HOW PUBLIC FINANCIAL MANAGEMENT SHAPES EDUCATION AND HEALTH OUTCOMES: A CONFIGURATIONAL PERSPECTIVE

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Reproducibility Package "ReadMe" file for fsQCA and Bayesian Analysis

This reproducibility package documents the data, calibration procedures, analytical steps, and results for the fsQCA (fuzzy-set Qualitative Comparative Analysis) and Bayesian analysis conducted for "*How Public Financial Management Shapes Education and Health Outcomes: A Configurational Perspective*" (Singh & Sutherland, 2026). The study investigates how public financial management configurations influence education and health outcomes across developing and middle-income economies, using data from PEFA assessments (2016–2025), UNESCO, the World Development Indicators (WDI), and the Worldwide Governance Indicators (WGI).

Eight analyses are reported across two outcome domains (education and health) and two sample specifications (full sample and low-expenditure sub-sample):

1. Primary education attainment, full sample
2. Primary education attainment, low education expenditure sub-sample
3. Secondary education attainment, full sample
4. Secondary education attainment, low education expenditure sub-sample
5. Universal Health Coverage, full sample
6. Universal Health Coverage, low health expenditure sub-sample
7. Under-Five Mortality Rate, full sample
8. Under-Five Mortality Rate, low health expenditure sub-sample

Statement about Rights

- I certify that the author(s) of the manuscript have legitimate access to and permission to use the data used in this manuscript.
- I certify that the author(s) of the manuscript have documented permission to redistribute/publish the data contained within this replication package. [Appropriate permissions are documented in the LICENSE.txt file.]

Data and Codes for Figures in the Paper

The Folder titled "Paper_Charts" has the excel file with the data in the sub-folder "Data for charts" – each sheet in the excel workbook has been named corresponding to the dataset corresponding to the respective figure. Charts have been made in python and the relevant codes are in the sub-folder "Python codes for charts". The output is saved in sub-folder "Figures". The source of the data as accessed in September 2025 for figures 1, 2 and 3 are mentioned in the table below..

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Disclaimer: The findings, interpretations, and conclusions expressed in this paper are those of the authors and do not necessarily reflect the views of the World Bank, its Executive Directors, or the governments they represent.

Figure	Source of Data	Folder-> Filename in the Replication Package
Figure 1 (2010-2024)	World Development Indicators, World Bank, accessed in September 2025 https://databank.worldbank.org/source/world-development-indicators	Paper_Charts -> Figures ->Figure1.png
Figure 2 (2010-2022)	World Development Indicators, World Bank, accessed in September 2025 https://databank.worldbank.org/source/world-development-indicators	Paper_Charts -> Figures ->Figure2.png
Figure 3 (2011-2022)	Our World in Data with underlying dataset as OECD — OECD Official Development Assistance (ODA) - DAC2A: Aid (ODA) disbursements to countries and regions, OECD Data Explorer - accessed in September 2025 https://ourworldindata.org/grapher/foreign-aid-received-net	Paper_Charts -> Figures ->Figure3.png

Data for statistical and econometric analysis

Sources

This study draws on five data sources as accessed in September, 2025:

1. PEFA Assessments (2016 to 2025): Public Expenditure and Financial Accountability framework scores for PI-01, PI-02, and PI-03. Available at: https://www.pefa.org/index.php/assessments/batch-downloads
2. UNESCO Institute for Statistics: Under-Five Mortality Rate (U5MR), Available at https://data.unicef.org/topic/child-survival/under-five-mortality/
3. World Bank World Development Indicators (WDI): GDP per capita (GDPpc), education expenditure as % of GDP (Edexp), health expenditure as % of GDP (Hexp), and Primary education attainment rate (PeD) and upper secondary education attainment rate (SeD). Available at: https://databank.worldbank.org/source/world-development-indicators
4. World Bank Development Data Hub: Universal Health Coverage Index (UHC). https://datacatalog.worldbank.org/search/dataset/0060802
5. Worldwide Governance Indicators (WGI): Government Effectiveness dimension (WGIge). Available at: https://www.worldbank.org/en/publication/worldwide-governance-indicators

Access

All data sources are publicly available. **Three raw dataset is provided with this package in the folder Final Datasets for Estimation:**

1. Full sample: all country-year observations with valid data across all variables- titled "**PFM_study_fsqca_dataset_June162026.csv**".
2. Low education expenditure sub-sample: observations from the full sample where education expenditure (Edexp) falls below the crossover (midpoint) value of 5.052156% of GDP, as specified in the calibration. This sub-sample was constructed in Microsoft Excel by filtering the full dataset to retain only rows where Edexp < 5.052156. The excel is titled as "**PFM_study_fsqca_low_Edexp_subsample_June162026.csv"**
3. Low health expenditure sub-sample: observations from the full sample where health expenditure (Hexp) falls below the crossover (midpoint) value of 5.436781% of GDP. This sub-sample was constructed in Microsoft Excel by filtering the full dataset to retain only rows where Hexp < 5.436781. The excel is titled as "**PFM_study_fsqca_low_Hexp_subsample_June162026.csv**"

All filtering used the raw (uncalibrated) expenditure variable values. The midpoint thresholds used for filtering correspond exactly to the crossover points specified in the calibration commands.

SOFTWARE AND SYSTEM REQUIREMENTS

Item	**Details**
Software	fsQCA software by Charles Ragin & Sean Davey
Download	https://sites.socsci.uci.edu/~cragin/fsQCA/software.shtml
Operating System	Windows
License	Free
Algorithm	Quine-McCluskey

Note: The analysis for this paper was conducted using the University of California's fsQCA desktop software, which is GUI-based and does not support scripting. As a result, the findings cannot be reproduced by running executable script files. Instead, this README and the accompanying data files provide detailed procedural documentation sufficient for a third party to replicate all results by following the steps described below. Reviewers are invited to follow these steps when conducting documentation and output verification to confirm that the procedure log, calibrated data, and reported outputs are internally consistent and support reproducibility of the analysis.

