

Back to the Future: the social construction of DOHaD-related exposures and the promise of public health interventions

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DOHaD summer course
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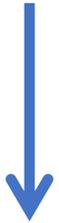
SCHOOL OF
PUBLIC HEALTH

Objectives

- Present the complexity of “disease causation” in the context of CVD
- Increase understanding of how the social construction of disease may result in health differentials
- Leave you feeling slightly less bummed by highlighting public health interventions to address social causation
 - if you are still bummed after the final portion of this presentation, day 3 is all about the promise of prevention and intervention, so hang in there

Traditional disease causation

- Individual exposed to some disease-causing factor



- Disease / injury results

Specific exposure

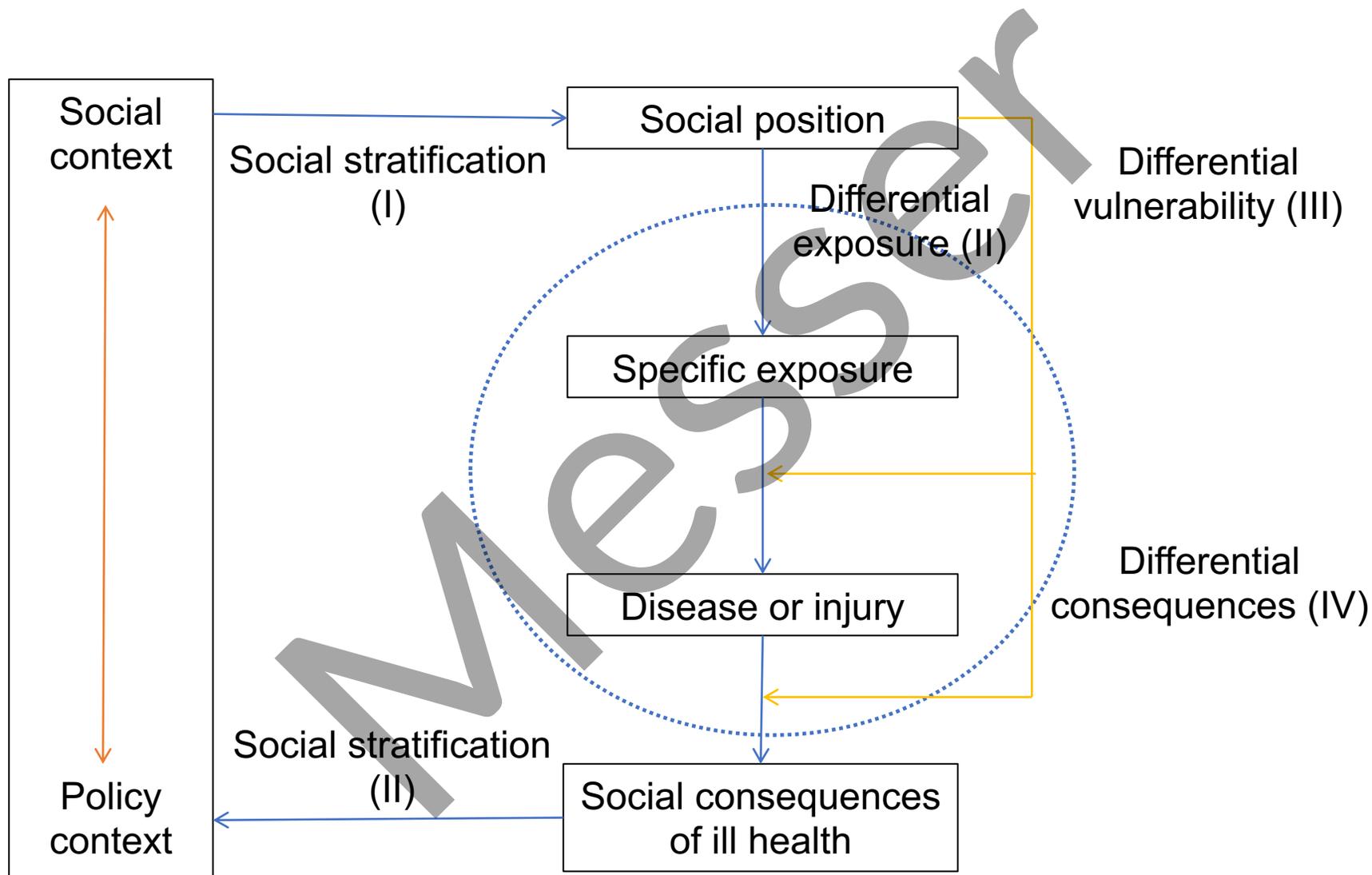


Disease or injury

