Propositions belonging to the thesis:

Beyond the average treatment effect: Risk-based approaches to medical decision making

1. Methods for estimating treatment effect heterogeneity can be categorized on the basis of the reference class, i.e. the set of characteristics chosen to determine patient similarity in treatment effects. (this thesis)

2. Standardization of healthcare databases is needed for comprehensive evaluation of treatment effect heterogeneity at scale. (this thesis)

3. A standardized framework for the assessment of treatment effect heterogeneity in observational settings has potential to aid medical decision making, but diagnostics for the quality of evidence are required. (this thesis)

4. A linear interaction of baseline risk with treatment often provides more reliable treatment benefit predictions than more flexible methods. (this thesis)

5. Publicly accessible, well-documented prediction models developed using best current practices can aid medical decision making. (this thesis)

6. It should be obvious that treatment effects are not necessarily the same for everyone. What may not be so obvious is that misapplying averages can cause harm, by either giving patients treatments that do not help or denying patients treatments that would help them. (Kravitz, R.L. et al, The Milbank Quarterly, 2004)

7. Analyses of large-scale medical data have the potential to identify new and unknown associations, patterns and trends in the data that may pave the way to scientific discoveries in pathogenesis, classification, diagnosis, treatment and progression of disease. (Shilo, S. et al, Nature Medicine, 2020)

8. Big data in healthcare is overwhelming not only because of its volume but also because of the diversity of data types and the speed at which it must be managed. (Raghupathi, W. and Raghupathi, V., Health Science and Systems, 2014)

9. Fragmentation is the primary problem that needs to be addressed if EHRs have any hope of being used in any serious clinical capacity. (Agrawal, R. and Prabakaran, S., Heredity, 2020)

10. Many factors are usually required for an effect to occur, but we rarely know all of them and how they relate to each other. (Pearl, J., Causality, 2009)

11. The aim of science is not to open the door to infinite wisdom, but to set a limit to infinite error. (Bertolt Brecht, Life of Galileo)