VARIABLE DEFINITIONS AND CALIBRATION

Raw variables

Variable name	**Description**	**Source**

PeD	Primary education attainment rate (%)	UNESCO
SeD	Upper secondary education attainment rate (%)	UNESCO
UHC	Universal Health Coverage Index	WB Dev. Data Hub
U5MR	Under-Five Mortality Rate (per 1,000 live births)	WDI
PI1	PEFA PI-01: Aggregate expenditure outturn	PEFA
PI2	PEFA PI-02: Expenditure composition outturn	PEFA
PI3	PEFA PI-03: Revenue outturn	PEFA
Edexp	Education expenditure as % of GDP	WDI
Hexp	Health expenditure as % of GDP	WDI
WGIge	WGI Government Effectiveness score	WGI
GDPpc	GDP per capita (USD)	WDI

Calibration thresholds summary table

The table below serves as a reference for the thresholds used in calibration. Full derivation details and calibration commands are documented in Steps 1 and 3 below.

Calibrated variable	**Raw variable**	**Full membership (1.0)**	**Crossover (0.5)**	**Full non-membership (0.0)**	**Basis**
ped	PeD	98.64	71.73	23.09	Percentile-based
sed	SeD	80.82	33.25	7.20	Percentile-based
uhc	UHC	72.0	51.0	33.6	Percentile-based
u5mr	U5MR	108.66	41.79	11.27	Percentile-based
pi1	PI1	3.5 (B+)	2.5 (C+)	1.5 (D+)	Theory-based (PEFA scale)
pi2	PI2	3.5 (B+)	2.5 (C+)	1.5 (D+)	Theory-based (PEFA scale)
pi3	PI3	3.5 (B+)	2.5 (C+)	1.5 (D+)	Theory-based (PEFA scale)
edexp	Edexp	8.27	5.05	3.12	Percentile-based
hexp	Hexp	9.45	5.44	3.31	Percentile-based
ge	WGIge	80.57	49.64	29.21	Percentile-based
gpd	GDPpc	47,949.73	5,837.84	811.18	Percentile-based

STEP-BY-STEP REPRODUCTION PROCEDURE FOR fsQCA

Step 1: Determine calibration thresholds in Excel

Before opening fsQCA, calculate the calibration thresholds in Microsoft Excel using the *PERCENTILE.INC* function. The dataset covers the period 2005 to 2023. The number of valid observations by variable were: PI1 (249), PI2 (248), PI3 (249), PeD (103), SeD (104), UHC (57), U5MR (213), Edexp (227), Hexp (226), WGIge (3,992), and GDPpc (3,793).
The variables PeD, SeD, UHC, U5MR, Edexp, Hexp, WGIge, and GDPpc were located in columns F through M of the Excel dataset respectively, with observations in rows 2 to 4029. For each variable, calculate the 90th, 50th, and 10th percentiles to obtain the full membership, crossover, and full non-membership thresholds. Using PeD as an illustrative example:

- Full membership (1.0): *=PERCENTILE.INC(F2:F4029, 0.9)* returned 98.64309082
- Crossover (0.5): *=PERCENTILE.INC(F2:F4029, 0.5)* returned 71.73000336
- Full non-membership (0.0): *=PERCENTILE.INC(F2:F4029, 0.1)* returned 23.09000015

Repeat this procedure for SeD (column G), UHC (column H), U5MR (column I), Edexp (column J), Hexp (column K), WGIge (column L), and GDPpc (column M). The thresholds for PI1, PI2, and PI3 were not derived from the data but set using theoretically grounded PEFA scale anchors: 3.5 (full membership, B+ or above), 2.5 (crossover, C+), and 1.5 (full non-membership, D+). The resulting thresholds are documented in the calibration thresholds summary table above and correspond to the values entered in Step 3.

Step 2: Step 10: Open the full sample data file in fsQCA

1. Launch the fsQCA software.

2. Go to *File > Open* and navigate to the folder where the datasets are stored. Select the appropriate dataset:
   - For Analyses 1, 3, 5, and 7 (full sample for all for outcomes): PFM_study_fsqca_dataset_full.csv

3. Confirm all variables load correctly.

Step 3: Run calibration

Using *Variables > Compute*, enter each of the following calibration commands in sequence. Thresholds represent full membership (1.0), crossover point (0.5), and full non-membership (0.0). Confirm that all calibrated variable values fall between 0 and 1 for all cases.

compute: ped = calibrate(PeD, 98.64309082, 71.73000336, 23.09000015)
compute: sed = calibrate(SeD, 80.82238083, 33.2491951, 7.20099988)
compute: uhc = calibrate(UHC, 72, 51, 33.6)
compute: u5mr = calibrate(U5MR, 108.6612573, 41.79294382, 11.2700163)
compute: pi1 = calibrate(PI1, 3.5, 2.5, 1.5)
compute: pi2 = calibrate(PI2, 3.5, 2.5, 1.5)
compute: pi3 = calibrate(PI3, 3.5, 2.5, 1.5)
compute: edexp = calibrate(Edexp, 8.265766479, 5.05215597, 3.119662164)
compute: hexp = calibrate(Hexp, 9.451896195, 5.43678069, 3.30845833)
compute: ge = calibrate(WGIge, 80.297575, 49.61597865, 29.30324703)
compute: gpd = calibrate(GDPpc, 47949.73028, 5837.842245, 811.1760615)

Save the calibrated dataset by navigating to *File > Save as*, then choose your desired folder location. *Type* the file name as "*PFM_study_fsqca_dataset_(full-calibrated)*" and keep the *Save as type* as *Comma Separated (*.csv)*. Click *Save* to complete the save process.

Note on u5mr: The calibrated variable u5mr represents high Under-Five Mortality Rate. The outcome modelled in Analyses 7 and 8 is specified as ~u5mr, where "~" indicates "absence of. Therefore, ich represents the absence of high Under-Five Mortality Rate, not its presence.

Step 4: Build the Truth Table

Navigate to *Analyze > Truth Table Algorithm*, set the outcome variable as "*ped*" and causal conditions as "*pi1, pi2, pi3, edexp, ge, gpd*".Then click *OK* to generate the Primary education (full sample) outcome.

