Measurement of Health and the Global Burden of Disease

Colin Mathers

Measurement and Health Information (MHI)
Information, Evidence and Research Cluster (IER)

World Health Organization

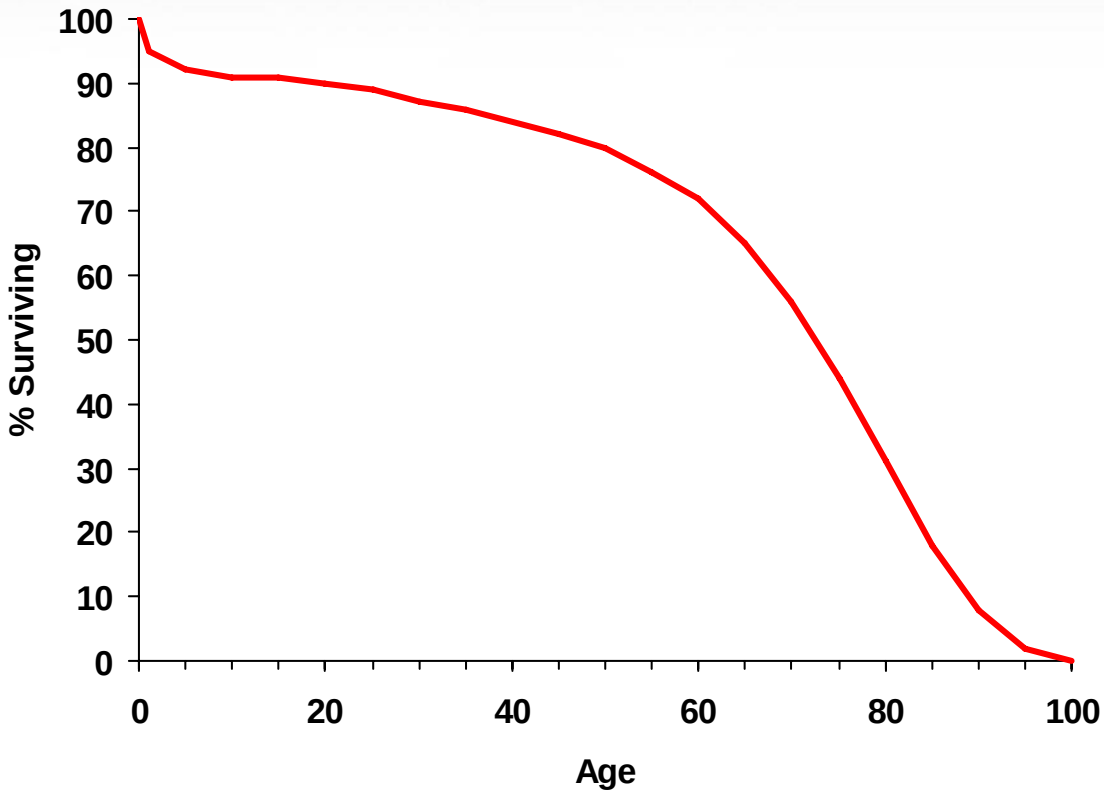
Background

- Increased focus on global health, many players, new actors (GFATM, GAVI, Gates, UNITAID, etc)
- Millenium Development Goals and Targets
- Indicators of population health needed for comparison, planning, monitoring, evaluation
- As life expectancy has risen, mortality rates alone insufficient
- Increased need to include non-fatal health outcomes in the policy debates
- Summary measures of population health combine information on mortality and non-fatal health outcomes

