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### **Supplemental Material**

#### **Global Access to Handwashing: Implications for COVID-19 Control in Low-Income Countries**

Michael Brauer, Jeff T. Zhao, Fiona B. Bennitt, and Jeffrey D. Stanaway

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**Excel Table S2.** Input data source counts by country and year.

**Excel Table S3.** Estimated proportion (mean, upper and lower uncertainty intervals) of the population without access to handwashing with available soap and water and estimated population (mean, upper and lower uncertainty intervals) without access to handwashing with available soap and water by country and year (1990 – 2019).

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**Additional File-** Excel Document

Figure S1: Proportion of population with no access to handwashing station, East Asia

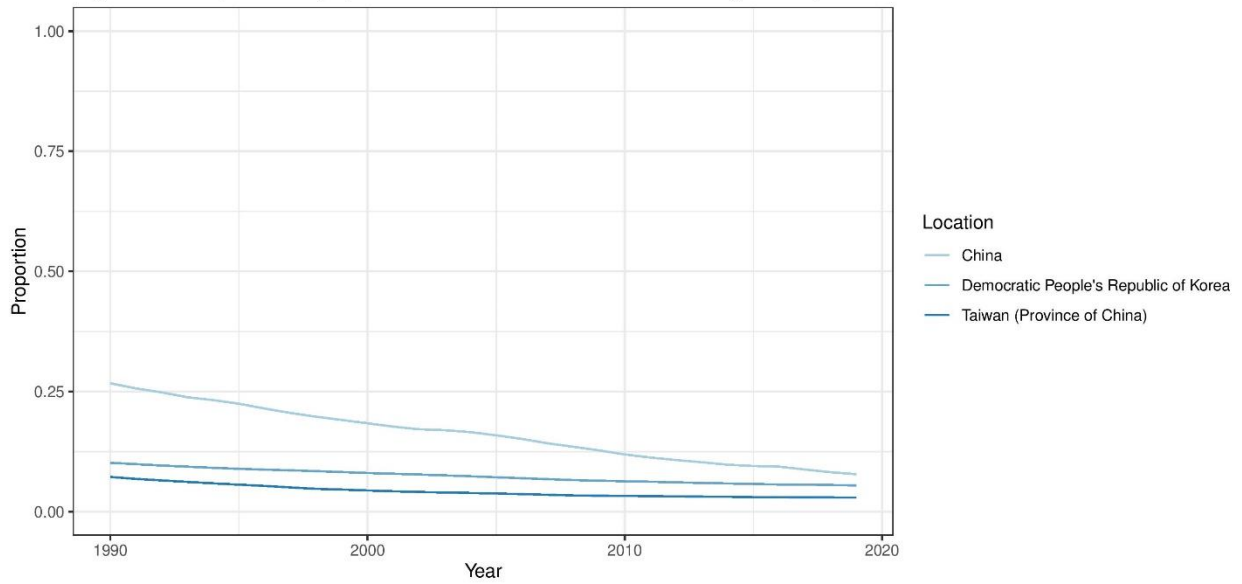


Figure S1. Estimated proportion of population with no access to handwashing station, East Asia (1990 – 2019).

Figure S2: Proportion of population with no access to handwashing station, Southeast Asia

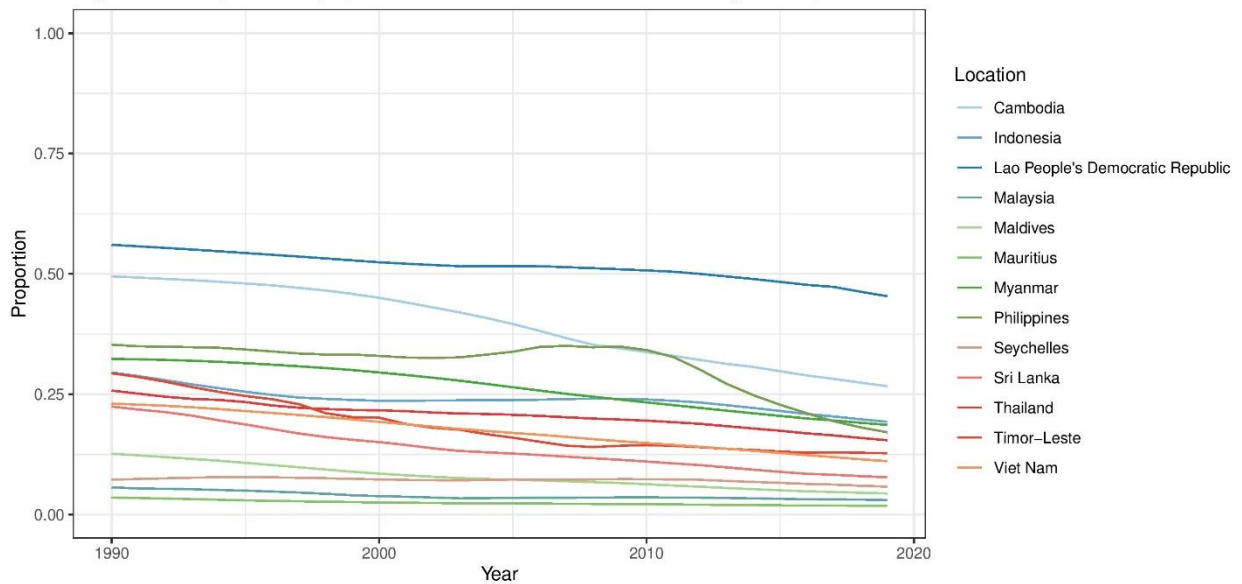


Figure S2. Estimated proportion of population with no access to handwashing station, Southeast Asia (1990 – 2019).

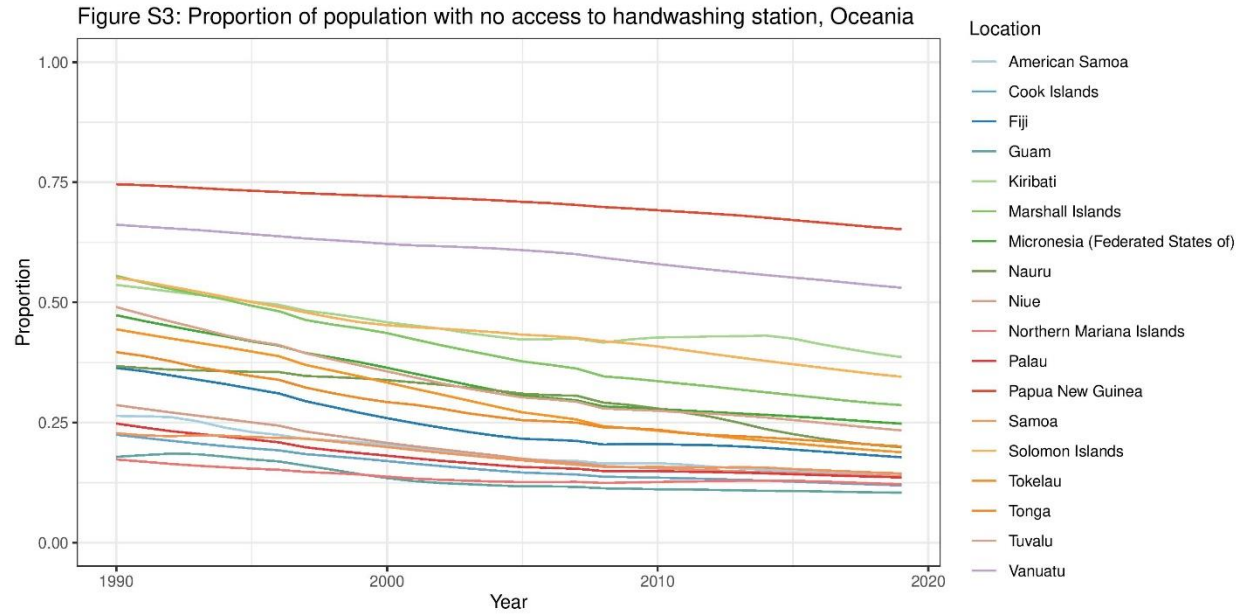


Figure S3. Estimated proportion of population with no access to handwashing station, Oceania (1990 – 2019).

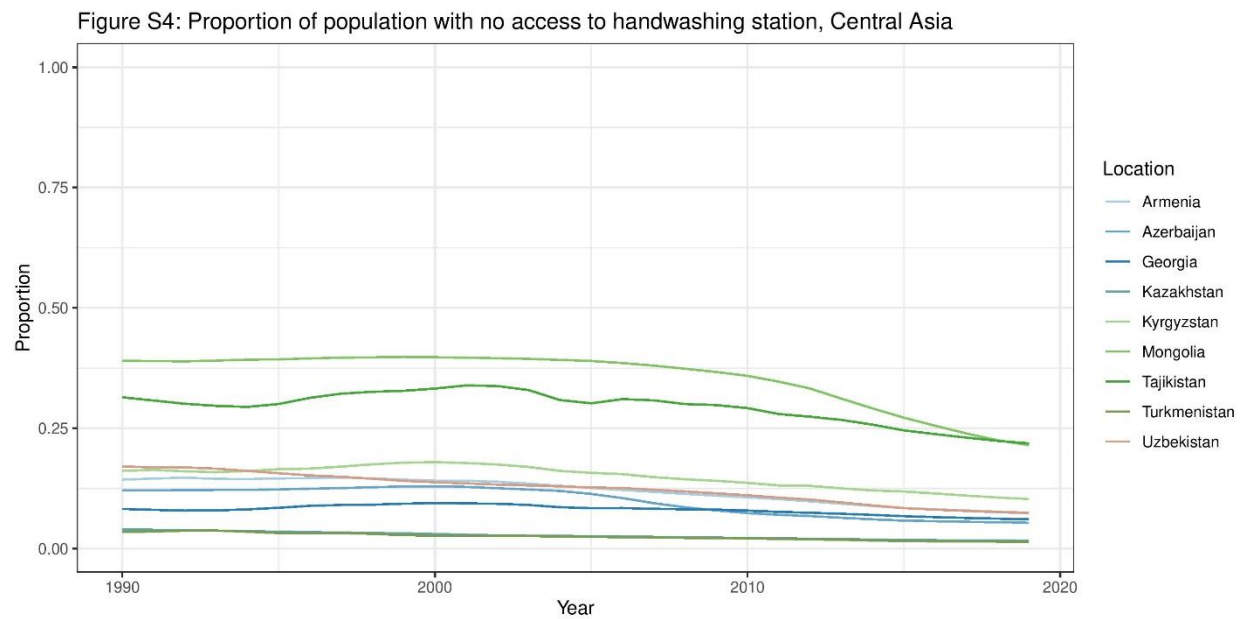


Figure S4. Estimated proportion of population with no access to handwashing station, Central Asia (1990 – 2019).