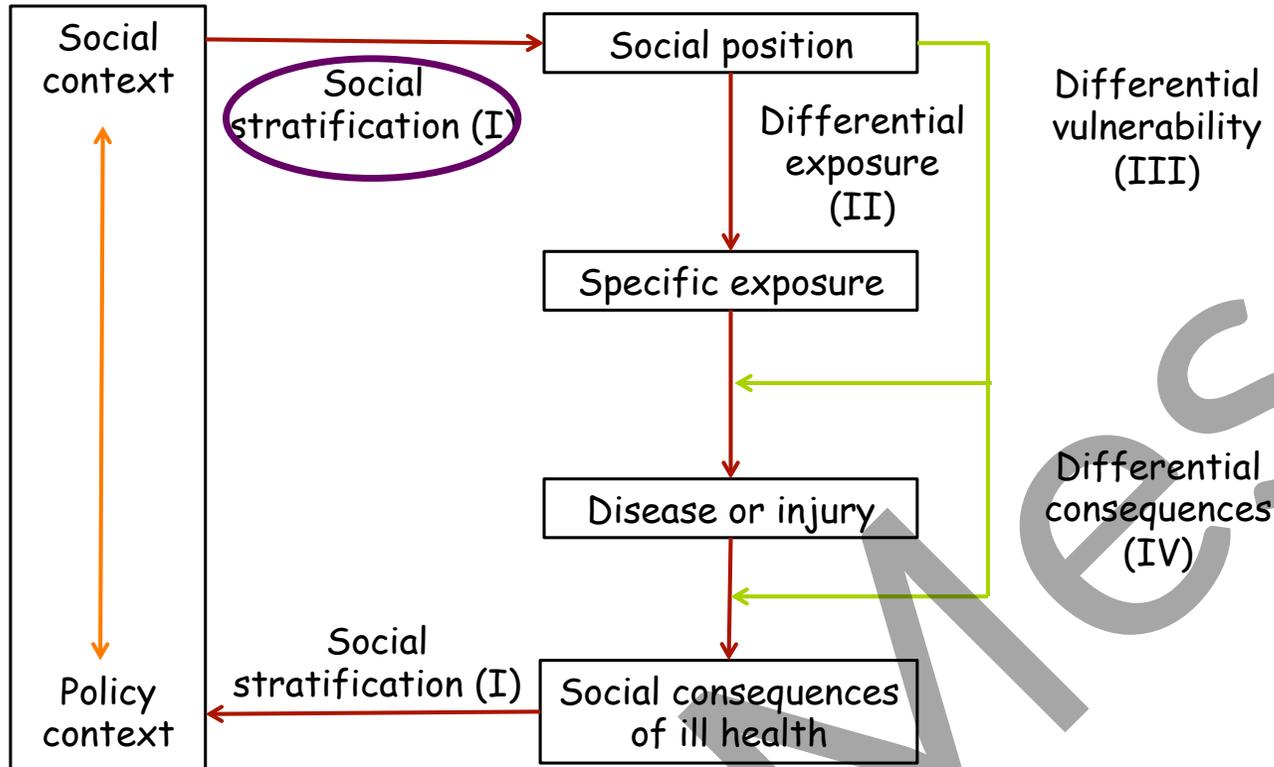


Cardiovascular disease

Actual disease causation

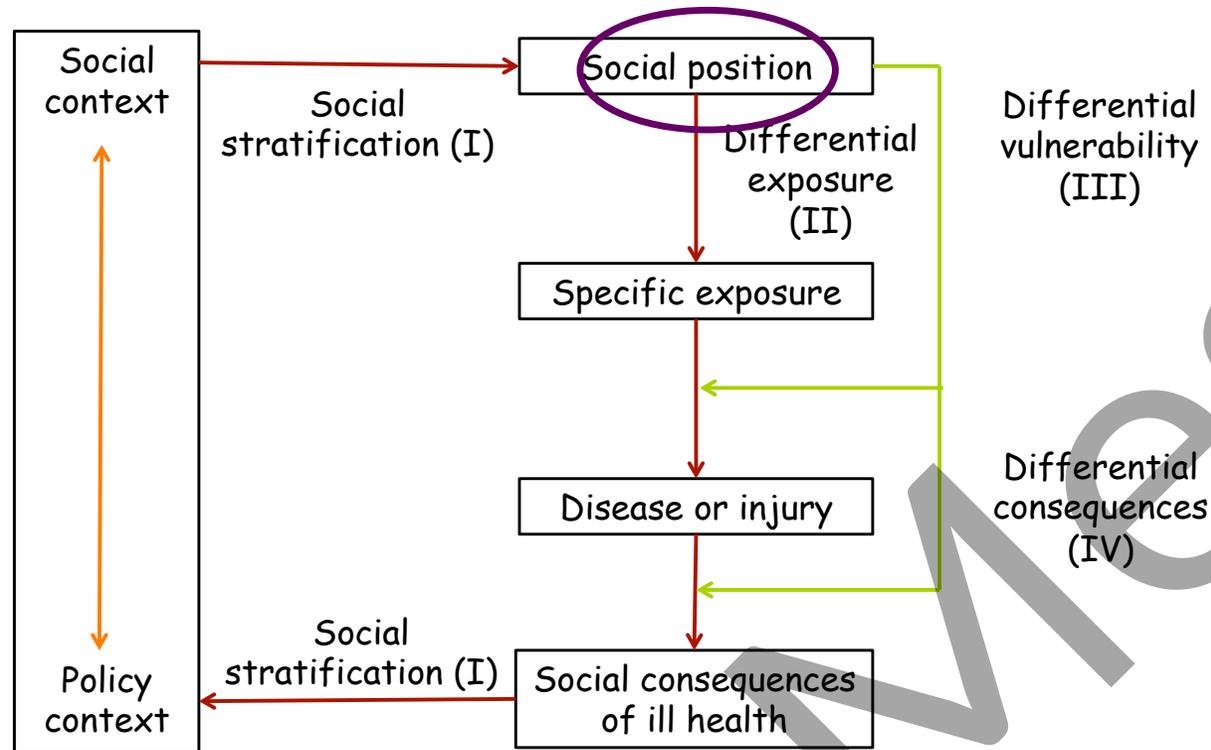


Social stratification -> health



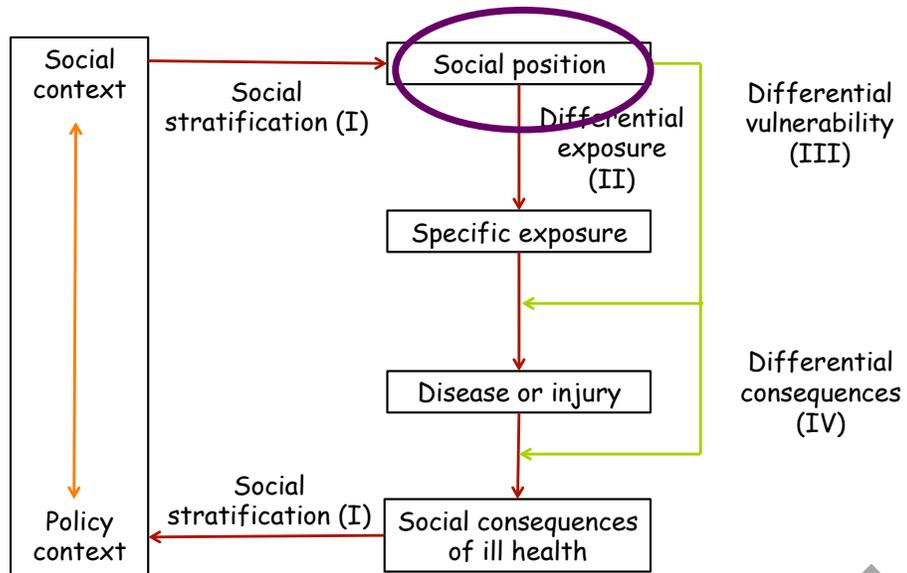
- Social context – immediate physical / social setting
 - education system
 - labor policies
 - housing policies (e.g., HOLC)
- Social stratification - system by which society ranks individuals and groups into those with more or less power
 - documentation status
 - race-based discrimination

Social position - health



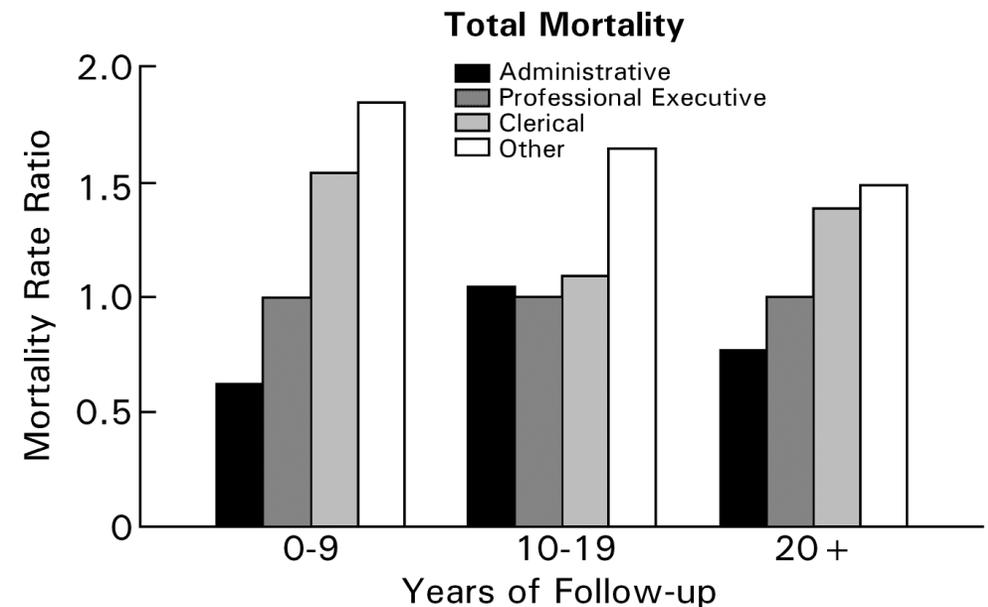
- Stratification inevitable characteristic of social context
 - South Africa – 63% Gini coefficient
 - Slovenia – 25% Gini coefficient
- Social position describes a person's place or standing within society
 - Individuals in society partially defined by their relationship to social context (education, income)
 - Meaning of social position varies by context
 - head of cattle
 - Professor of Obstetrics and Gynecology

