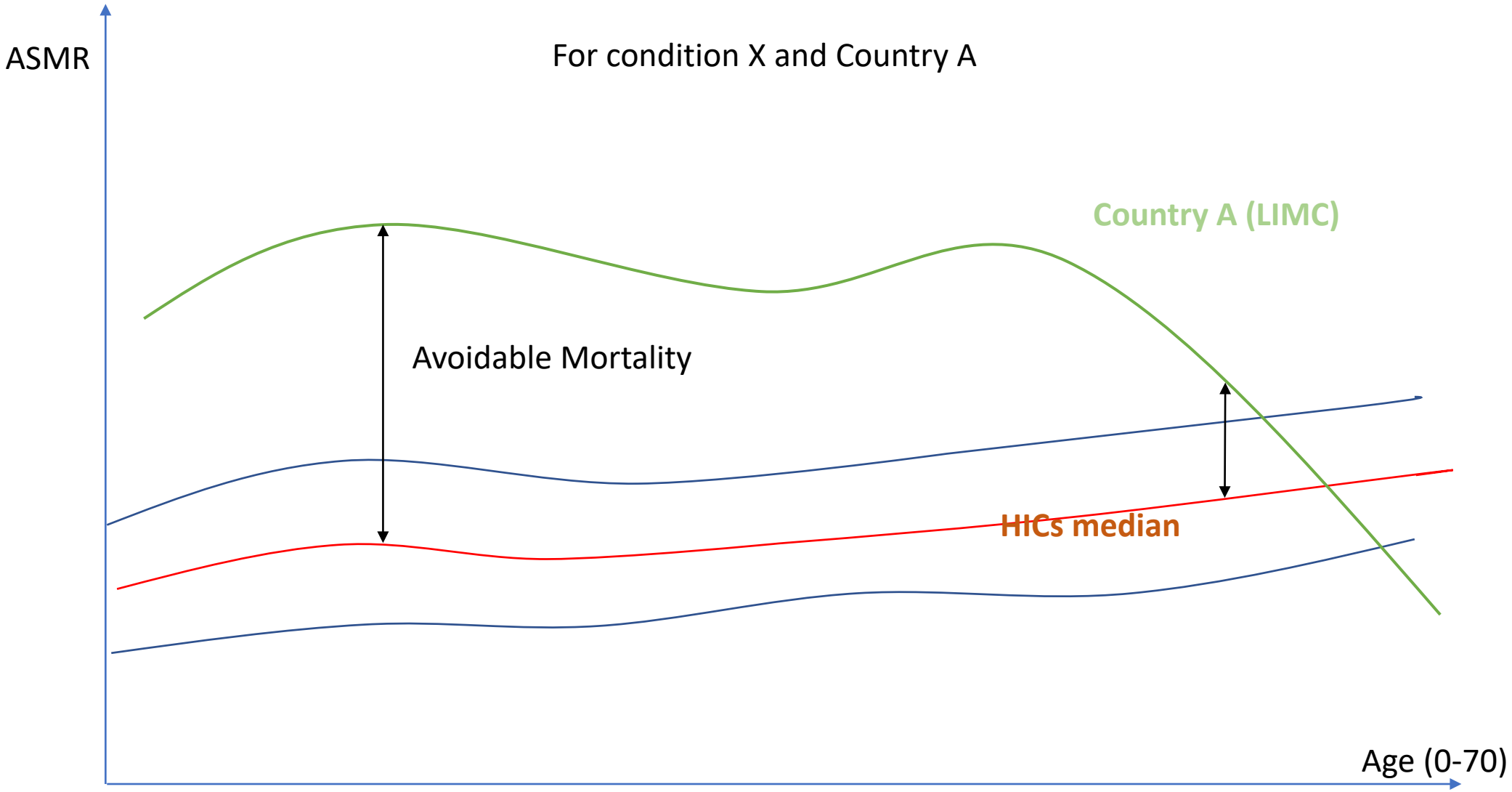


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Table 1-1. Avoidable SHS-associated deaths (0-69 years) using HICs' median age-specific mortality rate (Social Justice Approach) and the lowest age-specific mortality rate within each income group (Feasibility Approach) in 2019

Income groups	Total deaths associated with SHS	Avoidable deaths associated with SHS – Social justice approach	%	Avoidable deaths associated with SHS – Feasibility approach	%
LMIC Total	11,416,576	6,172,985	54%	2,707,733	24%
Low Income	1,416,304	1,078,588	76%	382,195	27%
Lower-Middle Income	5,159,990	3,163,414	**61%**	1,260,938	24%
Upper-Middle Income	4,840,282	1,930,983	**40%**	1,064,599	22%
High Income Countries	1,578,837	288,004	**18%**	288,004	18%
Global Total	12,995,413	6,450,648	50%	2,995,736	23%

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Table 1-2. Avoidable pediatric SHS-associated deaths (0-19 years) using HICs' median age-specific mortality rate (Social Justice Approach) and the lowest age-specific mortality rate within each income group (Feasibility Approach) in 2019

Income groups	Total deaths associated with SHS	Avoidable deaths associated with SHS - Social justice approach	%	Avoidable deaths associated with SHS - Feasibility approach	%
LMIC Total	1,880,386	1,558,183	83%	567,094	30%
Low Income	540,202	490,602	91%	154,120	28%
Lower-Middle Income	1,039,177	872,048	84%	340,271	33%
Upper-Middle Income	301,007	195,533	65%	72,704	24%
High Income Countries	41,374	8,984	22%	8,984	22%
Global Total	1,921,760	1,564,720	81%	576,078	30%

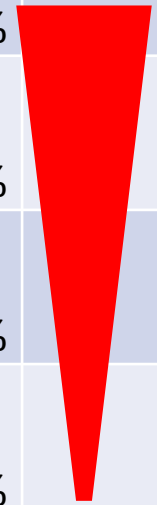

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Table 2-1 Avoidable SHS-associated deaths (0-69 years) by condition (000) in 2019

		HF	TB	HIV	MN	Leuk	Dem	ICNS	DCNS	CVD	NIHD	IHD	LD	DL	KD	LBW	CM	AS	Inj	MSD	PEM	EMBID
Social Justice Approach	L&MIC	1	832	807	435	36	17	216	13	1,000	219	82	386	472	191	633	204	420	18	9	131	51
	%	98	99	97	12	24	23	96	15	75	61	57	65	55	74	89	65	47	51	31	98	96
	LIC	<1	182	196	22	8	0	81	3	82	29	6	20	55	15	156	67	68	4	0	65	19
	%	99	100	99	11	47	13	99	30	81	77	62	63	67	79	93	81	63	72	27	100	99
	L-MIC	0	543	364	98	9	2	119	9	396	118	51	260	286	104	412	101	199	10	4	49	29
	%	98	99	97	8	16	9	96	21	76	67	69	77	62	80	91	65	50	56	32	98	97
	U-MIC	<1	108	247	315	19	15	16	1	522	72	25	106	132	72	64	36	152	4	5	16	3
	%	88	94	95	15	25	31	79	4	73	48	42	47	41	65	71	49	40	35	31	92	76
	HIC	<1	3	9	110	3	1	<1	3	20	17	5	34	33	11	3	3	25	3	2	1	1
	%	69	61	68	12	10	6	22	13	22	41	29	42	25	44	29	19	23	36	32	71	73
	Global	1	835	816	545	39	18	216	16	1,020	236	87	420	505	202	636	208	445	21	11	132	42
	%	97	98	96	12	22	20	95	14	71	59	54	62	51	71	88	63	45	48	31	98	77
Feasibility Approach	L&MIC	<1	292	569	403	19	13	84	10	267	55	37	261	160	39	187	64	140	5	8	59	36
	%	83	35	68	12	13	18	37	11	20	15	26	44	19	15	26	21	16	14	27	44	67
	LIC	<1	67	104	23	6	0	28	1	18	9	3	7	8	2	21	15	26	1	0	28	14
	%	91	37	53	12	33	9	35	12	18	23	31	21	10	10	13	18	24	19	31	42	72
	L-MIC	<1	152	272	102	6	2	47	7	62	23	25	189	72	18	148	38	51	3	4	20	21
	%	86	28	72	9	11	7	38	17	12	13	34	56	16	14	33	24	13	13	38	40	70
	U-MIC	<1	72	193	279	7	11	9	1	186	23	9	66	79	19	18	11	63	1	3	11	1
	%	41	63	75	13	9	24	43	3	26	16	15	29	25	17	20	15	17	12	19	65	28
	HIC	<1	3	9	110	3	1	<1	3	20	17	5	34	33	11	3	3	25	3	2	1	1
	%	69	61	68	12	10	6	22	13	22	41	29	42	25	44	29	19	23	36	32	71	73
	Global	<1	295	578	513	22	14	85	13	286	72	42	296	193	49	191	67	165	7	10	60	37
	%	83	35	68	12	12	16	37	11	20	18	26	44	19	17	26	21	17	17	28	45	67

