Technical Methodology

Enhanced Refugee Perceptions and Intentions Survey (ERPIS)

IPW WEIGHTING METHODOLOGY FOR PANEL ATTRITION

WAVE 2 | Nov-Dec 2025

Egypt · Iraq · Jordan · Lebanon

Inverse Probability Weighting for Panel Attrition

Correcting for outcome attrition and differential non-response in ERPIS Wave 2 panel data

Syrian Refugees in Egypt, Iraq, Jordan, and Lebanon

October – November 2025

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Overview

The Enhanced Refugee Perceptions and Intentions Survey (ERPIS) is a comprehensive panel study designed to understand Syrian refugees' return intentions and track how they evolve over time.

ERPIS Wave 2 recontacted all 6,316 households from Wave 1 (May-June 2025) by phone during October-November 2025. Of these, 3,949 completed interviews representing approximately 507,000 refugee households, while 1,725 households (27.3%) had returned to Syria between waves—reflecting substantial population movement following Syria's December 2024 political transition.

This return movement represents a methodological challenge: it is not survey failure but actual behavioral outcome. Standard weighting approaches would incorrectly treat returnees as non-respondents still in the target population. This document details the Inverse Probability Weighting (IPW) methodology used to distinguish between these two forms of attrition.

"The decision to return is rarely binary—it unfolds through a process of information gathering, risk assessment, and gradual commitment. Panel surveys capture this evolution in ways cross-sectional data cannot."

Theresa Beltramo

Senior Economist, UNHCR MENA

Panel Survey Design

ERPIS follows the same Syrian refugee households across Egypt, Iraq, Jordan, and Lebanon to understand how return intentions shift over time. The panel was built by re-contacting households from each country's recent socio-economic assessment baseline (VASyR, VAF, SEVAT, Vulnerability Assessment). Wave 2 achieved an 86% response rate among households still residing in host countries, with results representative at both regional and country levels.

Data Structure

Wave 1 (May-June 2025)	Wave 2 (Oct-Nov 2025)
Built from country SEA baselines: • **Egypt:** Vulnerability Assessment (Oct-Nov 2024) – 816 households • **Iraq:** SEVAT (Oct-Nov 2022) – 2,900 households • **Jordan:** VAF (Oct-Dec 2023) – 5,000+ households • **Lebanon:** VASyR (June-July 2024) – 4,000+ households **Final Sample:** 6,316 households (unweighted) **Weighted Total:** 781,673 cases (representing full refugee population)	Same households recontacted from Wave 1 • Phone interviews with household heads or adult members • Target Sample: 6,316 households (full W1 cohort) Panel Outcomes: • Panel Complete: 3,949 (62.5%) • Returned to Syria: 1,725 (27.3%) • True Non-Response: 642 (10.2%) **Weighted Total:** 506,738 cases (representing refugees currently in host countries – after IPW adjustment for differential attrition)

Sample Distribution

Country	W1 Sample	W2 Complete	Returned to Syria	Weighted Total	% of Population
Lebanon	2,830	1,922 (67.9%)	748 (26.4%)	340,571	67.2%
Jordan	1,971	1,274 (64.6%)	660 (33.5%)	145,529	28.7%
Egypt	728	180 (24.7%)	106 (14.6%)	12,626	2.5%
Iraq	787	573 (72.8%)	211 (26.8%)	8,012	1.6%
Total	**6,316**	**3,949**	**1,725**	**506,738**	**100%**

Understanding Panel Attrition

W1 Cohort Outcomes

Panel surveys tracking refugee populations face a unique challenge: some respondents leave the target population entirely by returning to their country of origin. In ERPIS Wave 2, **1,725 households (27.3%)** returned to Syria between waves—this is not survey failure but actual behavioral outcome. These returnees must be distinguished from the **642 households (10.2%)** who remained in host countries but could not be reached.