Note. *Check* the box "*Show solution cases in output*" and then keep the *dropdown* set at "*Country*" before clicking *OK* to view which countries fit the criteria for each solution pathway.

From the truth table window that pops up, navigate to *Edit > Delete and code*, set the frequency cutoff to *1* and the consistency cutoff to *0.85*. Click *OK* to apply. Compare the resulting output against the corresponding truth table file provided in this package.

Step 5: Run Boolean minimization

Click *Standard Analyses*. In the intermediate solution window, the software lists three causal conditions and asks the user to specify, for each causal condition, whether it is expected to contribute to the outcome when present, when absent, or in either state. For each analysis, the following directional expectations were applied by selecting *Present* for all conditions:

Condition	**Expected direction by outcome**			
	ped	**sed**	**uhc**	**~u5mr**
pi1 (Strong aggregate expenditure control)	Present	Present	Present	Present
pi2 (Strong expenditure composition control)	Present	Present	Present	Present
pi3 (Strong revenue outturn control)	Present	Present	Present	Present
edexp / hexp (High sectoral spending)	Present	Present	Present	Present
ge (High government effectiveness)	Present	Present	Present	Present
gpd (High GDP per capita)	Present	Present	Present	Present

Click *OK* to generate the three solution sets: COMPLEX SOLUTION, PARSIMONIOUS SOLUTION, and INTERMEDIATE SOLUTION.

Close the intermediate solution window and compare the output displayed in the main window with the corresponding results files provided in this package.

Step 6: Conduct necessity analysis

From the main window, navigate to *Analyze > Necessary Conditions.* In the dialog box, select the outcome variable used in Step 5 from the *Outcome dropdown*. Then, using the *Add Condition* dropdown, select each condition individually and click the arrow button to add each, one by one, to the conditions list. Add each condition and its negation (for example, pi1 and ~pi1) so that both are tested to account for causal asymmetries. Click *OK* to run the analysis. Compare the displayed results to those documented in the corresponding results files provided in this package.

Step 7: Repeat for the remaining three full sample analyses

Repeat steps 4, 5 and 6 separately for each of the remaining three full sample analyses for ped, uhc, and ~u5mr. Set the outcome variable and causal conditions as specified in the summary table below, then click *OK* to generate the truth table for each analysis.

Analysis	**Outcome variable**	**Causal conditions**	**Frequency cutoff**	**Consistency cutoff**
1: Primary education (full sample)	ped	pi1, pi2, pi3, edexp, ge, gpd	1	0.85
3: Secondary education (full sample)	sed	pi1, pi2, pi3, edexp, ge, gpd	1	0.85
5: UHC (full sample)	uhc	pi1, pi2, pi3, hexp, ge, gpd	1	0.85
7: U5MR (full sample)	~u5mr	pi1, pi2, pi3, hexp, ge, gpd	1	0.85

Note. A consistency cutoff of 0.85 was entered for all eight analyses. In fsQCA, truth-table rows are retained when their consistency meets or exceeds the specified cutoff. As a result, the output may display values slightly above 0.85, reflecting the observed consistency values of retained rows rather than a contradiction of the threshold entered.

Step 8: Create low spend sub-sample for education

From the desktop, open the *PFM_study_fsqca_dataset_(full-calibrated)*. Once opened, click *Save as* and then choose your desired folder location. *Type* the new file name as *PFM_study_fsqca_dataset_(low_Edexp-calibrated)* and keep the *Save as type* as *Comma Separated (*.csv)*. Click *Save* to create a new data file for the low education expenditure sub-sample.

In this new dataset, navigate to cell A1, and turn on filtering for the selected cell by pressing *CTRL+Shift+L* or by navigating to the *Filter* option on Excel's menu bar.

Navigate to the "*Edexp*" variable and filter the full dataset to retain only rows where Edexp < 5.05215597, the crossover point referenced in Step 2. The number of observations for Edexp should reduce from 228 to 113. Verify that the new range for *Edexp* is 1.57675 (South Sudan in 2012) to 5.04898 (Dominican Republic in 2012).

Turn off the filter then *Save* and *Close* the file.

Step 9: Create low spend sub-sample for health

Repeat Step 8 for health. From the desktop, open the *PFM_study_fsqca_dataset_(full-calibrated)*. Once opened, click *Save as* and then choose your desired folder location. *Type* the new file name as *PFM_study_fsqca_dataset_(low_Hexp-calibrated))* and keep the *Save as type* as *Comma Separated (*.csv)*. Click *Save* to create a new data file for the low education expenditure sub-sample.

In this new dataset, navigate to cell A1, and turn on filtering for the selected cell by pressing *CTRL+Shift+L* or by navigating to the *Filter* option on Excel's menu bar.

Navigate to the "*Hexp*" variable and filter the full dataset to retain only rows where *Hexp* < 5.43678069, the crossover point referenced in Step 2. The number of observations for *Hexp* should reduce from 226 to 113. Verify that the new range for *Hexp* is 2.10647 (Bangladesh in 2006) to 5.41881 (Grenada in 2010).

Turn off the filter then *Save* and *Close* the file.

Step 10: Open the low education spend sub-sample data file in fsQCA

1. Launch a new fsQCA session.
2. Go to *File > Open* and navigate to the folder where the datasets are stored. Select the appropriate dataset:
    - For Analyses 2 and 4 (low education expenditure sub-sample): *PFM_study_fsqca_dataset_(low_Edexp-calibrated)*
3. Confirm all variables load correctly.

Step 11: Repeat the sufficiency and necessity analysis for the low education expenditure sub-sample

Repeat steps 4, 5 and 6 for ped and sed using the low education expenditure sub-sample dataset. Set the outcome variable and causal conditions as specified in the summary table below, then click *OK* to generate the truth table for each analysis.

