Future of Disability: perspectives from IHME

25 August 2023

UNIVERSITY *of* WASHINGTON

Institute for Health Metrics and Evaluation

Disability forecasts

- Build on the GBD analysis of disease, risk and disability from 1990 to 2022.

- All modeling strategies used for age-specific cause-specific mortality are used for conditions with considerable mortality.

- For conditions e.g. depression with little direct mortality, a much simpler modeling strategy is used to estimate future prevalence.

Incidence, prevalence, YLDs

- For causes with a fatal component:
  - Forecast M:I or M:P ratio and apply to forecasts of mortality
- For causes without a fatal component, or for causes which mortality makes up a very small fraction of the burden:
  - Forecast prevalence independently
- YLDs are computed from the average disability weight and forecasts of prevalence
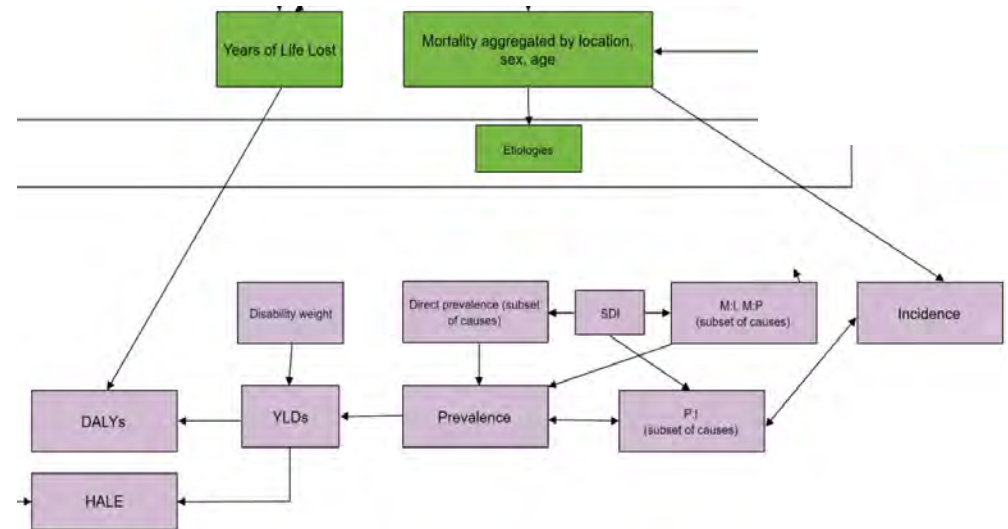
Non-fatal models for MP, MI, prevalence-only