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Table 2-2 Avoidable SHS-associated deaths (0-19 years) by condition (000) in 2019

		HF	TB	HIV	MN	Leuk	Dem	ICNS	DCNS	CVD	NIHD	IHD	LD	DL	KD	LBW	CM	AS	Inj	MSD	PEM	EMBID
Social Justice Approach	L&MIC	<1	75	102	27	18	0	171	7	13	9	0	3	26	11	633	202	114	4	1	102	40
	%	*99*	*100*	*99*	*36*	*50*	*n.a*	*98*	*45*	*85*	*75*	*88*	*65*	*94*	*88*	*89*	*69*	*67*	*81*	*52*	*100*	*94*
	LIC	<1	28	41	6	5	0	69	2	3	2	0	1	6	3	156	67	30	1	0	55	15
	%	*99*	*100*	*99*	*44*	*63*	*n.a*	*99*	*57*	*90*	*82*	*87*	*81*	*96*	*93*	*93*	*82*	*78*	*89*	*40*	*100*	*97*
	L-MIC	<1	42	45	15	6	0	90	5	8	6	0	1	17	6	412	100	53	2	0	40	23
	%	*99*	*100*	*98*	*38*	*37*	*n.a*	*98*	*51*	*86*	*77*	*90*	*60*	*95*	*89*	*91*	*68*	*65*	*83*	*38*	*100*	*95*
	U-MIC	<1	5	16	6	8	0	11	1	2	1	0	1	3	2	64	35	30	1	1	7	2
	%	*90*	*99*	*97*	*28*	*56*	*n.a*	*90*	*19*	*76*	*58*	*84*	*57*	*87*	*80*	*71*	*54*	*62*	*65*	*65*	*99*	*75*
	HIC	<1	3	9	110	3	1	<1	3	20	17	5	34	33	11	3	3	25	3	2	1	1
	%	*69*	*61*	*68*	*12*	*10*	*6*	*22*	*13*	*22*	*41*	*29*	*42*	*25*	*44*	*29*	*19*	*23*	*36*	*32*	*71*	*73*
	Global	1	835	816	545	39	18	216	16	1,020	236	87	420	505	202	636	208	445	21	11	132	42
	%	*97*	*98*	*96*	*12*	*22*	*20*	*95*	*14*	*71*	*59*	*54*	*62*	*51*	*71*	*88*	*63*	*45*	*48*	*31*	*98*	*77*
Feasibility Approach	L&MIC	<1	34	73	12	8	0	67	3	5	3	0	1	8	3	187	62	28	2	0	45	27
	%	*88*	*44*	*70*	*16*	*20*	*n.a*	*38*	*21*	*31*	*24*	*41*	*18*	*29*	*22*	*26*	*21*	*17*	*37*	*25*	*44*	*65*
	LIC	<1	12	26	2	2	0	26	1	1	0	0	0	1	0	21	15	11	0	0	24	11
	%	*92*	*42*	*62*	*17*	*28*	*n.a*	*37*	*17*	*30*	*18*	*35*	*19*	*12*	*16*	*13*	*18*	*28*	*34*	*21*	*43*	*70*
	L-MIC	<1	18	34	8	3	0	34	3	3	2	0	0	6	2	148	37	9	1	0	16	16
	%	*88*	*43*	*73*	*21*	*17*	*n.a*	*37*	*26*	*37*	*29*	*42*	*19*	*32*	*23*	*33*	*25*	*11*	*42*	*15*	*40*	*66*
	U-MIC	<1	4	13	1	3	0	7	0	1	0	0	0	2	1	18	11	8	0	0	5	1
	%	*60*	*74*	*80*	*5*	*19*	*n.a*	*52*	*9*	*17*	*12*	*39*	*16*	*43*	*25*	*20*	*16*	*16*	*23*	*32*	*69*	*26*
	HIC	<1	3	9	110	3	1	<1	3	20	17	5	34	33	11	3	3	25	3	2	1	1
	%	*69*	*61*	*68*	*12*	*10*	*6*	*22*	*13*	*22*	*41*	*29*	*42*	*25*	*44*	*29*	*19*	*23*	*36*	*32*	*71*	*73*
	Global	<1	295	578	513	22	14	85	13	286	72	42	296	193	49	191	67	165	7	10	60	37
	%	*83*	*35*	*68*	*12*	*12*	*16*	*37*	*11*	*20*	*18*	*26*	*44*	*19*	*17*	*26*	*21*	*17*	*17*	*28*	*45*	*67*

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Implications

- **Health system underperformance widens palliative care and pain relief divide**
  - Critical to prevent palliative care from being a **stop-gap for under-performing** and **inequitable** health systems

- Demonstrate **palliative care as** an **integral component of effective UHC**

- Promote **priority-setting** to consider **large proportion of SHS burden due to avoidable causes using existing and affordable medical interventions**