Analysis	**Outcome variable**	**Causal conditions**	**Frequency cutoff**	**Consistency cutoff**
2: Primary education (low spend sub-sample)	ped	pi1, pi2, pi3, edexp, ge, gpd	1	0.85
4: Secondary education (low spend sub-sample)	sed	pi1, pi2, pi3, edexp, gpd, ge	1	0.85

For each education outcome, the following directional expectations were applied by selecting *Present* for all conditions:

Condition	**Expected direction by outcome**	
	ped	**sed**
pi1 (Strong aggregate expenditure control)	Present	Present
pi2 (Strong expenditure composition control)	Present	Present
pi3 (Strong revenue outturn control)	Present	Present
edexp (High education sector spending)	Present	Present
ge (High government effectiveness)	Present	Present
gpd (High GDP per capita)	Present	Present

Step 12: Open the low health spend sub-sample data file in fsQCA

1. Launch a new fsQCA session.
2. Go to *File > Open* and navigate to the folder where the datasets are stored. Select the appropriate dataset:
    - For Analyses 2 and 4 (low education expenditure sub-sample): *PFM_study_fsqca_dataset_(low_Hexp-calibrated)*
3. Confirm all variables load correctly.

Step 11: Repeat the sufficiency and necessity analysis for the low education expenditure sub-sample

Repeat steps 4, 5 and 6 for uhc and ~u5mr using the low health expenditure sub-sample dataset. Set the outcome variable and causal conditions as specified in the summary table below, then click *OK* to generate the truth table for each analysis.

Analysis	Outcome variable	Causal conditions	Frequency cutoff	Consistency cutoff
6: UHC (low spend sub-sample)	uhc	ge, pi1, pi2, pi3, hexp, gpd	1	0.85
8: U5MR (low spend sub-sample)	~u5mr	pi1, pi2, pi3, hexp, ge, gpd	1	0.85

For each health outcome, the following directional expectations were applied:

Condition	Expected direction by outcome	
	uhc	~u5mr
pi1 (Strong aggregate expenditure control)	Present	Present
pi2 (Strong expenditure composition control)	Present	Present
pi3 (Strong revenue outturn control)	Present	Present
edexp (High education sector spending)	Present	Present
ge (High government effectiveness)	Present	Present
gpd (High GDP per capita)	Present	Present

All FSQCA Calibrated csv files mentioned above have been stored in the folder titled "FSQCA Calibrated CSV files"

STEP-BY-STEP REPRODUCTION PROCEDURE FOR BAYESIAN ANALYSIS

The Bayesian analysis is done in python. For ease of access a Jupyter notebook has been provided in the folder "**Bayesian codes**". The jupyter notebook/ python file is self-explanatory and outlines step by step process along with the codes. Python codes(fsqca_bayesian_chek_replicationcodes.ipynb) applies three Bayesian robustness checks — Beta-Binomial (BB), Spearman rank correlation (SP), and Posterior Consistency (PC) — to the fsQCA Intermediate Solution pathways identified by the software. **No fsQCA minimization is performed in this notebook.** All pathway strings, calibration anchors, and solution-level statistics are hardcoded from the software output and require no user entry beyond the data file path. The notebook is self-contained and executes sequentially from Cell 1 to Cell 12.

Data Requirements

The notebook reads from a single Excel file containing three sheets of calibrated scores as provided in the Folder "**Calibrated Dataset for Bayesian**". The excel file titled "**FSQCA_Calibrated_data.xlsx**" has been constructed by just combining the three calibrated excel files saved from FSQCA Calibration analysis namely – "*PFM_study_fsqca_dataset_(full-calibrated).csv", "PFM_study_fsqca_dataset_(low_Edexp-calibrated).csv"* and *"PFM_study_fsqca_dataset_(low_Edexp-calibrated).csv"*

No raw variables, truth tables, or solution outputs are needed in the Excel file. The sub-sample sheets are filtered versions of the full sheet.

Step-by-Step Instructions

Step 1

Cell 1 (Settings): The only required user action in the entire notebook. Change the DATA_FILE variable to match your Excel filepath:
Python DATA_FILE = '   # ← replace with the correct file path

All other settings (sheet names, column maps, bootstrap parameters, output directory) are pre-configured and require no changes unless the user wishes to modify bootstrap iterations (N_BOOT = 5000) or the consistency threshold (CONS_THR = 0.80).

Step 2

Cell 2 (Load data): Reads all three sheets and builds per-outcome datasets automatically. Prints a summary of rows loaded and outcome score ranges per sheet. If a sheet is missing or a column is not found, the cell prints a warning and skips that analysis rather than crashing. Check the printed output to confirm all three analyses loaded correctly before proceeding.

Step 3

Cell 3 (Bayesian functions): Defines bb_check, sp_check, pc_check, and pathway_from_string. No user action required. These are self-explanatory in the code — each function is documented with the formula it implements as per the methodological framework in Section 4.2 of the paper.

Step 4

Cell 4 (Forest plot function): Defines make_forest and clean_labels. No user action required. The clean_labels function replaces abbreviated column names with readable labels in plots (e.g. gdp → GDP PC, ge → Gov Eff).

Step 5

Cell 5 (Pathways are hardcoded from fsqca results): Contains all pathway strings, solution-level statistics (sol_cov, sol_cons), and sub-sample definitions hardcoded directly from the fsQCA software Intermediate Solution output. No user action required. If software results are revised, update the pathway strings, raw_cov, unique_cov, and sw_cons values in this cell only.

The structure is:
python('outcome', 'pathway_string', raw_cov, unique_cov, sw_cons)

Step 6

Cell 6 (Run checks): Executes all Bayesian checks across all three analyses (full sample, low-education sub-sample, low-health sub-sample). For each pathway, prints the calibration verification (Python consistency vs software consistency, difference, and flag), followed by BB, SP, and PC results. Runtime is approximately 3–5 minutes depending on hardware (5,000 bootstrap iterations per pathway per check).

Step 7

Cell 7 (Calibration verification): Displays a verification table confirming that Python-computed pathway consistency matches the software-reported consistency. A mean difference of 0.000 across all pathways confirms the calibrated scores in the Excel file are identical to those used by the software. Any flagged pathways (diff > 0.05) should be investigated before reporting results.

Step 8

Cell 8 (Generates Paper tables): Produces formatted Bayesian results tables organised by analysis and by outcome. Saves one Excel file per analysis (nb4_bayesian_main.xlsx, nb4_bayesian_edu.xlsx, nb4_bayesian_health.xlsx) to the fsqca_bayesian/ output directory, each with one sheet per outcome plus a combined sheet. No user action required.