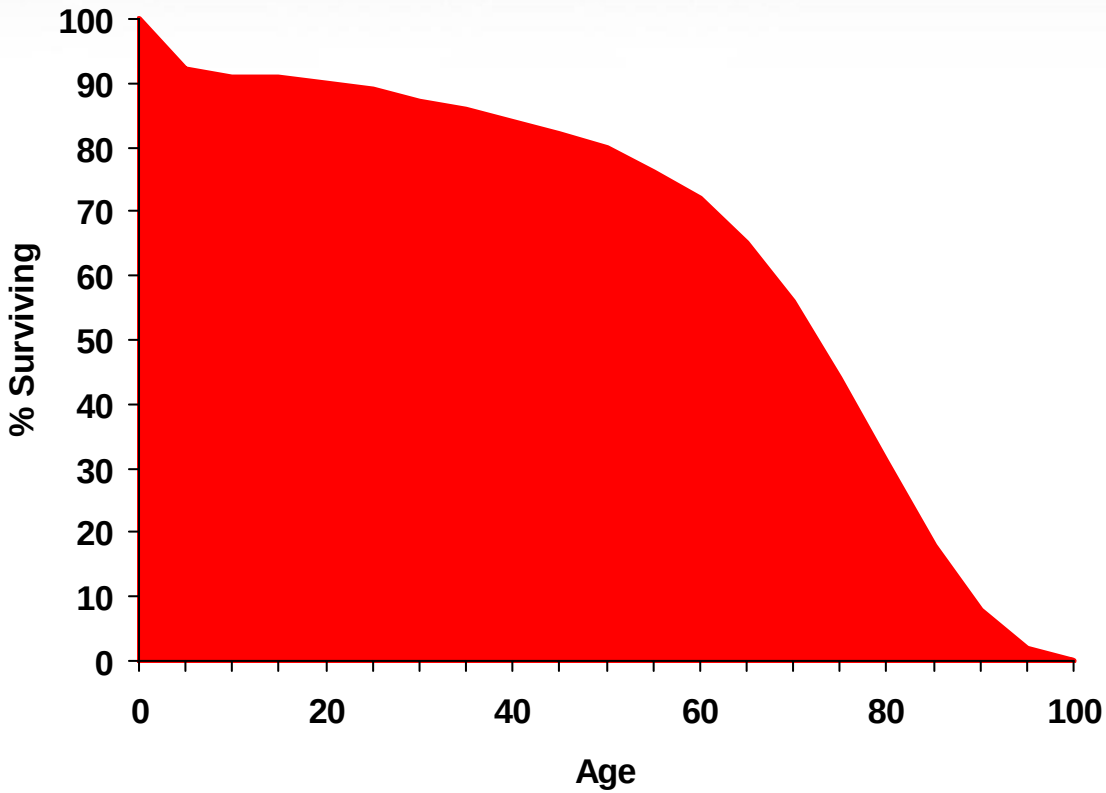
Uses of Summary Measures of Population Health (SMPH)

- Comparison of health status between populations and over time
- Quantifying health inequalities
- Measuring the health losses due to different diseases and risk exposures using a common metric
- Quantifying the benefits of health interventions for use in cost-effectiveness studies, intervention scale-up studies and priority setting exercises

