

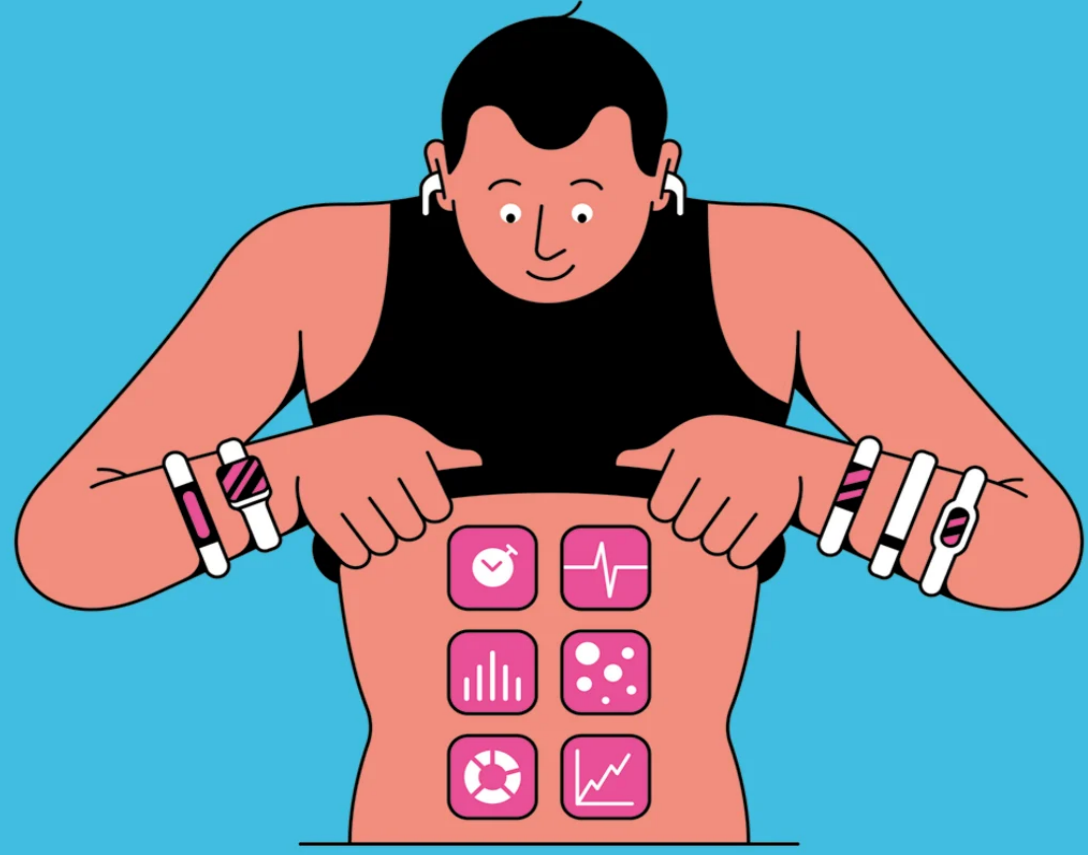
### Motivation

The Economist

The Fed: more rate pain awaits  
Alibaba and the 40 officials  
Why dodgy money loves London  
How to save America's Supreme Court

#### The quantified self

How data can help you live longer



“Wearables and artificial intelligence look set to **reshape health care** in three big ways: early diagnosis, personalised treatment and the management of chronic disease”

Extensive literature on **ethical issues**:

