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Director of Evaluation Office and Global Director for Innovation and Country Engagement
the International Initiative for Impact Evaluation (3ie)

MAKING DATA REUSABLE
LESSONS FROM REPLICATIONS OF IMPACT EVALUATIONS

Wednesday 9th October 2019

12:45 – 14:00 GMT

Room 3a, 3rd Floor, Student Central, Malet Street, WC1E 7HY, London

A 50 minute lecture followed by a 25 minute Q&A session

If you are following online and have questions
please email cedil@lshtm.ac.uk
or tweet us on @CEDILProgramme

International Initiative for Impact Evaluation

Making data reusable: lessons from replications of impact evaluations

Marie Gaarder, Director of Evaluation Office and Global Director for Innovation and Country Engagement, 3ie

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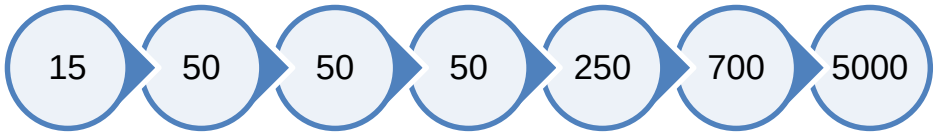
CEDIL, October 2019

Who we are & what we do

3ie is a member-based international NGO promoting evidence-informed development policies and programmes.

- **Grant maker, producer and standard setter** for policy-relevant impact evaluations, systematic reviews, evidence gap maps, evidence syntheses and replication studies focussed on low- and middle-income countries
- **Convener** of forums to build a culture of evaluation, capacity to undertake impact evaluations and reviews and commitment to evidence-informed decision-making
- **Producer** of knowledge products for policymakers, programme managers, researchers, civil society, the media and donors
- **Champion** of Global Public Evidence Goods



Research Transparency at 3ie

Highlights from the Policy

- **Preregister** studies in the appropriate registry
- Develop a **pre-analysis plan** before starting the study;
- Ensure all materials supporting research findings are available on the 3ie **Dataverse** (de-identified) for purposes of replicating the results (PBR) and reusing these data.
- Provide a comprehensive and **transparent description** of study context, design, analysis methods
- Adhere to **appropriate citation** of any data, program code and other methods;
- Provide **unrestricted access** to and **reuse of all published research** funded, in whole or in part, by 3ie.


Reproducibility? That sounds like something for nerds!
It can save lives!
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Reproducibility and replication

- **Push button replication**: press “go” on the statistical code
- **Pure: replicate original results using original data and methods as described in publication or code audit**
- **Measurement and estimation analysis: sensitivity of original approach to pre-specified research methods- reanalysis**
- **Theory of change analysis: sensitivity of original approach to pre-specified alternative hypothesis along the causal chain**

Other types of replication-informed research

- **External/ field replication**: Using interventions/methodologies from the original study in another location under the same settings as the original study
- **Systematic Reviews** answers a defined research question by collecting and summarizing all empirical evidence that fits pre-specified eligibility criteria.
- **Meta-analysis** is the use of statistical methods to summarize the results of these studies.


If I run the same code on the same data, I should get the published results right?
Seems like science 101!
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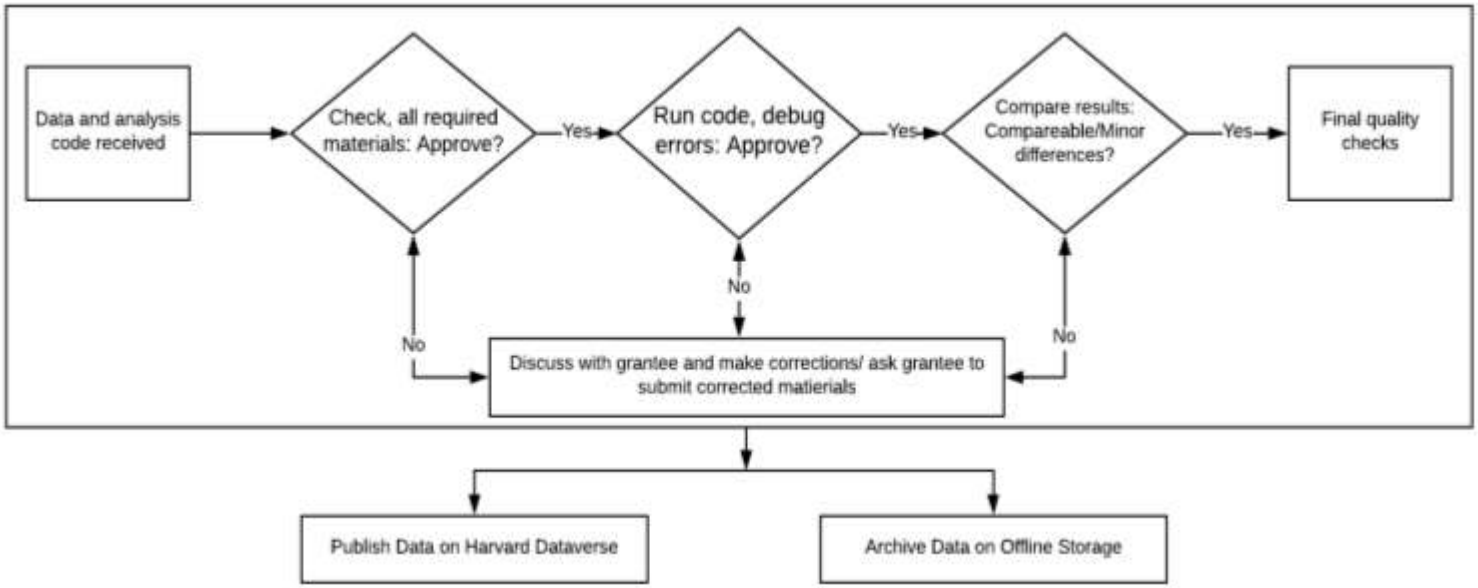
Findings from our latest replication paper