Social position - health, continued

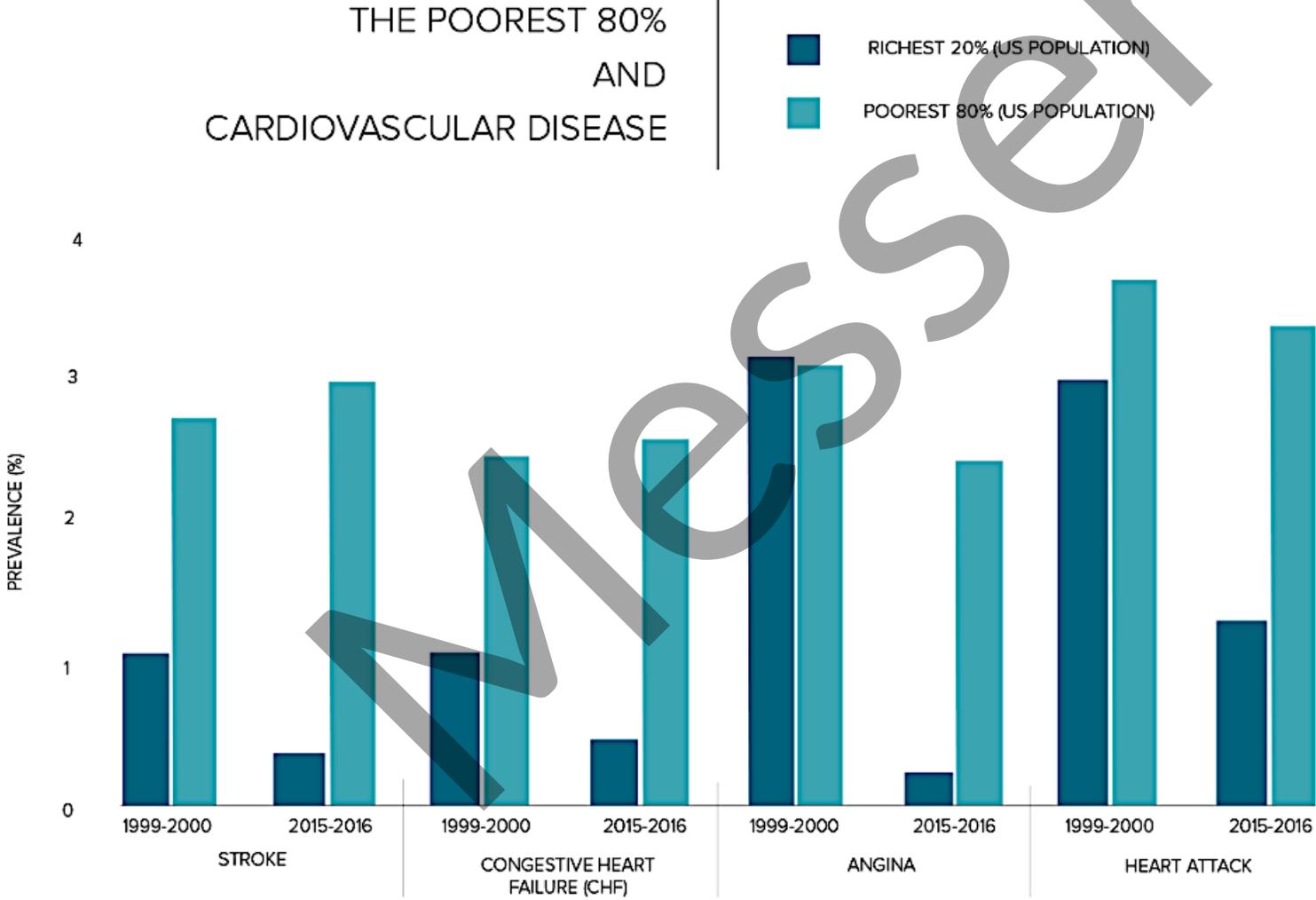


- Even when we think that intrinsic order is fair or tolerable social position will be associated with health outcomes

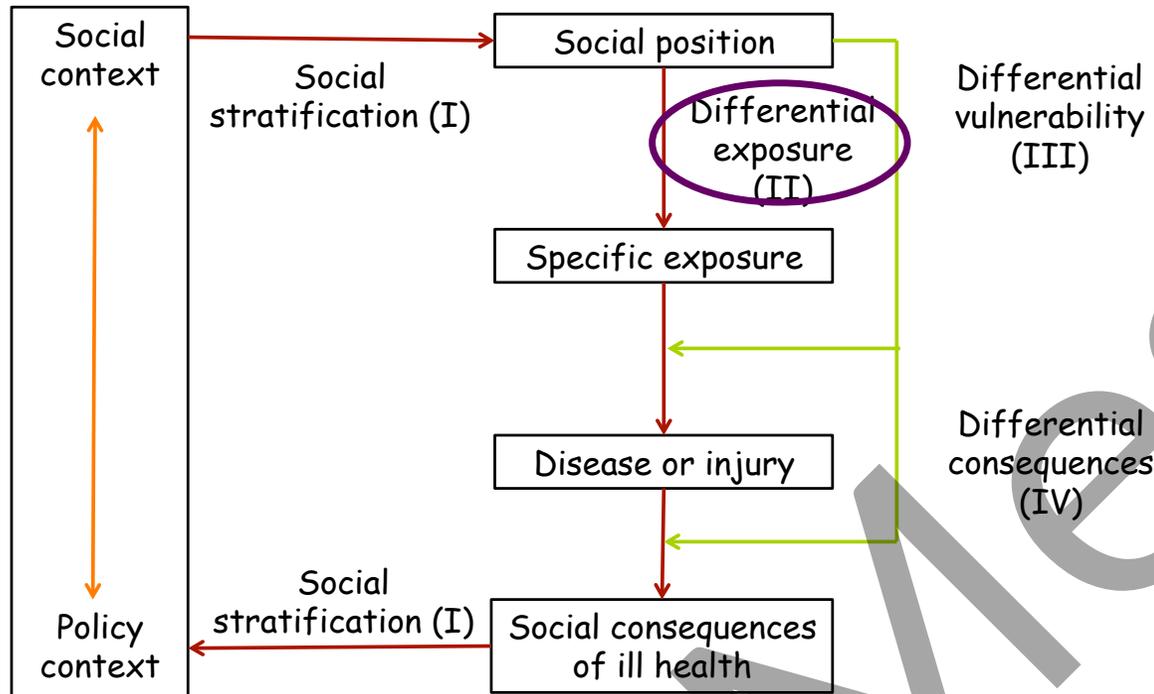
- Social gradients - Whitehall studies of British civil servants found robust association between descending job grade and coronary heart disease mortality