Location-year specific SDI

Age-sex-location specific slope on SDI

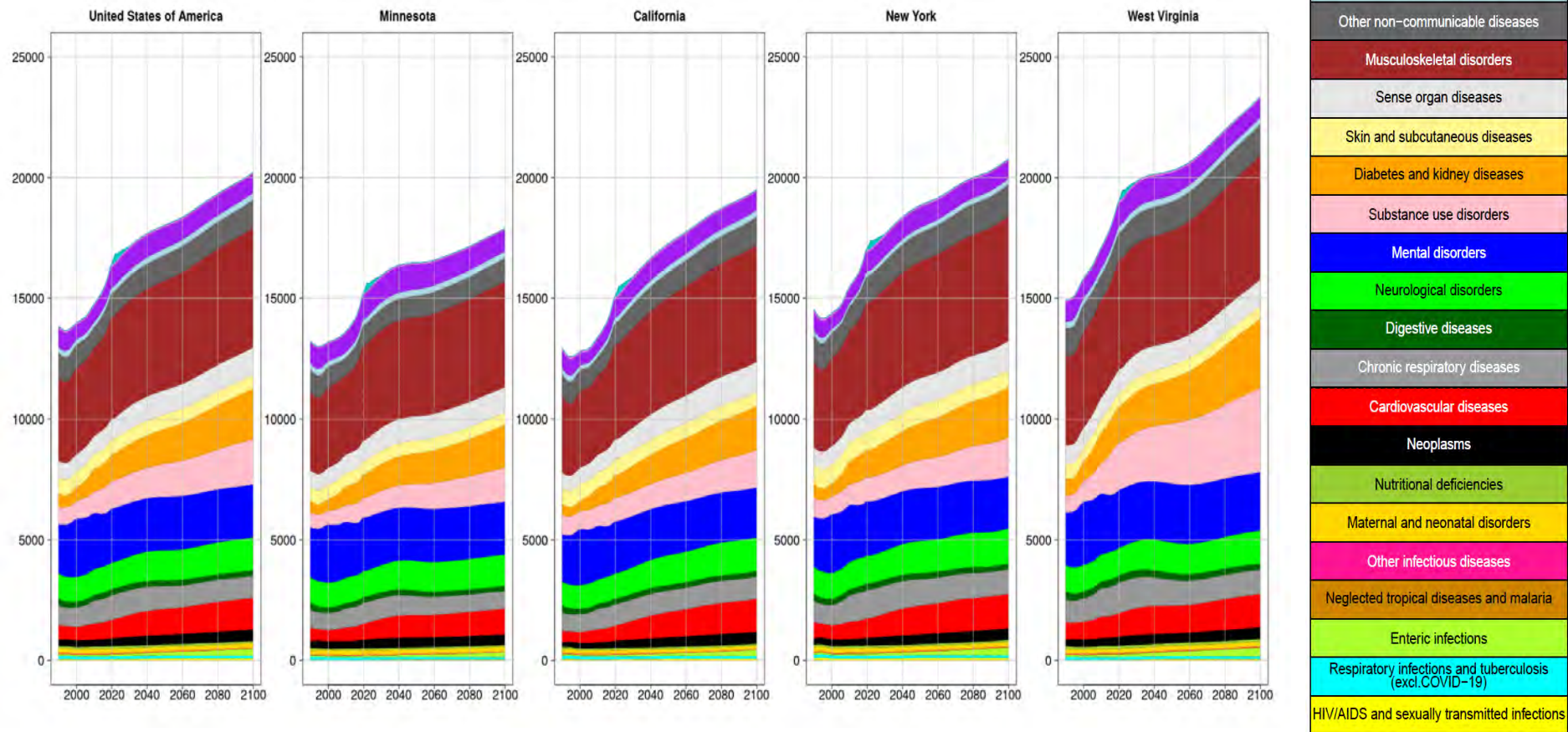$$log(R_{a,s,l,y}) = \beta_0 + \beta_1 SDI_{l,y} + \pi_{0:a,s,l} + \pi_{1:a,s,l} SDI_{c,y} + \epsilon_{a,s,l,y}$$

