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Data Science Talk and Workshop Series #2

Big Data and Social Inequalities

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Social Inequalities

the existence of unequal opportunities and rewards for different social positions or statuses within a group or society

- Oxford Dictionary

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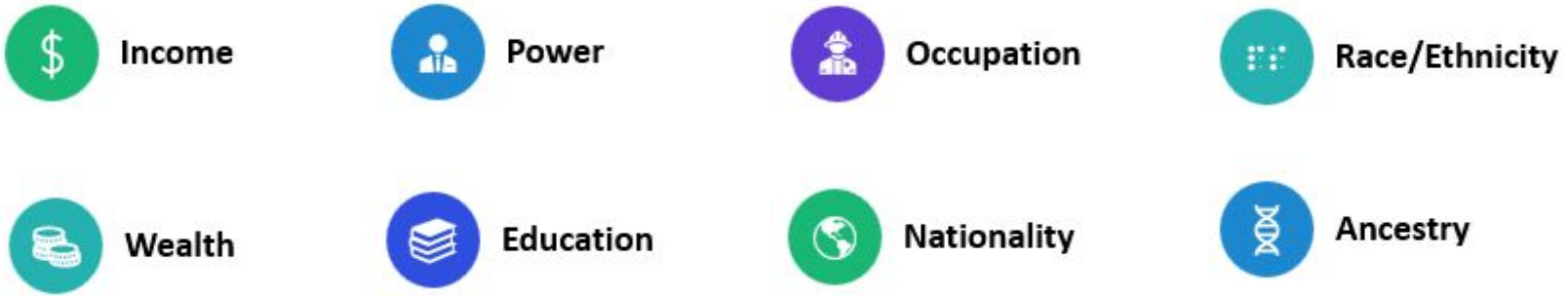
Dimensions of Social Inequalities



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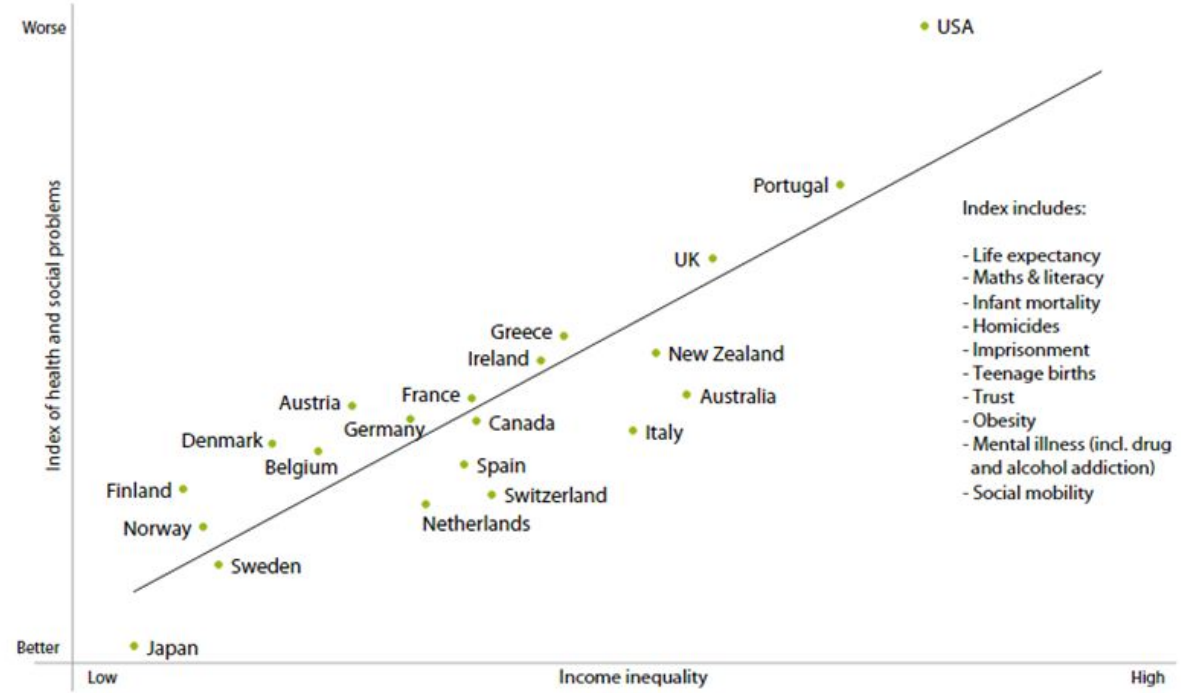
Why
inequalities are BAD?