Social position example: income

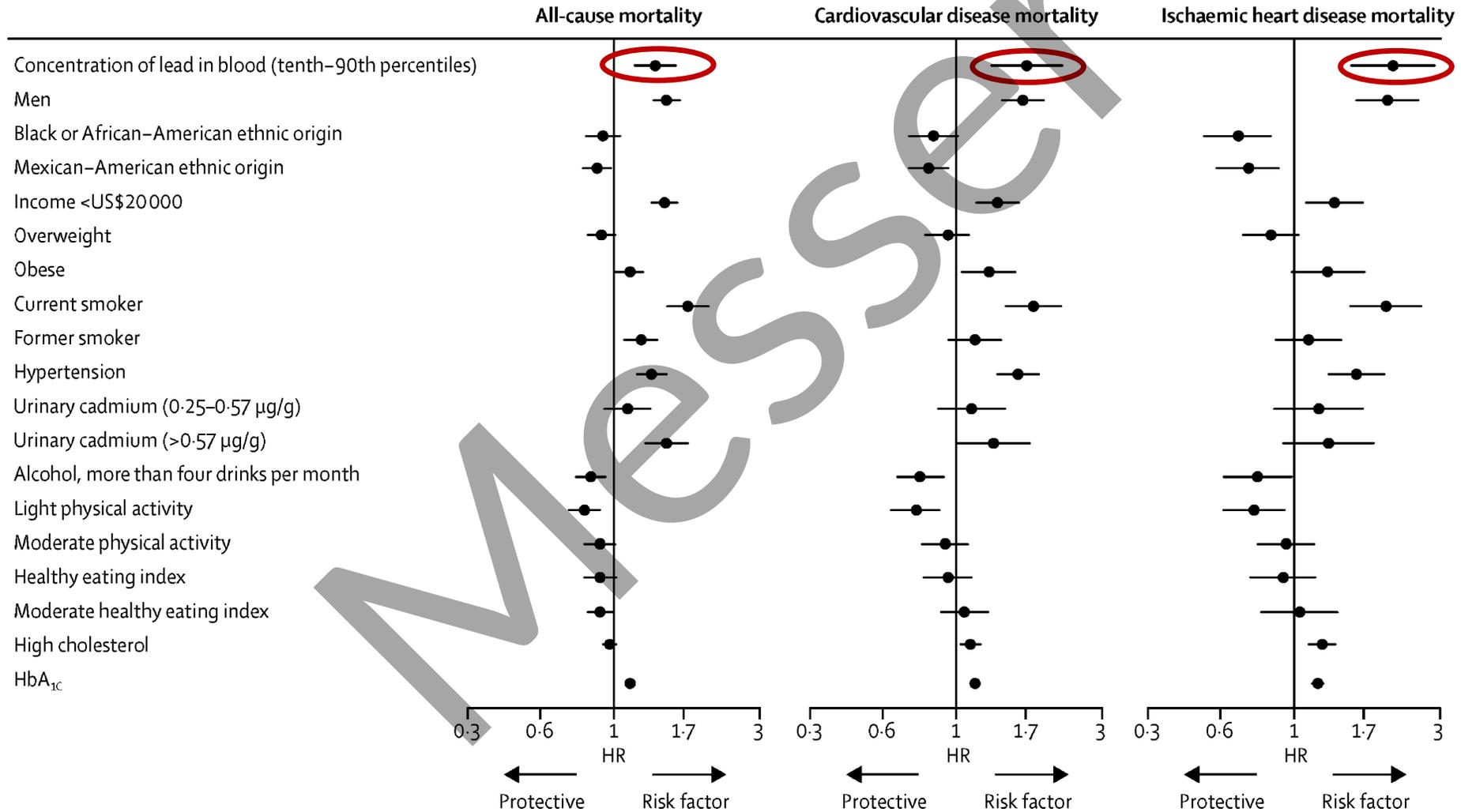


Differential exposure - health

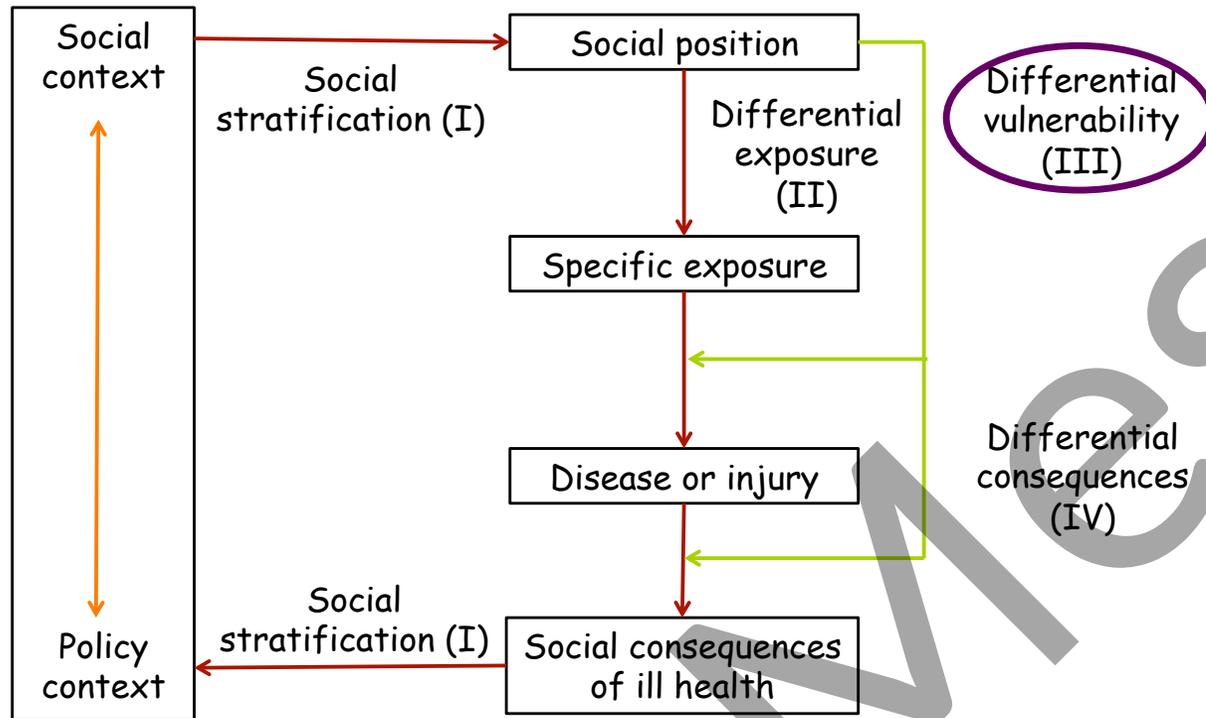


- Differential exposure – exposures vary between social groups by type, amount, duration
 - dangerous living conditions
 - dangerous jobs
 - ability to make healthy choices
 - greater risk of toxic exposures
- Advantage or disadvantage accumulates over time

Differential exposure example: lead

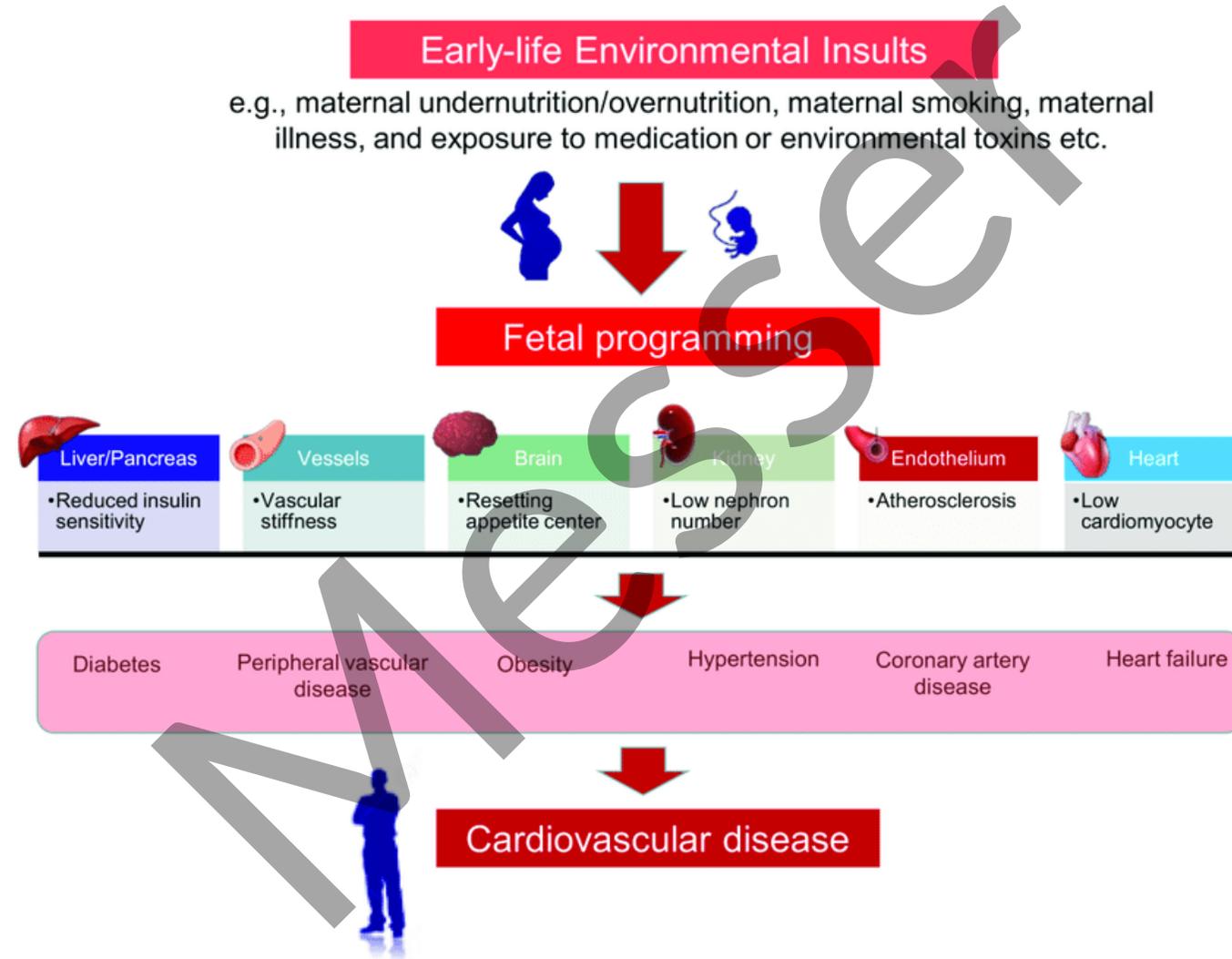


Differential vulnerability - health



- Differential vulnerability – health impact of adverse exposure dependent on other factors
 - Even if risk factor equally distributed, health impacts may be unevenly distributed due to underlying vulnerabilities
 - Vulnerabilities may also reflect differences between social groups in biological defenses (e.g., fetal programming)