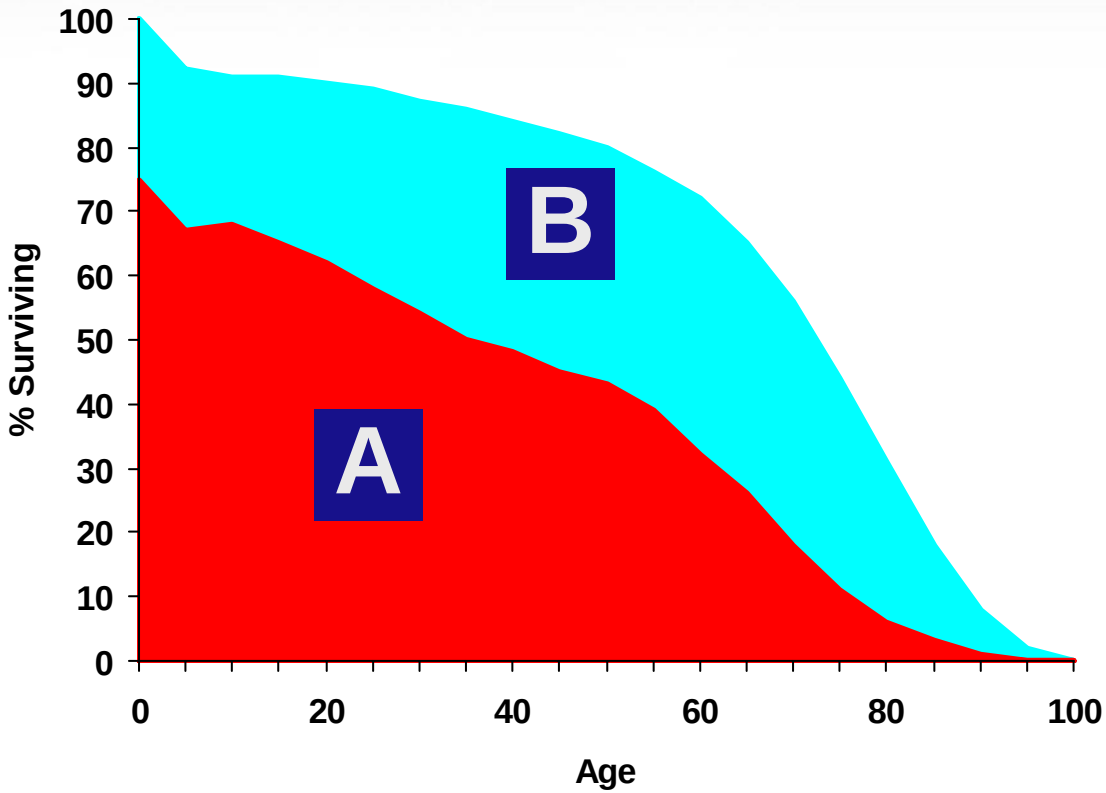
Summary measures of population health



Summary measures of population health

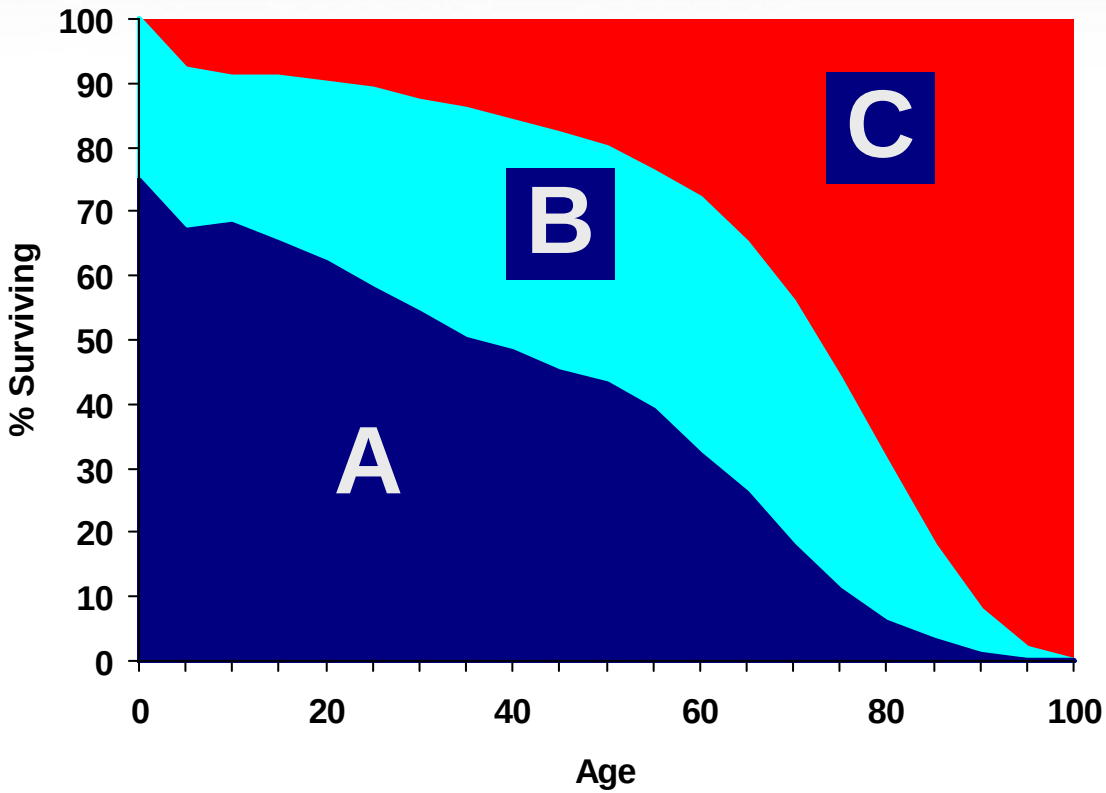


Summary measures of population health



Health Expectancy
= A + *f*(B)

Summary measures of population health



Health Expectancy
$= A + f(B)$

Health Gap
$= C + g(B)$

History

1971-1990s	Health Expectancies
1993-1996	DALY (Murray and Lopez – GBD 1990)
1999	Marrakech conference (SMPH book in 2002)
2000	HALE for 191 countries – WHR2000 (WHO)
2000-2004	GBD updates for years 1999-2002 (WHO)
2002	Comparative Risk Assessment (WHR2002)
2002+	WHO-CHOICE (Generalized CEA)
2003-2006	Disease Control Priorities Project (GBD 2001) GBD book available at www.dcp2.org/pubs/gbd
2007	IHME and start of GBD 2005 project