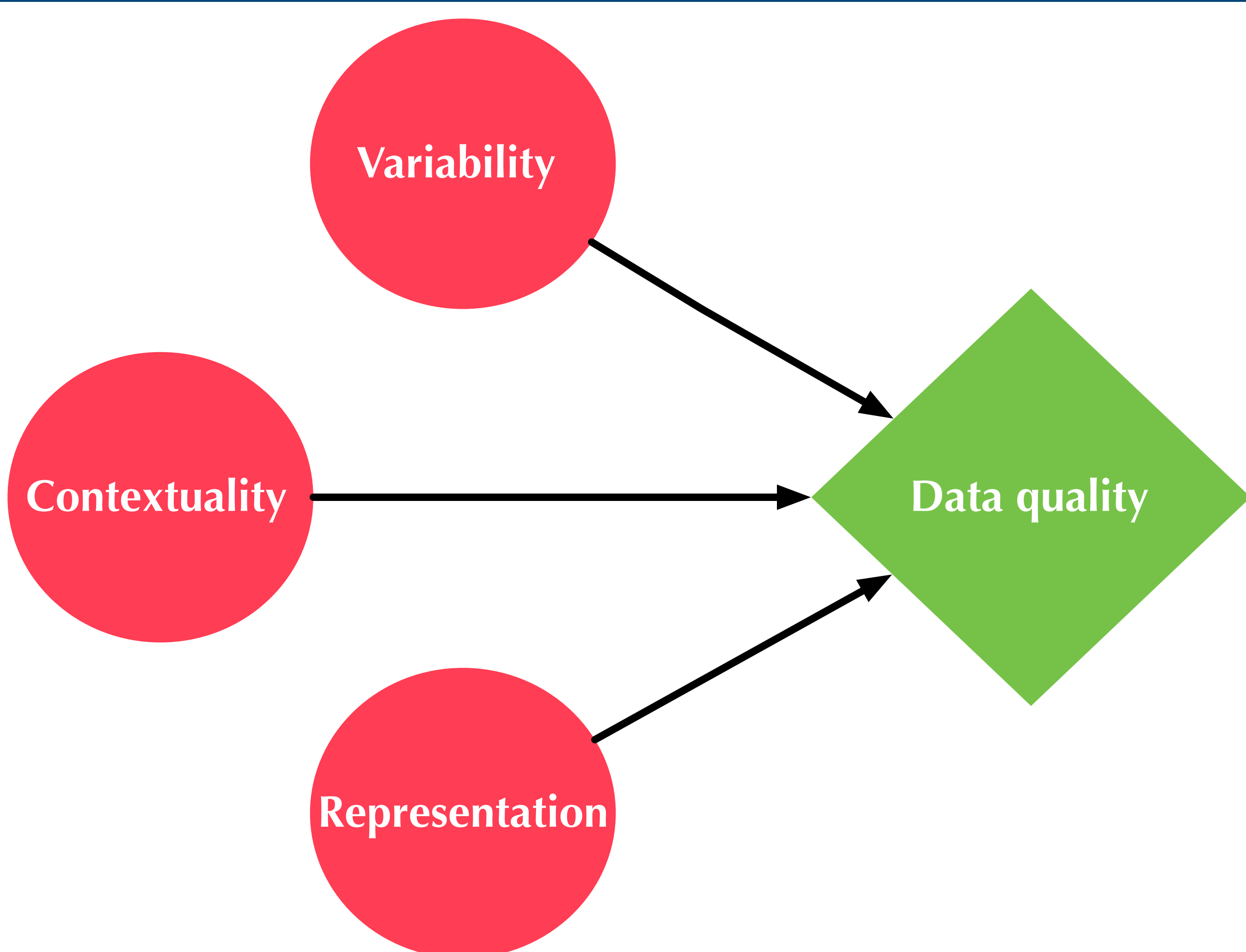
- artificial intelligence and big data in biomedicine (Blasimme & Vayena, 2020)
- privacy, security, autonomy (Morley & Floridi, 2020)
- political power of big tech (Sharon & Lucivero, 2019)

What about epistemic consequences and concerns?

Analysis of epistemic issues: **data quality** and **overestimation**

Need to **integrate epistemology and ethics** for wearables and AI in medicine

### Data quality



Strong **variability** between types of sensors, data collection, analysis, interpretation (Bayoumy et al., 2021)

Difficult to compare data on same physiological variables from different wearables (e.g. oxygen saturation)

Little **contextual** information on data practices (e.g. Fitbits: procedures, protocols, research questions)

Crucial role of contextual knowledge for quality assessment (Canali, 2020)