Step 9

Cell 9 (Spearman summary): Prints a per-outcome summary of Spearman posterior results with direction labels (Positive / Weak positive / Inconclusive / Negative). Reports overall mean rho and mean P(rho>0) per analysis. No user action required.

Step 10

Cell 10 (Forest plots): Generates one forest plot per outcome per analysis (eight plots total: four for full sample, two for low-education sub-sample, two for low-health sub-sample). Plots are saved as PNG files to fsqca_bayesian/ with filenames nb4_forest_{analysis}_{outcome}.png. No user action required.

Step 11

Cell 11 (Cross-analysis comparison): Prints a side-by-side comparison of BB and PC results for pathways that appear in both the full sample and a sub-sample. This identifies whether Bayesian confirmation holds across samples. No user action required.

Step 12

Cell 12 (Export): Saves a combined Excel file (bayesian_all_analyses.xlsx) containing raw results and formatted tables for all three analyses in one workbook. No user action required.

Output Files

All outputs are written to the fsqca_bayesian/ directory, created automatically on first run and also provided in the Replication package.

Important Notes for Replicators

Panel data and independence: The dataset contains multiple years per country. Bootstrap resampling in SP and PC treats each row as an independent observation, which overstates effective sample size. Confidence intervals should be interpreted as indicative rather than strictly inferential. The number of unique countries per analysis is the more appropriate reference for effective n.

U5MR specification: The outcome is modelled as ~u5mr (absence of high child mortality). NEGATE_U5MR = True is set in Cell 1, so Y = 1 − u5mr throughout. Pathways describe configurations sufficient for low child mortality. Positive BB, SP, and PC results confirm that pathway membership predicts the good outcome.

BB with small n(X=1): When the number of cases with pathway membership ≥ 0.5 is fewer than 5, BB results are unreliable and should not be reported as primary evidence. The n(X=1) and n(X=0) columns in the output tables allow readers to assess this for each pathway. PC and SP are the preferred checks for low-membership pathways.

Reproducing results exactly: Set SEED = 42 and N_BOOT = 5000 as pre-configured. Results will vary slightly across runs due to random resampling but will be stable to two decimal places with 5,000 iterations.

Mapping the results reported in the paper from fsQCA Software (reported in the next section after this table) and the Bayesian Results (from the Folder Bayesian Results in the replication package) to the Tables and Figures in the Paper

Analysis	**Results from output in replication package**	**Software**	**Table Number in the Paper**
Primary education attainment, full sample	Truth Table Analysis, Intermediate Solution	Fsqca	Table 2
Primary education attainment, low education expenditure sub-sample	Truth Table Analysis, Intermediate Solution	Python (Bayesian)	Table 3
Primary education attainment, full sample	Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian -> Bayesian_main.xlsx ->Sheet PeD	Python (Bayesian)	Table 4
Primary education attainment, full sample	Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian -> forest_main_ped.png	Python (Bayesian)	Figure 5
Secondary education attainment, full sample	Truth Table Analysis, Intermediate Solution	Fsqca	Table 5
Secondary Education Attainment, Low Education Expenditure Sub-sample	Truth Table Analysis, Intermediate Solution	Fsqca	Table 6
Secondary education attainment, full sample	Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian-> Bayesian_main.xlsx ->Sheet SeD	Python (Bayesian)	Table 7
Secondary education attainment, full sample	Bayesian Results -> fsqca_bayesian.zip - > fsqca_bayesian -> forest_main_sed.png	Python (Bayesian)	Figure 6

Universal Health Coverage, full sample	Truth Table Analysis, Intermediate Solution	Fsqca	Table 8
Universal Health Coverage, low health expenditure sub-sample	Truth Table Analysis, Intermediate Solution	Fsqca	Table 9
Universal Health Coverage, full sample	Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian -> Bayesian_main.xlsx ->Sheet UHC	Python (Bayesian)	Table 10
Universal Health Coverage, full sample	Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian-> forest_main_uhc.png	Python (Bayesian)	Figure 7
Under-Five Mortality Rate, full sample	Truth Table Analysis, Intermediate Solution	Fsqca	Table 11
Under-Five Mortality Rate (High Mortality), Low Health Expenditure Sub-sample	Truth Table Analysis, Intermediate Solution	Fsqca	Table 12
Under-Five Mortality Rate, full sample	Bayesian Results -> fsqca_bayesian.zip -> Bayesian_main.xlsx -> Sheet U5MR (~u5mr)	Python (Bayesian)	Table 13
Under-Five Mortality Rate, full sample	Bayesian Results -> fsqca_bayesian.zip - fsqca_bayesian- > forest_main_u5mr.png	Python (Bayesian)	Figure 8
Education (Primary and Secondary) and Health outcomes (UHC and U5MR), respective low health and education samples	**Primary Education** Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian - >bayesian_edu.xlsx -> Sheet PeD **Secondary Education** Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian - >bayesian_edu.xlsx -> Sheet SeD **UHC** Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian -> bayesian_health.xlsx -> Sheet UHC **U5MR** Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian-> bayesian_health.xlsx -> Sheet U5MR(~u5mr)	Python (Bayesian)	Table A1
Education (Primary and Secondary) and Health outcomes	**Primary Education** Bayesian Results -> fsqca_bayesian.zip ->	Python (Bayesian)	Figure A1

(UHC and U5MR), respective low health and education samples	fsqca_bayesian -> forest_edu_ped.png **Secondary Education** Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian -> forest_edu_sed.png **UHC** Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian -> forest_health_uhc.png **U5MR** Bayesian Results -> fsqca_bayesian.zip -> fsqca_bayesian -> forest_health_u5mr.png		