Figure 70.1 **Health and social problems are worse in more unequal countries**



Source: Wilkinson and Pickett (2009).

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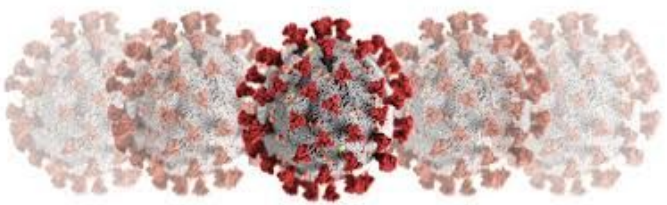
Takes COVID-19

for instance

- The worst insured, the least hygiene, and the most ignorant person can determine the quality of the whole public healthcare system.
- Those from low SES (the working class) are usually the ones least likely to have the ability to work remotely.
- No matter how healthy and how good of healthcare the privileged do have, the virus will eventually knock the door once everybody else has already infected.



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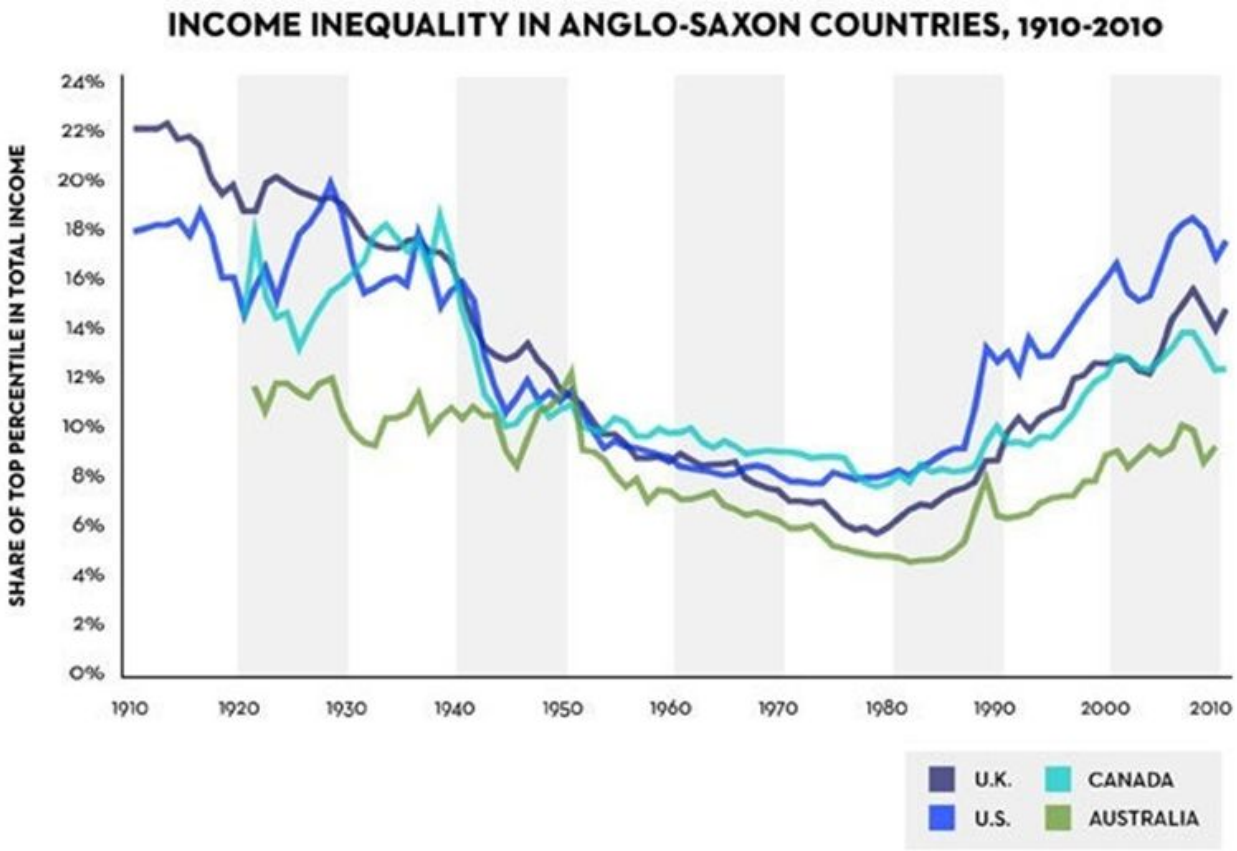