Differential vulnerability example: fetal programming



Differential vulnerability (cancer) example: accumulation of risk

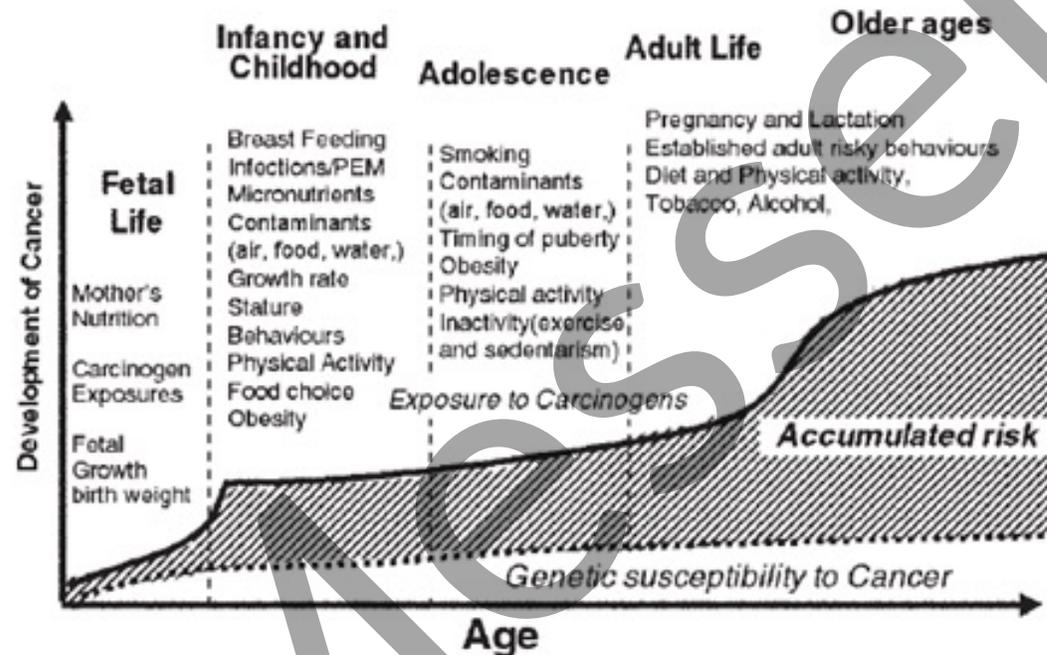


FIGURE 3 Graph of the life-course prevention of cancer illustrates how nutritional factors at various stages of the life course, starting from fetal life, may affect the development of cancer. The underlying genetic susceptibility to cancer is modified by diet, nutrition, and other carcinogenic agents in the environment, determining the accumulated risk for cancer. Cancer prevention should include actions at every stage of the life course; the greatest potential to combat cancer effectively is through reduction of cumulative risk.

Differential vulnerability example: comorbidities

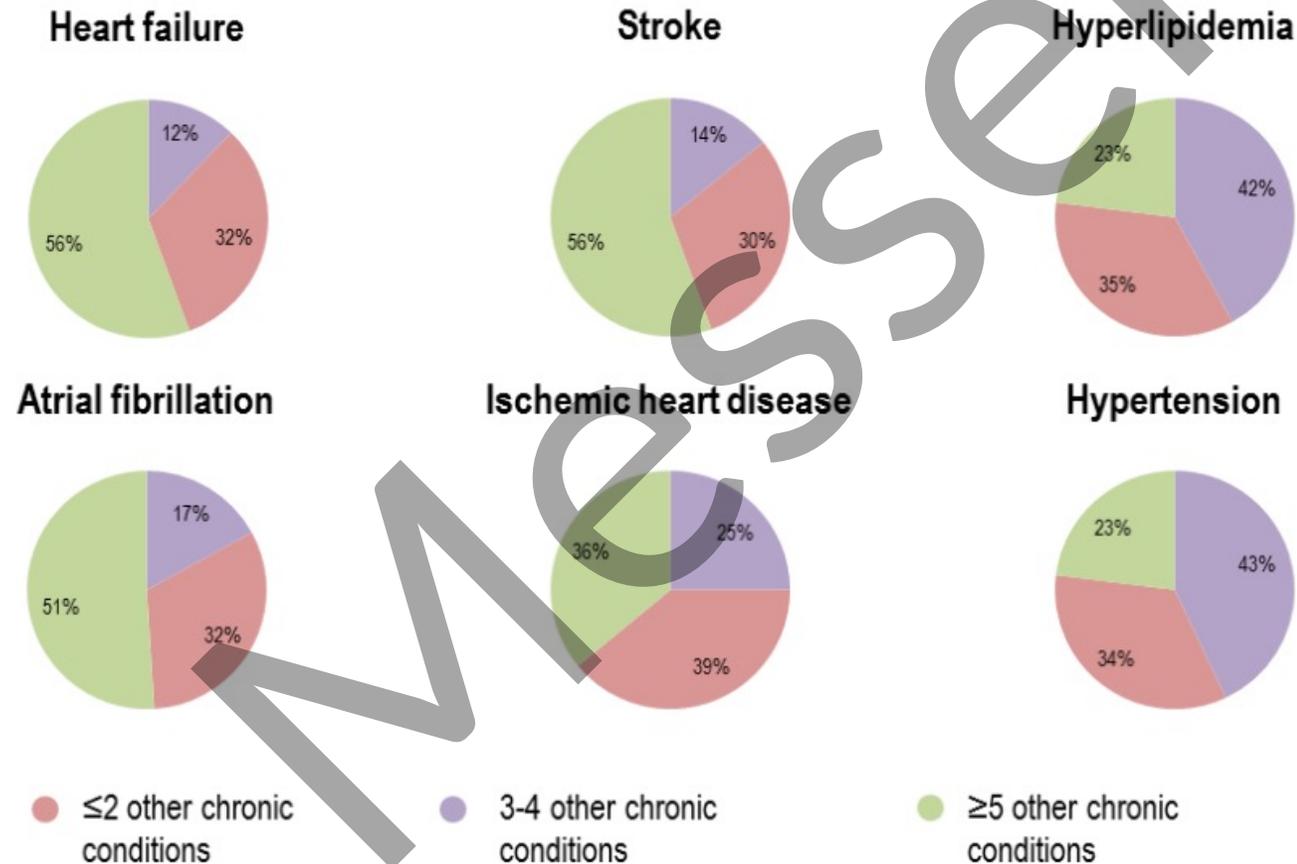
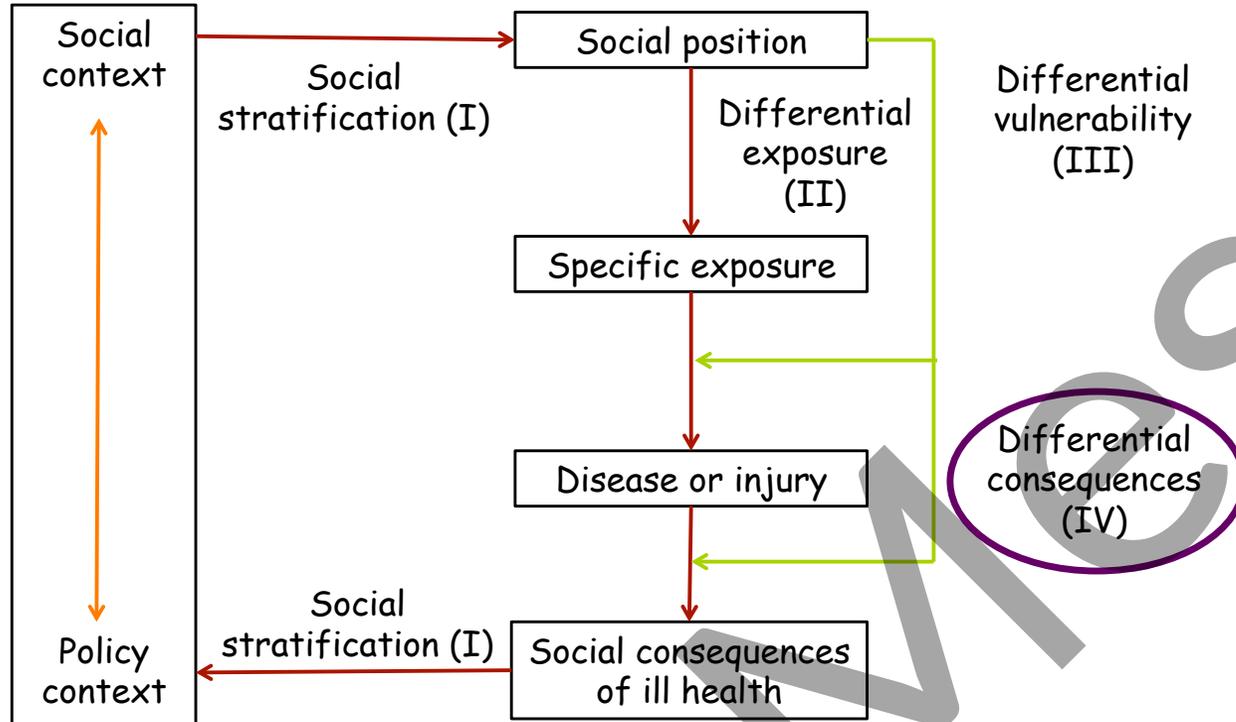