Push Button Replication process

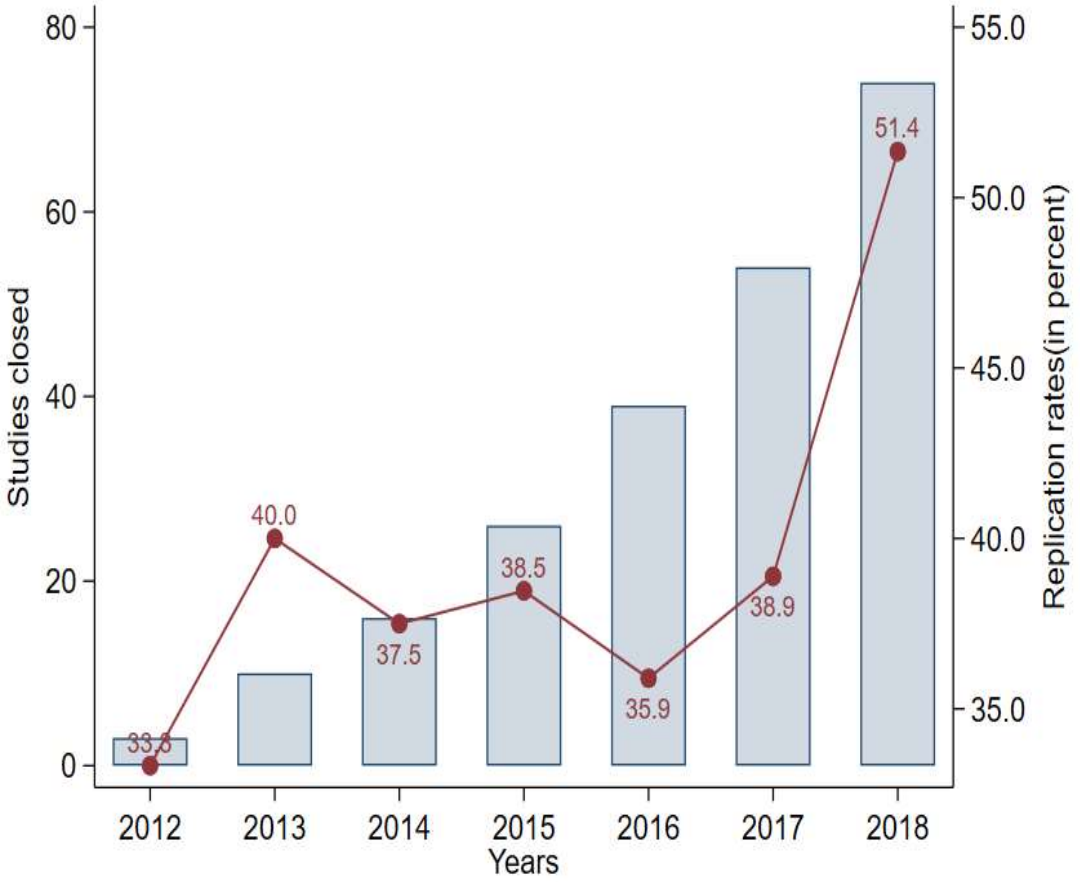


Findings from our latest replication paper

Our Sample

Findings from our latest replication paper

- Between 2013 and 2017, the replication rate consistently stayed well **below 40%**
- In 2018, we note a dramatic increase to **50%**
- In 2019, till date we have pushed this figure to about **61%**(With an annual replication rate of **100% for 2019**)

