

Technical Note

FIES annualized USU scenario model v1.0

Public release v1.1

Scope

This note documents the source-to-model pipeline, equations, data handling, deterministic scenarios, and prohibited outputs. It does not introduce rankings, global totals, or new mappings.

1. Inputs

The source inputs are the validated Step 8A.1 FAOSTAT FIES country extract, Amendment A1, and the author-approved Step 8E intensity mappings. Source records remain alphabetical and no rank field is created.

2. Equations

For state s , source population N_s , intensity I_s , and days at severity D_s :

$$B_{1,yr} = \sum_s N_s I_s D_s$$

$$U_{1,yr} = B_{1,yr} / R_1, \text{ where } R_1 = 1.96875 \text{ intensity-days.}$$

For per-100,000 outputs: $N_{s,100k} = \text{prevalence}_s / 100 \times 100,000$.

3. Source and derived states

Severe prevalence is source-derived. Moderate-only prevalence is a central residual: moderate-or-severe minus severe. No moderate-only confidence interval is produced, because nested covariance is unavailable.

4. Output universes

Universe	Records	Output	Restriction
Complete prevalence records	125	Per-100,000 scenarios	No ranking
Exact population records	99	Exact total scenarios	Not global
Censored population records	26	Per-100,000 only	No midpoint, zero, or imputation

5. Deterministic scenarios

The primary low, central, and high scenarios vary intensity and duration together. The wide stress scenarios hold intensity at central values and vary duration only. Neither range is a statistical confidence interval.

6. Reproducibility

The release includes CSV and JSON results, an xlsx workbook, and a reference Python script. The script reproduces per-100,000 and exact-total outputs without producing ranks or website files.

7. Prohibited outputs

- No country ranking.
- No global total.
- No derived moderate-only confidence interval.
- No cross-series rank or direct comparison.
- No automated website modification is produced by the Step 8F analysis pipeline.

References and source files

1. **FAO. Food Insecurity Experience Scale frequently asked questions.** <https://www.fao.org/measuring-hunger/access-to-food/frequently-asked-questions/>
2. **FAO. Applying the Food Insecurity Experience Scale.** <https://www.fao.org/measuring-hunger/access-to-food/applying-the-fies/en>
3. **FAOSTAT Food Security normalized bulk data; Step 8A.1 source-gate audit.** Internal source archive and validation package
4. **WSI Amendment WSI-USU-PILOT-v0.1-A1: Retrospective Annualized USU Scenario Models.** Internal methods amendment
5. **WSI Step 8E FIES intensity mapping and internal preview.** Internal author-approved mapping package
6. **Jones AD. Food Insecurity and Mental Health Status: A Global Analysis of 149 Countries. Am J Prev Med. 2017.** <https://pubmed.ncbi.nlm.nih.gov/28457747/>
7. **Frongillo EA et al. Food Insecurity Is Associated with Subjective Well-Being among Individuals from 138 Countries. J Nutr. 2017.** <https://doi.org/10.3945/jn.116.243642>
8. **Pourmotabbed A et al. Food insecurity and mental health: a systematic review and meta-analysis. Public Health Nutr. 2020.** <https://pubmed.ncbi.nlm.nih.gov/32174292/>