Integrating biological and social data for (biosocial) research

Michaela Benzeval
Director, Understanding Society
ISER, University of Essex

Outline

Part 1: What research questions can be answered by combining biological and social data?

Note focus on biomarkers not genetics

Part 2: How do you analyse biological data?

- ❖ Introduction to data
- ❖ Issues to consider with examples
- ❖ More information on data, advice etc

The value of integrating social and biological perspectives

The biomedical literature has generally treated socioeconomic position as a unitary construct. Likewise, the social science literature has tended to treat health as a unitary construct.

To advance our understanding of the relationship between socioeconomic position and health, and ultimately to foster appropriate policies and practices to improve population health, a more nuanced approach is required—one that differentiates theoretically and empirically among dimensions of both socioeconomic position and health.

Herd et al 2007, p.223

Biomarkers definition

a characteristic that is objectively measured and evaluated as an indicator of normal biological processes…

National Institute of Health Biomarkers Definitions Working Group (1998)

(but this doesn't mean there aren't errors)

What do we measure in blood (saliva, hair)?

- **Clinical indicators** of significant diseases eg glucosylated hemoglobin (HbA1c) and diabetes

- Established **risk factors** for significant diseases eg cholesterol and heart disease

- Markers for **stress pathways** between social and health eg cortisol, inflammatory markers (e.g. CRP)

- **Novel markers** e.g. telomere, epigenetics, omics

- **Composite risk scores** e.g. Framingham (CVD), Allostatic load (cumulative physiological burden)

# Why are biomarkers useful for social science research?

❑ Earlier and more precise 'objective' measures of health and illness

   - how does health change over lifecourse?

   - how can biomarkers and behaviours help us identify people in need?

❑ Understanding the pathways by which social factors are associated with health

❑ Intervention points and risk factors for policy intervention
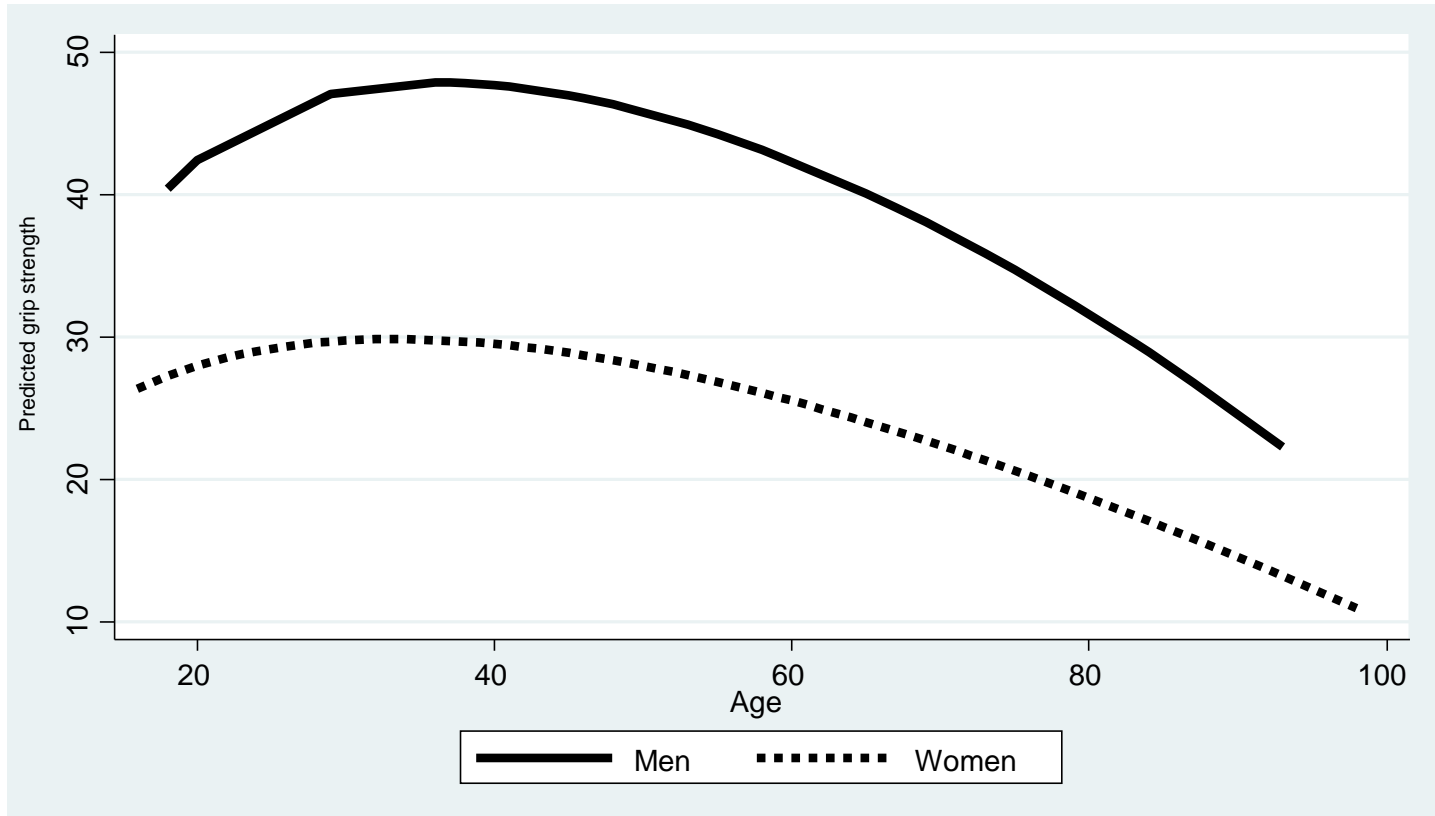
Example: how biomarkers differ over the lifespan