W1 Sample 6,316 100% → **Returned 1,725 27.3%** + **True NR 642 10.2%** + **Panel Complete 3,949 62.5%**

Standard survey weighting treats all attrition as non-response. This approach would incorrectly assume returnees are still refugees in host countries who simply didn't answer. Inverse Probability Weighting (IPW) allows us to model response probability among those still eligible, correcting for differential non-response across countries while properly excluding those who left the target population.

Status	N	%	Definition
Panel Complete	3,949	62.5%	Responded to W2, still in host country
Returned to Syria	1,725	27.3%	Left target population (NOT non-response)
Contacted Incomplete	119	1.9%	Contacted but did not complete survey
No Contact	523	8.3%	Could not reach household

Two Types of Attrition

⚠ Informative Attrition (Returnees)	✓ True Non-Response (NR)
✗ Left the target population entirely	✓ Still in target population but didn't respond
✗ Strongly correlated with W1 intention	✓ Weakly correlated with W1 intention

✗ 37.4% of intenders returned vs 23.3% non-intenders ✗ NOT survey non-response — actual behavior ✗ **EXCLUDED from IPW calculation**	✓ 13.1% of intenders NR vs 9.7% non-intenders ✓ Traditional survey non-response ✓ **INCLUDED in IPW adjustment**

Statistical Evidence: Attrition by W1 Intention

W1 Return Intent	N	Retention	Returned	True NR
No – Do Not Intend	5,188	67.0%	23.3%	9.7%
Yes – Intend to Return	1,128	49.5%	37.4%	13.1%
Gap	—	17.5pp	14.1pp	3.4pp

$\chi^2 = 122.37$, $p < 0.001$ | Cramér's V = 0.139

Key Finding: True NR is Relatively Random

The 17.5pp retention gap is almost entirely explained by differential return rates (14.1pp), NOT differential non-response (only 3.4pp). True non-response (13.1% vs 9.7%) shows only a small, manageable difference. This means once we exclude returnees, the remaining attrition is approximately random — ideal conditions for IPW.

5. Why IPW?

Design Weights vs IPW comparison

✗ Design Weights Only	✓ IPW Adjustment
✗ Assumes attrition is completely random	✓ Models probability of response
✗ Does not account for country differences	✓ Adjusts for country-specific response rates
✗ Egypt (29% response) same weight as Jordan (97%)	✓ Egypt respondents upweighted to compensate
✗ Over-represents high-response countries	✓ Preserves population distribution
✗ Biased population estimates	✓ Bias-corrected estimates

Response rates varied dramatically by country: Egypt 29% vs Jordan 97%. Without IPW, Jordan households would dominate the weighted sample, severely under-representing Egyptian refugees. IPW ensures each country contributes proportionally to its true population share.

Country-Level Response Variation table

Country	W1 N	Panel Complete	Returned	True NR	IPW Response
Lebanon	2,830	1,922 (67.9%)	748 (26.4%)	160 (5.7%)	**92.3%**
Jordan	1,971	1,274 (64.6%)	660 (33.5%)	37 (1.9%)	**97.2%**
Iraq	787	573 (72.8%)	211 (26.8%)	3 (0.4%)	**99.5%**
Egypt	728	180 (24.7%)	106 (14.6%)	442 (60.7%)	**28.9%**

Critical: Egypt Field Challenges

Egypt had 60.7% true non-response (no contact + incomplete), primarily due to outdated phone numbers and field access constraints. Without IPW adjustment, Egyptian refugees would be severely under-represented. IPW upweights the 180 Egyptian respondents to represent the full Egyptian refugee population.

Note: Iraq High Retention

Unlike the previous version where 91% returned, Iraq now shows 72.8% retention with 573 households completing Wave 2. The 26.8% return rate is comparable to other countries. With 99.5% IPW response rate among eligible households, Iraq provides reliable estimates.