- Opportunity to **advance integrated response** along the continuum of care

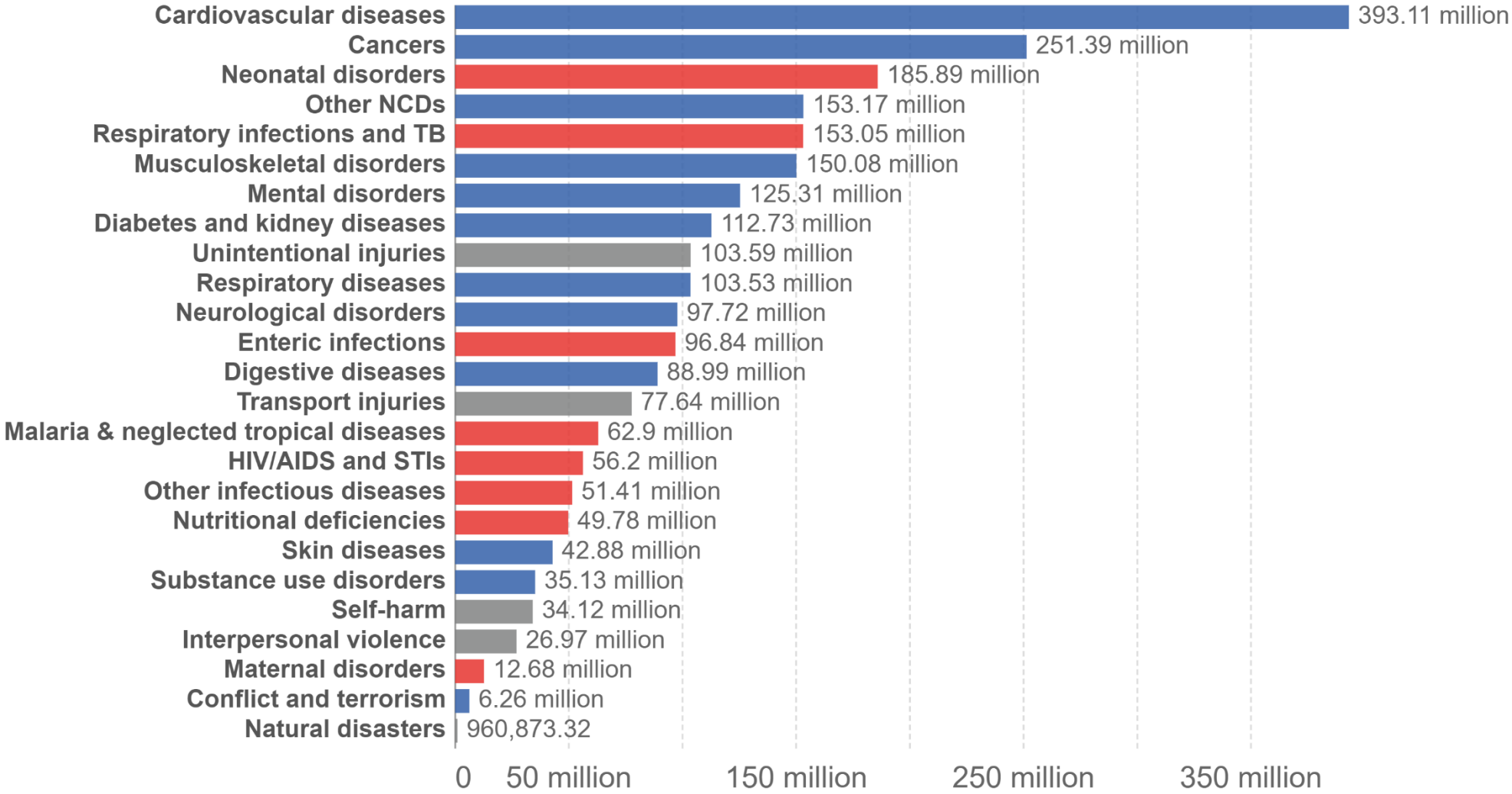
Thank You!

Transitions in the Global Disease Burden and the Need for Palliative Care

Professor Liz Grant
University of Edinburgh

Burden of disease by cause, World, 2019

Total disease burden, measured in Disability-Adjusted Life Years (DALYs) by sub-category of disease or injury. DALYs measure the total burden of disease – both from years of life lost due to premature death and years lived with a disability. One DALY equals one lost year of healthy life.



Source: IHME, Global Burden of Disease

OurWorldInData.org/burden-of-disease • CC BY

Note: Non-communicable diseases are shown in blue; communicable, maternal, neonatal and nutritional diseases in red; injuries in grey.

World Economic Forum Risk Report 2021

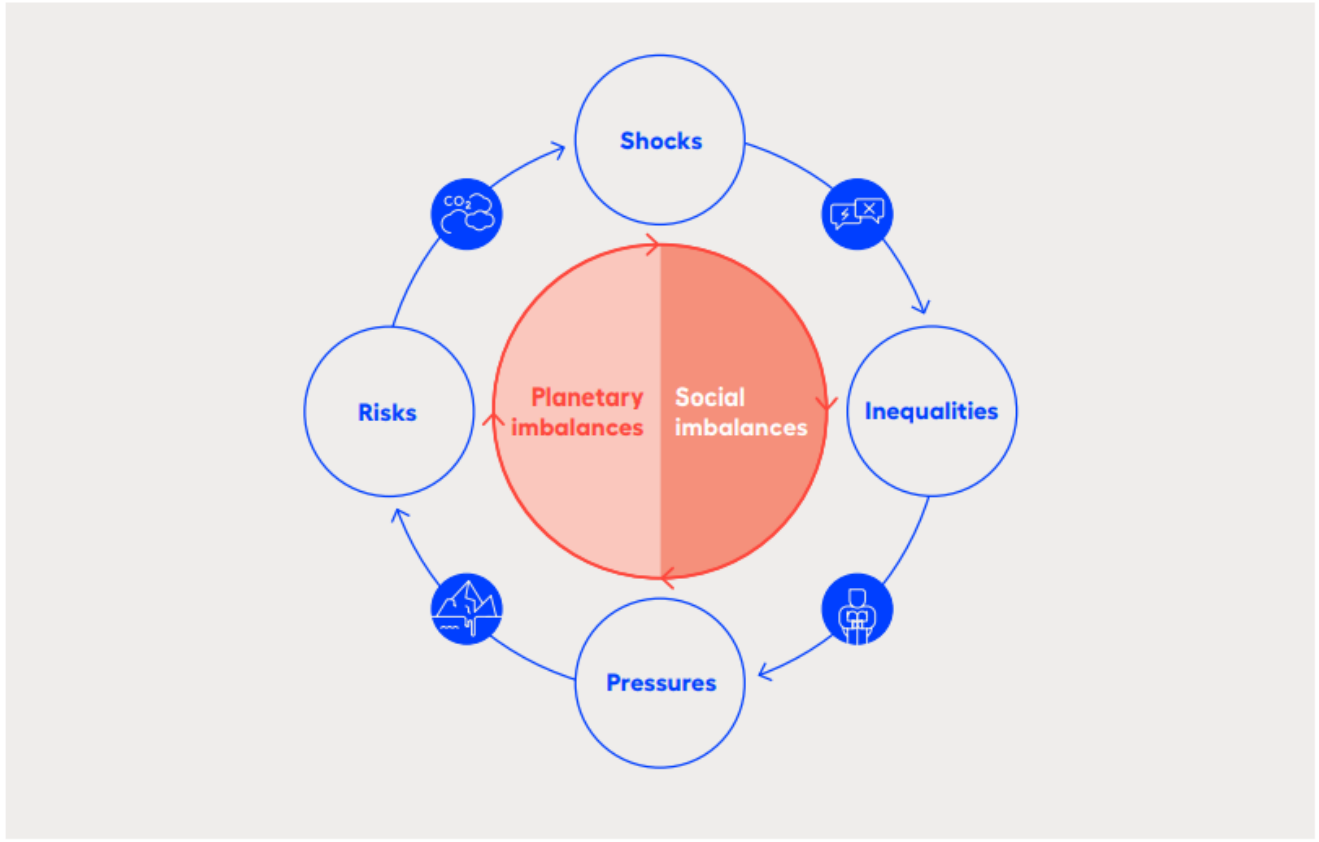
Top Risks
by likelihood

1. Extreme weather
2. Climate action failure
3. Human environmental damage
4. Infectious diseases
5. Biodiversity loss
6. Digital power concentration
7. Digital inequality
8. Interstate relations fracture
9. Cybersecurity failure
10. Livelihood crises

Top Risks
by impact

1. Infectious diseases
2. Climate action failure
3. Weapons of mass destruction
4. Biodiversity loss
5. Natural resource crises
6. Human environmental damage
7. Livelihood crises
8. Extreme weather
9. Debt crises
10. IT infrastructure breakdown

Planetary and Social Imbalances reinforcing each other



Source: Human Development Report Office.

Global Inequity

Sir Michael Marmot
@MichaelMarmot

Not enough money for global vaccines? Between March 2020 and July 2021, the world's 2,690 billionaires increased their wealth by $5.5trillion. You read that correctly: $5.5 trillion. theguardian.com/world/2021/aug…
12/08/2021, 17:06

The climate and health vortex

Climate change is impacting health

Directly through **e**xtreme weather events, heat, floods

Indirectly through ecosystems leading to more diseases - vector-borne, water-borne, diseases associated with food scarcity, mental illness

Indirectly through socio-economic systems with increased poverty, inequalities, migration and displacement

Health systems and services exacerbate climate change - the carbon footprint, single use equipment, PPI, transport, medicines, and energy demands.