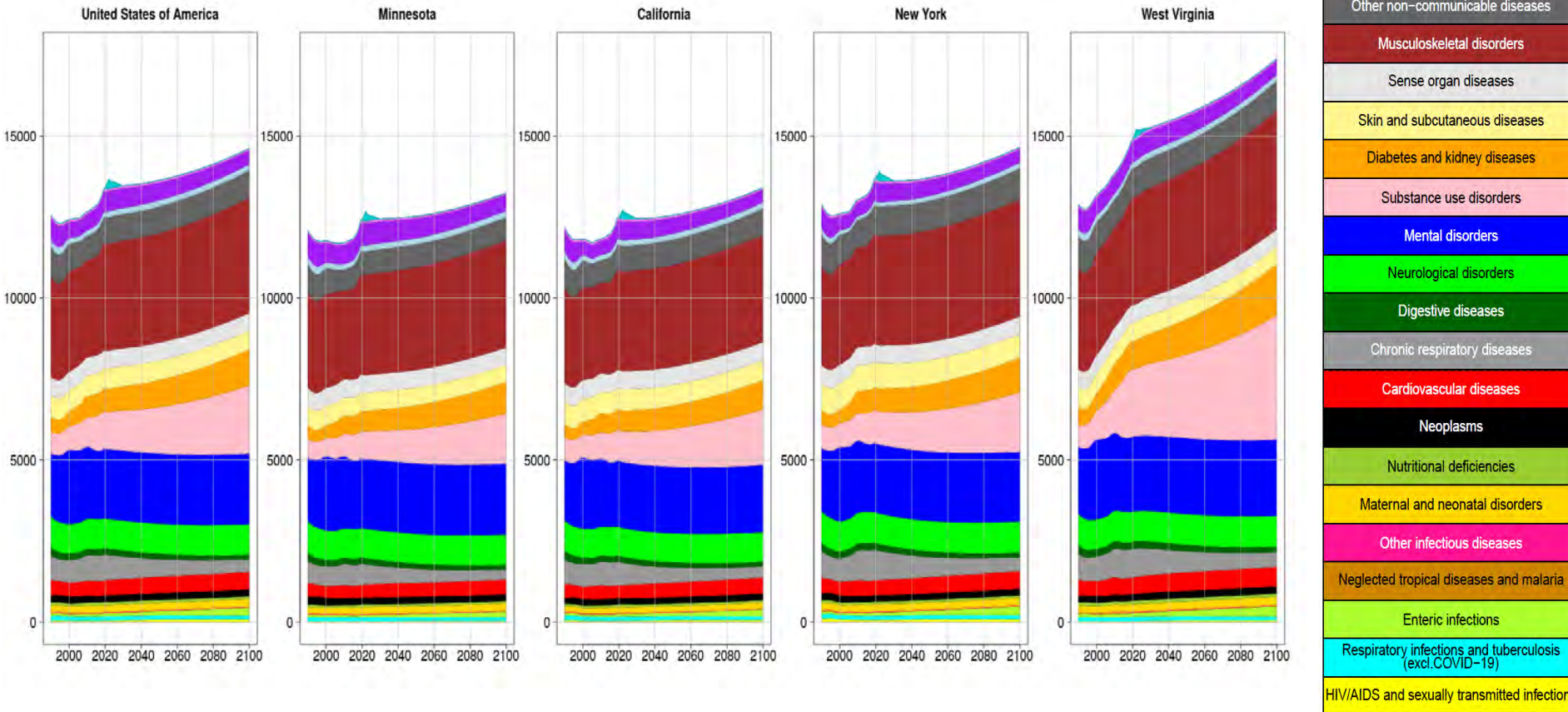Age-sex-location-year specific ratio of a given cause (e.g. MP ratio for ckd_diabetes_typ2)

Age-sex-location specific random intercept

Years lived with disability (million) 1990-2100

Years lived with disability (age stand rate / 100K) 1990-2100

Legend:
- COVID-19
- Self-harm and interpersonal violence
- Unintentional injuries
- Transport injuries
- Other non-communicable diseases
- Musculoskeletal disorders
- Sense organ diseases
- Skin and subcutaneous diseases
- Diabetes and kidney diseases
- Substance use disorders
- Mental disorders
- Neurological disorders
- Digestive diseases
- Chronic respiratory diseases
- Cardiovascular diseases
- Neoplasms
- Nutritional deficiencies
- Maternal and neonatal disorders
- Other infectious diseases
- Neglected tropical diseases and malaria
- Enteric infections
- Respiratory infections and tuberculosis (excl.COVID-19)
- HIV/AIDS and sexually transmitted infections