The lifecourse and biomarkers

Growth   Maintenance   Decline

Early life   Mid-life   Old-age

AGE
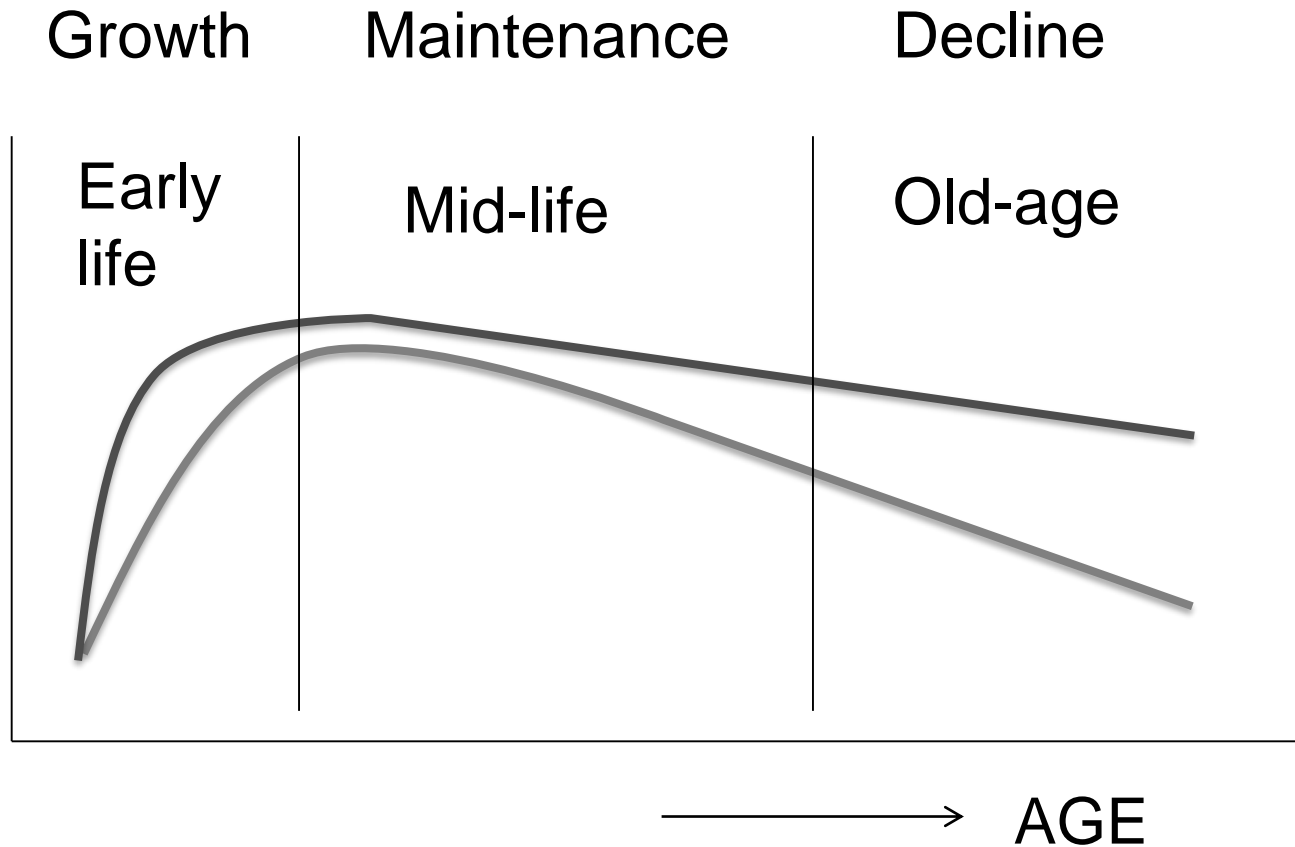
# Grip strength

Source: Understanding Society Wave 2 & 3

Examples: combining biomarker and self report data to understand illness behaviour

Why/how might biomarkers and self report health differ?