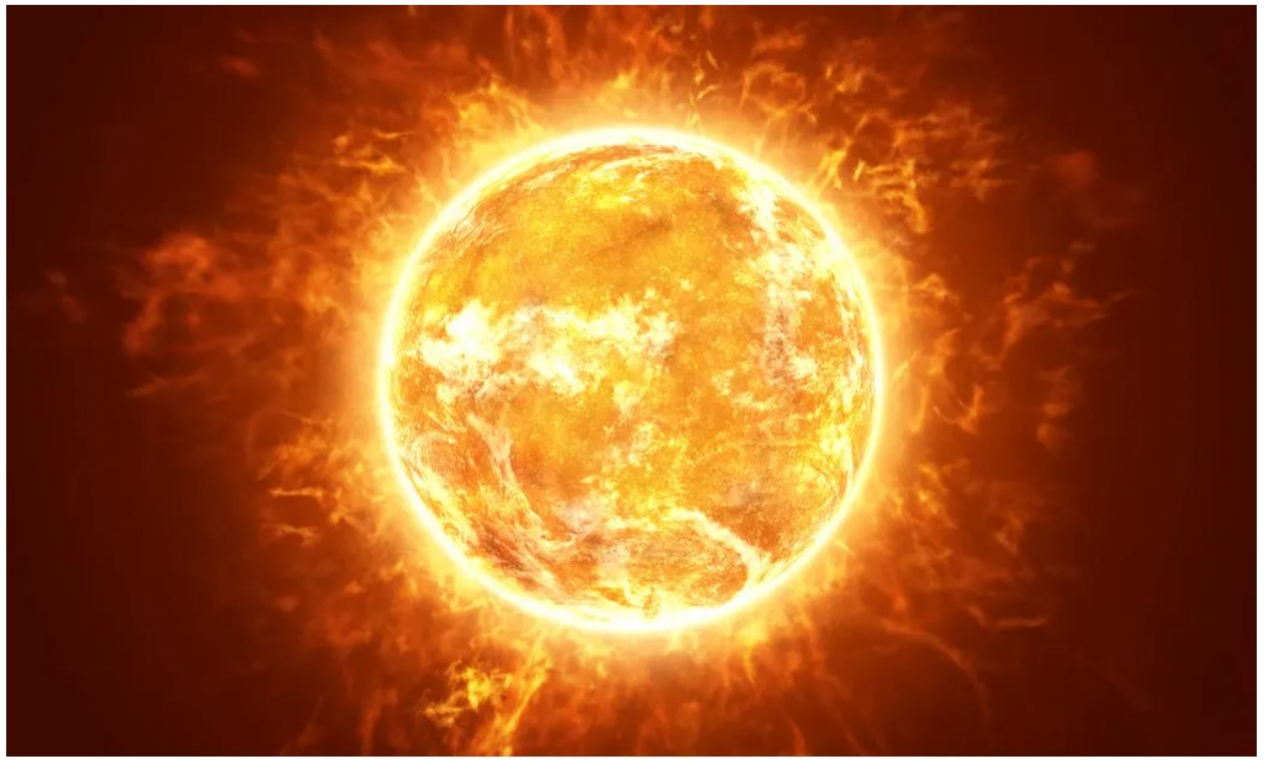
Disease transitions can’t be separated from the climate crisis

The Observer
Extreme weather

Burning planet: why are the world’s heatwaves getting more intense?

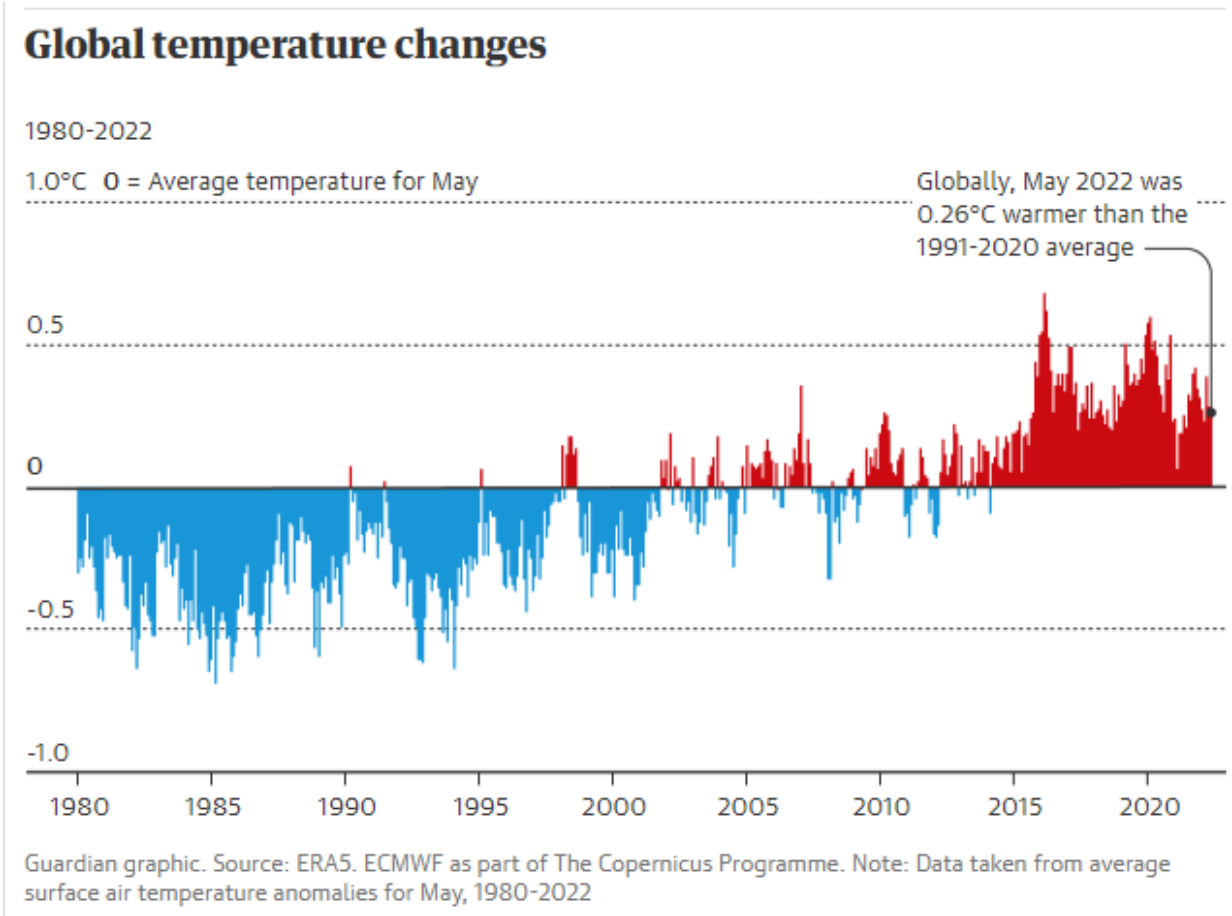
Fiona Harvey, Ashifa Kassam *in Madrid*, Nina Lakhani *in Phoenix, and* Amrit Dhillon *in New Delhi*

Sat 18 Jun 2022 17.26 BST



Climate change has meant that heatwaves ‘have increased in frequency, intensity and duration across the world’. Photograph: aryos/Getty Images

