Handling missing data, selection bias, and measurement error in observational studies

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Stellingen

behorende bij het proefschrift

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1. There is no one optimal statistical method that can handle biases across every study setting. Each source of bias should be handled on the basis of context-specific knowledge. (this thesis)
2. Multiple imputation is not a panacea to handle missing values and should be used more consciously. (this thesis)
3. Incorporating experts' content knowledge is recommended to detect measurement errors in time-serial data rather than solely relying on automated approaches. (this thesis)
4. A research question such as 'what is the effect of X on Y?' requires further elaboration. One should consider whether and how medication use or other factors has affected the measurements of interest. (this thesis)
5. Problems of confounding, selection, and measurement bias can be addressed with a question; what is the missing information? This calls for unified perspectives for addressing these biases.
6. Conducting comparison studies evaluating existing methods should be incentivized. For many analysis problems, the issue is not a lack of available methods; rather, it is a lack of accessibility to available methods. (after STRATOS initiative)
7. Simulations allow empirical comparisons between available methods under various data structures and violation of assumptions. Utilizing simulation studies will benefit clinical researchers.
8. Even in the emergence of big data and machine learning, careful considerations of the research setting, clinical knowledge, and study designs remain highly important – possibly more than ever.
9. Prisoners in a cave we (epidemiologists) are, looking at shadows (data) cast upon the cave wall. The shadows reflect a fragment of the real world (medical reality). (after The Allegory of the Cave).
10. "Every new discovery is just a reminder - we are all small and stupid. [...] all of that exists inside of one universe out of who knows how many" (Everything Everywhere All At Once, 2022). Because nothing matters, everything we give meaning matters.