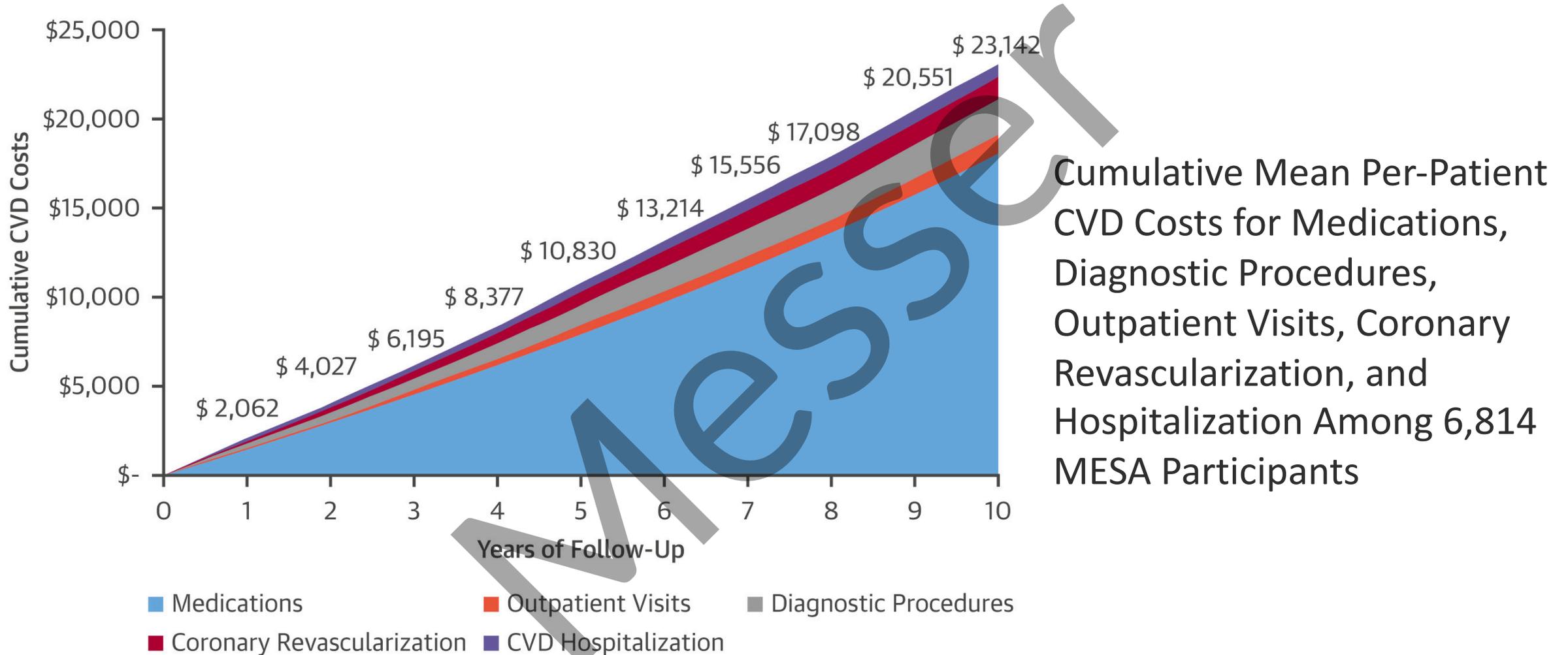
Figure 3. Number of coexisting medical conditions among fee-for-service Medicare beneficiaries with common cardiovascular diagnoses. Reproduced with permission from Centers for Medicare & Medicaid Services. Available at: <https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/chronic-conditions/downloads/2012chartbook.pdf>. Accessed July 26, 2016.

Differential consequences - health



- Social stratification affects one's ability to prevent illness and cope with disease or injury
- Consequences include social and economic costs of disease
 - Direct and indirect costs of healthcare and income forgone due to morbidity borne by families

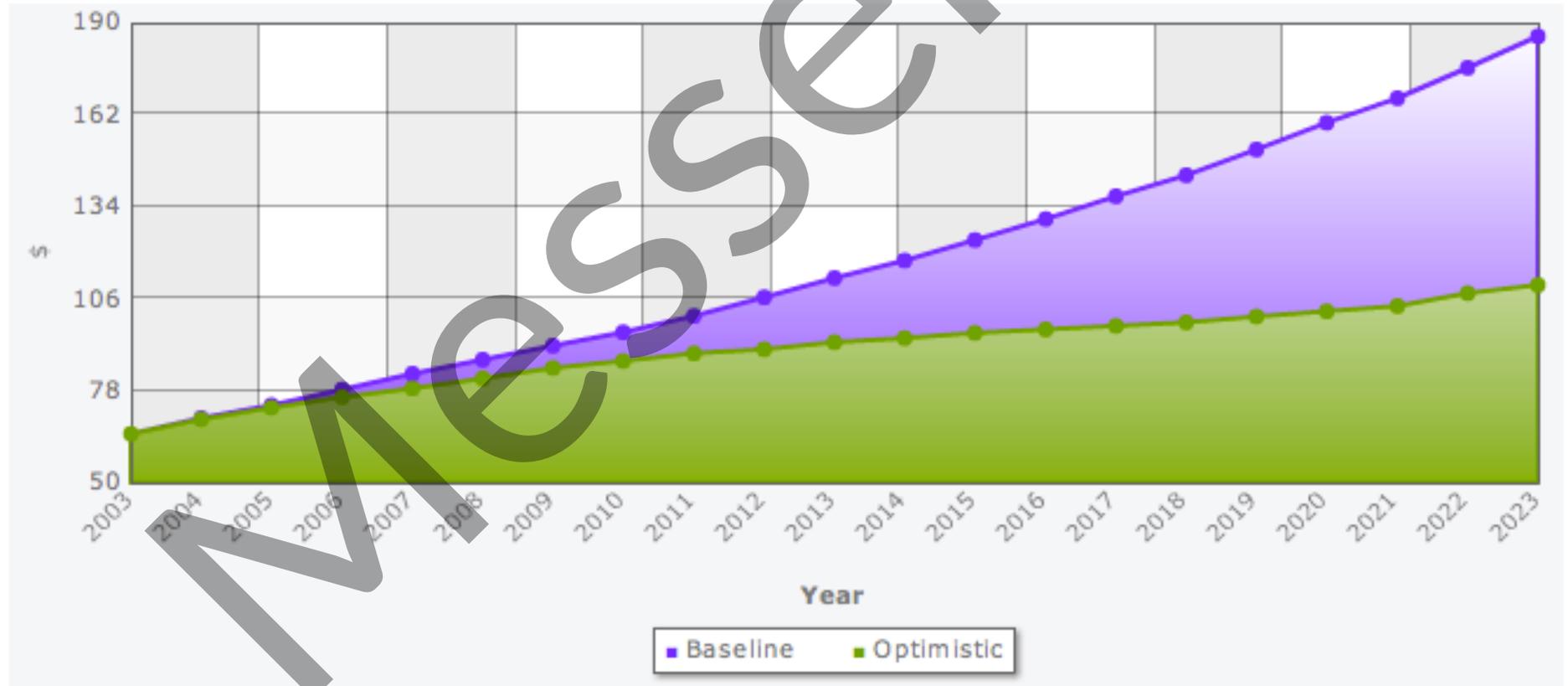
Differential consequences: average individual costs