“We cannot adapt our way out of the climate crisis” Katherine Hayhoe



Eight records broken this past year

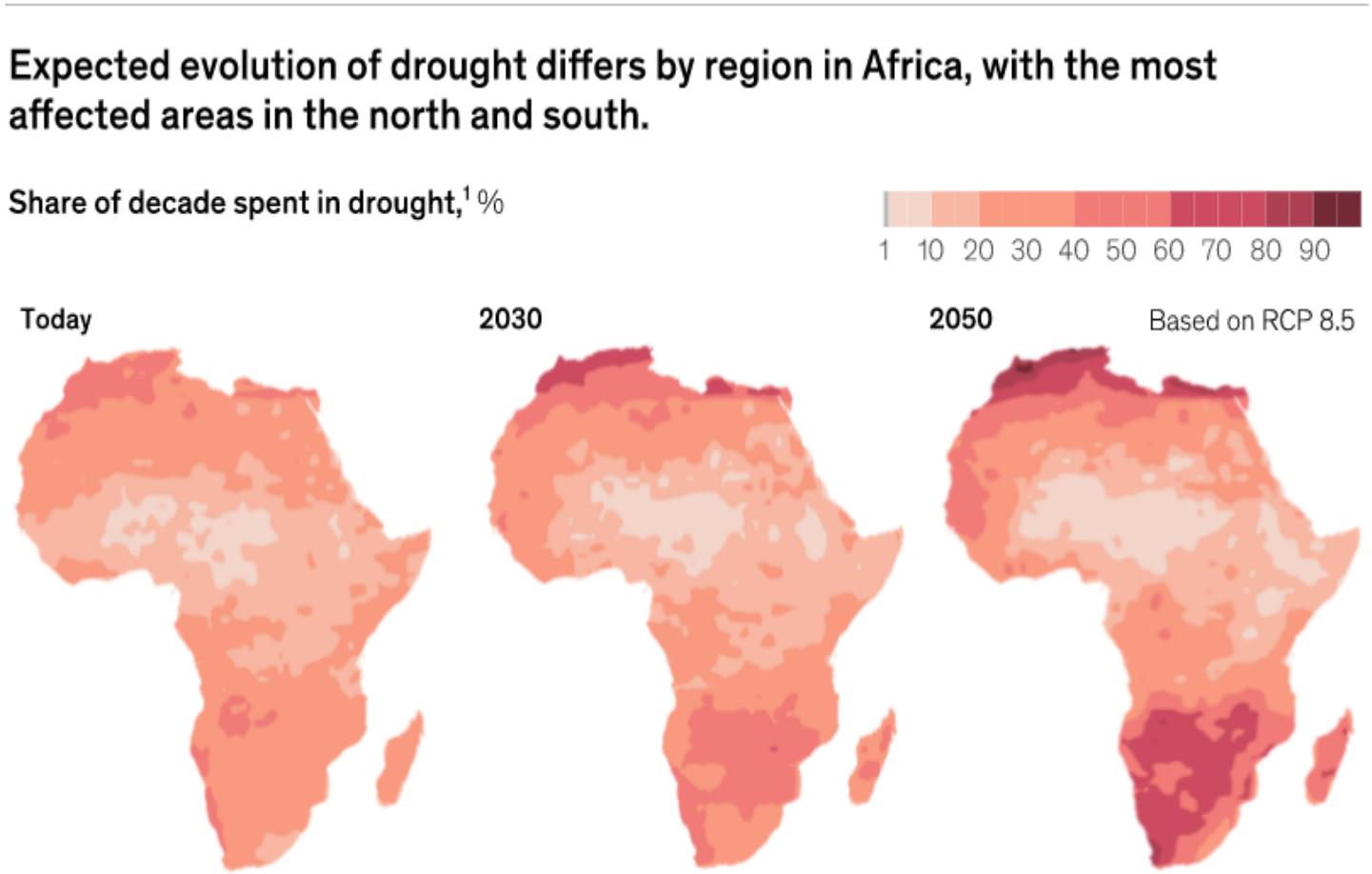
1. Last 7 years hottest on record
2. 2021 global mean sea level reached a new record high (4.5mm a year 2013-2021)
3. Ozone zone over Antarctica larger and deeper than 70% of ozone holes (since 1979)
4. First ever recorded rainfall seen at Summit Station, the highest point on the Greenland ice sheet

Western Europe saw its worst ever flooding (241mm in 22 hrs)