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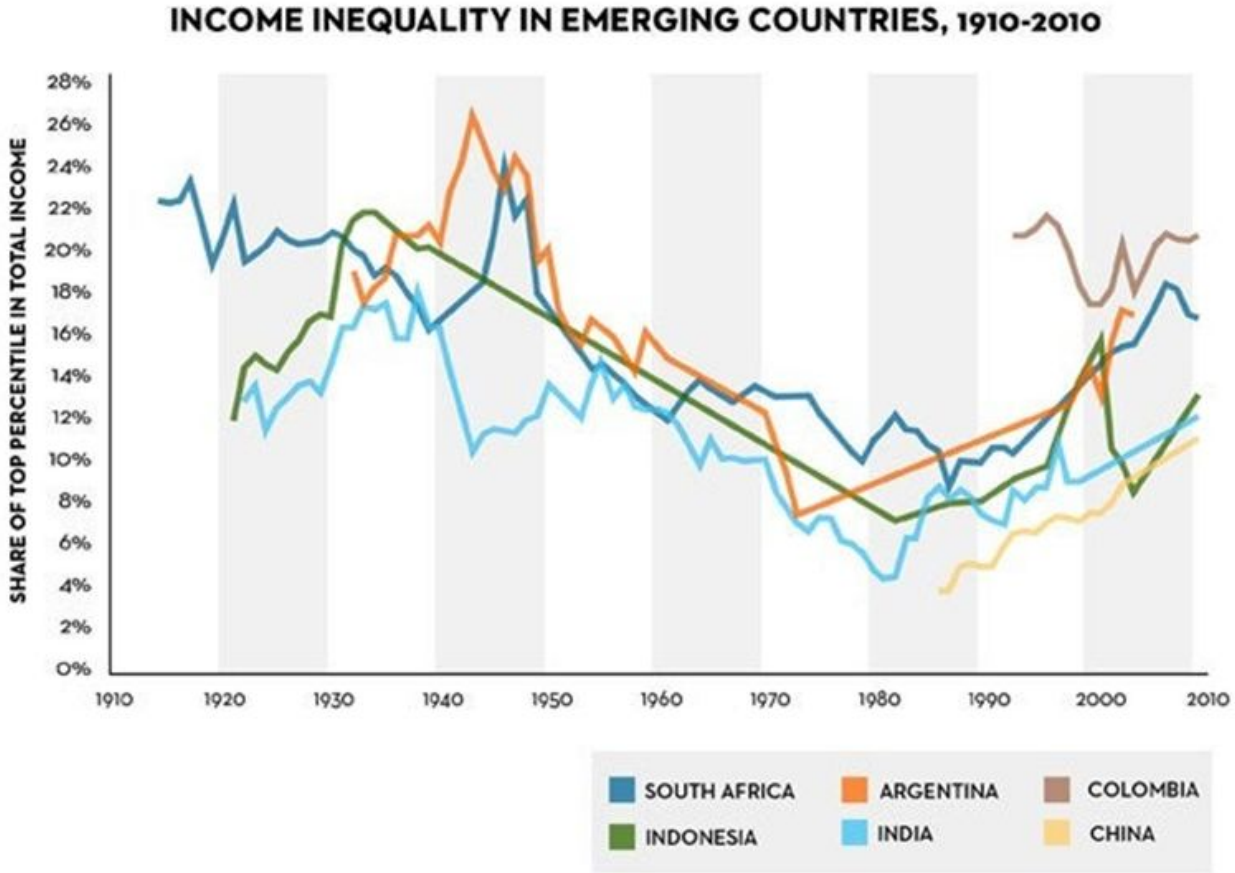

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Last	Previous	Min	Max	Unit	Frequency	Range
▼ 183 2019	▲ 185 2018	34 1998	185 2018	USD	Yearly	1991 - 2019 Updated on 03 Dec 2019

View Indonesia's Monthly Earnings from 1991 to 2019 in the chart:

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Big Data

extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions

- Oxford Dictionary

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Positive Effects of Big Data

The rise of open science

Transform human abilities to tackle global challenges

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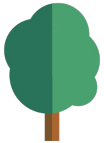
Concerns over the use of Big Data



The unsustainable nature of the digital data landscape.

The quality and credibility of the data themselves.

The processes used to transform those data into knowledge.

The extent to which big and open data are reinforcing existing social divides.

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Case 1: Data Brokers Enable Targeting of Financially Vulnerable Communities

- Behavioral profiling allows advertisers to offer goods at different prices (price discrimination).
- Behavioral profiling is also used by especially seedy companies to target a variety of financial and economic scams at vulnerable populations most likely to fall prey to their offers.
- Users undervalue the personal data they provide and most users don't even know their data is being shared with third parties.

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THE WALL STREET JOURNAL.