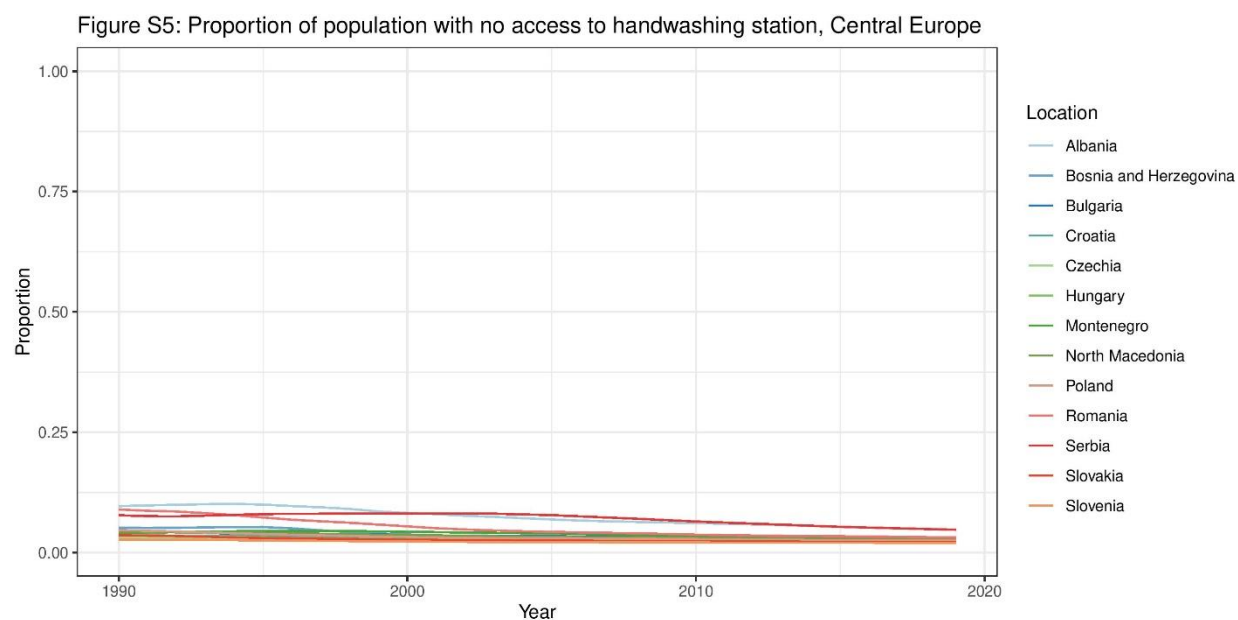


Figure S5. Estimated proportion of population with no access to handwashing station, Central Europe (1990 – 2019).

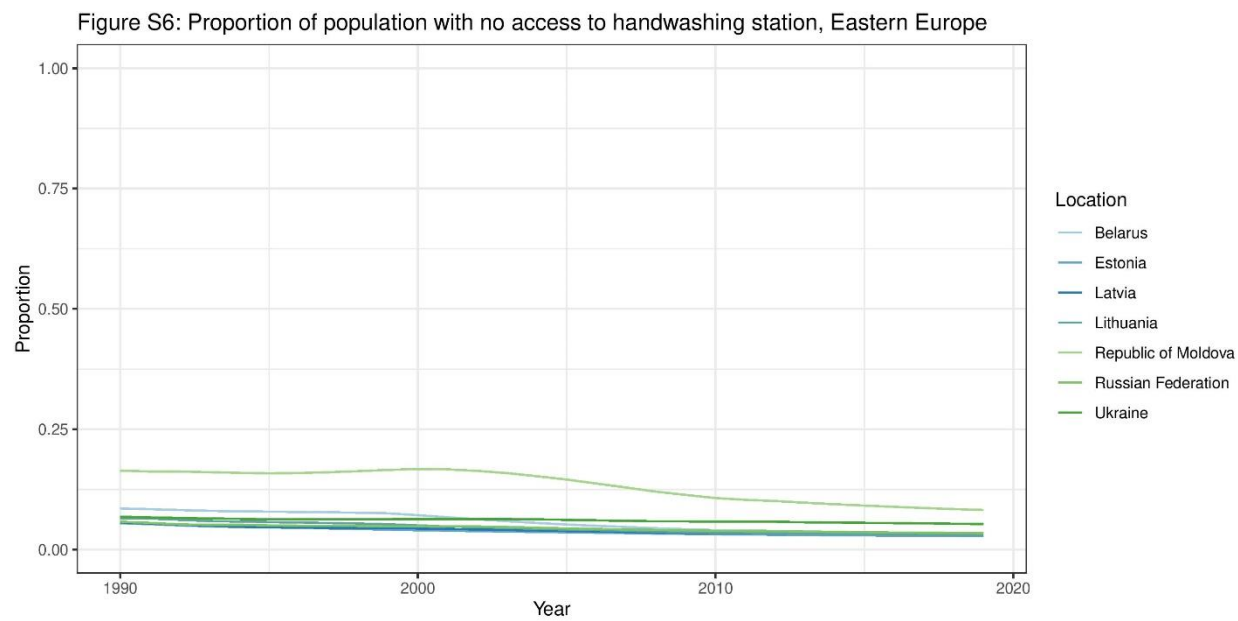


Figure S6. Estimated proportion of population with no access to handwashing station, Eastern Europe (1990 – 2019).

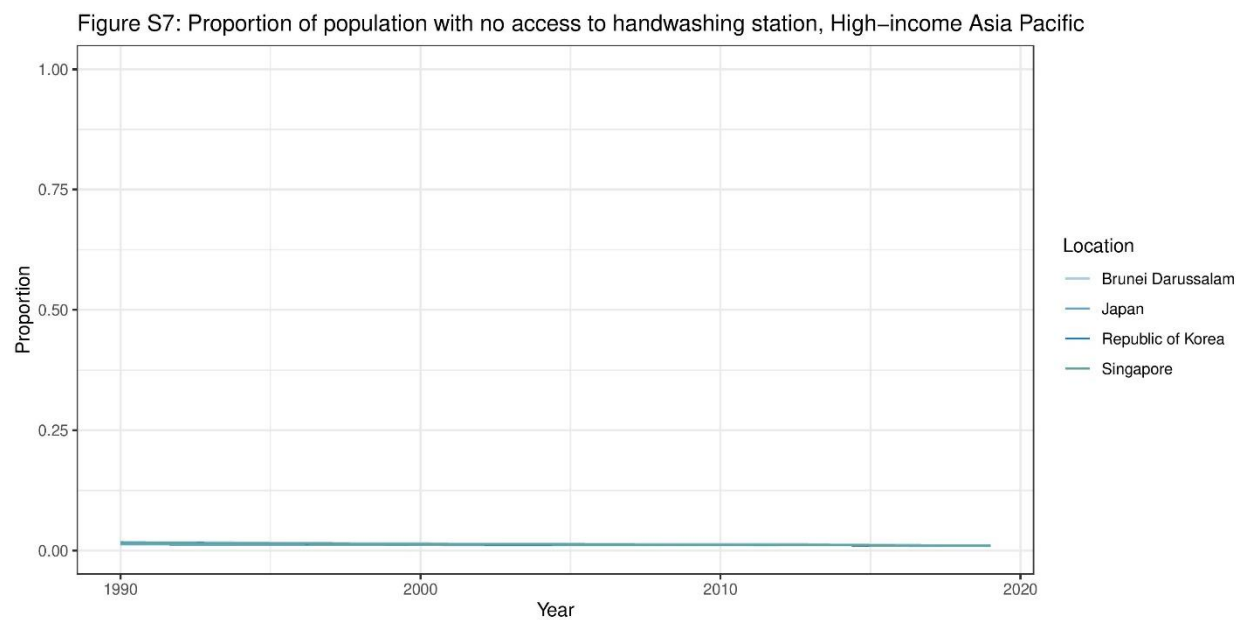


Figure S7. Estimated proportion of population with no access to handwashing station, High-income Asia Pacific (1990 – 2019).

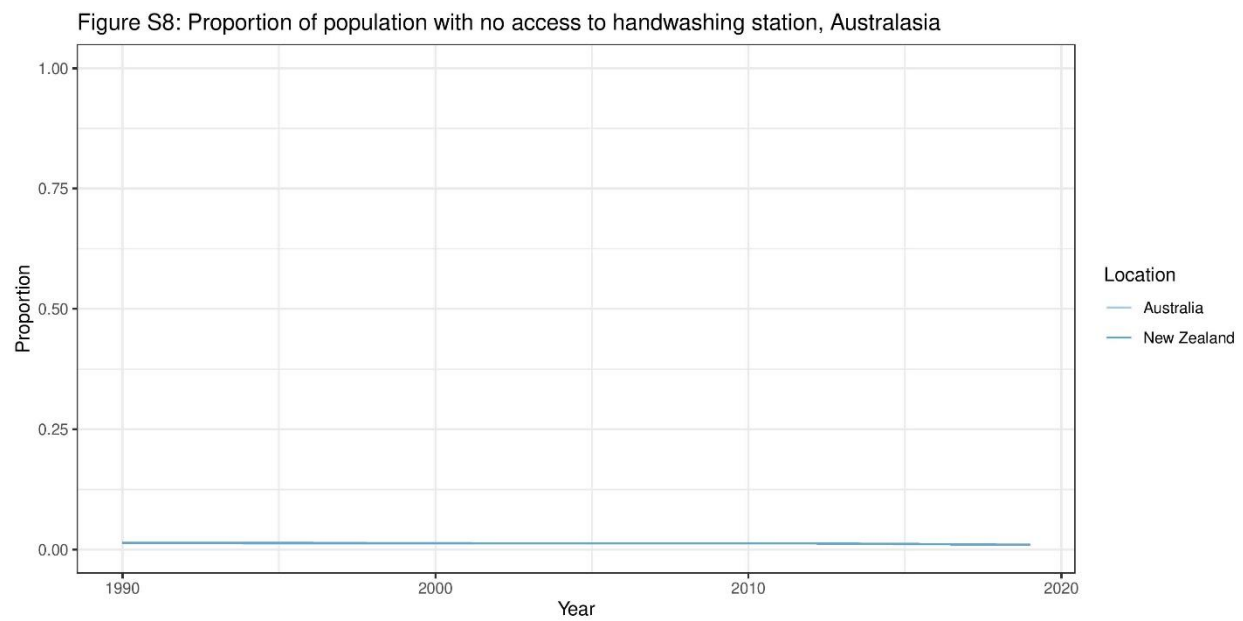


Figure S8. Estimated proportion of population with no access to handwashing station, Australasia (1990 – 2019).

