

Reflection on

Replication studies

**– improving reproducibility in the empirical sciences -
Advisory report KNAW**

André Knottnerus

KNAW January 15, 2018

 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? (equipose)

Comments (2): Study methods ct'd

- ⊕ 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 en 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*