6. Exceptional heatwaves - Death Valley reached 54.4C for 2nd consecutive year – (Delhi 49C May)

7. Hurricane Ida tied for strongest landfall on record (240km/hour) in Louisiana (21 named storms)

8. More drought in the world –Lake Mead on Colorado River feel to 47m below full supply level



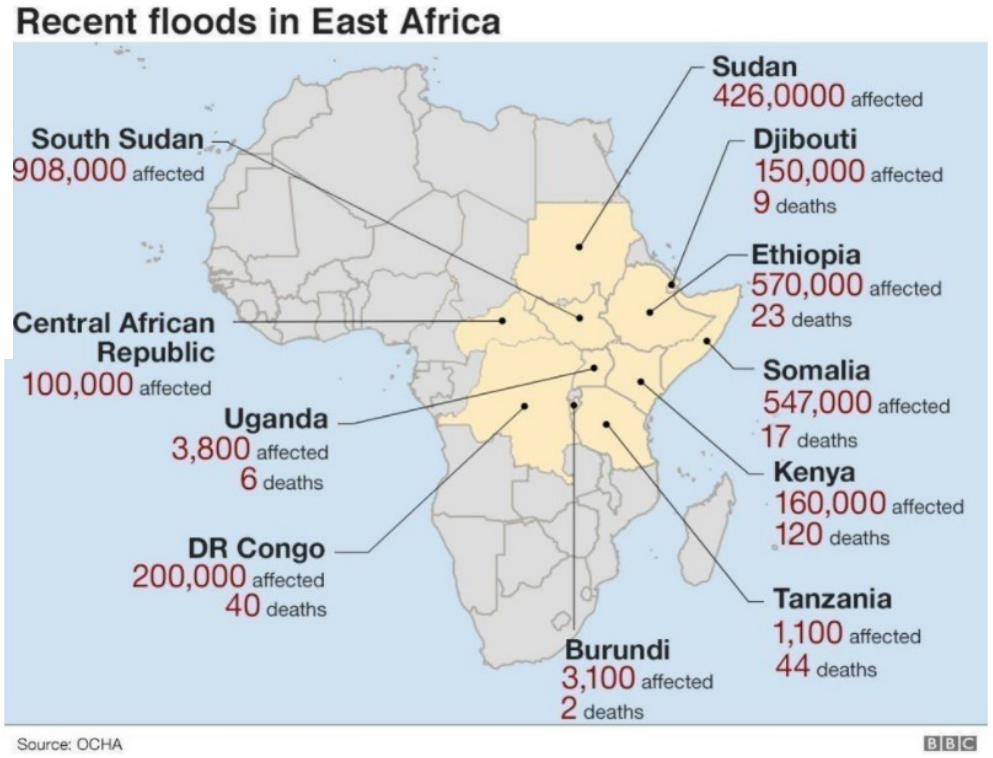
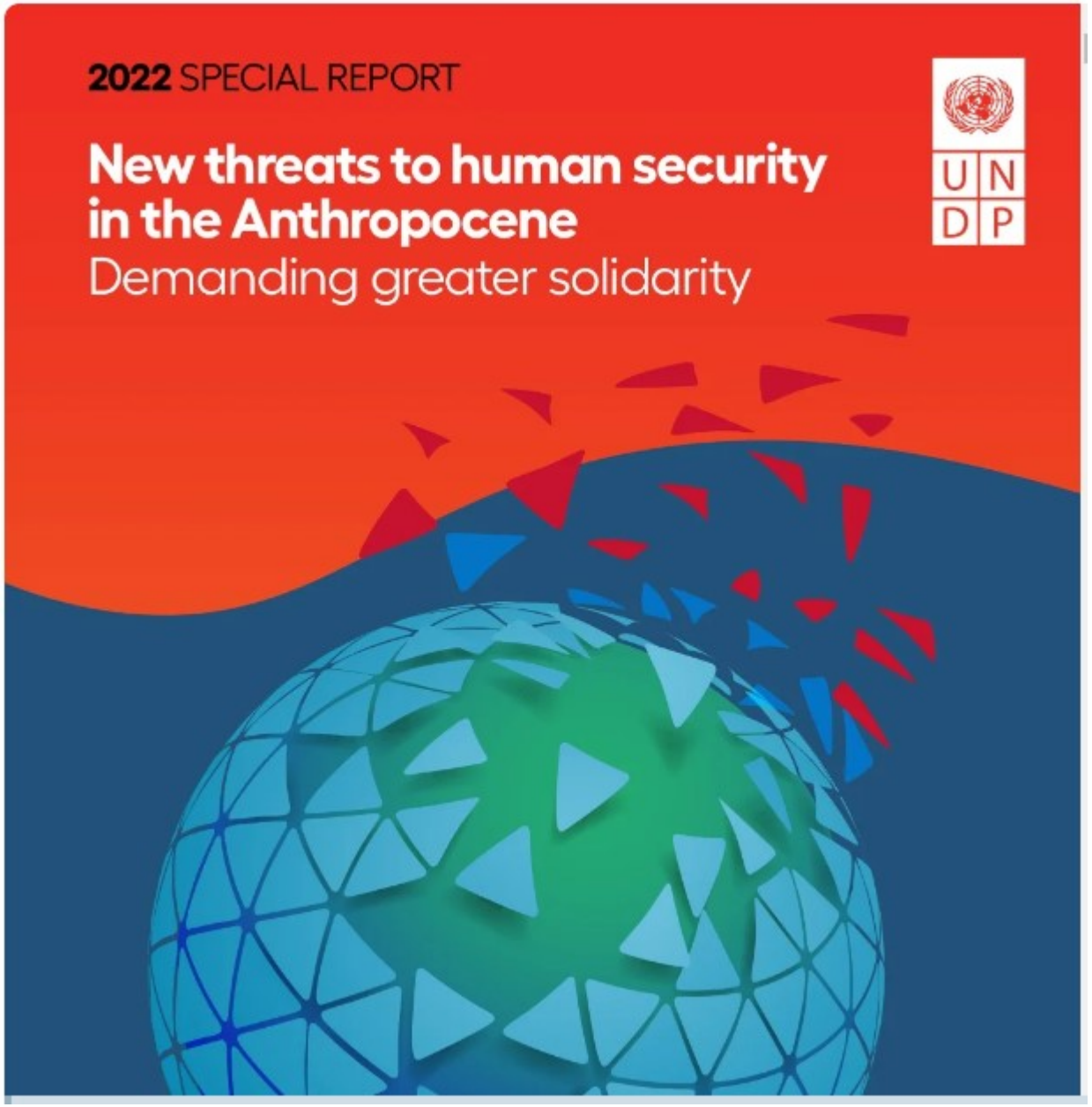


Image 1 McKinsey Global Institute
Image 2 BBC

Disease transitions can’t be separated from other threats

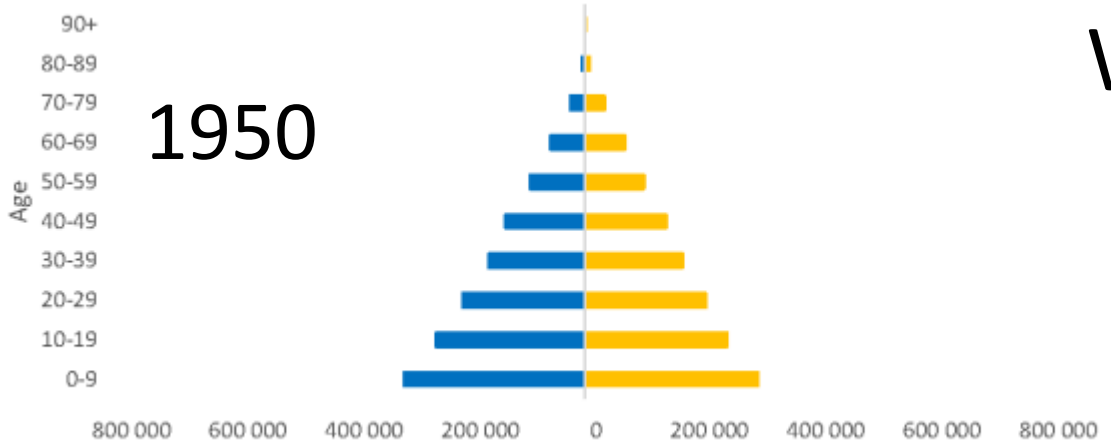


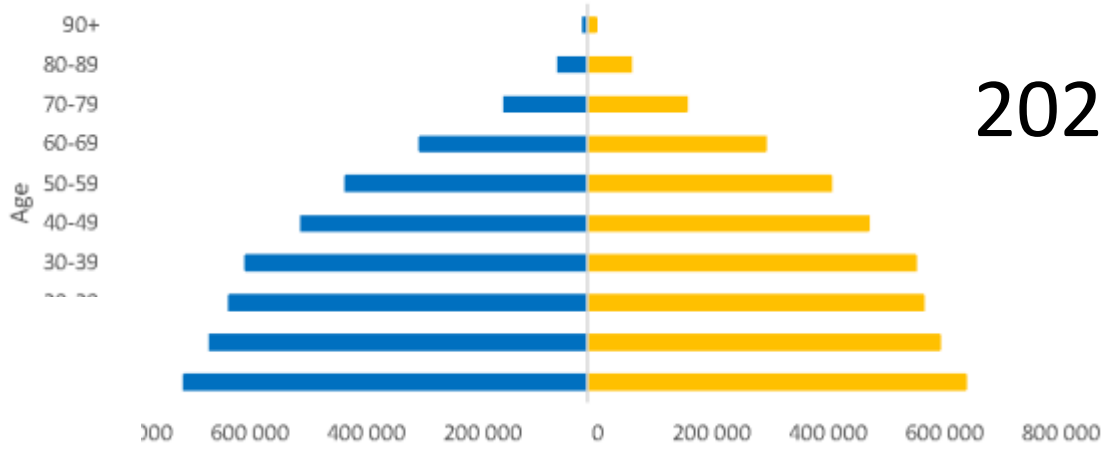
We are seeing an unparalleled rise in uncertainty, fear, distrust and insecurity -

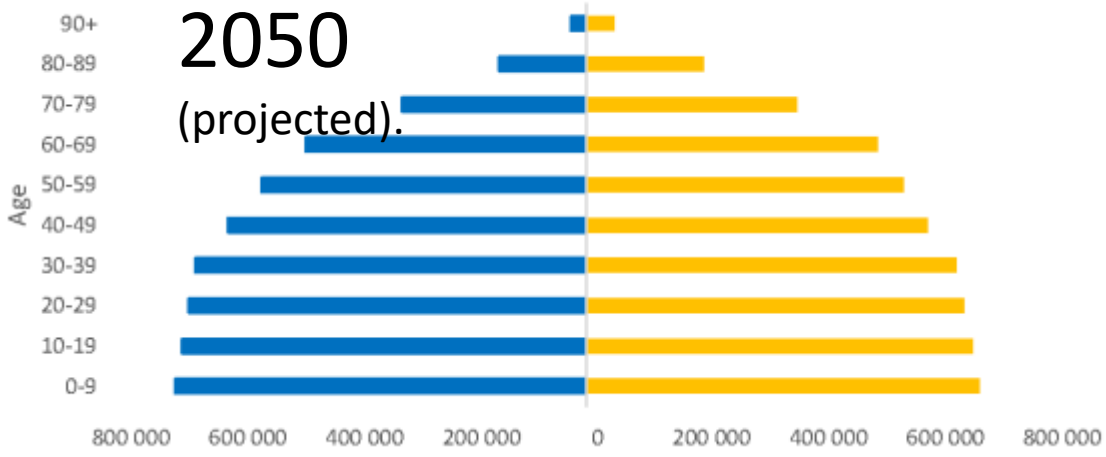
“digital technologies, inequalities, conflicts, and the ability of healthcare systems to tackle new challenges like the COVID-19 pandemic.”