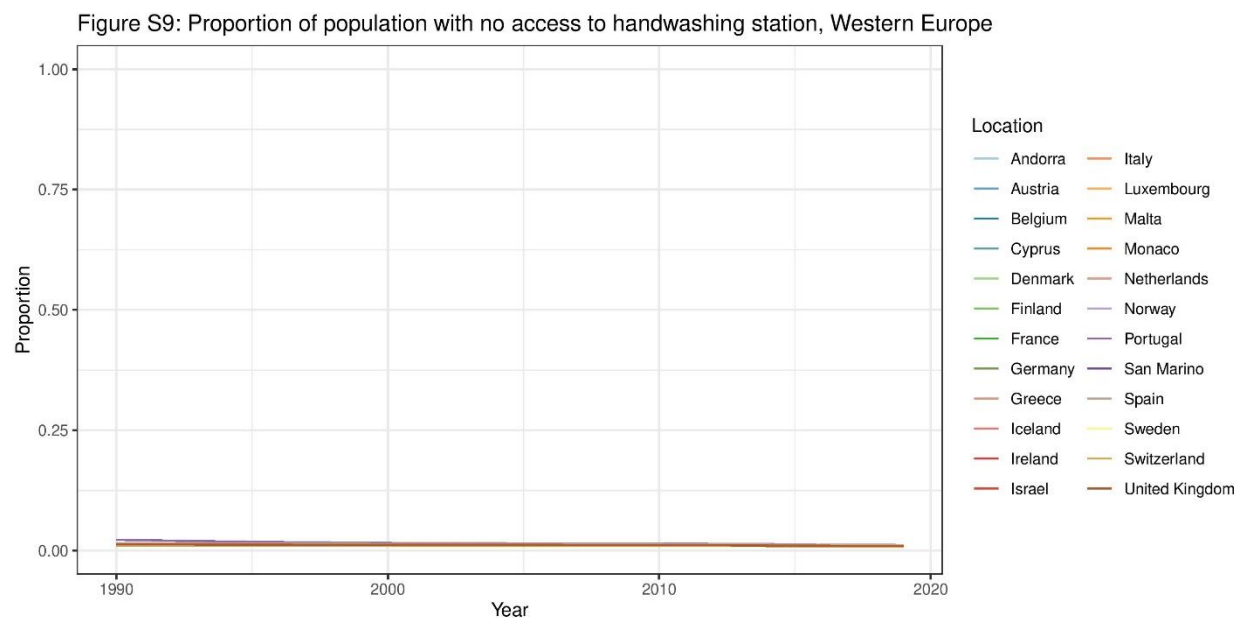


Figure S9. Estimated proportion of population with no access to handwashing station, Western Europe (1990 – 2019).

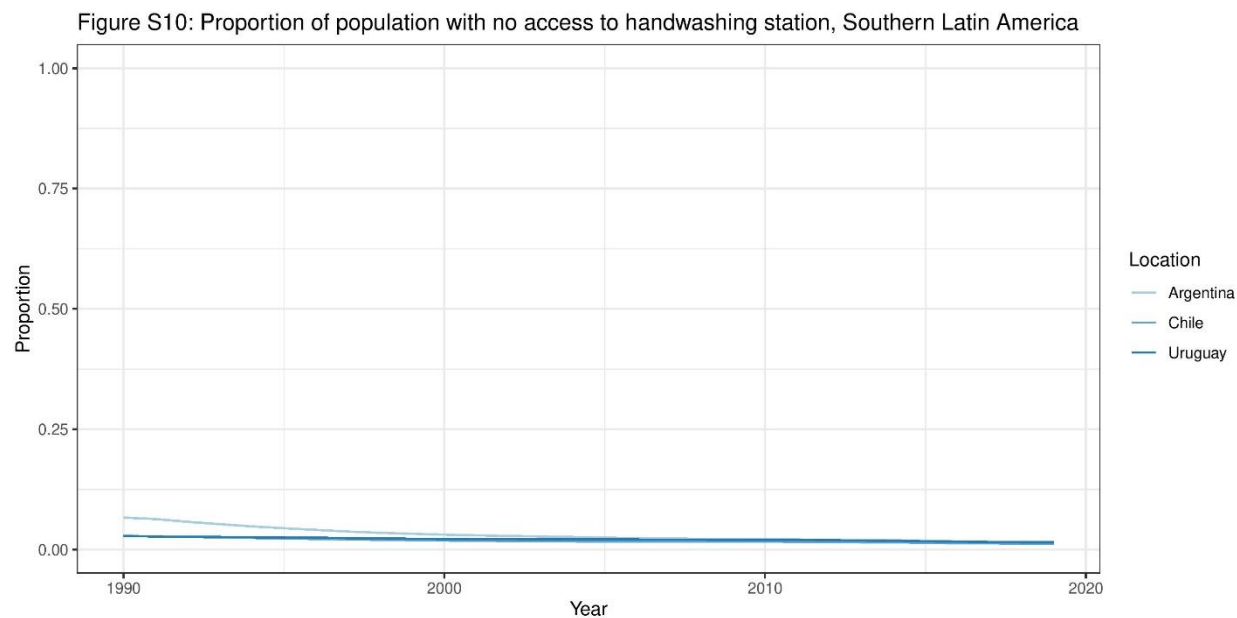


Figure S10. Estimated proportion of population with no access to handwashing station, Southern Latin America (1990 – 2019).



Figure S11: Proportion of population with no access to handwashing station, High-income North America

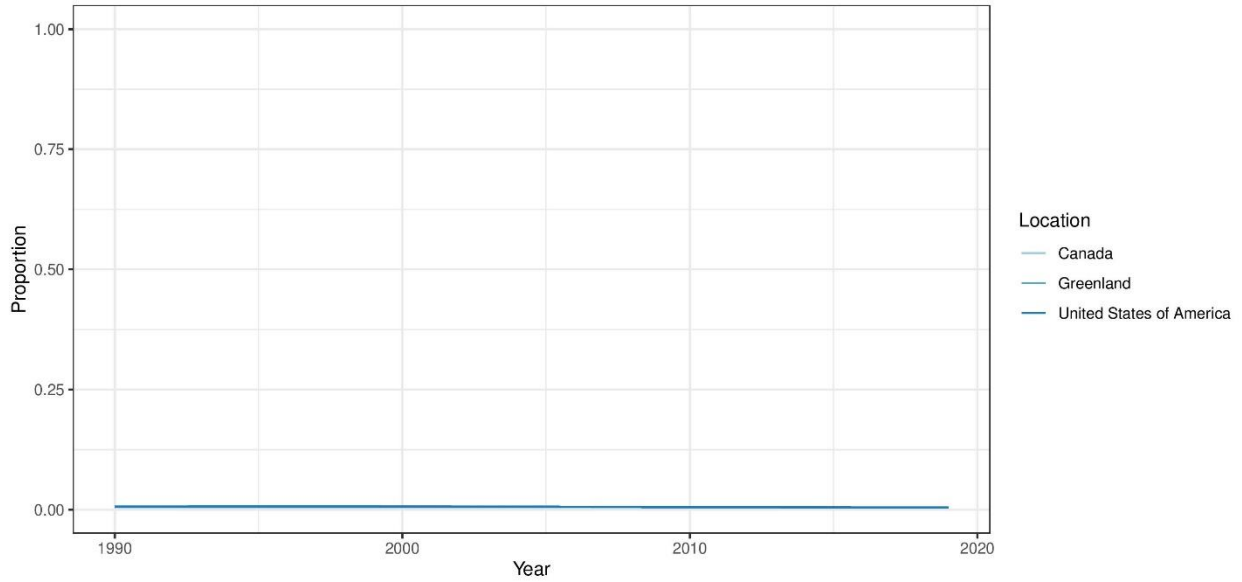


Figure S11. Estimated proportion of population with no access to handwashing station, High-income North America (1990 – 2019).

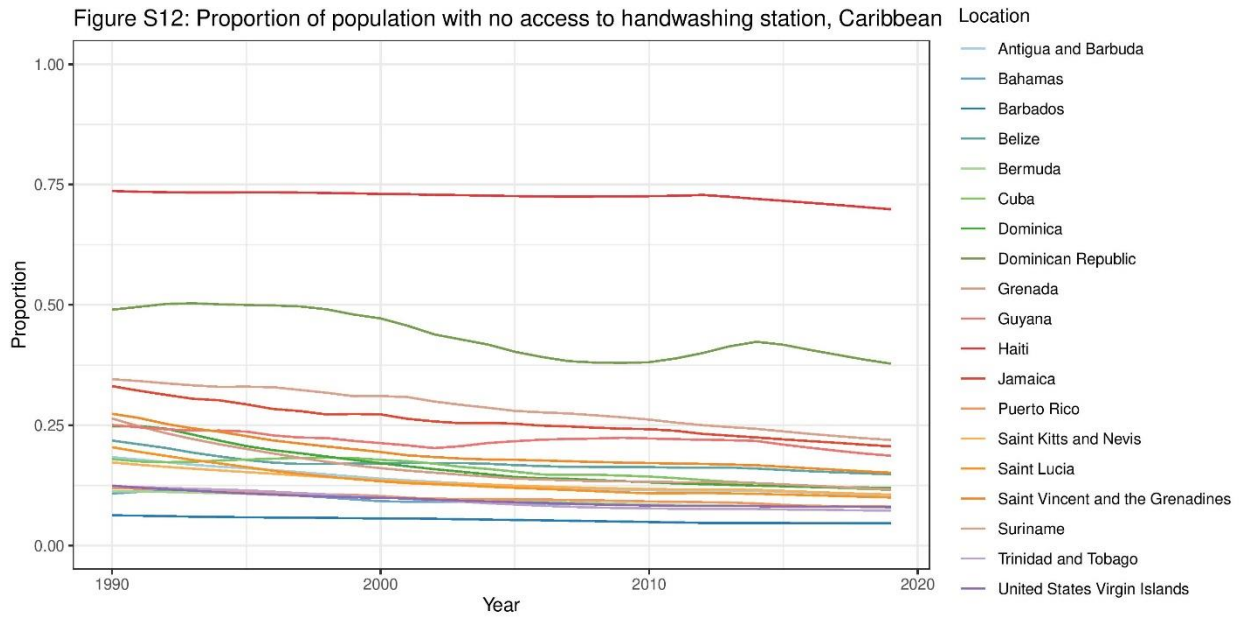


Figure S12. Estimated proportion of population with no access to handwashing station, Caribbean (1990 – 2019).

