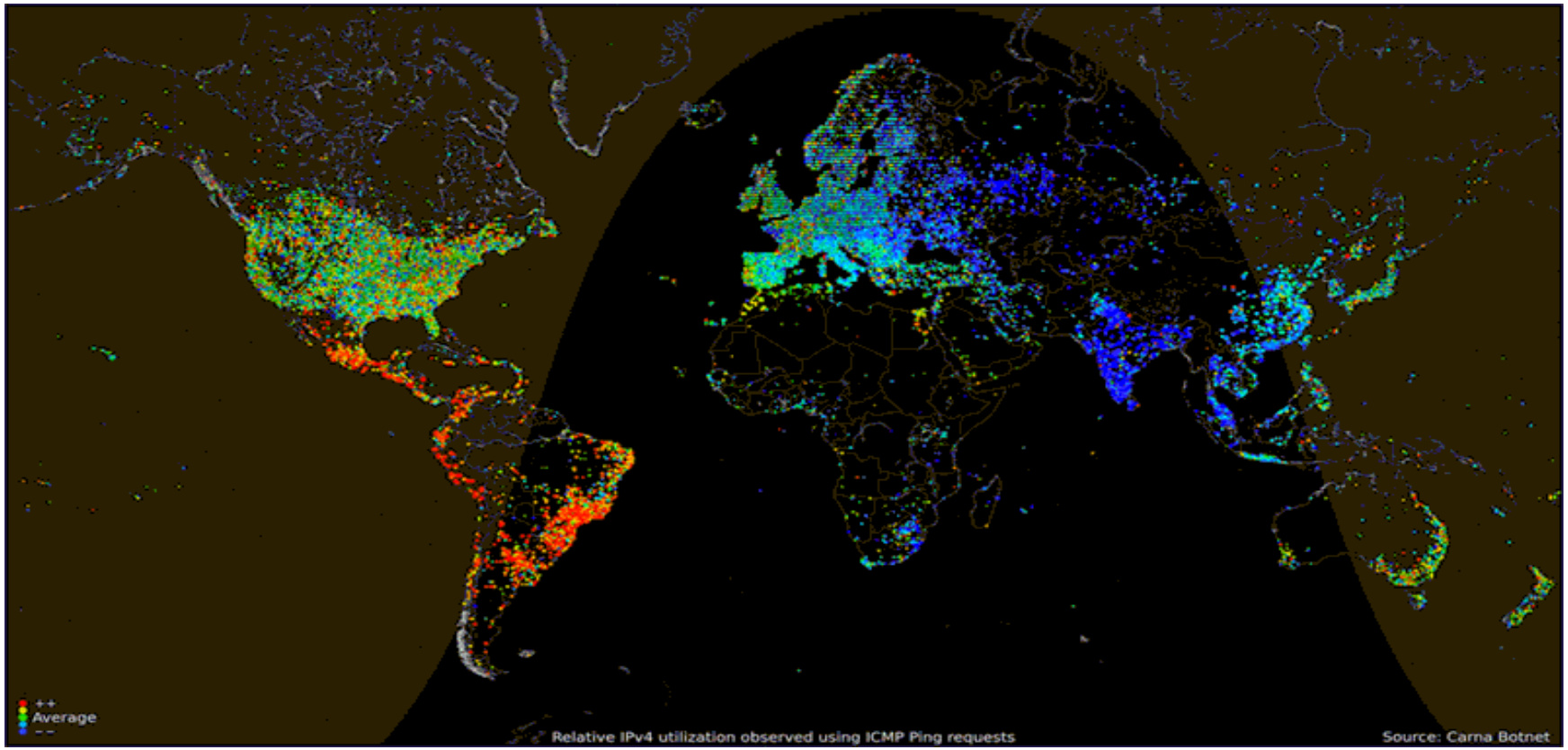
The “Good” Algorithm? Artificial Intelligence, Ethics, Law, Health.

AI and Human Health



Artificial Intelligence in the road of Health for All Perils and Hope

PONTIFICIA ACADEMIA PRO VITA

Felix Rigoli, MD, PhD. felix.rigoli@usp.br

Summary

- There is progress towards health systems available for all people
- Advances using artificial intelligence in many aspects of health services enable to expand the reach and benefits of knowledge and cure
- A disquieting number of studies begin to show how the AI potential is also an amplifier of biased policies

- Use of terms:
  - Artificial Intelligence (AI), algorithmic decision systems (ADS) and others: **A set of processes that substitute decisions formerly made by humans, through the use of machine data processing**.
- Approach:
  - Healthcare with equal rights and equal access
- Plan for the presentation:
  - How new tools may move closer to a Health for All ideal.
  - A tour of the perils in different areas
  - Analytical frameworks to orient AI towards common good or at least to do no harm

How AI can contribute to achieve Health for All

- Health systems bottlenecks in poor countries may be overcome using AI supported by distributed computing.