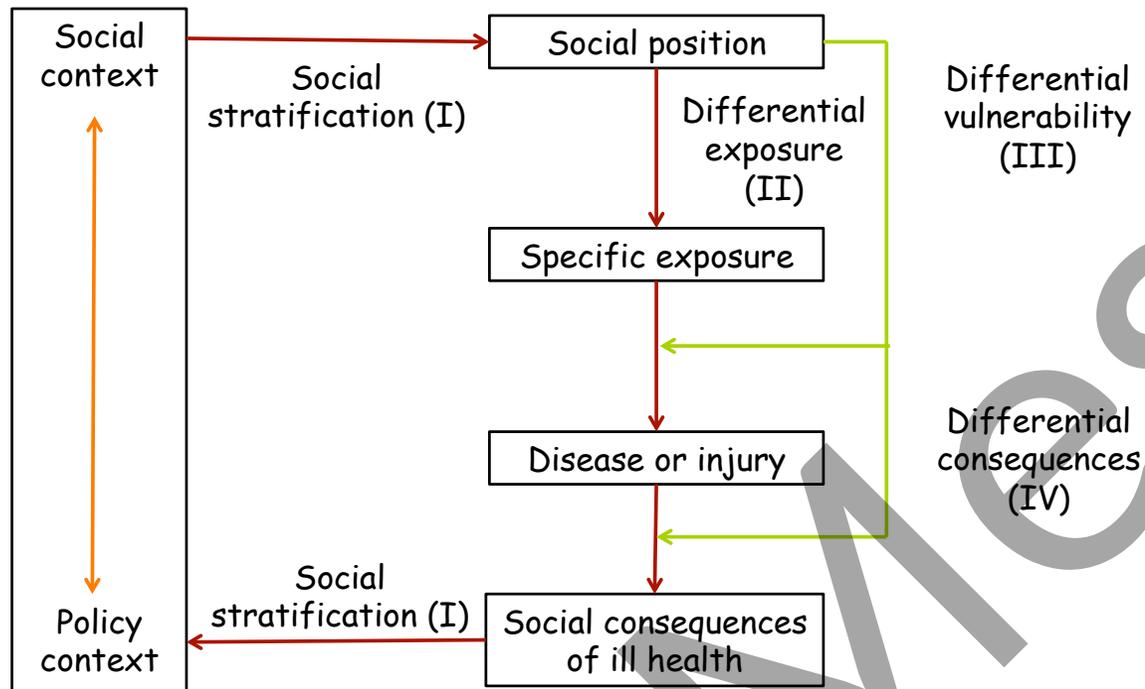
Differential costs: national CVD treatment costs

Direct cost of CVD treatment in the US (only treatment costs, not other costs)

- Purple (baseline) line: predicted treatment expenditures
- Green (optimistic) line represents estimated expenditures if small adjustments were made to improve CVD prevention



Social differentials and health - summary



- Differentials in capacity to withstand health shocks lead to skewed distribution of poor health to lower SES households
- Ill health / disability / health care costs important cause of impoverishment for current and **next** generation



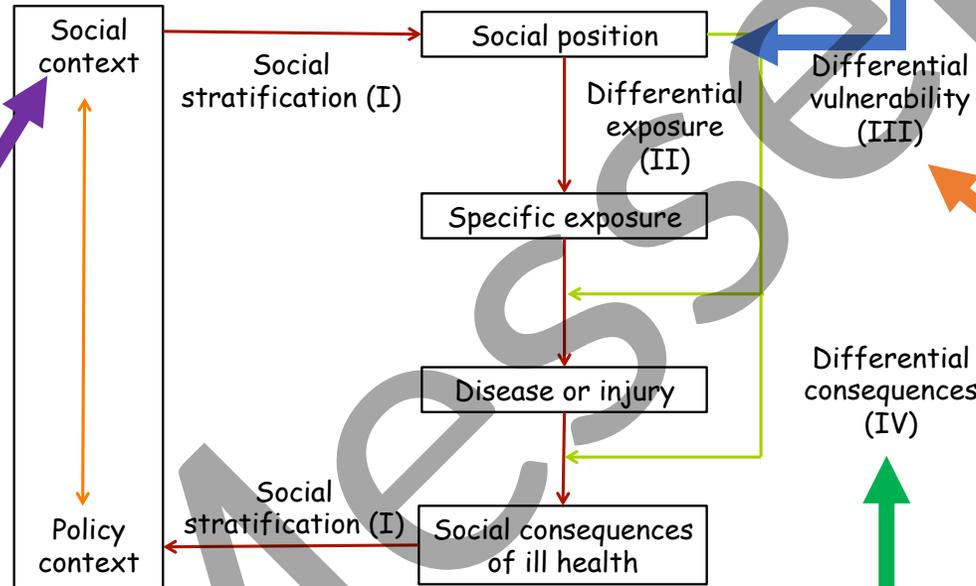
Due to recent
budget cuts, the
light at the end of
the tunnel has been
turned off.

Effective public health interventions

Social position –
Minimum basic income
experiment in Ontario resulted in
better nutrition, health, housing
stability and social connections
(Hamilton and Mulvale, 2019)

Social context –
Paid family and medical leave
improves worker health, family
well-being and employer
outcomes (Bartel et al., 2023)

Social consequences –
ACA increased coverage and
access for adults with CVD,
differentials remain (Barghi, et al.,
2019)



Differential exposure –
Use of PPE during pesticide
application associated with
reduced inflammatory
biomarkers (Lari, et al., 2023)

Differential vulnerability –
Healthy Families America parents
have fewer LBW infants and
engage in more breastfeeding (Lee,
et al., 2009; Sandy et al., 2009)

Differential consequences –
Paid sick leave associated with
decreased worry among those
diagnosed with cancer (Jones,
2022)