Figure S13: Proportion of population with no access to handwashing station, Andean Latin America

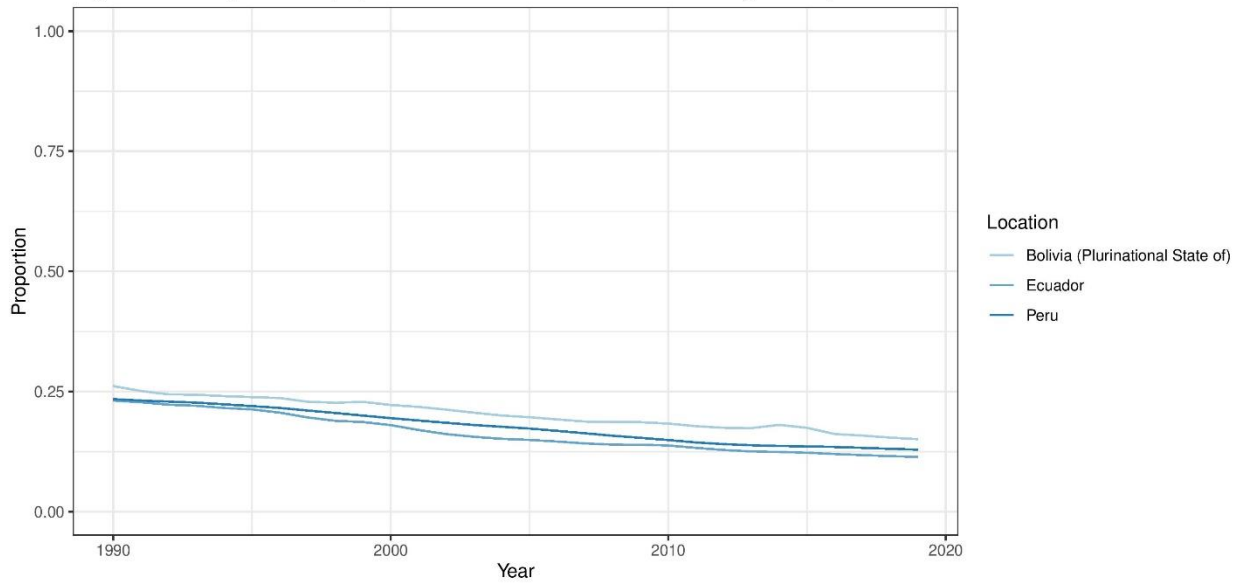


Figure S13. Estimated proportion of population with no access to handwashing station, Andean Latin America (1990 – 2019).

Figure S14: Proportion of population with no access to handwashing station, Central Latin America

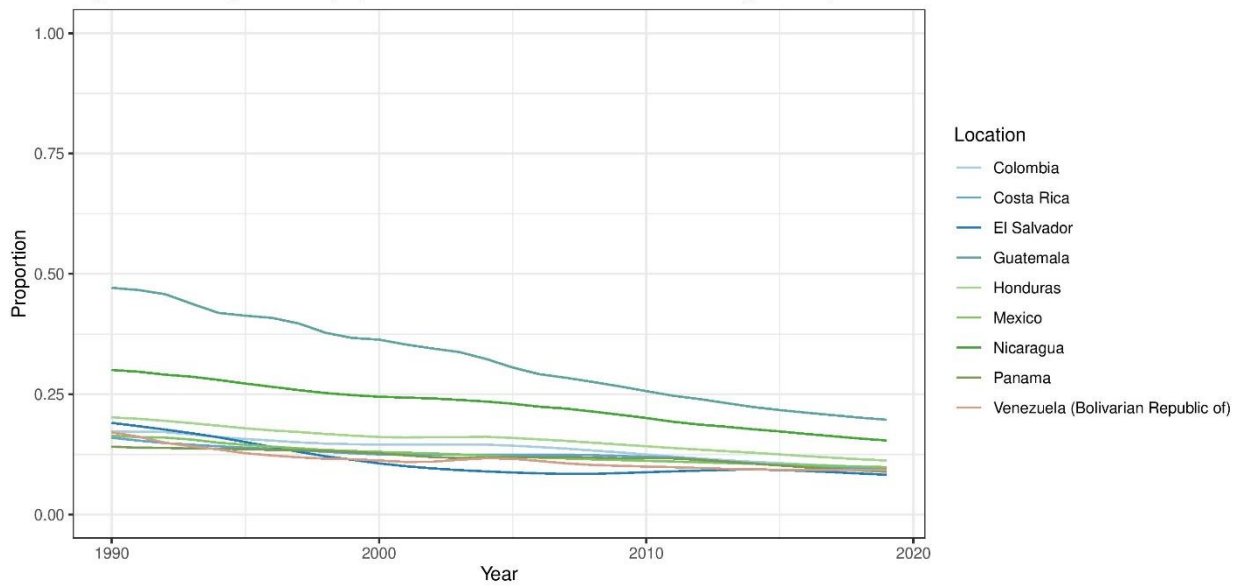


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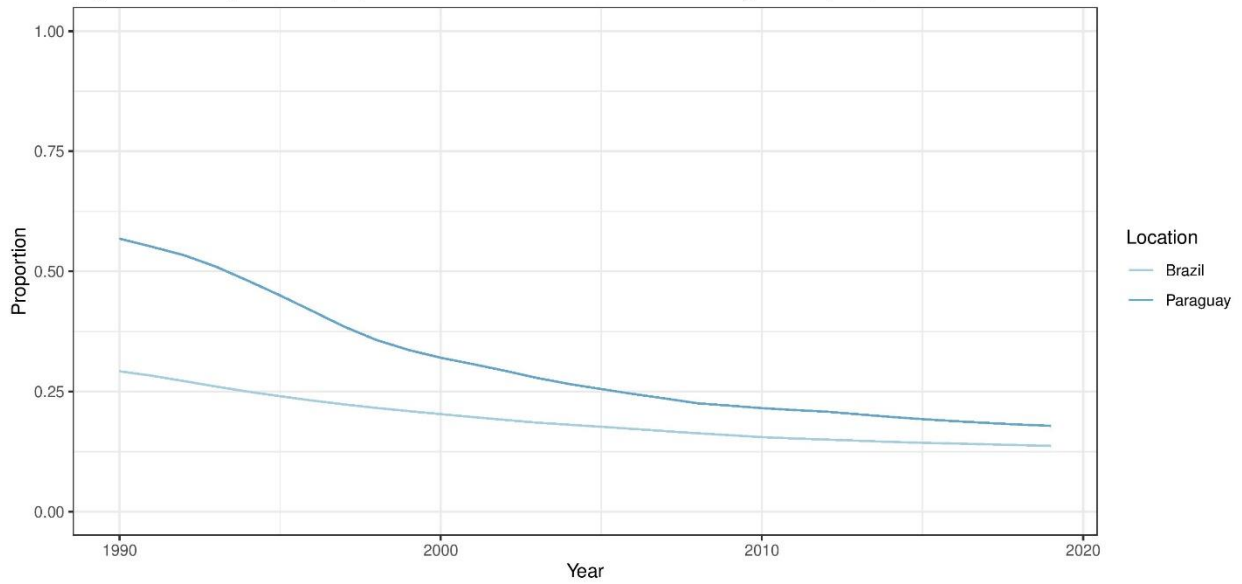


Figure S15 Estimated proportion of population with no access to handwashing station, Tropical Latin America (1990 – 2019).

Figure S16: Proportion of population with no access to handwashing station, North Africa and Middle East

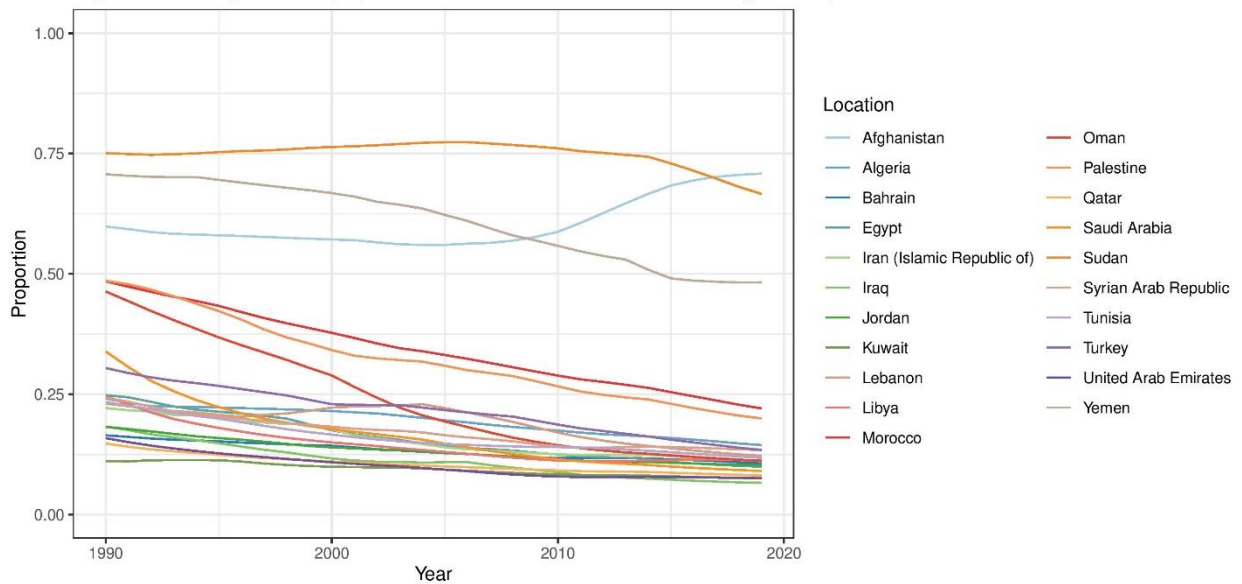


Figure S16. Estimated proportion of population with no access to handwashing station, North Africa and Middle East (1990 – 2019).