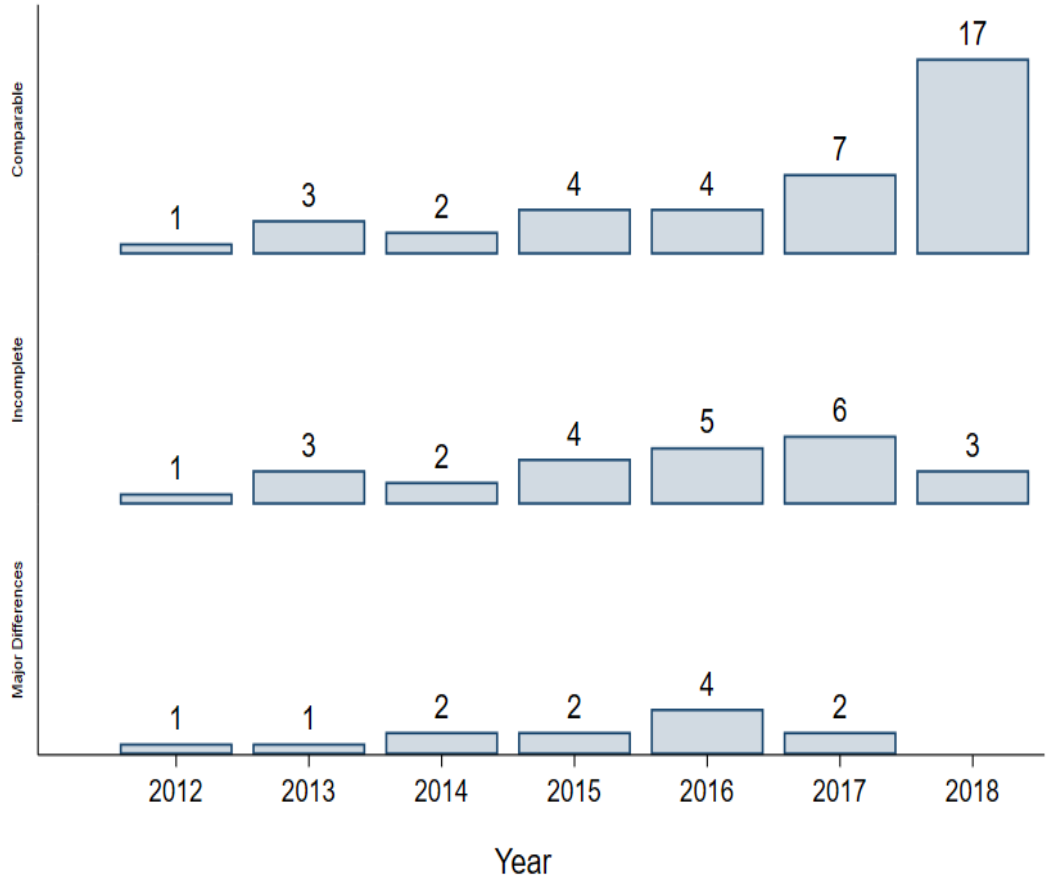


Source: Author's Calculation.