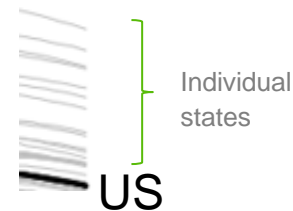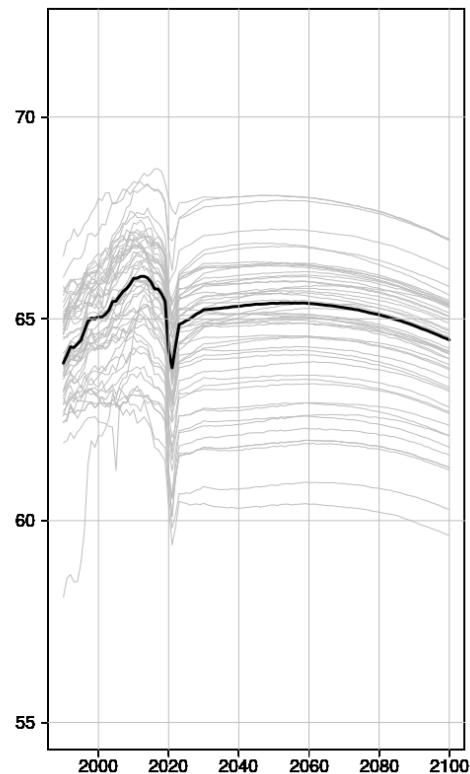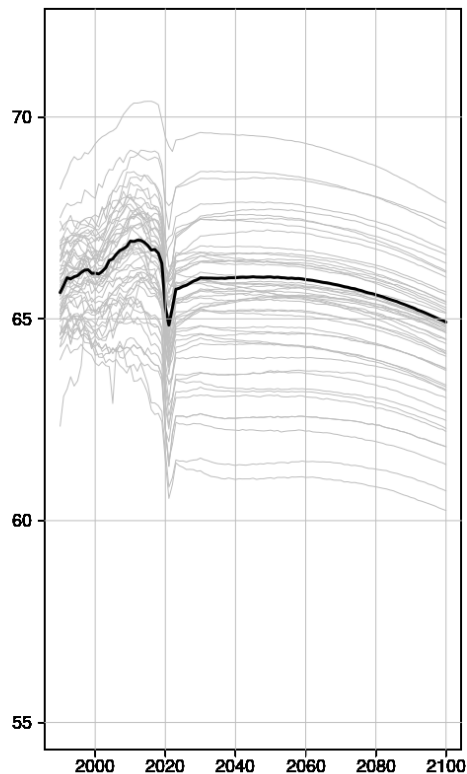Panels: United States of America, Minnesota, California, New York, West Virginia
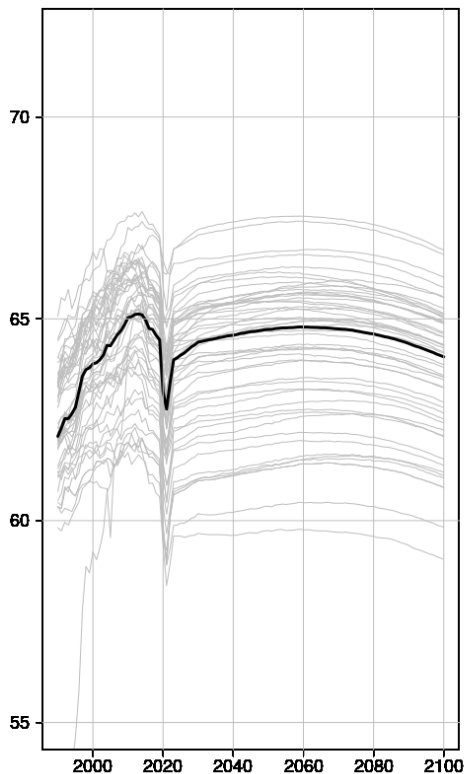
# US and states 1990-2100: healthy life expectancy

Males | Females | Both sexes

Moving to Race-County analysis: US County-Level Health Disparities Research

- Granular view of burden of disease trends by racial and ethnic group and educational levels in 3,110 counties in 20-year span.

- Partnership with the **National Institutes on Minority Health and Health Disparities (NIMHD)**, part of the **National Institutes of Health (NIH)**, to examine where certain segments of the US population are disproportionately likely to suffer poor health and early death.