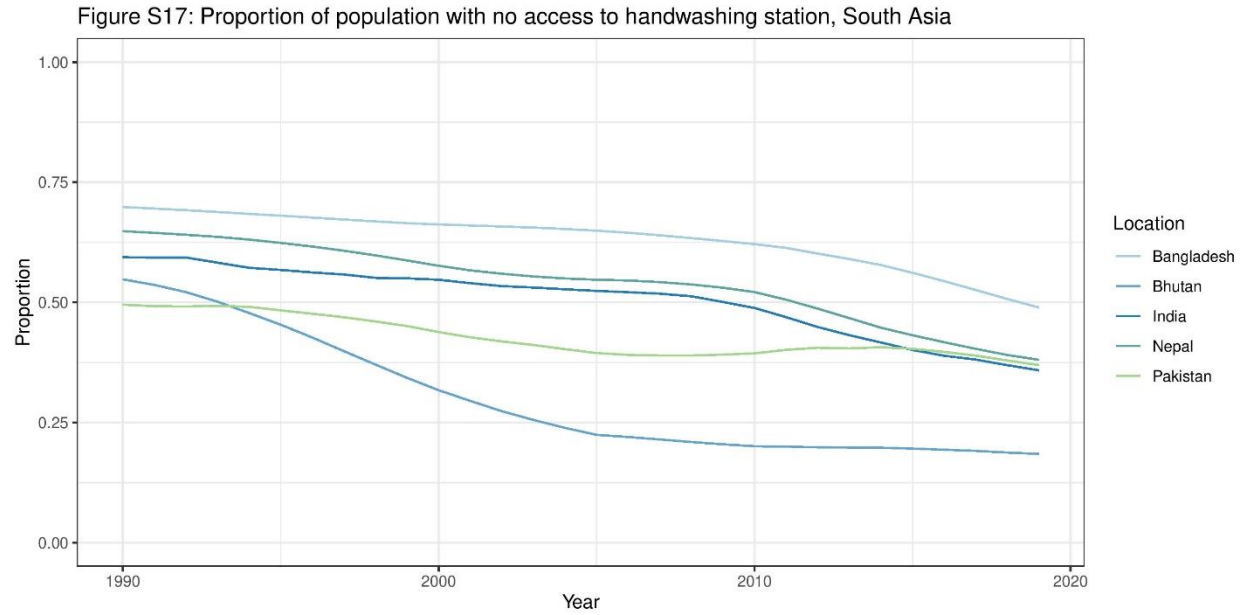


Figure S17. Estimated proportion of population with no access to handwashing station, South Asia (1990 – 2019).

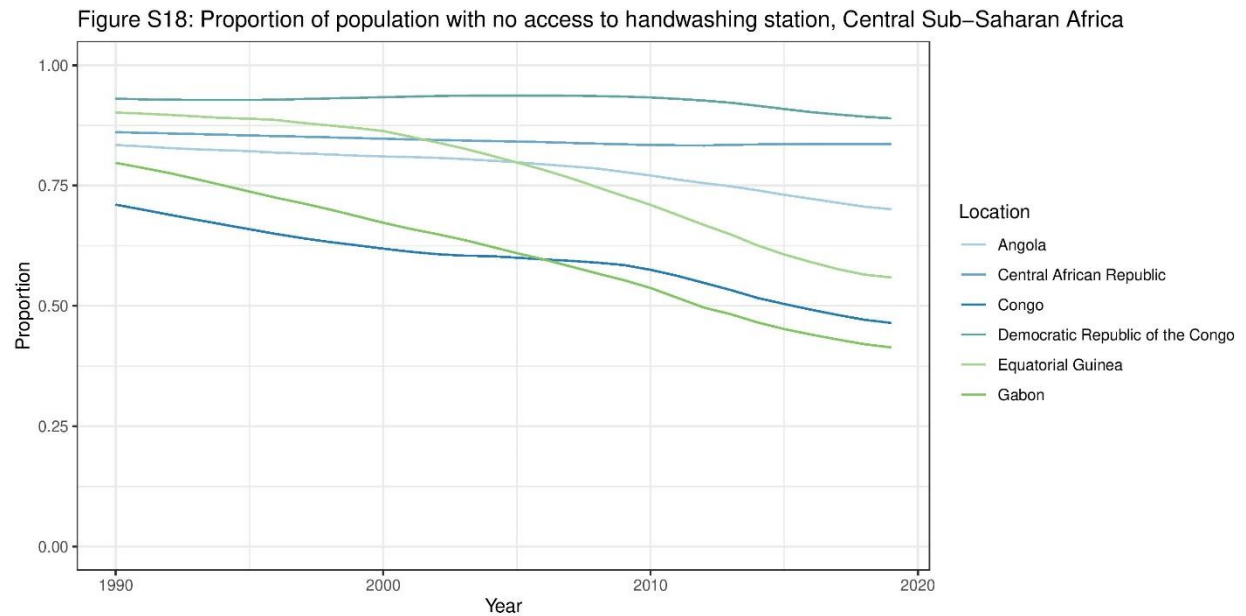


Figure S18. Estimated proportion of population with no access to handwashing station, Central Sub-Saharan Africa (1990 – 2019).

Figure S19: Proportion of population with no access to handwashing station, Eastern Sub-Saharan Africa

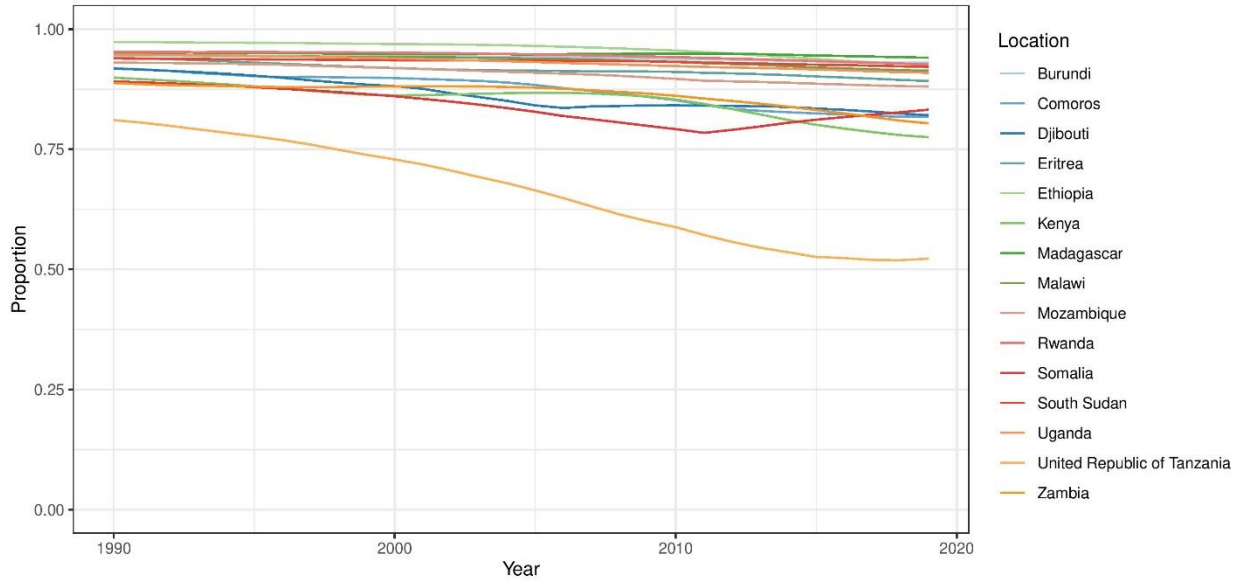


Figure S19. Estimated proportion of population with no access to handwashing station, Eastern Sub-Saharan Africa (1990 – 2019).

Figure S20: Proportion of population with no access to handwashing station, Southern Sub-Saharan Africa

