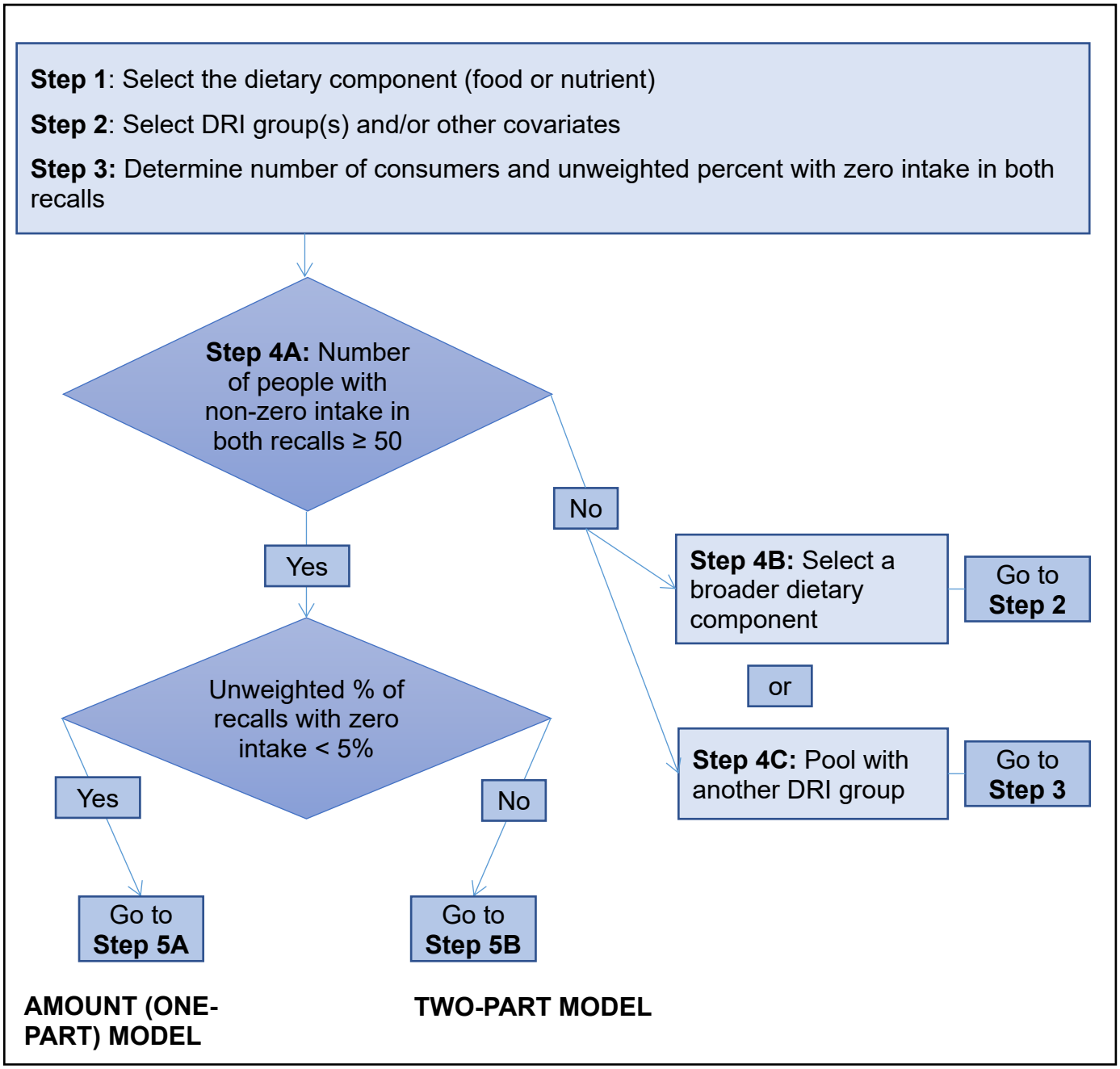
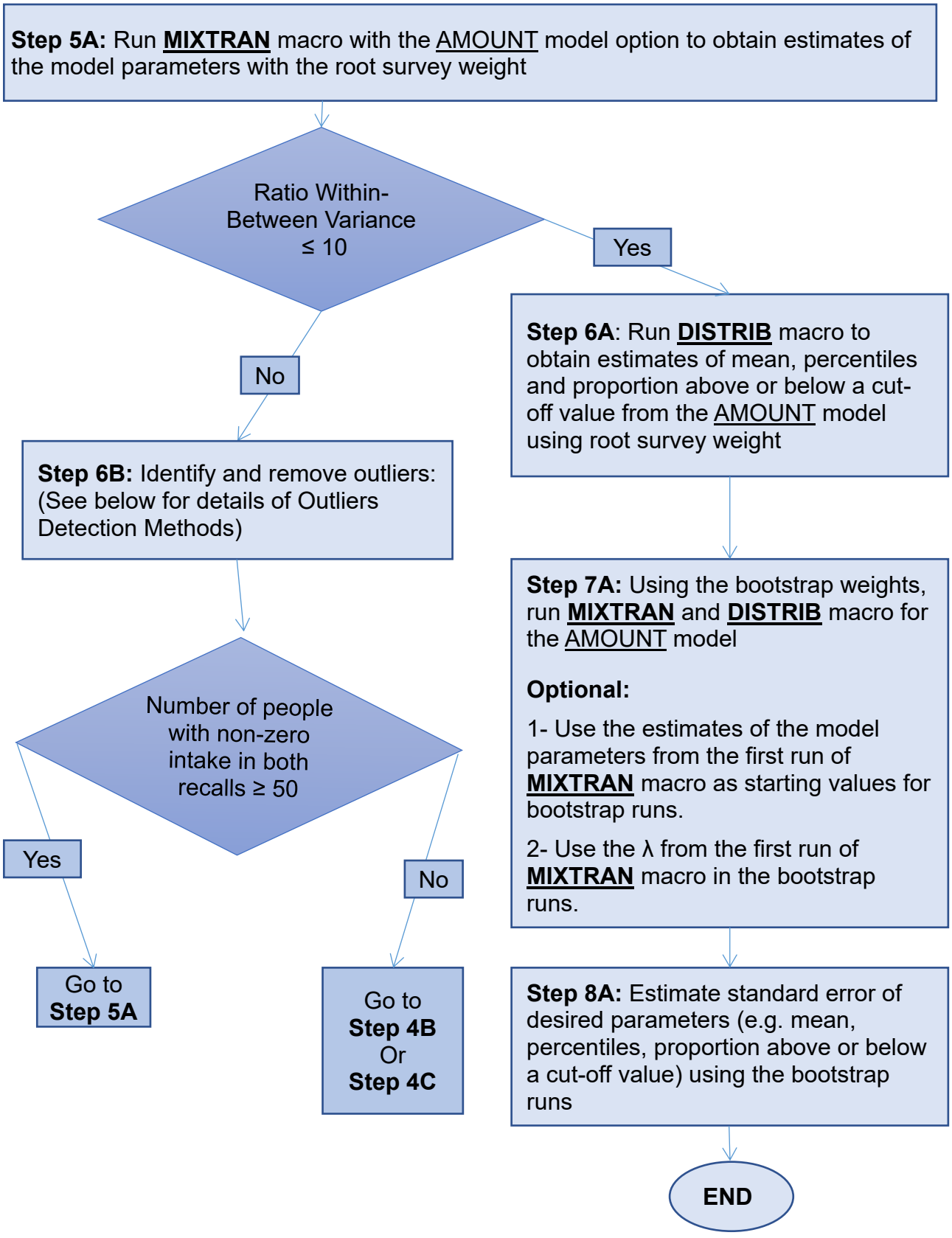
Flowchart for Estimation of Usual Intakes using the univariate NCI method