- Opportunities to deliver better quality services in hard-to-reach areas, even in places where health professionals are scarce

How AI can contribute to achieve Health for All

- Algorithms and big data allow public health authorities to consolidate global trends in communicable diseases and public health emergencies;
- as well as to estimate disease incidence, even when the public authorities are not communicating the cases

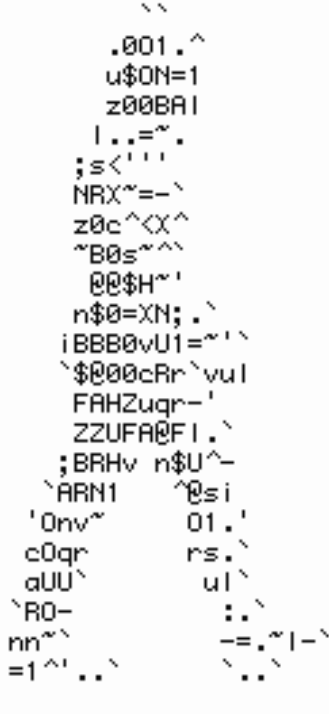
Perils in the Progress: Amplification of Prejudices

Algorithms replicate and amplify prejudices and assumptions (either present, or invisible)

- Black patients in the US and Brazil and pain medication. (Black people are less prone to suffer from pain?).
- Hospital algorithm avoided supporting the more socially at-risk population who really should be the ones that receive more help

Perils in the Progress: Humans vanishing

- Automated decision-making hides human problems from the policy maker
- The human relation involving both the patient and the practitioner vanishes, and the protocol on the screen guides the whole process. The humanity of the person has become transparent; the reality is on the screen.

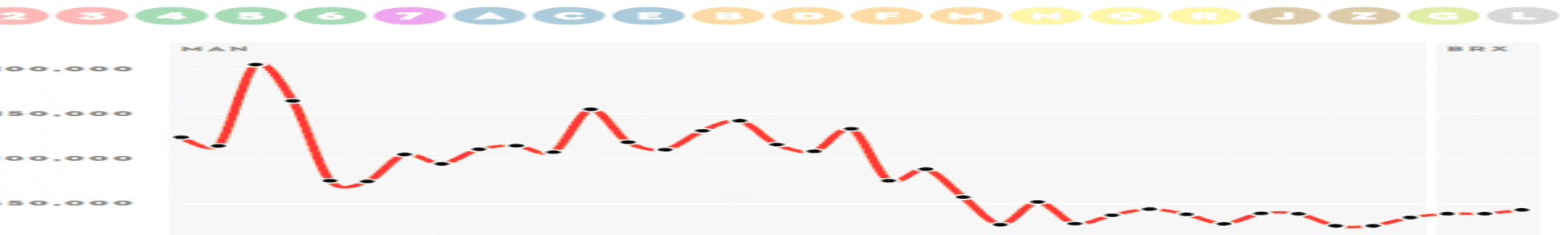


Perils in the Progress: Too much data

- Medical “Data Lakes”: data will remain in stock, available for future uses, including hacking or selling.
- There is an implicit profiling in gathering population data; part of that profiling may consist in targeting actions towards the poor.

Perils in the Progress: To be forgotten

- Profiling using AI to predict patterns is persistent, even intergenerational
- “Family history of drug abuse” will stay in the medical records. It may go from medical records to criminal records.
- The “right to be forgotten”: Forget everything that is not justifiably needed for the future



Health Data as Public Goods

- Data firms offer patients or governments in poor countries to hand over databanks in return for medical care or financial reward.
- Companies tempt low-income countries or researchers to part with patient data, without considering the rights of those whose data are shared
- Data collected through public efforts should be handled as a public good

The Observer
Data protection

Revealed: how drugs giants can access your health records

Experts say information sold on by Department of Health and Social Care can be traced back to individual medical records

Toby Helm *Political Editor*

Sat 8 Feb 2020 21.03 GMT

1,677

▲ Sources allege that 'anonymous' data can be traced back to specific surgeries and individual patients. Photograph: Christopher Thomond/The Guardian

Advertisement

AIRFRANCE

OHLALADEALS

LISBON
FROM
R$ 2.350
RTN ALL INC.

MILAN
FROM
R$ 2.480
RTN ALL INC.

MADRID
FROM
R$ 2.540
RTN ALL INC.