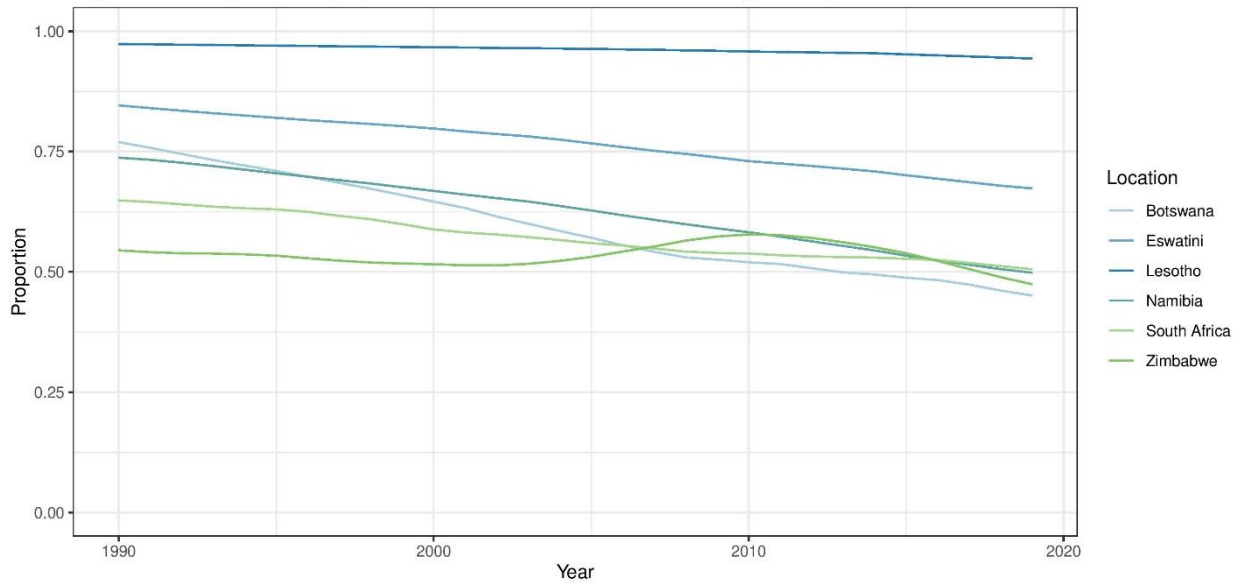


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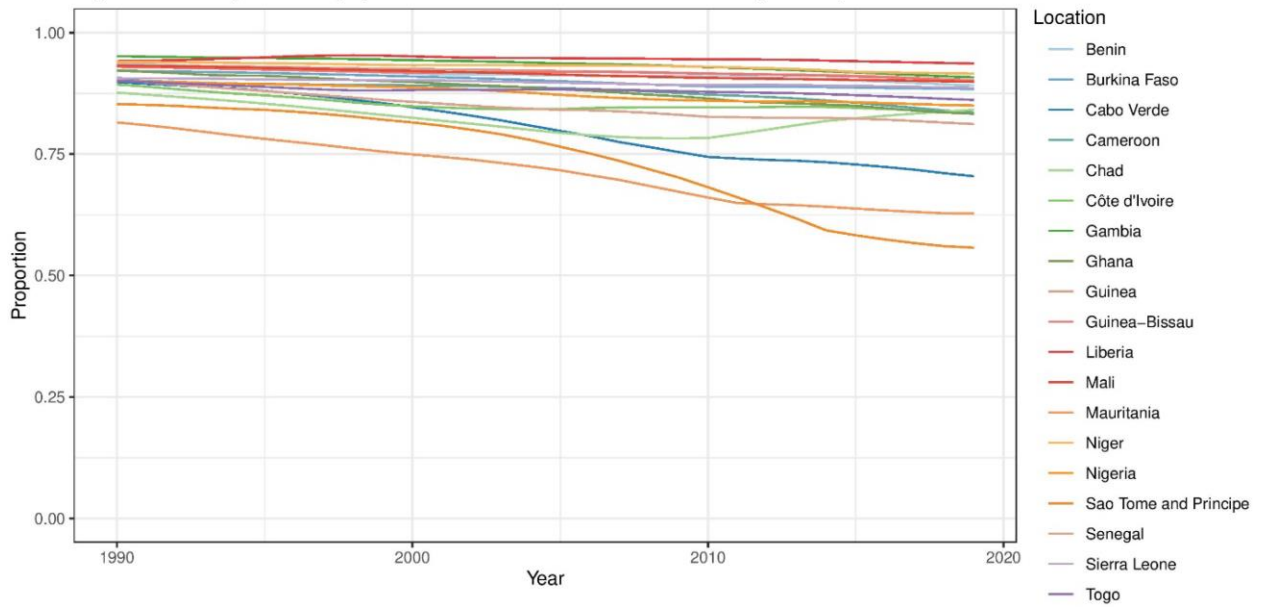


Figure S21. Estimated proportion of population with no access to handwashing station, Western Sub-Saharan Africa (1990 – 2019).

**wash\_hwws, Bangladesh, Both**  
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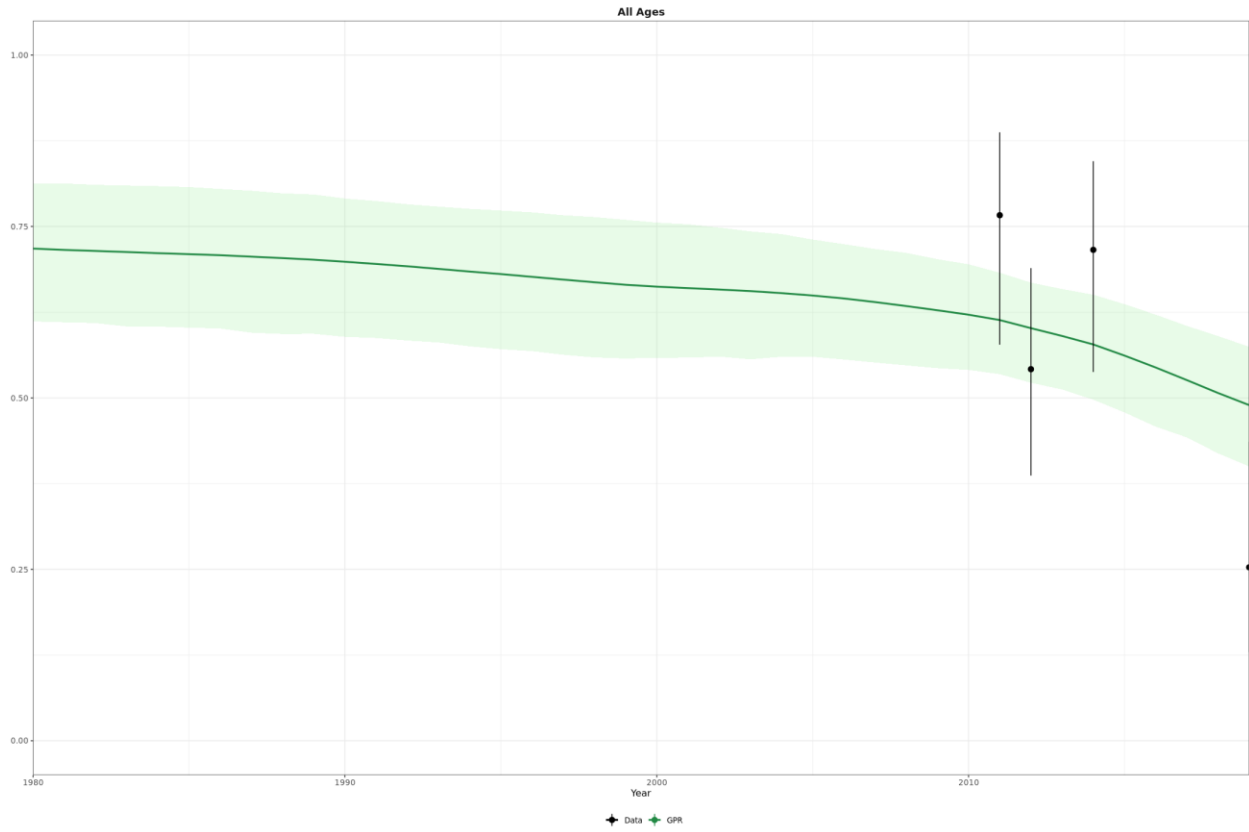


Figure S22. Spatiotemporal Gaussian process regression model estimates and input survey data of the proportion of the population of Bangladesh lacking access to handwashing facilities with available soap and water in 2019.

**wash\_hwws, China, Both**

Amplitude 0.258

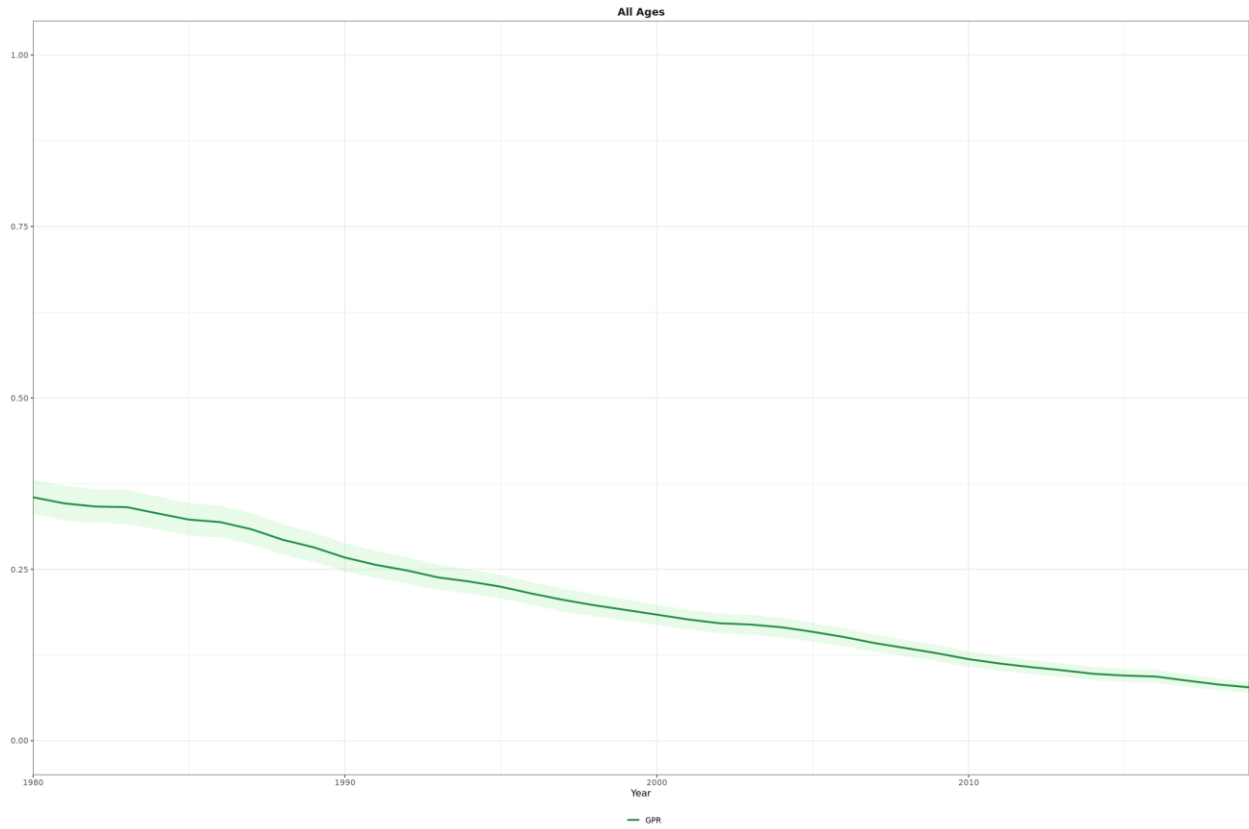


Figure S23. Spatiotemporal Gaussian process regression model estimates and input survey data of the proportion of the population of China lacking access to handwashing facilities with available soap and water in 2019.