What is Palliative Care’s role in responding to these issues

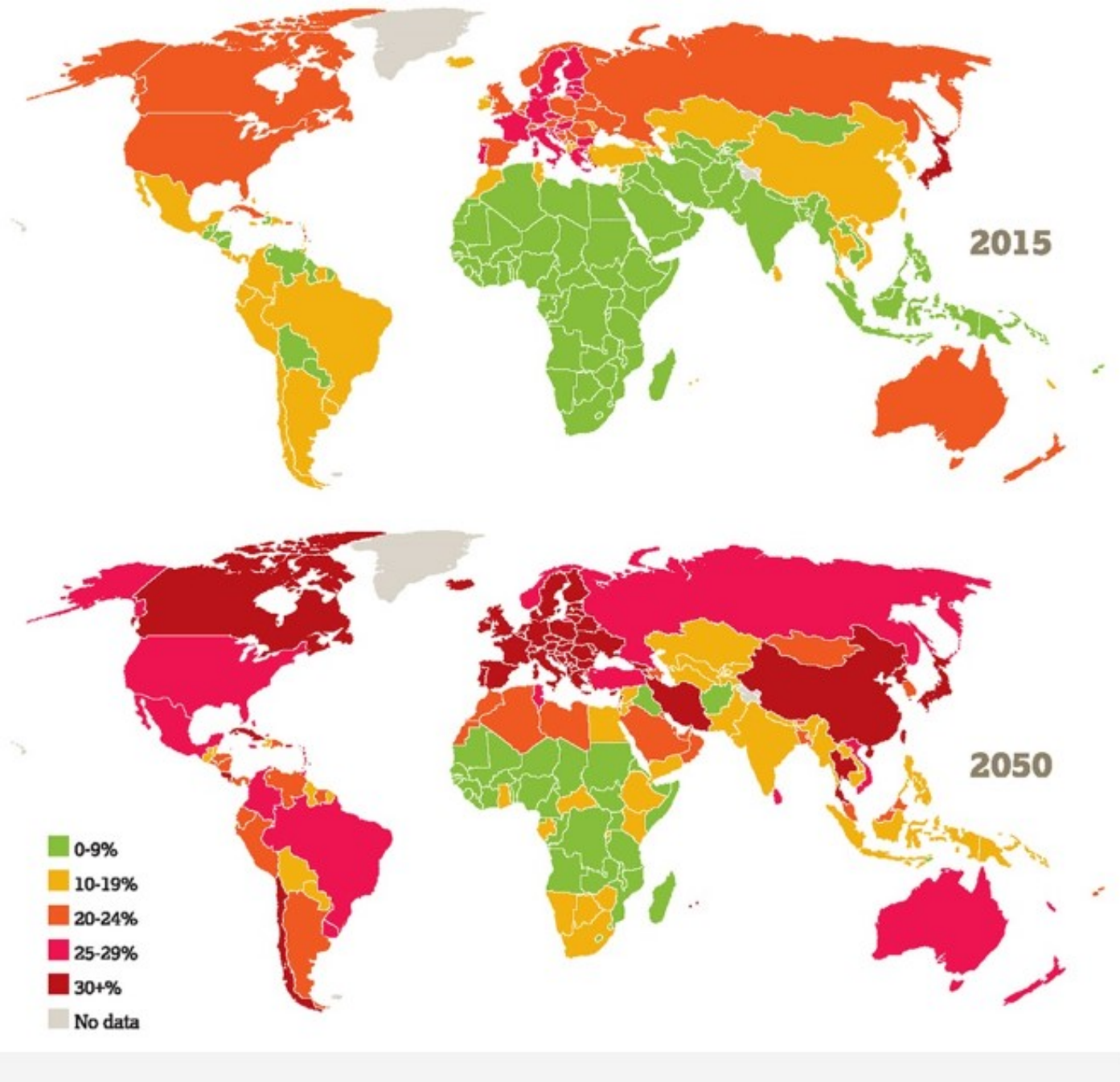
World Population Pyramids







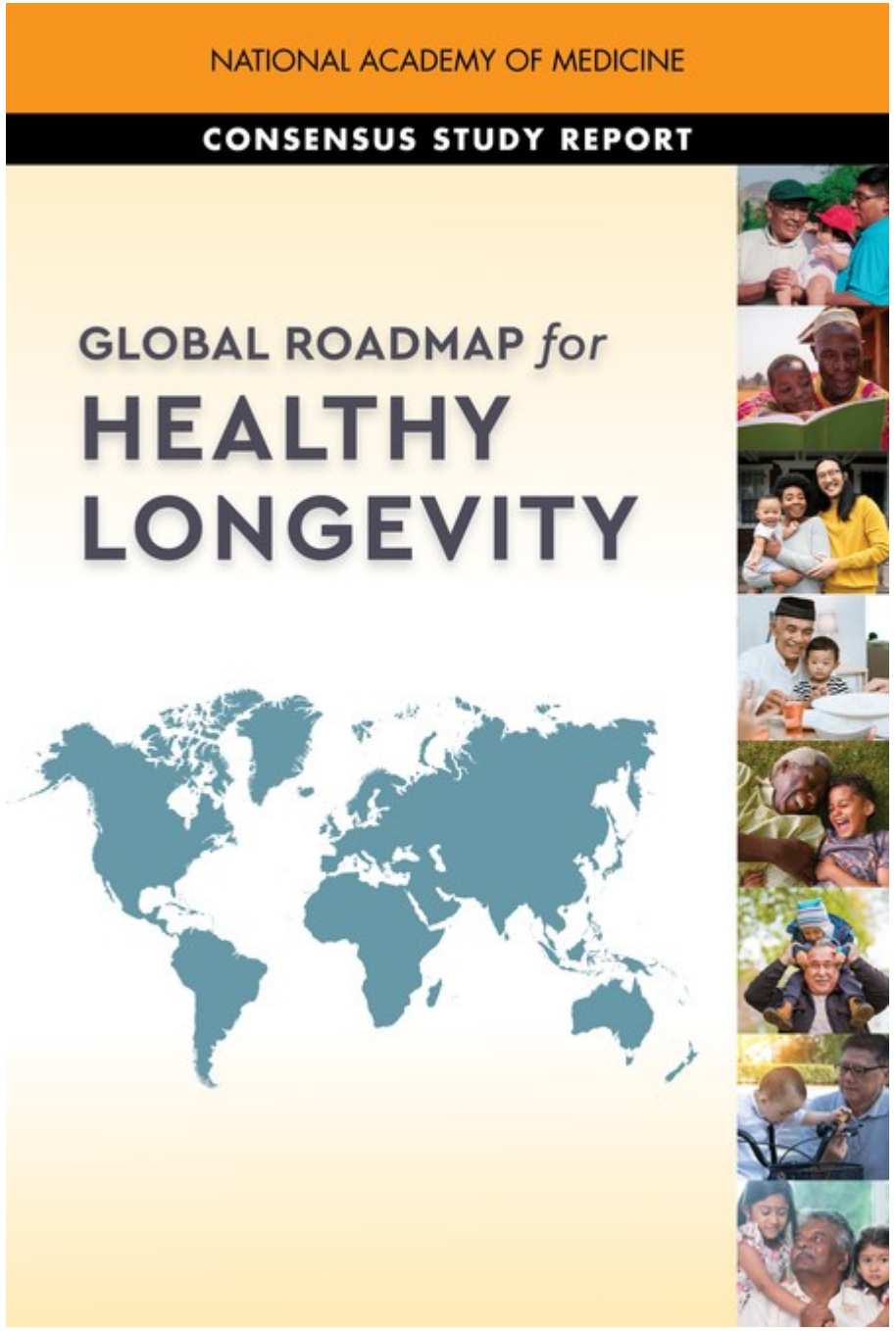
Blue = male population; yellow = female population.



