Reflection on
Replication studies
– improving reproducibility in the empirical sciences -
Advisory report KNAW

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Importance of KNAW report on replication research, January 2018

Comments
Importance of report

- Comprehensive analysis achieved (study methods, study reporting, incentive system)
- Key problems and tasks described
- From challenges to well targeted proposed solutions
  - *Improve reproducibility:*
    - Improve study methods and reporting, proper incentives.
  - *Conduct more replication studies*
    - Improve information-sharing & know-how, better incentives
- Unique contribution to international evaluation and initiatives
Comments (1): Study methods

Type of problem determines required study
- Internal validity (error, bias, fraud) well addressed
- Also attention for external validity issues important: reproducibility in (e.g., robustness or sensitivity as to setting, changes/improvements over time)
- Pure replication or more extensive learning (methods/techniques/skills/settings/taking new knowledge into account)
- Different starting positions (e.g., diagnostic prediction research ↔ RCTs)
- Ethics of allowing replication of a conclusive RCT? (equipoise)
Independent researchers? Mutual obligation within scientific community.

Not just one replication: ongoing responsibility, improvements over time in crucial elements

Living meta-analyses

Avoid bureaucracy of numerous different guidelines: co-ordination

First and foremost, we need well-trained capable researchers of high intrinsic quality and integrity
Comments (3): Reporting

👍 Reporting: much has been done (e.g., trial registries, reporting standards (EQUATOR)* further improvements needed, e.g.,
👍 Reproducible descriptions of techniques and settings
👍 Compliance with registries and basic reporting standards

* Enhancing the QUAlity and Transparency Of health Research
Comments (4): Incentive system

- Agree with most recommendations to researchers funding agencies, research institutions, journals, funders
- Criteria for need/priority for replication
- Review, and prioritize published key studies to be revisited
- Regulatory requirements for introducing tools & interventions (market, insurance), not only for medicines
- Incentives for sharing data: Research data as a global public good. *(Knottnerus JA, J Clin Epidemiol. 2016 Feb;70:270-1.*
Comments (5): ‘journals should ..’

- **improve study reporting**
  - require preregistration of hypothesis-testing studies - avoid extra bureaucracy for observational studies: consider decentral accessible repositories (e.g., IRBs)
  - issue detailed evidence-based guidelines and checklists for reporting studies and ensure compliance with them - big steps being made
  - require storage of study data and methods in accessible repositories - work to do (data quality, protection, recognition of data collectors)

- **create proper incentives**
  - be more open to publishing studies with null results and incentivise researchers to report such results – agree, given relevant hypotheses
  - offer incentives for conducting rigorous studies and producing reproducible research results – such quality will be valued

- **create better incentives**
  - encourage the submission of replication studies – agree