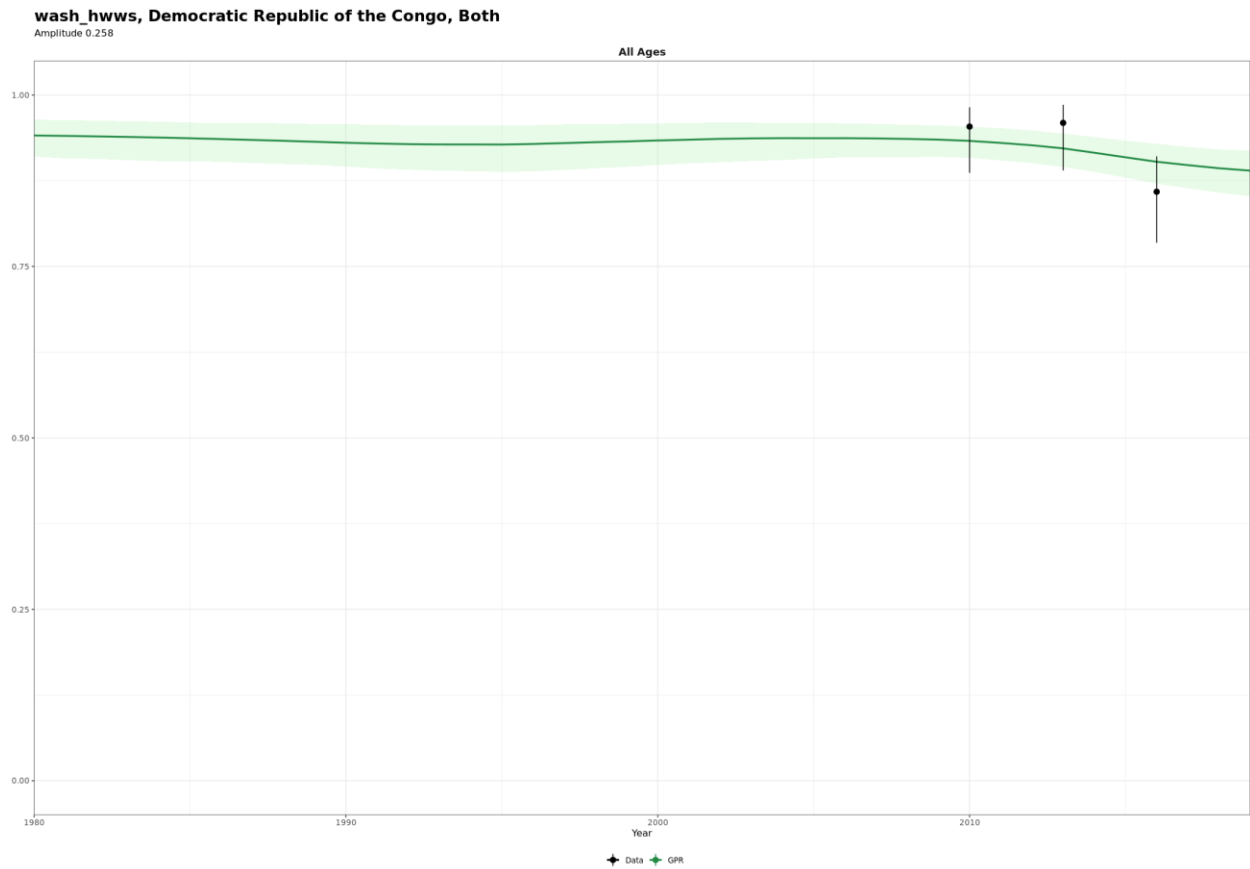


Figure S24. Spatiotemporal Gaussian process regression model estimates and input survey data of the proportion of the population of the Democratic Republic of the Congo lacking access to handwashing facilities with available soap and water in 2019.

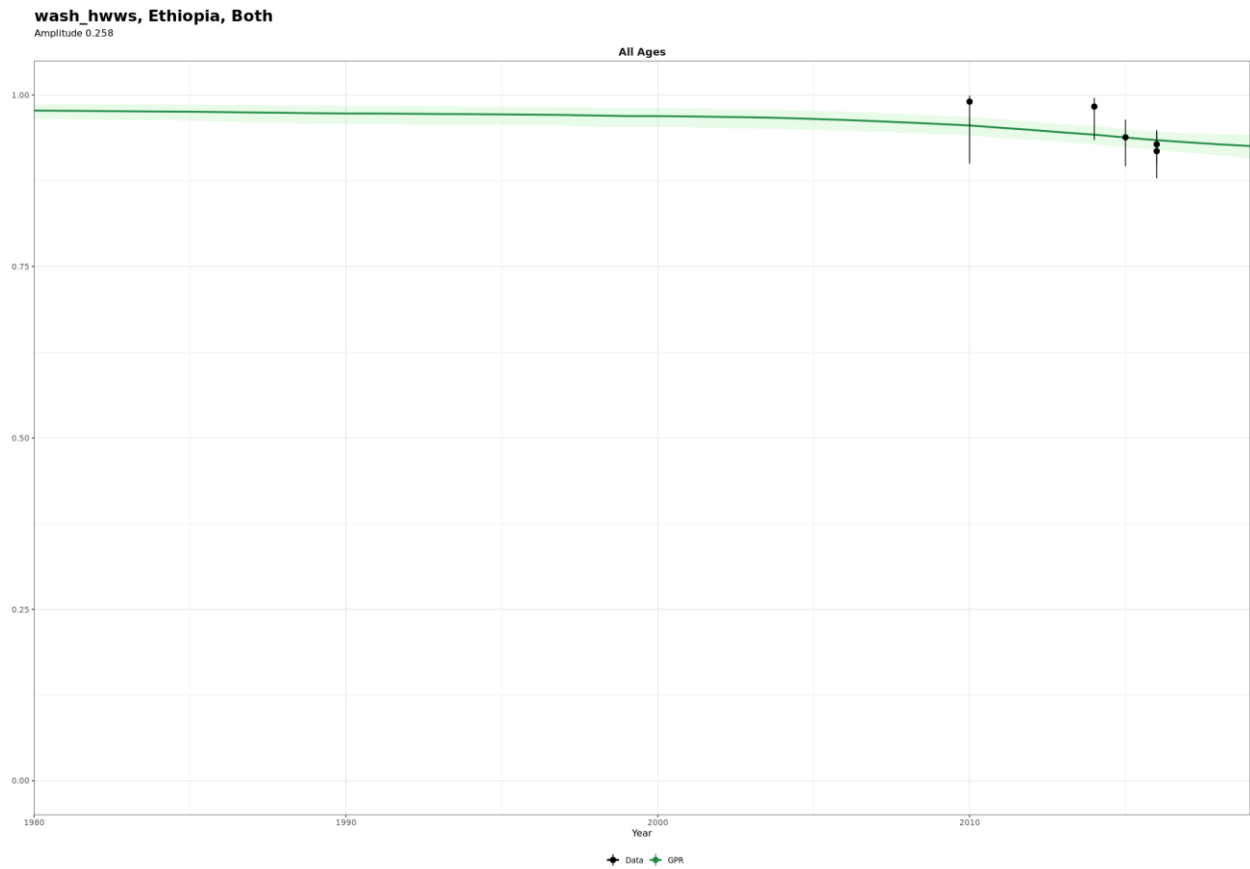


Figure S25. Spatiotemporal Gaussian process regression model estimates and input survey data of the proportion of the population of Ethiopia lacking access to handwashing facilities with available soap and water in 2019.

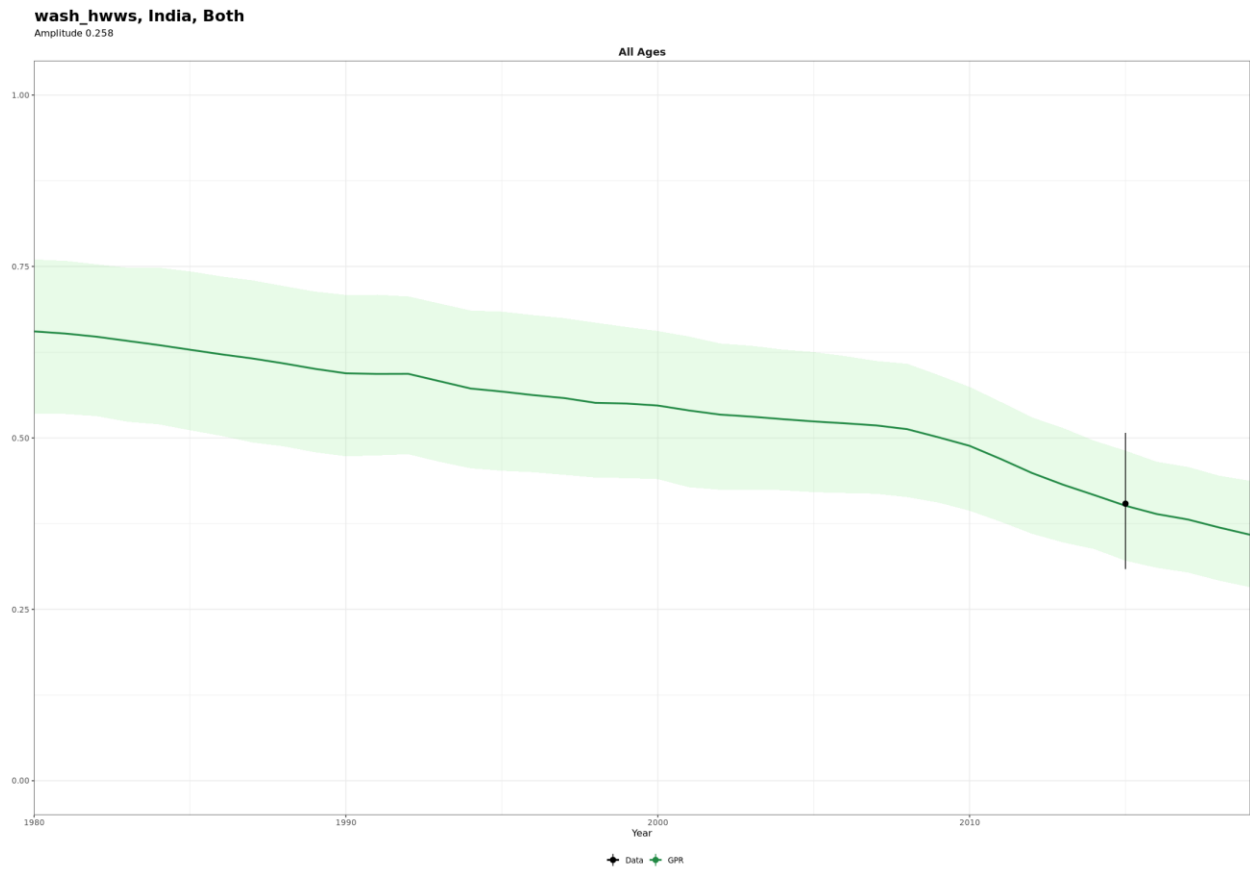


Figure S26. Spatiotemporal Gaussian process regression model estimates and input survey data of the proportion of the population of India lacking access to handwashing facilities with available soap and water in 2019.