DEPARTING FROM SAO PAULO

BOOK NOW

SEE CONDITIONS

AIRFRANCE

Artificial intelligence (AI)

Welfare surveillance system violates human rights, Dutch court rules

Government told to halt use of AI to detect fraud in decision hailed by privacy campaigners

Jon Henley *and* Robert Booth

Wed 5 Feb 2020 13.18 GMT

1,290

Advertisement

Algorithms, Guidelines and Pharma

A memo from McKinsey (2015)

- *"We envisage a world in which most care is protocolized—that is, in which **clinical decisions on the best treatment options are suggested to physicians by an automated decision algorithm** informed by advanced analytics.*

- *In this environment, **winning pharmaceutical companies will be those able to influence the algorithm**"*

“Winning pharmaceutical companies will be those able to influence the algorithm”

- **Australia**: guidelines covering 10 disease;70% of them included at least one author with a potentially relevant undisclosed tie to the pharmaceutical company interested
- **Canada**: 59% of the authors of 37 clinical guidelines had received financial support from the pharmaceutical industry

“Winning pharmaceutical companies will be those able to influence the algorithm”

- **USA**:
  - 86% of 125 authors of cancer guidelines had financial conflicts of interest, including 84% who accepted general payments and 47% who accepted research payments
  - Clinical guidelines concerning the 10 top revenue drugs: 57 % of the authors had financial conflicts of interest related to the manufacturers of the drug under study
  - Dermatology guideline authors in the US received payments ranging from USD 10.000 to 100 000 from the industry in 40 out of 49 cases

“Winning pharmaceutical companies will be those able to influence the algorithm”

- **Japan**: Six prominent oncology guidelines, of 326 eligible authors, 78.2% received payments from pharmaceutical companies
- **Germany**: 10 out of 15 voting members in the committee had received money from the company that produced the drug under study

The Way Forward:

- Priority Goals
- The process also matters
- Algorithms are unsafe
- An oath of Do No Harm
- Current systematic efforts

Priority goal

For achieving better use of Artificial Intelligence, we must place improving the health of everyone as the explicit goal and then build the systems toward this goal.

Rising the Ceiling or elevating the Floor?

"Medicine should move away from advances that put more years in the lives of the privileged, and concentrate its efforts to elevate the floor of life expectancy for the many" `

* Fitz Mullan

The process also matters

- During the process there should be enough care to check if the algorithm is going to lead to an unfair result, as predictably it might.
- Which bad things may unintentionally happen?
- How may they be avoided, in order to benefit everyone?

Safety Test for Algorithms

- In the same fashion that drugs have side effects, the first test for an algorithm or a drug is related to safety.
- The pace of innovation and the culture of secrecy in the industry are among the main causes of involuntary negative effects.
- UK National Institute for Clinical Excellence (NICE): a set of evidence standards for digital health to check safety, effectiveness and reduction of inequalities.

- Addressing equity in AI is not an afterthought but rather a core feature of how to implement AI in the health system

Oath of Do No Harm in the age of Big Data and artificial intelligence

- Do not collect and keep information for the sake of it, as one day it may be used for ill purposes.
- More data points about an individual inevitably lead to profiling and commercial uses.
- Never create barriers between people and services. Always remove obstacles between resources and those who need them.
- Integrate systems for the needs of people, not for the interest of new or more technically elegant systems.
- Any type of data use without explicit consent is ethically wrong.

Current efforts:

- **The Montreal Declaration for a Responsible Development of Artificial Intelligence*:** 10 Principles
- **Aequitas Project **and Z-Inspection ***:** Standard datasets to test algorithm effects
- **Algorithmic Impact Assessments****:**Transparency and Safety in public tendering of AI

*H-Pod: *Politics, organizations and law*
**University of Chicago, *Aequitas Project*
*** University of Frankfurt, *Z-Inspection*
**** AI Now Institute. *Algorithmic Impact Assessments: A Practical Framework For Public Agency Accountability*

Conclusions (1)

- Artificial intelligence and its technological developments have huge potential to deliver benefits to individual health and to communities.
- It is already doing so for those who can afford to pay for the new services.
- It can make a positive difference in improving health of the less well-off members of society.
- Requires policies and procedures acknowledging that any artificial intelligence applied to social issues needs to actively go against inequality, otherwise it will amplify it.

Conclusions (2)

- The leading role should be played by governments through appropriate safeguards, procurement systems and regulatory initiatives.
- A 2019 UN Report calls for governments' genuine commitment to designing its "digital welfare state not as a Trojan Horse for neoliberal hostility towards welfare and regulation but as a way to ensure a decent standard of living for everyone in society"

- *“If we just let machines learn ethics by observing and emulating us, they will learn to do lots of unethical things. So maybe AI will force us to confront what we really mean by ethics before we can decide how we want AIs to be ethical.”* Pedro Domingos

- *“Our ethical evolution still lags behind the technological revolution”* Virginia Eubanks