AMOUNT (ONE-PART) MODEL



TWO PART MODEL

Step 5B: Run **MIXTRAN** macro with CORR model option to obtain estimates of the model parameters with the root survey weight

Note: NOCORR model will also be automatically run by **MIXTRAN**

Model convergence

No → Go to **Step 6D**

Yes → Ratio Within-Between Variance ≤ 10

No → **Step 6B:** Identify and remove outliers: (see below for details of Outliers Detection Methods)

Yes → Number of people with non- zero intake in both recalls ≥ 50

Yes → Go to **Step 5B**

No → Go to **Step 4B** Or **Step 4C**

Yes → **Step 6C:** Test for correlation: run **MIXTRAN** with the CORR model using at least the first 50 bootstrap weights.

Note:
Use the λ from **Step 5B** in the bootstrap runs to ensure testing from a similar model

Optional:
Use the estimates of the model parameters corresponding to CORR model from **Step 5B** as starting values for bootstrap runs.

Step 7C: Estimate the Fisher's transformation of the correlation coefficient parameter (ρ) and its standard error from **Step 6C** to test the significance of the correlation coefficient between the probability of consumption and the amount consumed

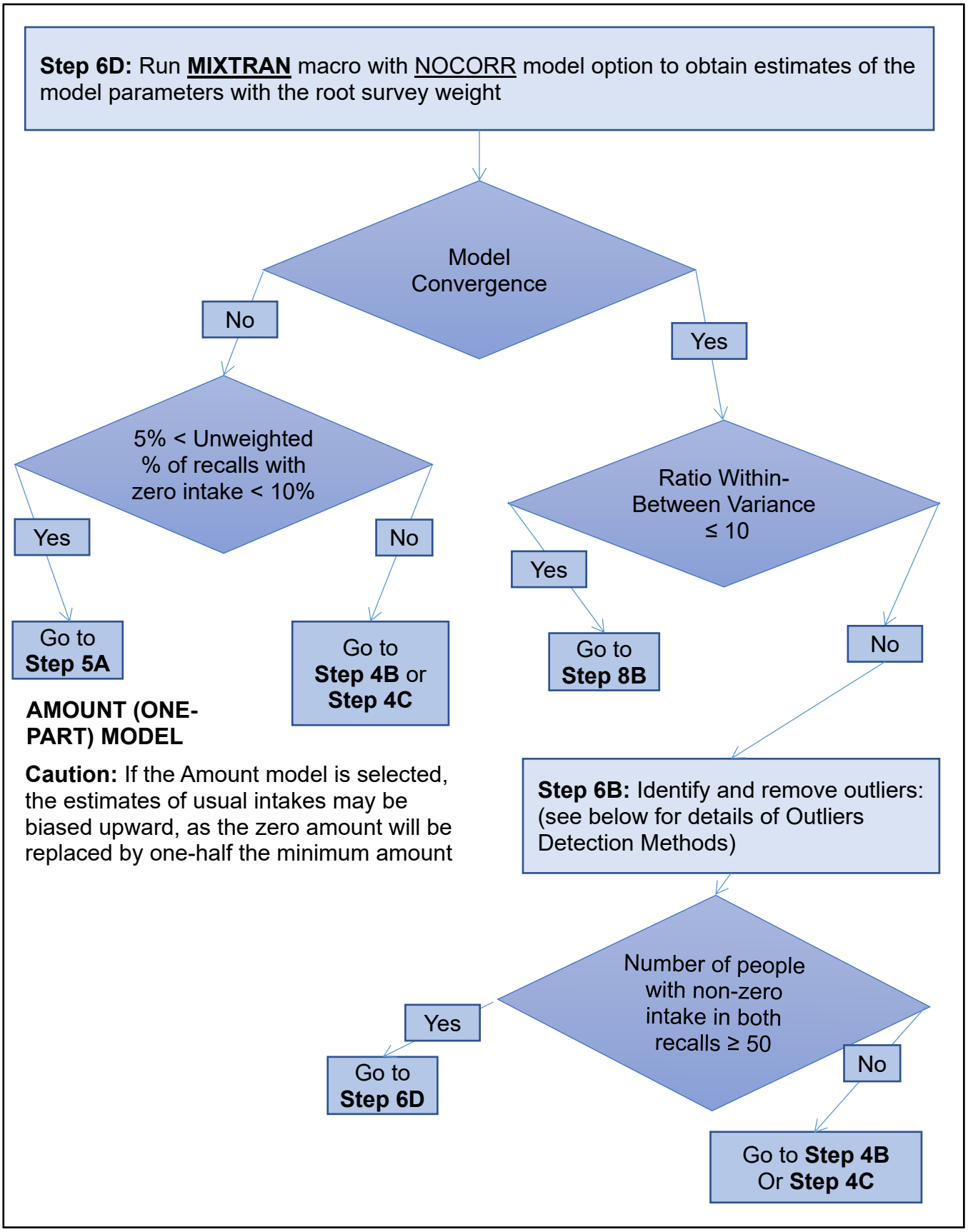
ρ significantly ≠ 0

No → Go to **Step 8B**

Yes → Go to **Step 8C**

UNCORRELATED MODEL

CORRELATED MODEL


Step 6D: Run MIXTRAN macro with NOCORR model option to obtain estimates of the model parameters with the root survey weight
Model Convergence
No
Yes
5% < Unweighted % of recalls with zero intake < 10%
Yes
No
Go to Step 5A
Go to Step 4B or Step 4C
AMOUNT (ONE-PART) MODEL
Caution: If the Amount model is selected, the estimates of usual intakes may be biased upward, as the zero amount will be replaced by one-half the minimum amount
Ratio Within-Between Variance ≤ 10
Yes
No
Go to Step 8B
Step 6B: Identify and remove outliers: (see below for details of Outliers Detection Methods)
Number of people with non-zero intake in both recalls ≥ 50
Yes
No
Go to Step 6D
Go to Step 4B Or Step 4C

UNCORRELATED MODEL

Step 8B: Using parameter estimates from **MIXTRAN** corresponding to the NOCORR model option, obtained either as part of the **Step 5B** or from **Step 6D**, run **DISTRIB** macro to obtain estimates of mean and percentiles with the NOCORR option in the MODELTYPE parameter using the root survey weight.

Step 9B: Run **MIXTRAN** and **DISTRIB** macros with the NOCORR model option using bootstrap weights (analysis of **Step 6C** may need to be re-run)