**wash\_hwws, Indonesia, Both**

Amplitude 0.258

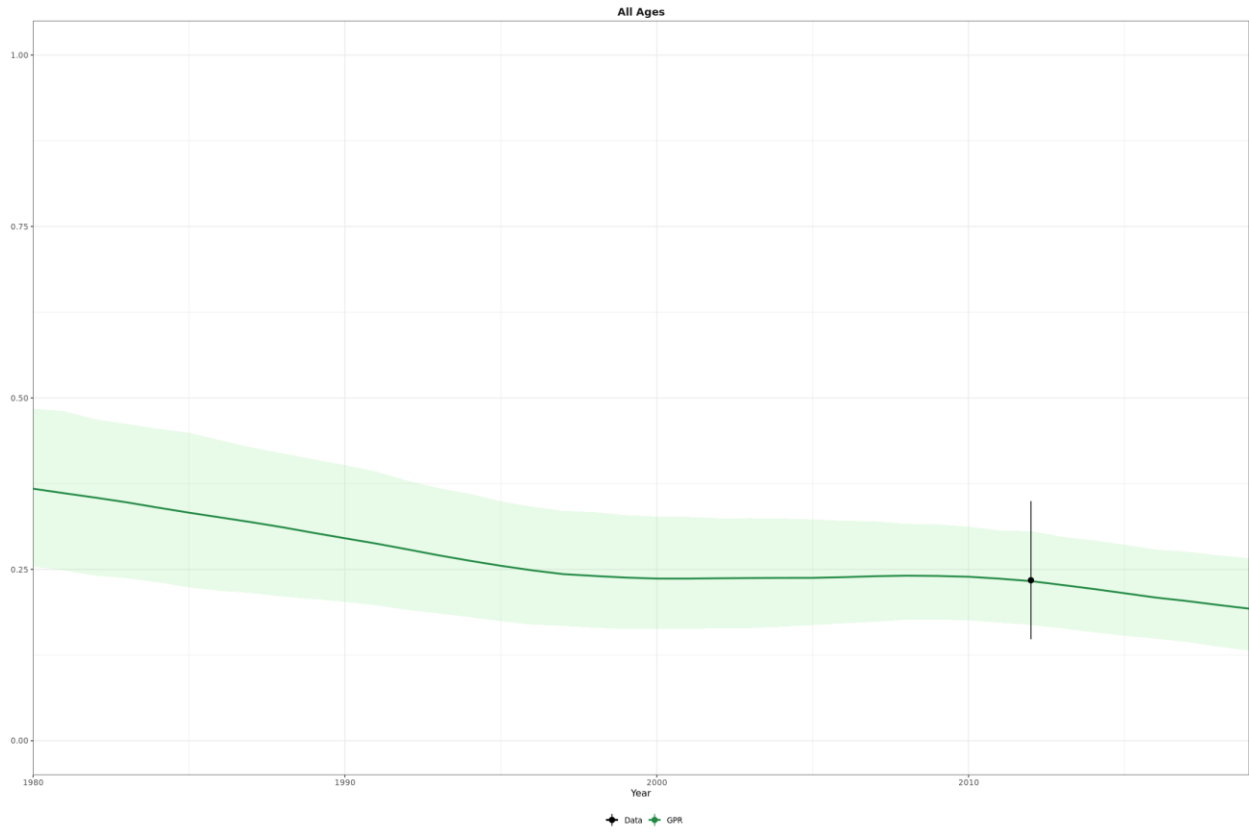


Figure S27. Spatiotemporal Gaussian process regression model estimates and input survey data of the proportion of the population of Indonesia lacking access to handwashing facilities with available soap and water in 2019.

**wash\_hwws, Nigeria, Both**

Amplitude 0.258

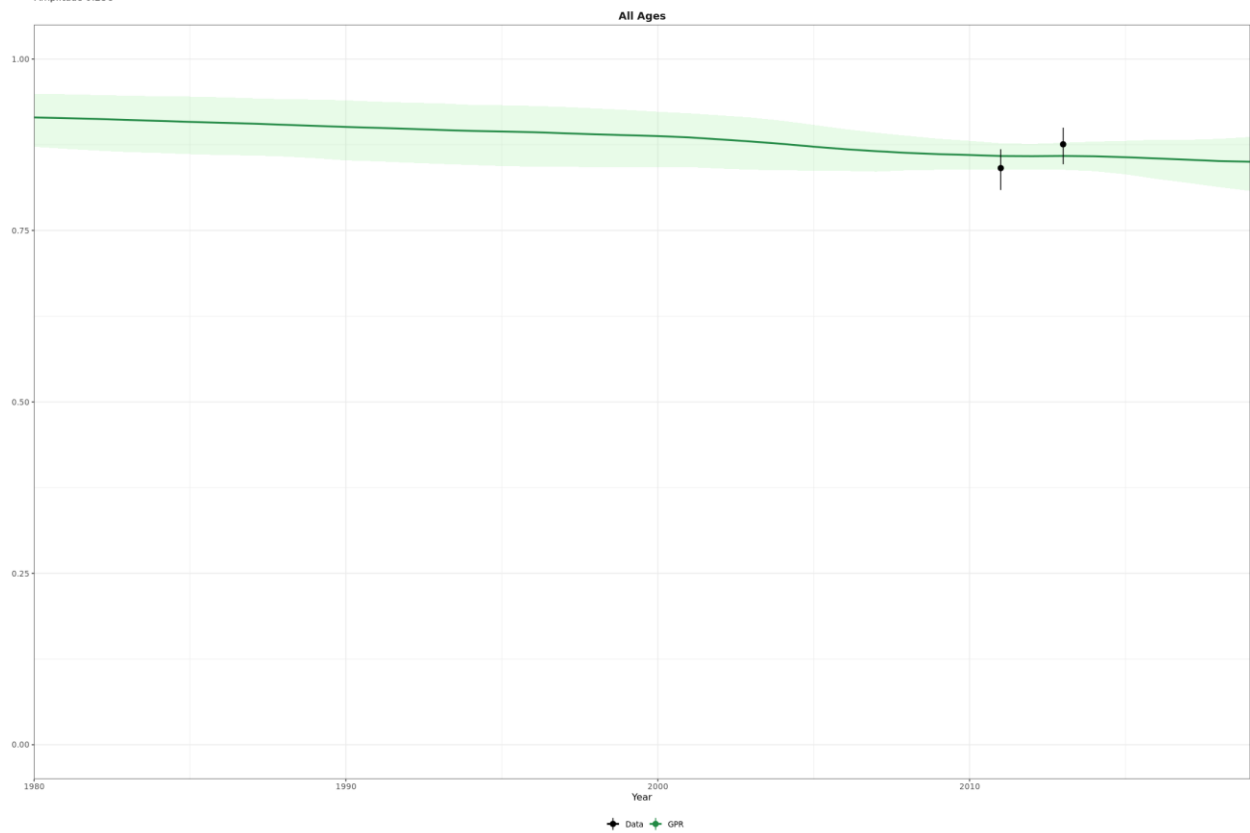


Figure S28. Spatiotemporal Gaussian process regression model estimates and input survey data of the proportion of the population of Nigeria lacking access to handwashing facilities with available soap and water in 2019.

**wash\_hwws, Pakistan, Both**

Amplitude 0.258

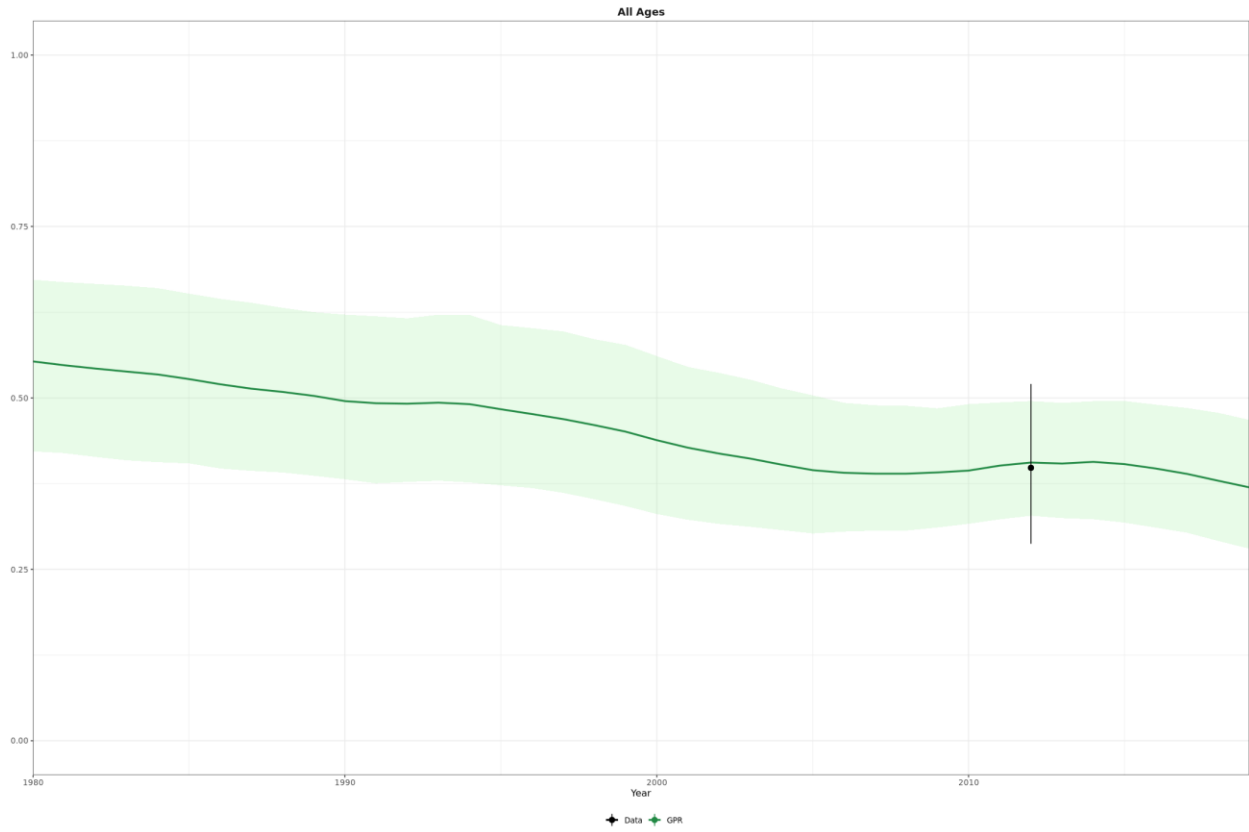


Figure S29. Spatiotemporal Gaussian process regression model estimates and input survey data of the proportion of the population of Pakistan lacking access to handwashing facilities with available soap and water in 2019.