FsQCA RESULTS AND GENERATED OUTPUT FILES

Analysis 1: Primary education attainment, full sample

```
*********************
*TRUTH TABLE ANALYSIS*
*********************

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: ped = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.851983
                                   raw        unique
                                   coverage   coverage    consistency
                                   ---------- ----------  ----------
pi1*pi3*edexp*ge                   0.34354    0.0435861   0.92843
~pi1*pi2*pi3*~ge*~gdp              0.158529   0.0386206   0.839338
~pi1*~pi2*pi3*ge*~gdp              0.135356   0.0235402   0.896468
pi1*pi2*edexp*~ge*~gdp             0.303081   0.0568275   0.849047
pi1*~pi2*pi3*ge*gdp                0.163862   0.0137931   0.972707
pi1*pi2*edexp*ge*gdp               0.264828   0.00919539  0.993103
~pi1*~pi2*~pi3*edexp*~ge*~gdp      0.113287   0.051862    0.855556
pi1*pi2*pi3*~edexp*~ge*gdp         0.156138   0.00533324  0.98037
solution coverage: 0.618851
solution consistency: 0.829022


*********************
*TRUTH TABLE ANALYSIS*
*********************

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: ped = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.851983
                       raw        unique
                       coverage   coverage    consistency
                       ---------- ----------  ----------
ge                     0.531862   0.0787129   0.886845
gdp                    0.438805   0.0185748   0.976268
~pi1*pi2*pi3           0.165517   0.0248276   0.800712
pi1*pi2*edexp          0.424828   0.088092    0.852713
~pi1*~pi2*~pi3*edexp   0.115126   0.0318161   0.857534
solution coverage: 0.738759
solution consistency: 0.806303
```

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: ped = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.851983
Assumptions:
pi1 (present)
pi2 (present)
pi3 (present)
edexp (present)
ge (present)
gdp (present)

	raw coverage	unique coverage	consistency
	----------	----------	----------
pi3*ge	0.441563	0.118253	0.893894
~pi1*pi2*pi3	0.165517	0.0248277	0.800712
pi1*pi2*edexp	0.424828	0.128	0.852713
pi2*pi3*gdp	0.28046	0.00202304	0.984506
~pi1*~pi2*~pi3*edexp	0.115126	0.0520461	0.857534

solution coverage: 0.687816
solution consistency: 0.80534

Analysis of Necessary Conditions

Outcome variable: ped
Conditions tested:

	Consistency	Coverage
pi1	0.779770	0.617176
~pi1	0.342437	0.542857
pi2	0.574897	0.697768
~pi2	0.557977	0.521306
pi3	0.748874	0.582463
~pi3	0.349241	0.573889
edexp	0.705839	0.750783
~edexp	0.505012	0.529299
ge	0.531862	0.886845
~ge	0.718161	0.554767
gdp	0.438805	0.976268
~gdp	0.786023	0.544043

Analysis 2: Primary education attainment, low education expenditure sub-sample

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File: …/PFM_study_fsqca_dataset_(low_Edexp-calibrated).csv
Model: ped = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.882936
                                   raw        unique
                                   coverage   coverage    consistency
                                   ----------  ----------  ----------
~pi1*~pi2*pi3*~edexp*ge*~gdp       0.233096   0.122048    0.882936
pi1*pi2*pi3*~edexp*~ge*gdp         0.192763   0.0796195   0.955844
pi1*~pi2*pi3*~edexp*ge*gdp         0.187525   0.0413812   0.934726
solution coverage: 0.389192
solution consistency: 0.894104

**********************
*TRUTH TABLE ANALYSIS*
**********************

File: …/PFM_study_fsqca_dataset_(low_Edexp-calibrated).csv
Model: ped = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.882936
        raw        unique
        coverage   coverage    consistency
        ----------  ----------  ----------
ge      0.493955   0.15662     0.788462
gdp     0.46724    0.129905    0.942917
solution coverage: 0.62386
solution consistency: 0.814081


**********************
*TRUTH TABLE ANALYSIS*
**********************

File: …/PFM_study_fsqca_dataset_(low_Edexp-calibrated).csv
Model: ped = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey
```

--- INTERMEDIATE SOLUTION ---

```
frequency cutoff: 1
consistency cutoff: 0.882936
Assumptions:
pi1 (present)
```

pi2 (present)
pi3 (present)
edexp (present)
ge (present)
gdp (present)

	raw coverage	unique coverage	consistency
	----------	----------	----------
pi3*ge	0.389192	0.231001	0.814693
pi1*pi2*pi3*gdp	0.192763	0.0345717	0.955844

solution coverage: 0.423764
solution consistency: 0.822155

Analysis of Necessary Conditions

Outcome variable: ped
Conditions tested:

	Consistency	Coverage
pi1	0.649003	0.451860
~pi1	0.532717	0.471270
pi2	0.447859	0.563241
~pi2	0.742241	0.418983
pi3	0.757432	0.469938
~pi3	0.379240	0.397148
edexp	0.364049	0.757081
~edexp	0.915623	0.438975
ge	0.493955	0.788462
~ge	0.847004	0.436555
gdp	0.467240	0.942917
~gdp	0.842290	0.406677

Analysis 3: Secondary education attainment, full sample

```
*********************
*TRUTH TABLE ANALYSIS*
*********************

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: sed = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.858267
                                raw        unique
                                coverage   coverage   consistency
                                ---------- ---------- ----------
pi1*pi3*edexp*ge                0.368797   0.0320605  0.908594
~pi1*pi2*pi3*~ge*~gdp           0.174417   0.0606932  0.841439
~pi2*pi3*edexp*ge*~gdp          0.201033   0.00867045 0.842772
pi1*~pi2*pi3*ge*gdp             0.181071   0.0231885  0.97928
pi1*pi2*edexp*ge*gdp            0.28794    0.0100819  0.983471
pi1*pi2*~pi3*edexp*~ge*~gdp     0.137114   0.0141147  0.912752
pi1*pi2*pi3*~edexp*~ge*gdp      0.171594   0.0110902  0.981546
solution coverage: 0.545432
solution consistency: 0.860369

*********************
*TRUTH TABLE ANALYSIS*
*********************

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: sed = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.858267
                raw        unique
                coverage   coverage   consistency
                ---------- ---------- ----------
gdp             0.484739   0.0713799  0.981625
edexp*ge        0.453283   0.0671455  0.87539
pi1*pi2*~pi3    0.185709   0.0254064  0.820125
~pi1*pi2*pi3    0.18208    0.0358917  0.802667
solution coverage: 0.640202
solution consistency: 0.824033