Optional:

1- Use the estimates of the model parameters from the **MIXTRAN** macro, obtained either as part of the **Step 5B or** from **Step 6D**, as starting values for bootstrap runs.

2- Use the λ from the first run of **MIXTRAN** macro in the bootstrap runs.

Step 10B: Estimate standard error of desired parameters (e.g. mean, percentiles, proportion above or below a cut-off value) using the bootstrap runs

END

CORRELATED MODEL

Step 8C: Using parameter estimates from **MIXTRAN** corresponding to the CORR model option, obtained from **Step 5B**, run **DISTRIB** macro to obtain estimates of mean and percentiles with the CORR model option using root survey weight

Step 9C: Run **MIXTRAN** macro with the CORR model option with remaining bootstrap weights from **Step 6C.**

Note:

Use the λ from **Step 5B** in the bootstrap runs to be consistent with **Step 6C**

Optional:

Use the estimates of the model parameters corresponding to CORR model from **Step 5B** as starting values for bootstrap runs.

Step 10C: Run **DISTRIB** macro with the CORR model option for all the bootstraps considered in **Step 6C** and **Step 9C**.

Step 11: Estimate standard error of desired parameters (e.g. mean, percentiles, proportion above or below a cut-off value) using the bootstrap runs.

END

For Step 6B: Methods for Outlier Detection used in Analysis of Nutrients and Episodically Consumed Foods

Method I: Large Within-Between Variance Components

- When the ratio of within/between variation is greater than 10, consider the mean distribution of the difference between Day 1 and Day 2 recalls.
- Values were identified as possible outliers if they fell ±3, ±2.5 or ±2 SD away from the mean distribution of difference between Day 1 and Day 2 values
- Day 2 recalls were removed as Day 1 recalls are considered to be less biased
- The scenario which first resulted in the within-between variance ratio less than 10 and excluded the fewest second 24hr recalls was retained

Method II: Normality Violation (Krebs-Smith [2])

- Perform a Box-Cox transformation of the raw non-zero values to approximate normality
- Extreme values identified as points either below the 25th percentile minus 2.5*IQR of the transformed distribution OR above the 75th percentile plus 2.5*IQR of the transformed distribution
- Analysis with and without extreme values conducted and compared