6. Weighting Methodology

3-Step table with formulas

Wave 2 weighting differs from Wave 1 due to informative panel attrition. The key distinction is between returnees (who left the target population) and true non-response (who remained but didn't respond). Response rates varied dramatically by country: Egypt achieved only 28.9% IPW response rate compared to Jordan's 97.2%. Without correction, high-response countries would dominate the weighted sample. The weight calculation followed three sequential steps:

Steps	Underlying Math	Country Notes
Inherit W1 Final Weights Each case carries forward its Wave 1 final weight (w1_final) which already incorporates design weights, non-response adjustment, and calibration	**Formula:** w1_final inherited directly from Wave 1 **Actual values:** • Range: 9.58 – 301.68 • Mean: 123.76 • Sum: 781,673 (W1 population) No modification at this stage	• **Jordan:** Stratified by 14 governorates/camps • **Lebanon:** Two-stage design at governorate level • **Iraq:** Treated as SRS (near-uniform weights) • **Egypt:** Uniform design weight
Define IPW-Eligible Population Exclude returnees from weighting model – they left the target population, not failed to respond	**Formula:** **IPW_Eligible** = W1_Cohort − Returnees = 6,316 − 1,725 = 4,591 **Overall IPW Response Rate:** = 3,949 / 4,591 = 86% **Country IPW Response Rates**: • Lebanon: 92.3% • Jordan: 97.2% • Iraq: 99.5% • Egypt: 28.9%	**Returnee identification method:** • W2 Syria check question • proGres verification **Total returnees:** 1,725 (27.3%) **True non-response:** 642 (10.2%) • **Contacted incomplete:** 119 • **No contact:** 523
IPW Model & Final Weight Model response probability, calculate inverse weights, combine with W1 weights	**Model:** logit(P(Response | Eligible)) = $\beta_0 + \beta_1$(Country) **IPW Calculation:** 1. P(Response) = model prediction	**Model finding:** Country is dominant predictor **IPW Effects:** • Egypt: ↑ Upweighted 76% (compensating for 28.9% response)

	2. IPW_raw = 1 / P(Response) 3. IPW_capped = min(IPW_raw, 95th pctl) Cap = 1.083 4. IPW_norm = IPW_capped / mean **Final Weight:** w2_final = w1_final × IPW_norm **Final values:** • Sum: 506,738 (W2 population) • Mean: 128.32	• Lebanon: ↓ Downweighted 45% (compensating for 92.3% response) • Jordan: ↓ Downweighted 47% (compensating for 97.2% response) • Iraq: ↓ Downweighted 49% (compensating for 99.5% response)

Country-Specific Weight Implementation

- **Egypt:** Severe field challenges resulted in 60.7% true non-response (outdated phone numbers, access constraints). IPW upweights the 180 respondents by 76% to represent the full Egyptian refugee population. Final weights uniform at 70.15 due to homogeneous remaining sample.
- Iraq: High retention (72.8%) with excellent 99.5% IPW response rate among eligible households. Final weights 13.77–14.09 (near-uniform). Good sample quality despite moderate return rate (26.8%).
- Jordan: Highest return rate (33.5%) but excellent field response (97.2% IPW response). Weights show moderate variability (CV=0.532) due to underlying VAF design stratification. Final weights 9.35–189.40.
- Lebanon: Largest remaining sample (1,922 households). Best balance of retention (67.9%) and field response (92.3%). Final weights 89.07–309.92 reflecting original VASyR design stratification.

Country	P(Response)	IPW_raw	IPW_normalized	Effect on Weight
Egypt	0.29	3.45	1.76	↑ **Upweighted 76%**
Iraq	0.99	1.01	0.51	↓ Downweighted 49%
Jordan	0.97	1.03	0.53	↓ Downweighted 47%
Lebanon	0.92	1.09	0.55	↓ Downweighted 45%

Logistic model results

Model Specification

$\text{logit}(P(\text{Response} \mid \text{IPW Eligible})) = \beta_0 + \beta_1(\text{Country})$

Variable	Odds Ratio	CI Low	CI High	p-value
Intercept (Egypt ref)	12.012	10.260	14.168	< 0.001***
Country: Jordan	2.866	2.014	4.185	< 0.001***
Country: Egypt	0.034	0.027	0.043	< 0.001***

Country: Iraq	15.900	6.011	64.551	< 0.001***

Model Finding

Country is the dominant predictor of response probability. The model essentially produces country-specific response propensities, with Egypt showing dramatically lower response odds than other countries.