*********************
*TRUTH TABLE ANALYSIS*
*********************

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: sed = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey
```

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.858267
Assumptions:
pi1 (present)
pi2 (present)
pi3 (present)
edexp (present)
ge (present)
gdp (present)

	raw coverage	unique coverage	consistency
	----------	----------	----------
~pi1*pi2*pi3	0.18208	0.0383114	0.802667
pi3*edexp*ge	0.383718	0.0697667	0.890501
pi2*pi3*gdp	0.305886	0.00826722	0.97871
pi1*pi2*~pi3*edexp	0.172199	0.0727913	0.897059
pi1*pi3*ge*gdp	0.329074	0.0241966	0.98018

solution coverage: 0.574064
solution consistency: 0.841312

Analysis of Necessary Conditions

Outcome variable: sed
Conditions tested:

	Consistency	Coverage
pi1	0.789616	0.568525
~pi1	0.343995	0.485763
pi2	0.613182	0.666594
~pi2	0.537165	0.456321
pi3	0.780340	0.553490
~pi3	0.335728	0.488556
edexp	0.720051	0.697598
~edexp	0.514380	0.483053
ge	0.562974	0.855655
~ge	0.722470	0.502032
gdp	0.484739	0.981625
~gdp	0.794657	0.495661

Analysis 4: Secondary Education Attainment, Low Education Expenditure Sub-sample

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(low_Edexp-calibrated).csv
Model: sed = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.950521

	raw coverage	unique coverage	consistency
	----------	----------	----------
pi1*pi2*pi3*~edexp*~ge*gdp	0.219972	0.0945286	0.958549
pi1*~pi2*pi3*~edexp*ge*gdp	0.217	0.091556	0.950521

solution coverage: 0.311528
solution consistency: 0.961468

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(low_Edexp-calibrated).csv
Model: sed = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.950521

	raw coverage	unique coverage	consistency
	----------	----------	----------
gdp	0.54993	0.54993	0.97266

solution coverage: 0.54993
solution consistency: 0.97266

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(low_Edexp-calibrated).csv
Model: sed = f(pi1, pi2, pi3, edexp, ge, gdp)
Algorithm: Quine-McCluskey

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.950521
Assumptions:
pi1 (present)
pi2 (present)
pi3 (present)
edexp (present)

ge (present)
gdp (present)

	raw coverage	unique coverage	consistency
	----------	----------	----------
pi1*pi2*pi3*gdp	0.219972	0.0416164	0.958549
pi1*pi3*ge*gdp	0.269912	0.091556	0.959831

solution coverage: 0.311528
solution consistency: 0.961468

Analysis of Necessary Conditions

Outcome variable: sed
Conditions tested:

	Consistency	Coverage
pi1	0.623651	0.380073
~pi1	0.570739	0.428571
pi2	0.473237	0.497500
~pi2	0.724719	0.358529
pi3	0.790711	0.432099
~pi3	0.368007	0.322060
edexp	0.378709	0.688649
~edexp	0.943502	0.389448
ge	0.531500	0.746244
~ge	0.846595	0.374540
gdp	0.549930	0.972660
~gdp	0.837678	0.347987

__Analysis 5: Universal Health Coverage, full sample__

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: uhc = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.871536

	raw coverage	unique coverage	consistency
	----------	----------	----------
pi1*~pi2*pi3*ge*~gdp	0.28783	0.101081	0.872826
~pi1*pi3*~hexp*ge*gdp	0.119361	0.0344105	0.982301
pi1*pi3*hexp*ge*gdp	0.246609	0.0544833	0.992785
~pi1*~pi2*~pi3*~hexp*~ge*gdp	0.088177	0.0351274	0.960938

solution coverage: 0.433716
solution consistency: 0.908408

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: uhc = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.871536

	raw coverage	unique coverage	consistency
	----------	----------	----------
gdp	0.416869	0.190692	0.99063
pi1*~pi2*ge	0.329768	0.10359	0.870388

solution coverage: 0.520459
solution consistency: 0.910345

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: uhc = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.871536
Assumptions:
pi1 (present)

pi2 (present)
pi3 (present)
hexp (present)
ge (present)
gdp (present)

	raw coverage	unique coverage	consistency
	----------	----------	----------
gdp	0.416869	0.215783	0.99063
pi1*~pi2*pi3*ge	0.303243	0.102156	0.878505

solution coverage: 0.519026
solution consistency: 0.921706

Analysis of Necessary Conditions

Outcome variable: uhc
Conditions tested:

	Consistency	Coverage
pi1	0.734091	0.608437
~pi1	0.367404	0.480319
pi2	0.452355	0.776138
~pi2	0.673873	0.485286
pi3	0.734450	0.584260
~pi3	0.389628	0.545409
hexp	0.666704	0.671238
~hexp	0.522251	0.533895
ge	0.566698	0.844100
~ge	0.678174	0.521643
gdp	0.416869	0.990630
~gdp	0.750221	0.483819

Analysis 6: Universal Health Coverage, low health expenditure sub-sample

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(low_Hexp-calibrated).csv
Model: uhc = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.876712

	raw coverage	unique coverage	consistency
	----------	----------	----------
~pi1*pi3*~hexp*ge*gdp	0.186065	0.0861582	0.990244
~pi1*~pi2*~pi3*~hexp*~ge*gdp	0.161318	0.0824919	0.967033
pi1*~pi2*pi3*~hexp*ge*~gdp	0.293305	0.212646	0.876712

solution coverage: 0.481203
solution consistency: 0.913043

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(low_Hexp-calibrated).csv
Model: uhc = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.876712

	raw coverage	unique coverage	consistency
	----------	----------	----------
gdp	0.449123	0.250226	0.987903
pi1*~pi2*ge	0.339134	0.140236	0.850575

solution coverage: 0.589359
solution consistency: 0.901823

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(low_Hexp-calibrated).csv
Model: uhc = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.876712
Assumptions:
pi1 (present)

pi2 (present)
pi3 (present)
hexp (present)
ge (present)
gdp (present)

	raw coverage	unique coverage	consistency
	----------	----------	----------
gdp	0.449123	0.285055	0.987903
pi1*~pi2*pi3*ge	0.30247	0.138403	0.88

solution coverage: 0.587526
solution consistency: 0.927641

Analysis of Necessary Conditions

Outcome variable: uhc
Conditions tested:

	Consistency	Coverage
pi1	0.593942	0.458274
~pi1	0.532531	0.534991
pi2	0.412460	0.706436
~pi2	0.740594	0.433709
pi3	0.758009	0.514944
~pi3	0.399628	0.487696
hexp	0.350132	0.786008
~hexp	0.875331	0.474181
ge	0.587526	0.766746
~ge	0.769925	0.504808
gdp	0.449123	0.987903
~gdp	0.763509	0.415669

Analysis 7: Under-Five Mortality Rate, full sample

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: ~u5mr = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.854825
                                     raw        unique
                                     coverage   coverage      consistency
                                     ---------- ----------    ----------
pi1*pi3*ge                           0.34058    0.0276299     0.908331
~pi1*~pi2*ge*~gdp                    0.177364   0.0120583     0.859246
pi1*pi2*hexp*~gdp                    0.302791   0.016331      0.875859
pi1*pi2*ge*~gdp                      0.261393   0.00883013    0.91614
pi1*pi3*~hexp*gdp                    0.166255   0.00294346    0.976575
pi2*pi3*~hexp*gdp                    0.166445   0.00512713    0.988163
pi1*pi2*hexp*ge                      0.23946    0.00294346    0.908829
~pi1*~pi2*~pi3*hexp*ge               0.0950435  0.00284851    0.888199
pi2*pi3*hexp*~ge*~gdp                0.259494   0.0128179     0.894599
~pi1*~pi2*~pi3*~hexp*~ge*gdp         0.0795669  0.00826049    0.942632
pi1*~pi2*~pi3*hexp*~ge*gdp           0.0827952  0.00949478    0.980877
~pi2*pi3*~hexp*ge                    0.203475   9.49502e-05   0.870431
pi3*~hexp*ge*gdp                     0.181542   0             0.986584
solution coverage: 0.618494
solution consistency: 0.868881

**********************
*TRUTH TABLE ANALYSIS*
**********************

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: ~u5mr = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.854825
               raw       unique
               coverage  coverage   consistency
               ---------- ---------- ----------
ge             0.512627  0.143372   0.882911
gdp            0.372483  0.0379794  0.959873
pi1*pi2*hexp   0.349315  0.0222179  0.87408
pi2*pi3*hexp   0.324724  0.0139574  0.89482
solution coverage: 0.683344
solution consistency: 0.869938
```