*The graph shows the closed studies with data and code files available

Findings from our latest replication paper

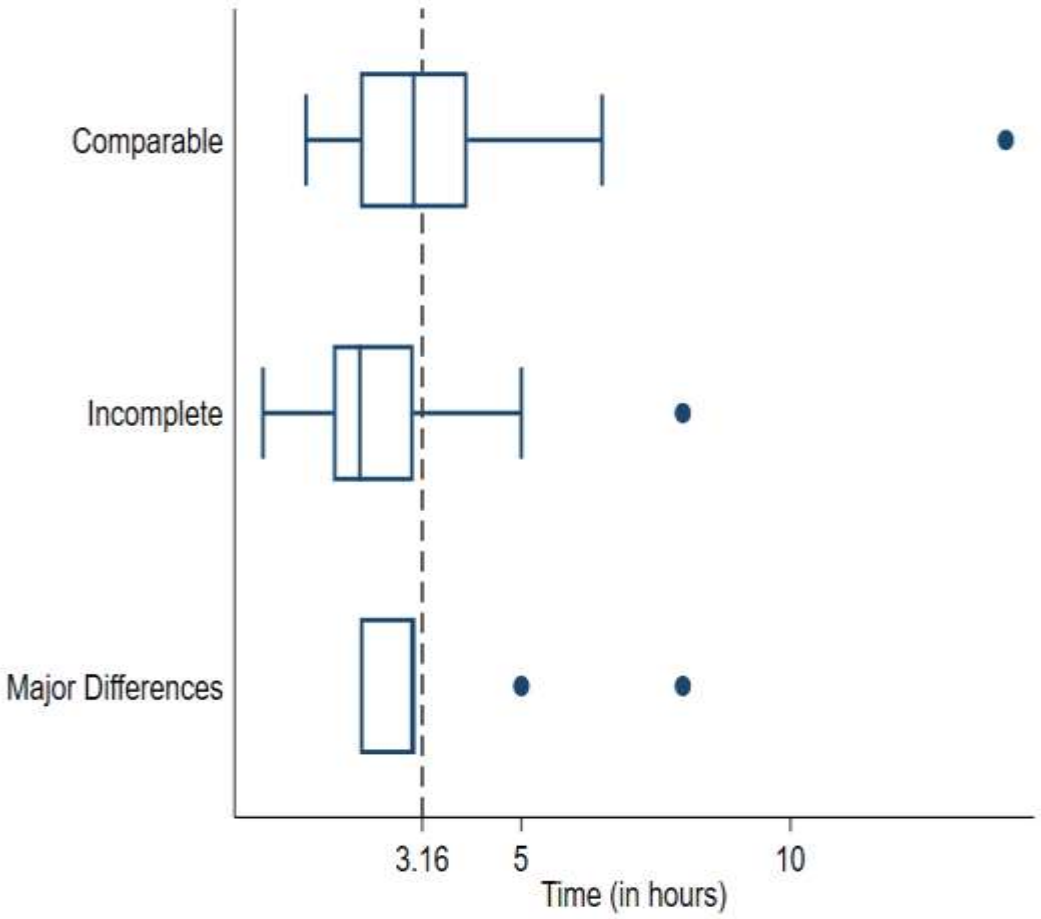
- The number of comparable studies in 2018 is **17** which is much higher (about **140%** increase) than the previous years



Source: Author's Calculation.

Findings from our latest replication paper

- It took about 3 hours to complete the replication for one study (across multiple rounds)
- The time taken for comparable studies ranged from 2 to 6 hours



Source: Author's Calculation.

Challenges

- *Educating in-house staff on the importance of the verification process*
- *Reaching out to researchers from older studies to access correct replication materials*
- *Opposition from researchers to make data open, citing retrospective nature of the policy*
- *Access to government or proprietary data for verification purposes only*
- *Ownership of data: Data funded using public money is public property*
- *Data Privacy*

Findings from our latest replication paper

Lessons Learnt

- *Open data is an ongoing process*
- *Policy articulation and enforcement can serve as important steps to re-inforce commitment to transparency*
- *Open data begins with informed consent*
- *Conduct replications soon after a project is complete*
- *Build internal capacity to manage replications*

Thank you

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Validity of assumptions - tips

Tips for exercises to validate assumptions

- ☐ Test balance for additional, relevant variables
- ☐ Test balance at applicable units of analysis or for analyzed subsets of the data
- ☐ Use outside data to explore equivalence of groups or clusters used in the study
- ☐ Run placebo tests, especially for natural experiment designs
- ☐ Explore assumptions visually, especially distributions or across time
- ☐ Identify important untested assumptions for chosen estimation methods and test using accepted methods

Data transformations - tips

Tips for data transformation exercises

- ☐ Employ alternative imputation methods for missing values to test robustness
- ☐ Use an alternative outlier drop rule to test robustness
- ☐ Explore the impact on the results of any dropped observations
- ☐ Decompose constructed variables to understand the implications of the composition and weights
- ☐ Consider different constructions supported by theory or qualitative analysis
- ☐ Use alternate data for key variables to test robustness

Estimation methods - tips

Tips for checking estimation methods

- ☐ Run additional robustness tests for key parameter or specification choices in the estimation strategy
- ☐ Explore estimation strategies from other disciplines with applicable approaches, especially in cases whether the other disciplines sometimes analyze similar questions
- ☐ Apply newly available techniques for an estimation strategy
- ☐ Check for the correct application of estimation strategies given the set-up of the study

Heterogeneous impacts - tips

Tips for heterogeneous impacts exercises

- ☐ Identify theoretically or clinically relevant subgroups and check whether heterogeneous impacts are tested for these subgroups
- ☐ Test for heterogeneous impacts for relevant subgroups
- ☐ Search for variation in treatment effects using machine learning methods