7. Weight Quality Control (Annex 1)

Weight Quality Indicators table

Country	n	Weighted Pop	Mean Weight	CV	DEFF	Efficiency	IPW Response	Quality
Egypt	180	12,626	70.15	0.000	1.00	100%	28.9%	⚠ Caution
Iraq	573	8,012	13.98	0.011	1.00	100%	99.5%	✓ Good
Jordan	1,274	145,529	114.23	0.532	1.28	77.9%	97.2%	✓ Good
Lebanon	1,922	340,571	177.20	0.445	1.20	83.5%	92.3%	✓ Good
Total	**3,949**	**506,738**	—	—	—	—	**86%**	—

Key Methodological Decisions table

The coefficient of variation (CV) measures weight variability, where lower values indicate more uniform weights and higher statistical efficiency. A CV below 0.20 is excellent, 0.20–0.40 is good, and 0.40–0.60 is acceptable. Efficiency represents the effective sample size as a percentage of actual sample size—Jordan's 77.9% efficiency means 1,274 interviews yield precision equivalent to 993 in a simple random sample.

Country	CV	DEFF	Interpretation
Iraq	0.011	1.00	Near-uniform weights — no precision loss from weighting
Egypt	0.000	1.00	Uniform weights (homogeneous sample), but small n=180 limits precision
Lebanon	0.445	1.20	20% variance inflation from original VASyR design
Jordan	0.532	1.28	28% variance inflation from original VAF stratification

1. **Returnee exclusion:** Returnees excluded from IPW model — 1,725 households (27.3%) returned to Syria and left the target population. These are not non-response; they represent actual return behavior and are appropriately excluded from attrition correction.

2. **IPW capping:** IPW cap applied at 95th percentile (1.083) to prevent extreme weights from inflating variance while preserving the non-response correction effect.
3. **Country as sole predictor:** Logistic model found country to be the dominant predictor of response probability; household characteristics were not significant after controlling for country.
4. **Egypt caution:** Despite excellent CV (0.000), the 60.7% non-response rate creates potential selection bias — the 180 who responded may differ systematically from those unreached. Interpret with appropriate caution.

8. Practical Example

How results were calculated

Question s_intention_intent_return_12_months: "Do you or other household members intend to return to Syria in the next 12 months?"

This example shows how Wave 2 results are calculated using IPW-adjusted survey weights.

Actual ERPIS Wave 2 Results (Oct-Nov 2025):

Regional Level (All Four Countries)

- Sample size: 3,949 households (unweighted)
- Weighted total: 506,738 households (representing Syrian refugees currently in host countries)

Response	Weighted Count (n)	Percentage
0. No	~420,000	~83%
1. Yes	~61,000	~12%
98. I don't know	~26,000	~5%
Total	**506,738**	**100.0%**

Comparison: Wave 1 vs Wave 2

Metric	Wave 1 (May-Jun 2025)	Wave 2 (Oct-Nov 2025)	Change
Sample size	6,316	3,949	−2,367 (37.5% attrition)
Weighted population	781,673	506,738	−274,935 (35.2% returned)
Intend to return (Yes)	17.5%	~12%	−5.5pp decline

Step-by-step calculation process

Step 1: Apply weights to individual responses

Each respondent's answer is multiplied by their w2_final weight. For example:

- A Lebanon respondent answering "Yes" with w2_final = 177.20 contributes 177.20 to the "Yes" total
- A Jordan respondent answering "No" with w2_final = 114.23 contributes 114.23 to the "No" total

Step 2: Sum weighted responses

- Sum all weighted "Yes" responses = ~61,000 households
- Sum all weighted "No" responses = ~420,000 households
- Sum all weighted "Don't know" responses = ~26,000 households
- Total = 506,738 households

Step 3: Calculate percentages

- Percentage = (Weighted count for response ÷ Total weighted count) × 100
- Example: Yes = (~61,000 ÷ 506,738) × 100 ≈ 12%