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(full-calibrated).csv
Model: ~u5mr = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.854825
Assumptions:
pi1 (present)
pi2 (present)
pi3 (present)
hexp (present)
ge (present)
gdp (present)

	raw coverage	unique coverage	consistency
	----------	----------	----------
ge	0.512627	0.143372	0.882911
gdp	0.372483	0.0379794	0.959873
pi1*pi2*hexp	0.349315	0.0222179	0.87408
pi2*pi3*hexp	0.324724	0.0139574	0.89482

solution coverage: 0.683344
solution consistency: 0.869938

Analysis of Necessary Conditions

Outcome variable: ~u5mr
Conditions tested:

	Consistency	Coverage
pi1	0.725406	0.638529
~pi1	0.397549	0.496384
pi2	0.558486	0.740992
~pi2	0.582888	0.492618
pi3	0.735945	0.613989
~pi3	0.370109	0.501286
hexp	0.634066	0.676458
~hexp	0.573014	0.573233
ge	0.512627	0.882911
~ge	0.696826	0.513756
gdp	0.372483	0.959873
~gdp	0.790541	0.510391

Analysis 8: Under-Five Mortality Rate (High Mortality), Low Health Expenditure Sub-sample

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(low_Hexp-calibrated).csv
Model: ~u5mr = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.875626

	raw coverage	unique coverage	consistency
	----------	----------	----------
~pi2*pi3*~hexp*ge	0.308698	0.0479306	0.867656
pi1*pi3*~hexp*ge	0.33467	0.0576434	0.897001
pi1*pi3*~hexp*gdp	0.206714	0.00570101	0.966436
pi2*pi3*~hexp*gdp	0.219594	0.0464526	0.989534
~pi1*~pi2*~pi3*~hexp*~ge*gdp	0.108952	0.0411738	0.926391

solution coverage: 0.516257
solution consistency: 0.886512

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(low_Hexp-calibrated).csv
Model: ~u5mr = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.875626

	raw coverage	unique coverage	consistency
	----------	----------	----------
gdp	0.368664	0.129434	0.957237
pi3*ge	0.441299	0.202068	0.888984

solution coverage: 0.570733
solution consistency: 0.892963

****
TRUTH TABLE ANALYSIS
****

File: …/PFM_study_fsqca_dataset_(low_Hexp-calibrated).csv
Model: ~u5mr = f(pi1, pi2, pi3, hexp, ge, gdp)
Algorithm: Quine-McCluskey

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.875626

Assumptions:
pi1 (present)
pi2 (present)
pi3 (present)
hexp (present)
ge (present)
gdp (present)

	raw coverage	unique coverage	consistency
	----------	----------	----------
gdp	0.368664	0.129434	0.957237
pi3*ge	0.441299	0.202068	0.888984

solution coverage: 0.570733
solution consistency: 0.892963

Analysis of Necessary Conditions

Outcome variable: ~u5mr
Conditions tested:

	Consistency	Coverage
pi1	0.660260	0.559592
~pi1	0.500210	0.492311
pi2	0.527870	0.635324
~pi2	0.657092	0.481361
pi3	0.759499	0.591807
~pi3	0.379011	0.415317
hexp	0.341215	0.779171
~hexp	0.892733	0.507807
ge	0.548773	0.875084
~ge	0.729938	0.465276
gdp	0.368664	0.957237
~gdp	0.831289	0.459072

Contact

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