



Reproducible Research Repository

Air Pollution and Student Learning in Pakistan

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This review verifies the reproducibility of the exhibits included in the paper "*Air Pollution and Student Learning in Pakistan*".

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Main findings

- **Every exhibit of the paper has been reproduced accurately.**
- The code was successfully executed on a new computer after:
 1. Opening the do file "run_all", updating the directory, installing the required packages and running the script
 2. Opening the R script "03_make_figures" installing the required packages and running the script
- The output demonstrates consistent stability across multiple runs. Specifically, executing the code two times consecutively yielded identical results.
- The code takes approximately 40 minutes to run.
- We conducted our reproducibility analysis based on the paper shared by the authors
- **Verification Process and Data Handling:**
 - The reproducibility package relies on 2 types of data: open and restricted data (available only from the data owners).
 - Open data is included in the public reproducibility package.
 - Reviewers used restricted intermediate data provided directly by the authors to conduct the reproducibility verification, and this is not included in the public reproducibility package.
 - *data_hash_report.csv* lists the SHA256 hashes of all files in the Data folder to support data integrity checks. Users who acquire the forthcoming/accessible/limited-access/restricted data can use this file to verify that the data has not been altered.
- **Reproducibility Summary:**

- **Data:** Some data is restricted and has not been included in the reproducibility package. For more details, refer to the README file.
- **Code:** All code files are included in the reproducibility package but operate from intermediate data, not raw data.
- **Outputs:** All outputs are generated by code included in the reproducibility package.
- **Dependencies environment:** The reviewers created a new environment using the latest versions of dependencies available at the moment of the review.

List of exhibits and reproducibility status

Results in the Main Section of the Paper

- **Figure 1** Reproduced.
- **Figure 2** Does not apply. This is not an analytical figure
- **Figure 3** Reproduced.
- **Figure 4** Reproduced.
- **Figure 5** Reproduced.
- **Figure 6** Reproduced.
- **Table 1** Reproduced.
- **Table 2** Reproduced.
- **Table 3** Reproduced.

Reproduction Environment

Paper exhibits were reproduced on a computer with the following specifications:

- OS: Windows 11 Enterprise
- Processor: Intel(R) Xeon(R) Gold 5218 CPU @ 2.30GHz (2.30 GHz) (2 processors)
- Memory available: 16 GB
- Software version: Stata 19.5 MP