TECH

Facial-Recognition Software Suffers From Racial Bias, U.S. Study Finds

Report amplifies concerns about the rollout of algorithms that analyze images

By Asa Fitch
Dec. 19, 2019 9:01 pm ET

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MIT
Technology
Review

Artificial Intelligence Dec 20, 2019

A US government study confirms most face recognition systems are racist

Almost 200 face recognition algorithms—a majority in the industry—had worse performance on nonwhite faces, according to a landmark study.

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Case 2: In Online Searches, Big Data Systems Reproduce Racial Bias

- Algorithms discriminate based on data they lack, causing minority groups to suffer as a results.
- Even Google ads discriminate based on the name of the person searched *

* Latanya Sweeney, Discrimination in Online Ad Delivery, 11 Queue 10 (2013), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2208240.

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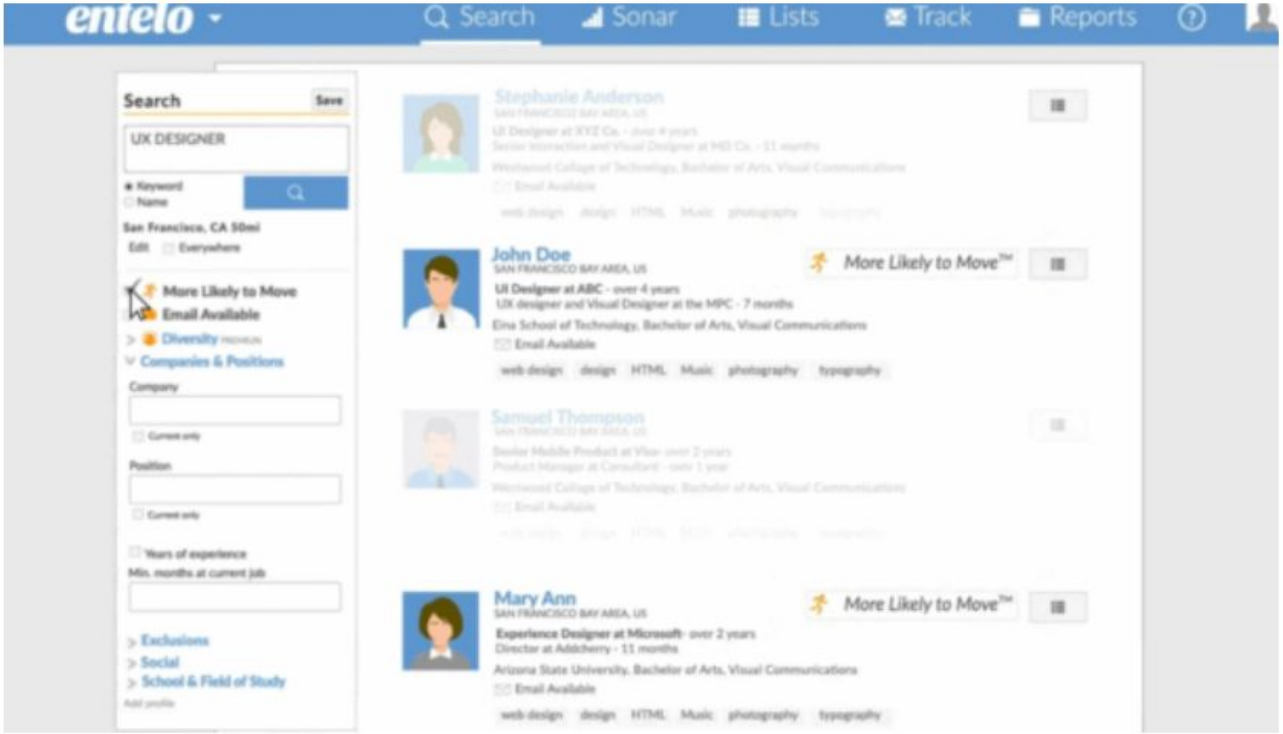

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Case 3: Hiring Algorithms May Put Jobs Out of Reach

- Institutional, structural, and other forms of bias are critical aspects of any equity analysis, especially when it comes to employment.
- Without active measures to mitigate them, biases will arise in predictive hiring tools by default.
- While predictive hiring tools rarely make affirmative hiring decisions, they often automate rejections.