Lack of **representation** for key members of the general population

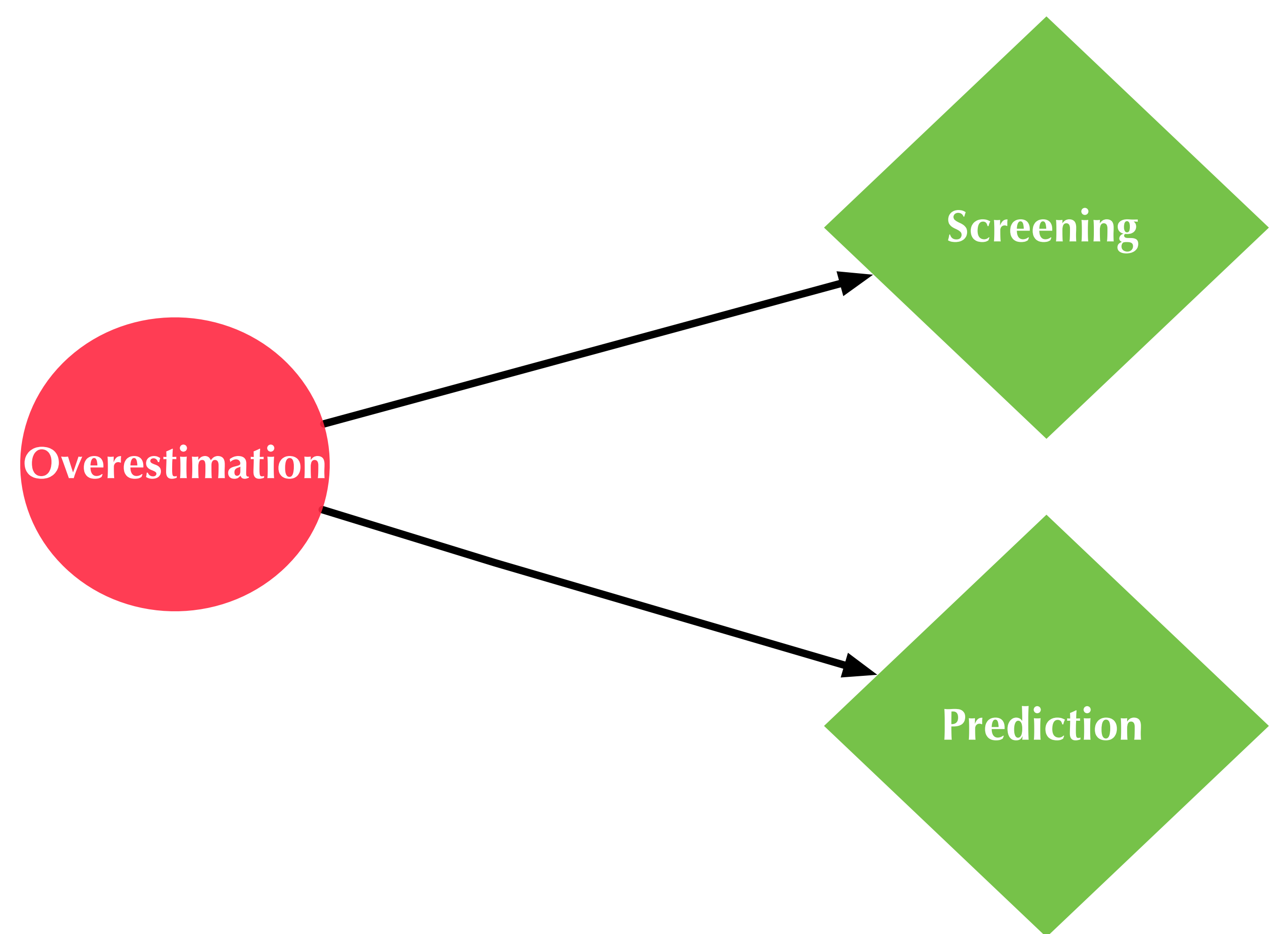
E.g. Adolescents and children: adoption varying substantially depending on other technologies, areas of the world, socio-economic status

Need to integrate **ethics and epistemology**:

- Non-representative data as an epistemic problem, e.g. providing weak basis for knowledge claims about population health
- Ethically, non-representative data leading to policy that is not socially distributed and acceptable
- Data quality as the focus of epistemic and ethical considerations, e.g. epistemic focus on accuracy doesn't solve barriers of access and inclusion

More focus on data quality in the philosophy of AI?

### Overestimation



**Screening** as identification of specific conditions and individuals associated with this condition (Canali et al., in press)

Crucial function for wearables, but substantial overestimation (e.g. heart rate monitoring for atrial fibrillation screening, Wyatt et al., 2020)

Expected function of wearables and AI: **prediction**, as the inference of future trends/events of interest (Canali et al., in press)

Even more problems of overestimation with prediction (e.g. predictive algorithms for COVID-19, Mishra et al., 2020)

Need to integrate **ethics and epistemology**:

- Epistemic failure in building sound knowledge, e.g. the state of influenza-like disease in a population
- Ethically, also a source of anxiety, doubt, lack of trust in users and patients
- Overestimation as the focus of both ethical and epistemic considerations, e.g. epistemic focus on accuracy doesn't solve doubt and anxiety

More focus on ethics of overestimation in the philosophy of AI?