❑ Awareness of illness, help seeking behaviour

❑ Self report bias

❑ Help identify unmet need ('clinical iceberg') and poor management of illness

Measuring diabetes, *Understanding Society* waves 2 & 3

HbA1C, Self report, medication, Any — Females

HbA1C, Self report, medication, Any — Males
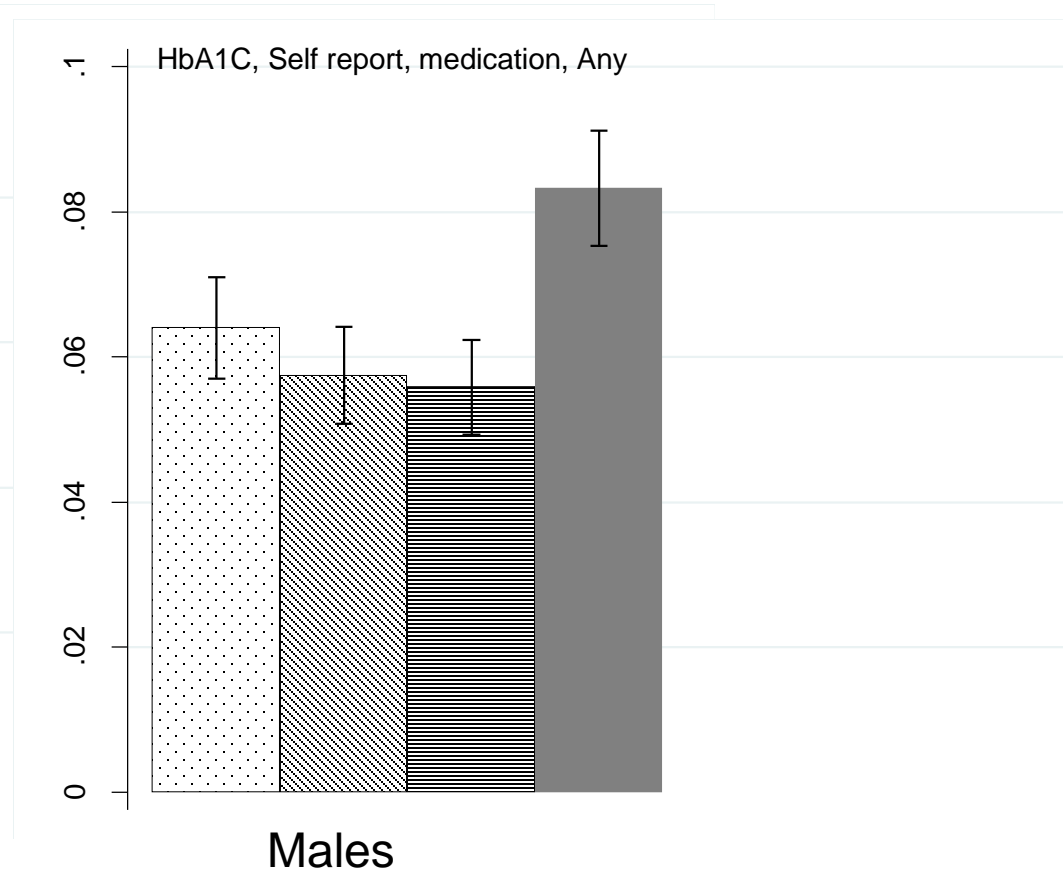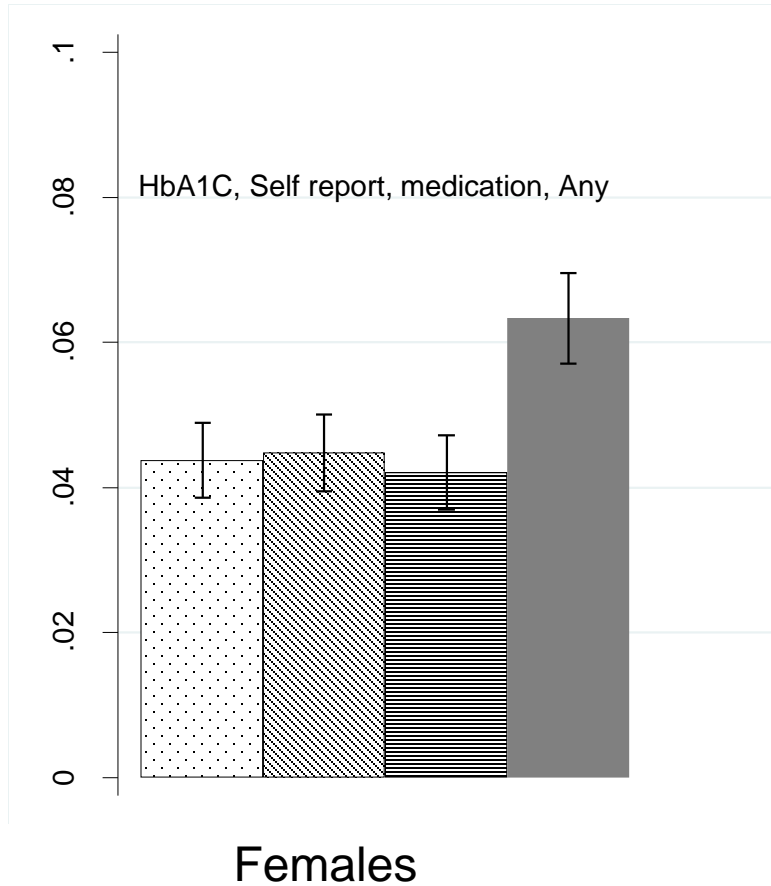
Decomposing the "actual diabetes" prevalence, *Understanding Society* waves 2 & 3
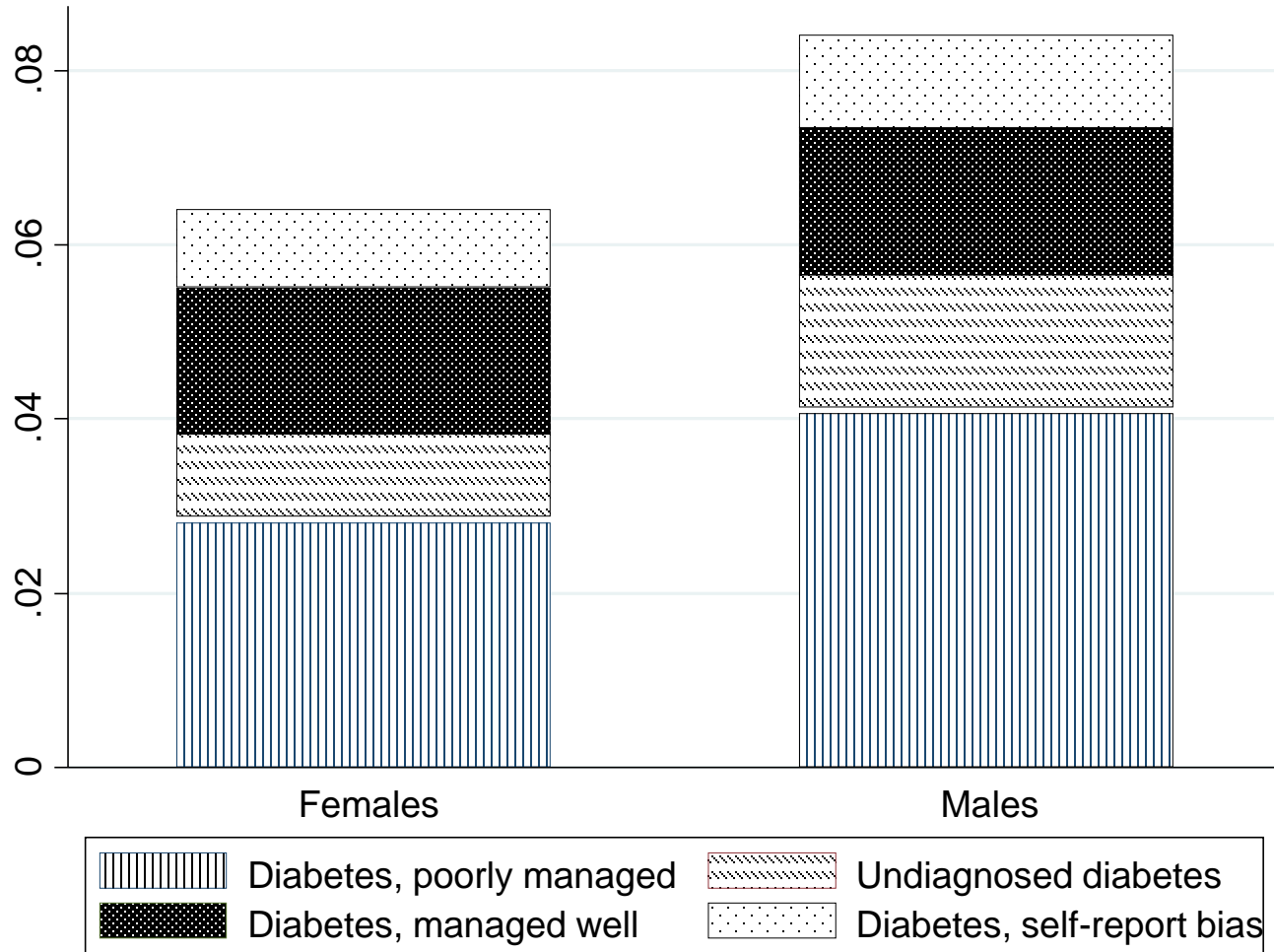
# Examples Do biomarkers give us more confidence about social pathways?