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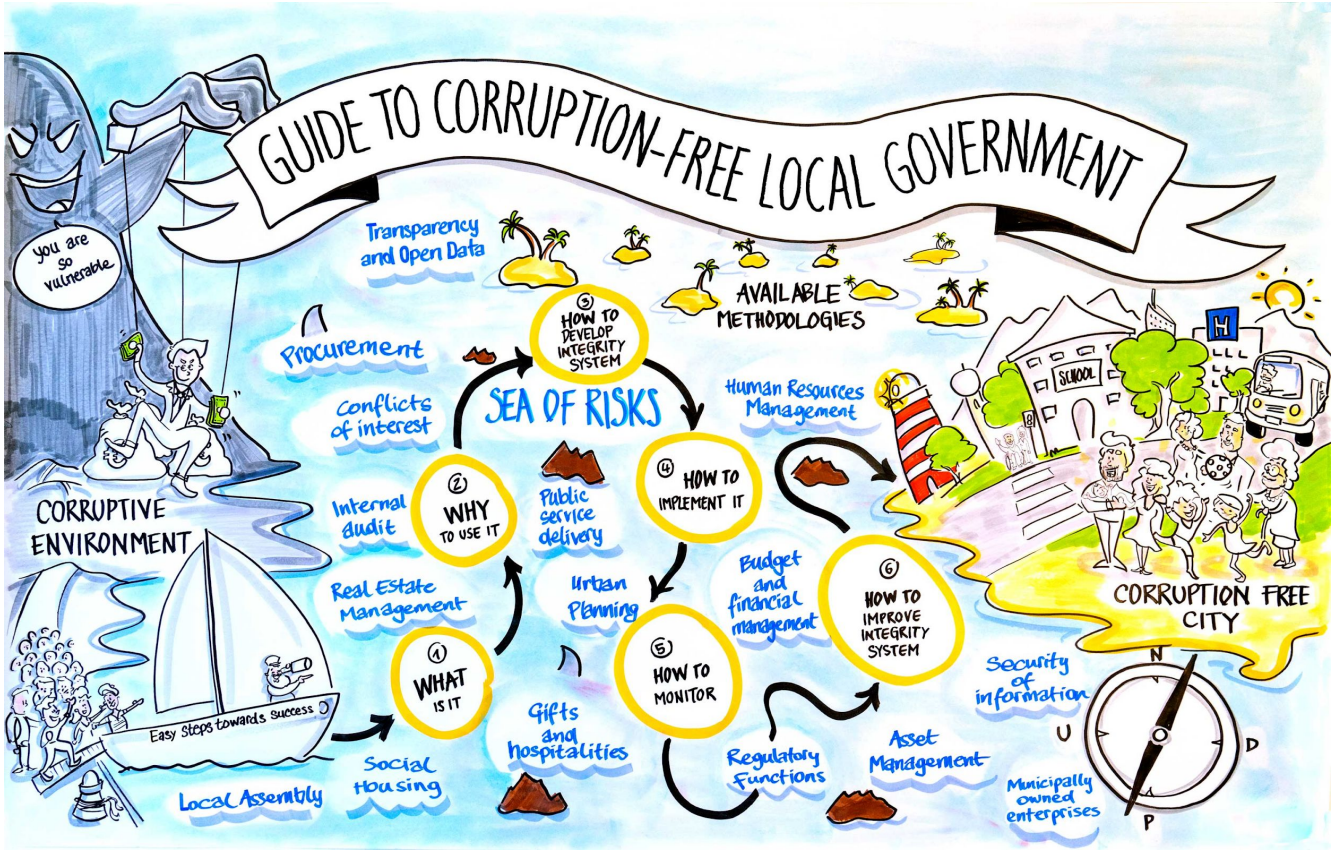

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Case 4: The Temptation to Abuse Government Databases

- Governments at every level collect personal data, with varying degrees of scope and detail.
- Private companies often play a central role in helping governments gather and store data.
- The availability of personal data—and government's inability to properly manage and oversee its own staff's activities—has led to abuse.

Solution?

Substantial investment in **Data Governance and Stewardship**

Priority in supporting **Fairness in Data Handling**

Promotion in **Interdisciplinary** and **Interdomain Collaboration**

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What needs to be done?

- The identification of exclusions and inequalities built into data pipelines.
- Investment in adequate data expertise and skills
- The development of intelligent and ethical strategies for data sharing and the development of algorithms.
- Mechanisms to promote the quality and trustworthiness of data sources and analytic tools.
- Creative solutions to global challenges in dialogue with relevant publics.

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What needs to be done? (cont)

- The understanding that whether and how data should be open needs to be decided on a case-by-case basis.
- Sustainable data infrastructures and related expertise.
- Resources that are interoperable, long-term, internationally coordinated, and publicly accountable.
- Critical scrutiny of research across different audiences.

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Thank You!

Any Questions?

Ahmad Raf'ie Pratama, Ph.D.