Leading Causes of Mortality and Burden
Global estimates for 2002

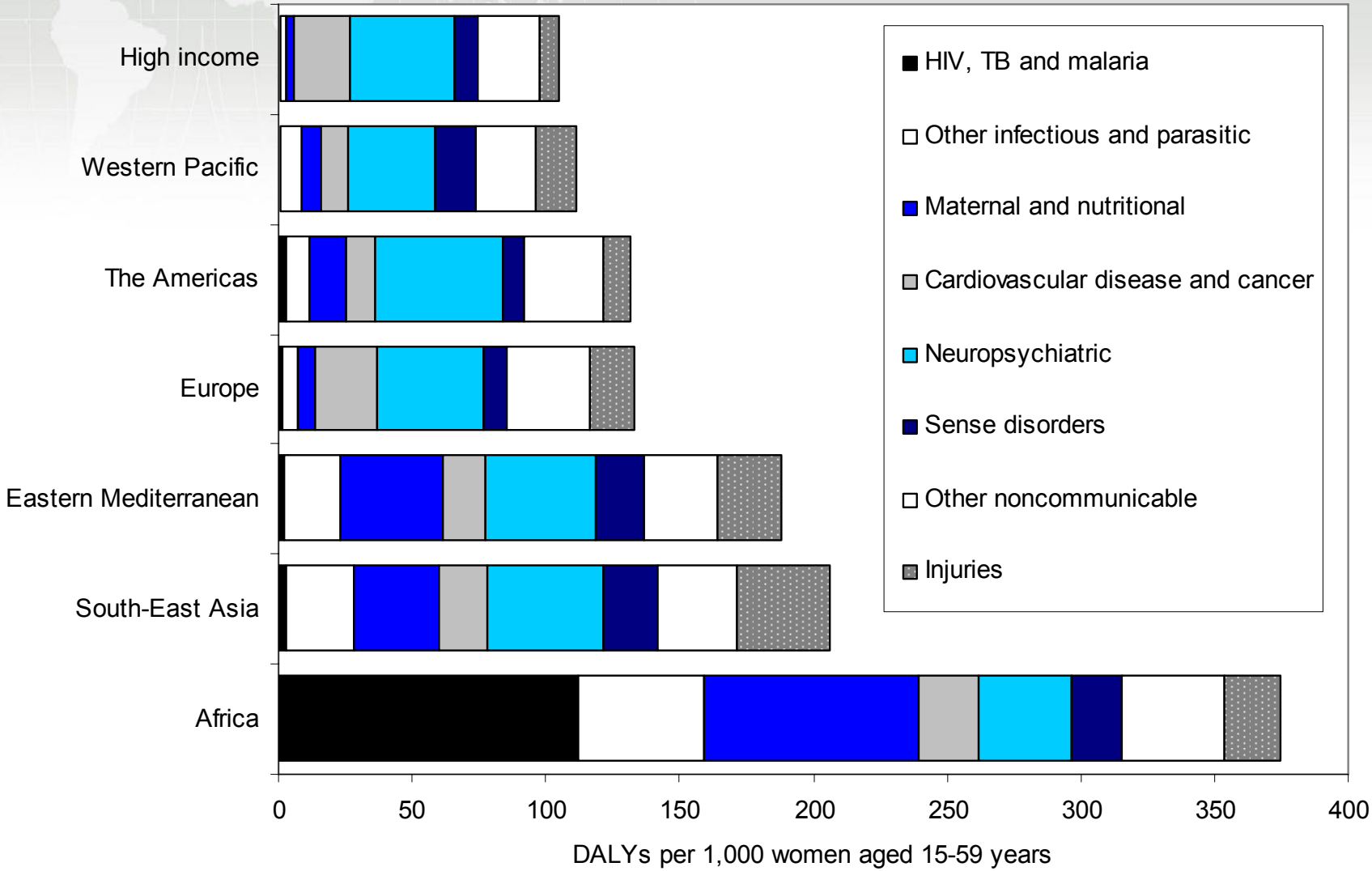
Mortality

	%
• Ischaemic heart disease	12.6
• Cerebrovascular disease	9.7
• Lower respiratory infections	6.8
• HIV/AIDS	4.9
• COPD	4.8
• Perinatal conditions	4.3
• Diarrhoeal diseases	3.2
• Tuberculosis	2.7
• Malaria	2.2
• Lung Cancer	2.2

