The Harmful Fetishisation of Reductive Personal Tracking Metrics in Digital Systems

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The Harmful Fetishisation of Reductive Personal Tracking Metrics in Digital Systems

- 'Quantified Self'

- Data applied to 'body problems'

- Increasingly hard to avoid

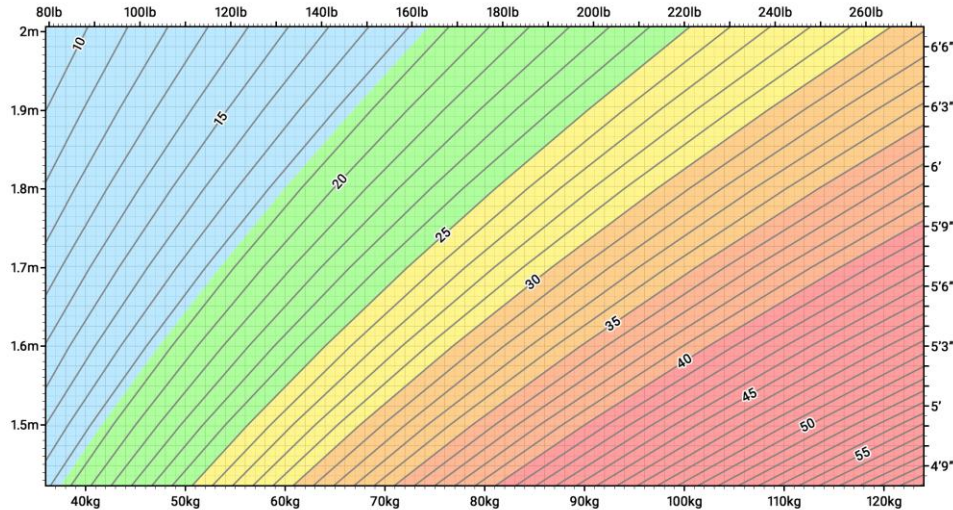# The Harmful Fetishisation of Reductive Personal Tracking Metrics in Digital Systems

- Simple metrics used beyond their remit
- Not just a problem in health *(Eckhouse et. al 2019)*

The Body Mass Index

$$\frac{weight}{(height)^2}$$

- Easy to calculate
- Population measure
- Only two variables

The Body Mass Index

Categories L-R: underweight, normal weight, overweight, moderately obese, severely obese and very severely obese; as defined by WHO.
nagualdesign (CC BY-SA 4.0)

- Output of formula is used as a categorical variable
- Boundaries of categories are value judgements
- Used by World Health Organisation
- Also used by eugenicists, and health insurance companies

BMI and Fat Studies

- We don't know:
  - Causal links between health and weight (*Flegal et al 2005*)

- We do know:
  - Idealising thinness is profitable (*Moynihan 2006)*
  - Fat people are stereotyped as lazy, unhealthy, and having poor willpower *(Fletcher 2023)*
  - Weight stigma in healthcare is common and harmful *(Yamawaki et al 2018)*
  - Anti-fat discrimination intersects with other axes of discrimination
  - Fat people are people.

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- Fatness becomes a 'body problem' to be solved at an individual level

- The AMA has recognised the limitations of BMI as applied to individuals (*2023)*

- BMI is 'fetishized' as a metric: it remains important to individual digital health metrics to an unreasonable degree given its applicability and relevance to health

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BMI as algorithm

- Deterministic model

- Input:
  - Height
  - Weight

- Output
  - Numerical value
  - Categorisation
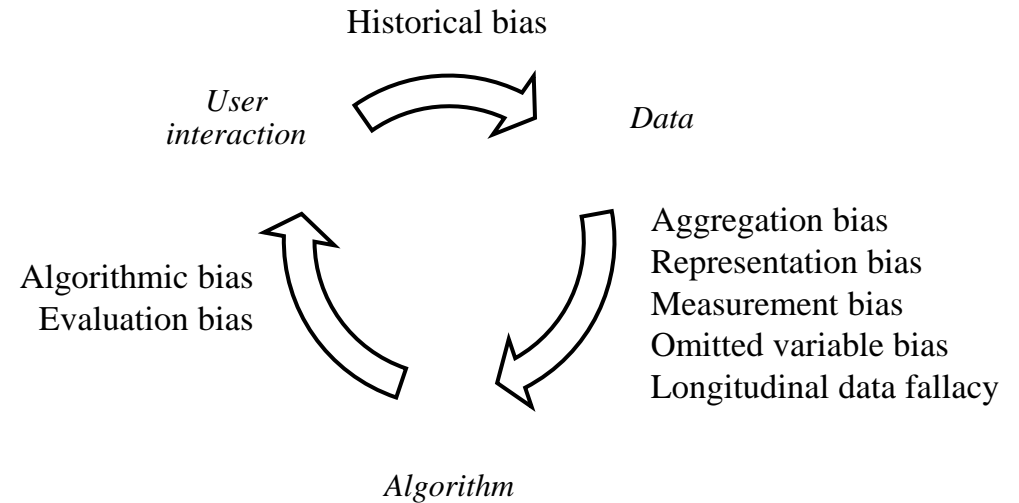
Digital harms from the BMI, represented using Mehrabi et al.'s (2022) cycle diagram

Data → Algorithm

- **Aggregation** bias: Conclusions drawn about individuals from a population

- **Representation** bias: BMI developed using data from Belgium and Scotland, but applied worldwide

- **Measurement** bias: Prioritisation of an easily-calculable measure over other measures of health

- **Omitted variable** bias: Omission of other metrics outside of height and weight

- **Longitudinal data fallacy**: Drawing conclusions about the impact of BMI change, from data about cohorts with different BMIs

Algorithm → User

- **Algorithmic** bias: BMI categories used to distinguish between 'acceptable' and 'requiring intervention,' independent of health research

- **Evaluation** bias: BMI problematic metric for health

User → Data

- **Historical** bias: Use of an established but problematic metric in new technology

Quetelet index created as population measure (1832)

US health insurance companies use Index to set different premium levels for individuals

Health insurance companies standardise obese, overweight and underweight BMI categories (1970s)

1800 → 1850 → 1900 → 1950 → 2000 →

Galton uses Index to promote medical racism, eugenics and the superiority of white bodies (1863)

WHO lowers the category thresholds, against their panel of expert advice but with the support of pharmaceutical firms (1995)

Reflective questions: think beyond the BMI

- Drawing on design justice principles *(Costanza-Chock 2020):*
  - Are you considering the needs and wants of fat people in your design, and are you assessing the impact of your design on fat people?
  - If you are using health metrics in your work, what definition of 'health' is promoted through the metrics you're using? How does this definition of health impact the communities you are designing for?
  - How are you supporting the user of your tech product to understand change in the metrics you are using as part of an ongoing process, rather than as a goal to be attained?
  - How is your technology facilitating users to learn and explore data related to their own health without encoding value judgements into the process?

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Full paper: https://doi.org/10.1145/3630106.3658943

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