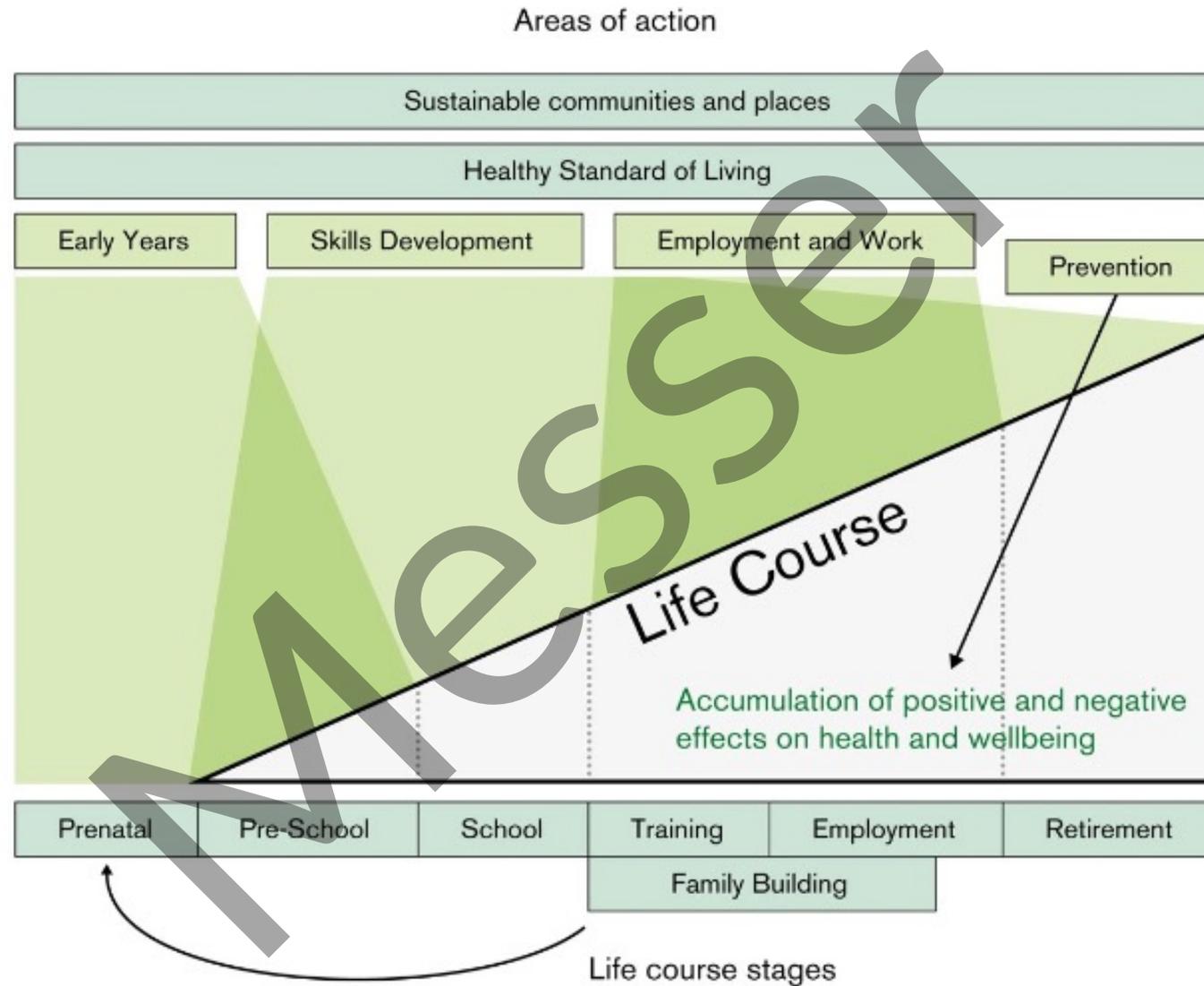


Thank you
Questions?

Messer

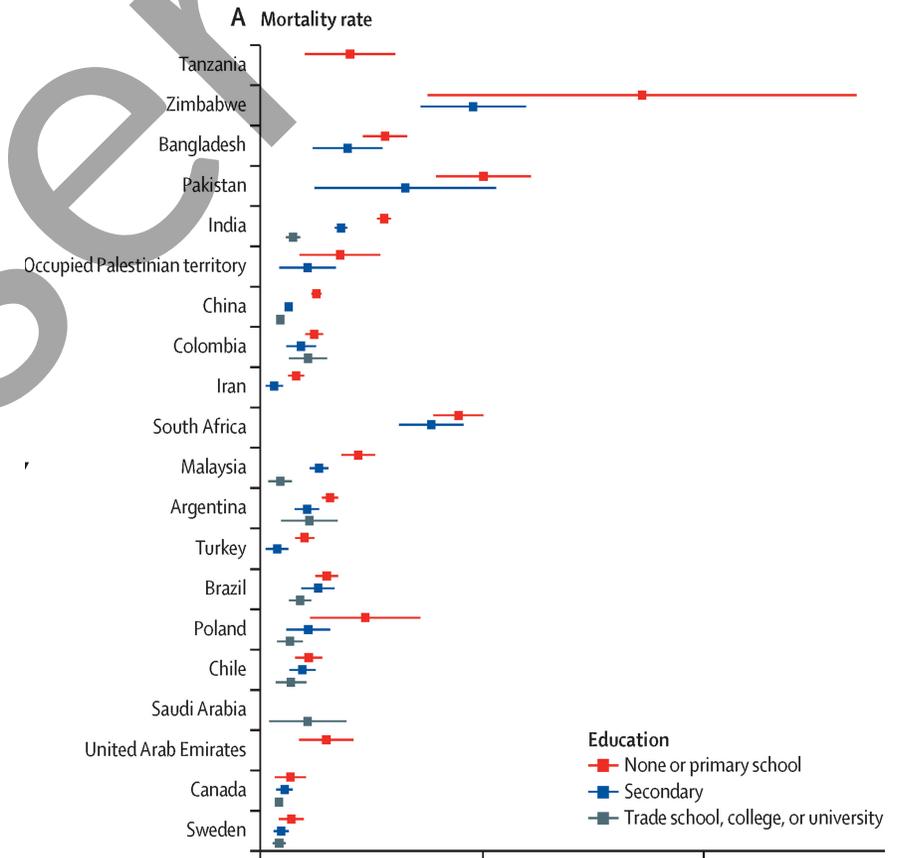
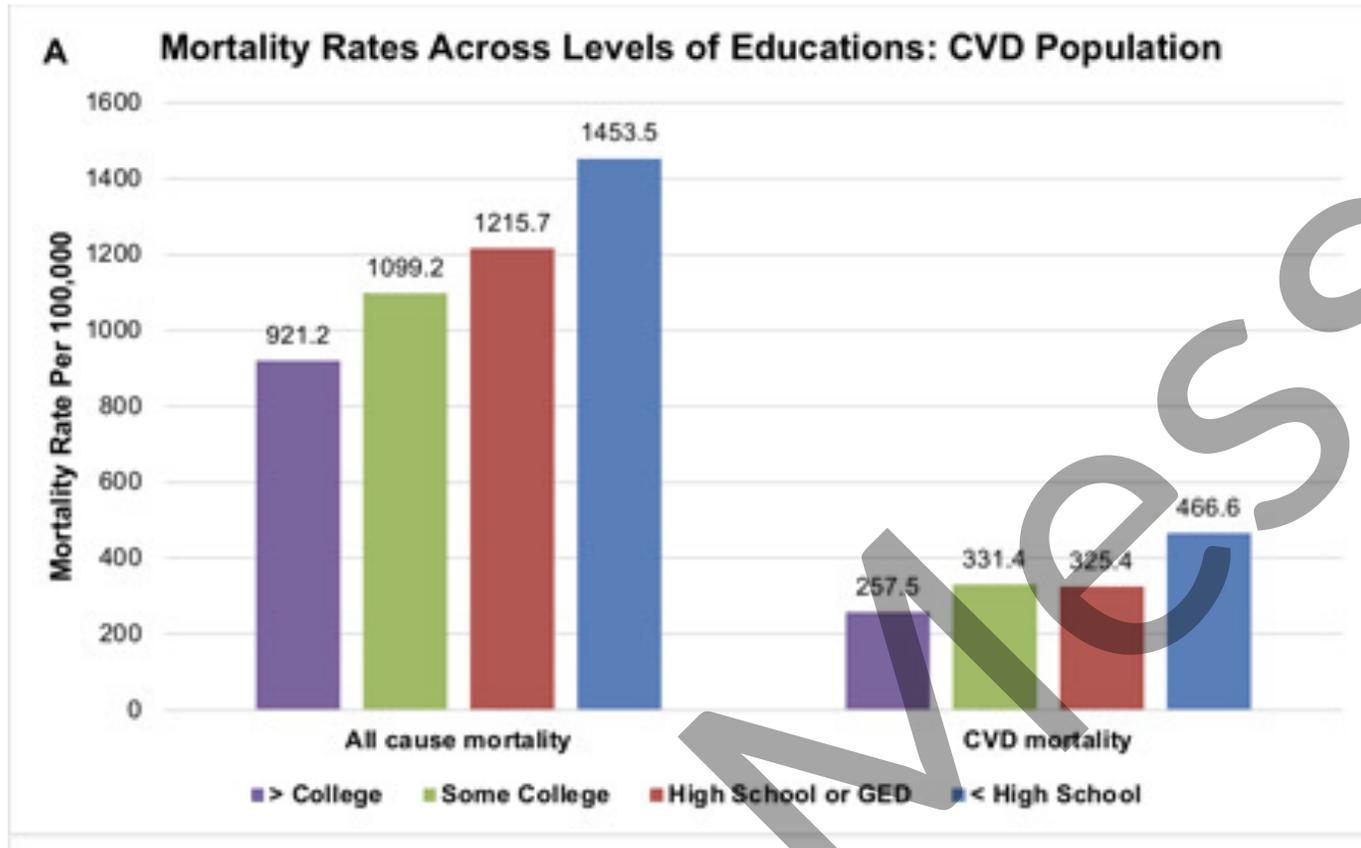
extra slides

Figure 5 Action across the life course



Source: [Fair Society Healthy Lives \(2010\)](#).

Social position example: education



Yan R, Li W, Yin L, et al. Cardiovascular Diseases and Risk-Factor Burden in Urban and Rural Communities in High-, Middle-, and Low-Income Regions of China: A Large Community-Based Epidemiological Study. *J Am Heart Assoc.* 2017 Feb 6;6(2):e004445.

Khan N, Javed Z, Acquah I, et. al. Impact of Educational Attainment on All-Cause and Cardiovascular Mortality: Findings from a National Study of US Adults. *Circulation.* November 16, 2021. 144(Supplement 1)

Differential exposure example: $PM_{2.5}$