Proportion of pop > 60 in 2015 and 2050
HealthAge International

The balance -

- Rapidly rising numbers of older adults
- Rising rates of age-related chronic illnesses
- Loss of human value, well-being, function, and dignity to disability caused by chronic
- illness, frailty, and cognitive decline;
- Shifting family structures – globalization, urbanization and migration;
- Suboptimal system of retirement
- Social fraying between generations
- Lack of investment in identifying social determinants of healthy longevity including built environment
- Climate change and pollution



Palliative care in the spaces between

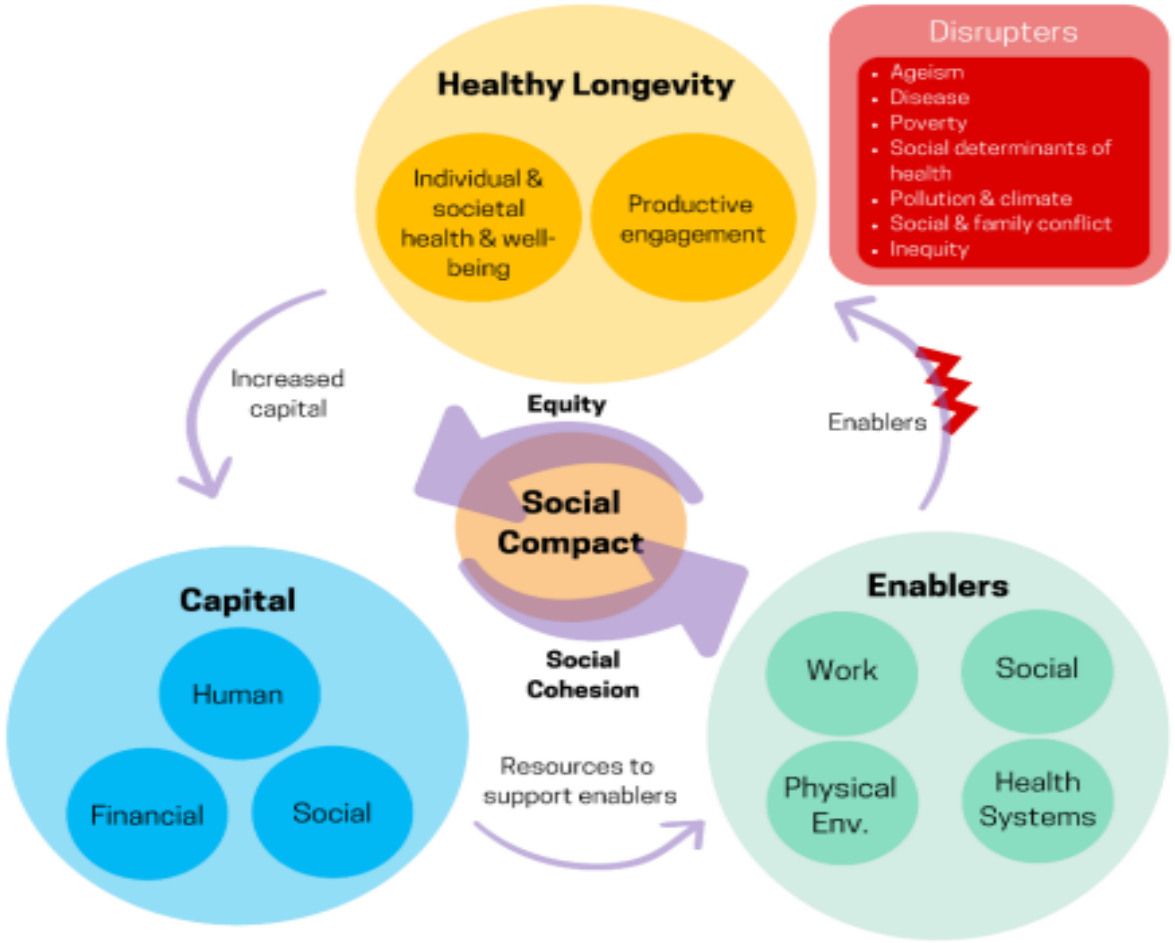


FIGURE 1-4 The virtuous cycle of healthy longevity.

Can Palliative Care work within the spaces to ensure effective transitions?

National Academy of Medicine. 2022. Global Roadmap for Healthy Longevity. Washington, DC: The National Academies Press. https://doi.org/10.17226/26144

Transitions because of conflict

Some 1.2 billion people live in conflict-affected areas

560 million reside in countries not classified as fragile contexts

274 million people in need of humanitarian assistance and protection in 2022 United Nations Office for the Co-ordination of Humanitarian Affairs 2022

PallCHASE Statement on the Humanitarian Crisis in Ukraine

March 1, 2022
Care, Community Engagement, In The Media

Comment

The value of alleviating suffering and dignifying death in war and humanitarian crises

Despite a vast literature on humanitarian crisis response,[1-5] palliative care, pain relief, and care for the dying and bereaved need increased and urgent attention,[5-11] particularly in the context of armed conflict. global leaders and governments to ensure timely measures are enacted to maintain human dignity for those with serious health-related suffering during the conflict.[16]

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March 21, 2022
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S0140-6736(22)00534-7

Conflict issues

Trial of LRA commander Ongwen still divides northern Uganda

News feature 30 June 2021

Death threats and sleepless nights: The emotional toll of reporting Ethiopia's Tigray conflict

First person 29 June 2021

Famine fears and fresh fighting: A humanitarian primer as Ethiopia heads to the polls

Analysis 21 June 2021

Death of Boko Haram leader doesn't end northeast Nigeria's humanitarian crisis

Analysis 17 June 2021

Aid reform's new leader: A Q&A with Jan Egeland

Interview 17 June 2021

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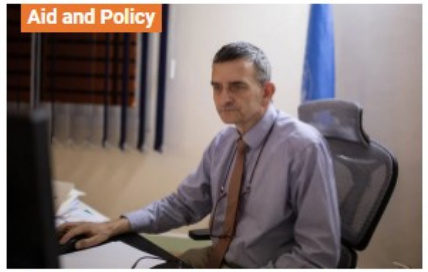
On COVID vaccinations for refugees, will the world live up to its promises?

News feature 8 June 2021

Caught in the middle: Peace activists in Cameroon try to end a brutal war

Congo volcano risk remains as evacuees return



Q&A: Can a new UN peace operation help stabilise Sudan?

UN peacekeeper withdrawal leaves security vacuum in Darfur

What can we do?

- Tell the story of the changing needs of palliative care and the value of palliative care and pain relief through the experiences of people – incorporating the problems and the solutions into the story

- Hold on to the conviction of why it matters and why the status quo is no longer tenable once the story has been told