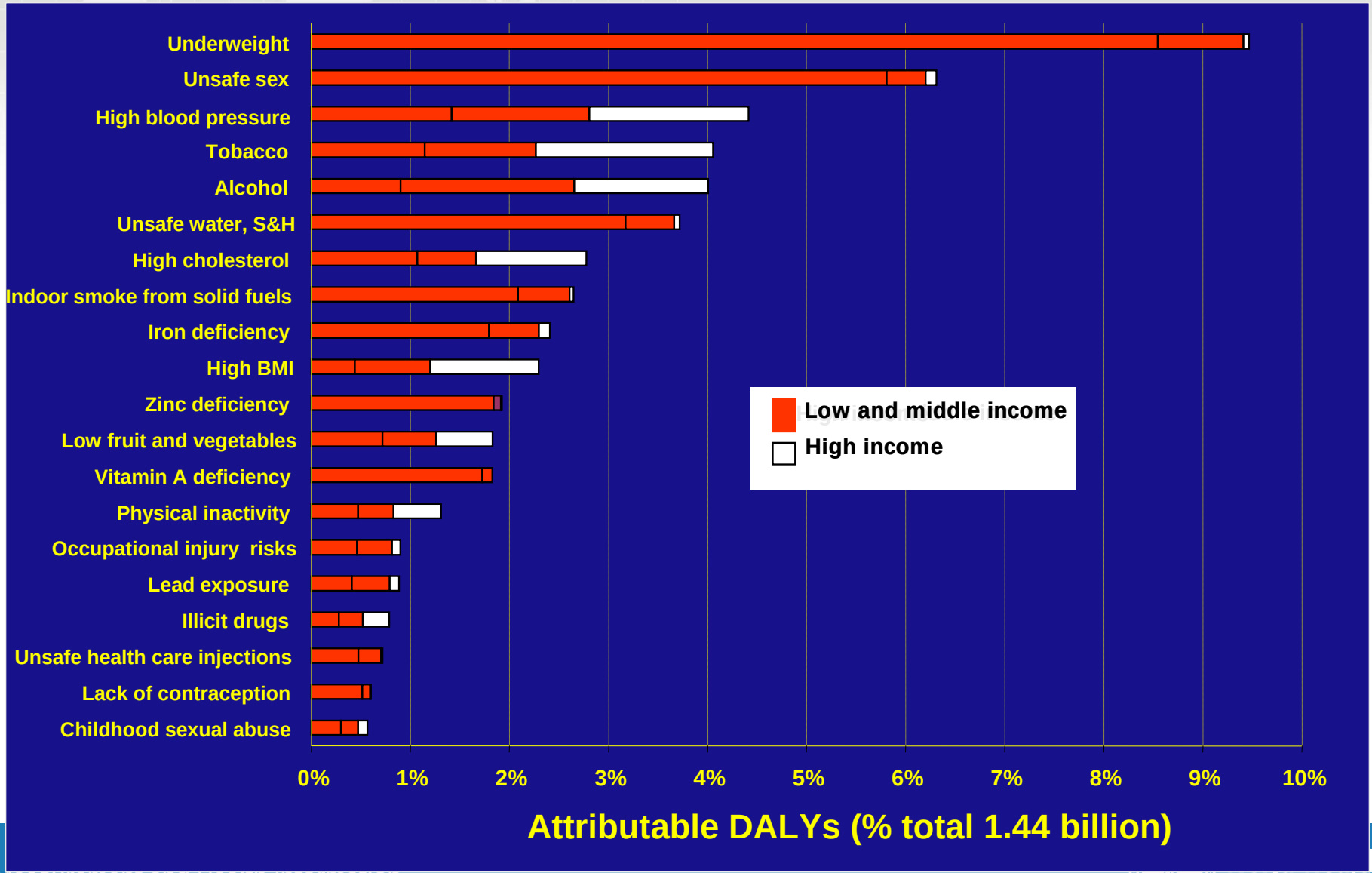
DALYs

	%
• Perinatal conditions	6.5
• Lower respiratory infections	6.1
• HIV/AIDS	5.7
• Depression	4.5
• Diarrhoeal diseases	4.2
• Ischaemic heart disease	3.9
• Cerebrovascular disease	3.3
• Malaria	3.1
• Road traffic accidents	2.6
• Tuberculosis	2.3

Major causes of burden of disease in women 15-59, 2004



Global distribution of burden of disease attributable to 20 leading selected risk factors



Disability Adjusted Life Years

$$DALY = YLL + YLD$$

Time is used as the common metric for mortality and health states

YLL Years of life lost due to mortality

YLD Equivalent years of healthy life lost due to disability / loss of health functioning

Values incorporated in DALYs

1. Years of life lost for a death at age x → How long should people in good health expect to live? Normative standard?
2. Are all people equal → use of same standard life expectancy regardless of local LE
3. Current value of future years of life? → 3% discounting
4. Value of healthy year of life equal at all ages? → age weights
5. How compare years lost due to death with years lived in poor health? → "disability weight" - what is being "weighed": disability, health, value of health, wellbeing, QoL, utility ???

Summary measures of population health: burning issues

- Incorporating social value choices. Resolving(?) the philosophical debate around age-weighting and discounting.
- Setting normative standards to measure years of life lost (premature mortality). What is premature? Male/female differences.
- Large, unresolved agenda around cross-population health measurement: key domains, measurement strategies, cross-population comparability (calibrating self-report)
- Valuing health states: what is being valued, how to value it, who does the valuing
- Addressing the data gaps in linking population health state distributions to disease and injury causes
- Comorbidity and attribution to disease and injury causes