Latino   Black

AIAN   API

Difference in life expectancy compared to White populations (years)
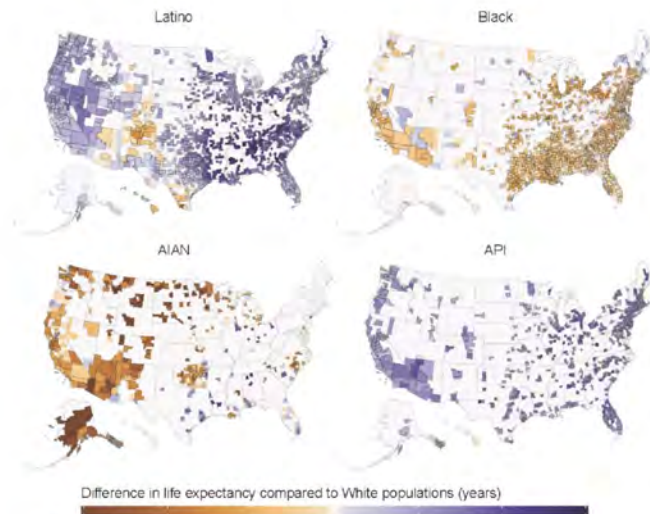
Cause-specific mortality by county, race, and ethnicity in the USA, 2000–19: a systematic analysis of health disparities

GBD US Health Disparities Collaborators*

Summary
Background Large disparities in mortality exist across racial–ethnic groups and by location in the USA, but the extent to which racial–ethnic disparities vary by location, or how these patterns vary by cause of death, is not well understood. We aimed to estimate age-standardised mortality by racial–ethnic group, county, and cause of death and describe the intersection between racial–ethnic and place-based disparities in mortality in the USA, comparing patterns across health conditions.

Methods We applied small-area estimation models to death certificate data from the US National Vital Statistics system and population data from the US National Center for Health Statistics to estimate mortality by age, sex, county, and racial–ethnic group annually from 2000 to 2019 for 19 broad causes of death. Race and ethnicity were categorised as non-Latino and non-Hispanic American Indian or Alaska Native (AIAN), non-Latino and non-Hispanic Asian or Pacific Islander (Asian), non-Latino and non-Hispanic Black (Black), Latino or Hispanic (Latino), and non-Latino and non-Hispanic White (White). We adjusted these mortality rates to correct for misreporting of race and ethnicity on death certificates and generated age-standardised results using direct standardisation to the 2010 US census population.

Published Online
August 3, 2023
https://doi.org/10.1016/
S0140-6736(23)01088-7

See Online/Comment
https://doi.org/10.1016/
S0140-6736(23)01522-2

*Collaborators listed at the end of the Article

Correspondence to:
Dr Laura Dwyer-Lindgren,
Institute for Health Metrics and
Evaluation, University of
Washington, Seattle, WA 98195,
USA
ladwyer@uw.edu

Life expectancy by county, race, and ethnicity in the USA, 2000–19: a systematic analysis of health disparities

GBD US Health Disparities Collaborators*

Summary
Background There are large and persistent disparities in life expectancy among racial–ethnic groups in the USA, but the extent to which these patterns vary geographically on a local scale is not well understood. This analysis estimated life expectancy for five racial–ethnic groups, in 3110 US counties over 20 years, to describe spatial–temporal variations in life expectancy and disparities between racial–ethnic groups.

Methods We applied novel small-area estimation models to death registration data from the US National Vital Statistics System and population data from the US National Center for Health Statistics to estimate annual sex-specific and age-specific mortality rates stratified by county and racial–ethnic group (non-Latino and non-Hispanic White [White], non-Latino and non-Hispanic Black [Black], non-Latino and non-Hispanic American Indian or Alaska Native [AIAN], non-Latino and non-Hispanic Asian or Pacific Islander [API], and Latino or Hispanic [Latino]) from 2000 to 2019. We adjusted these mortality rates to correct for misreporting of race and ethnicity on death certificates and then constructed abridged life tables to estimate life expectancy at birth.

Lancet 2022; 400: 25–38
Published Online
June 16, 2022
https://doi.org/10.1016/
S0140-6736(22)00876-5

See **Comment** page 2

*Collaborators are listed at the
end of the Article

Correspondence to:
Dr Laura Dwyer-Lindgren,
Institute for Health Metrics and
Evaluation, University
of Washington, Seattle,
WA 98195, USA
ladwyer@uw.edu