Work and health

- ❑ People who are in work have better health than those unemployed

- ❑ Assumed returning to work will improve health

- ❑ But is all work good for health?

- ❑ Existing literature looked this with self report data but personality may lead to negative affect ie report poor quality work and health

- ❑ Biomarkers provide objective measure health to better understand this association

- ❑ Investigated those out of work in one wave with health in subsequent wave if returned to work or stayed unemployed

- ❑ Measures of health allostatic load – cumulative burden of stress on physiological systems

Is returning to work good for health?, *Understanding Society* waves 2 & 3
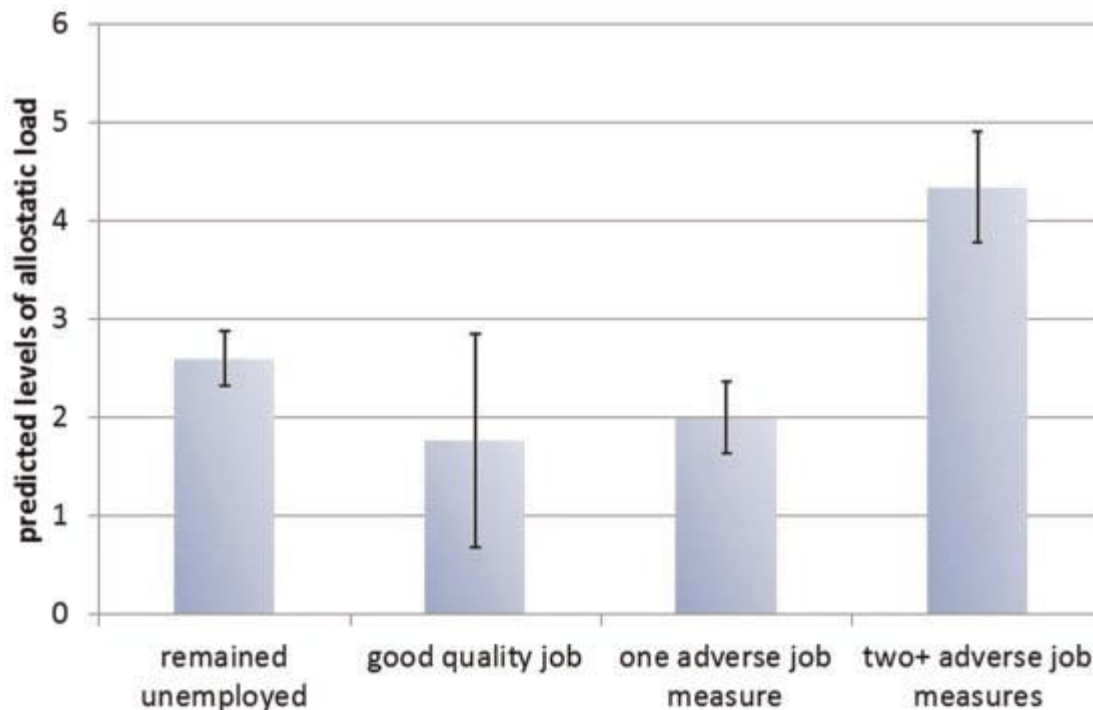
Source: Chandola and Zhang (2017, IJE)

Control for health differences at w1 so unlikely to be selection effect, and age, sex, income, education differences

For more information visit
www.ncrm.ac.uk