

Workshop on Demographic Analysis

Using Cohort Component Projections to Evaluate
Census Results

The master application of the balancing equation



"It's a fine, for the late return of our Census form..."

Cohort Component Projections

So far, we have considered techniques to estimate and evaluate each of the following

- Census Counts, by Age and Sex
- Fertility
- Mortality
- Migration

But how do we know that all of these demographic pieces are correctly estimated? Will they ever fit together perfectly? ...

Cohort Component Projections

Will they ever fit together perfectly?

Answer: No.

This is a key aspect of demographic analysis: getting the pieces to fit together!

Outline of this session:

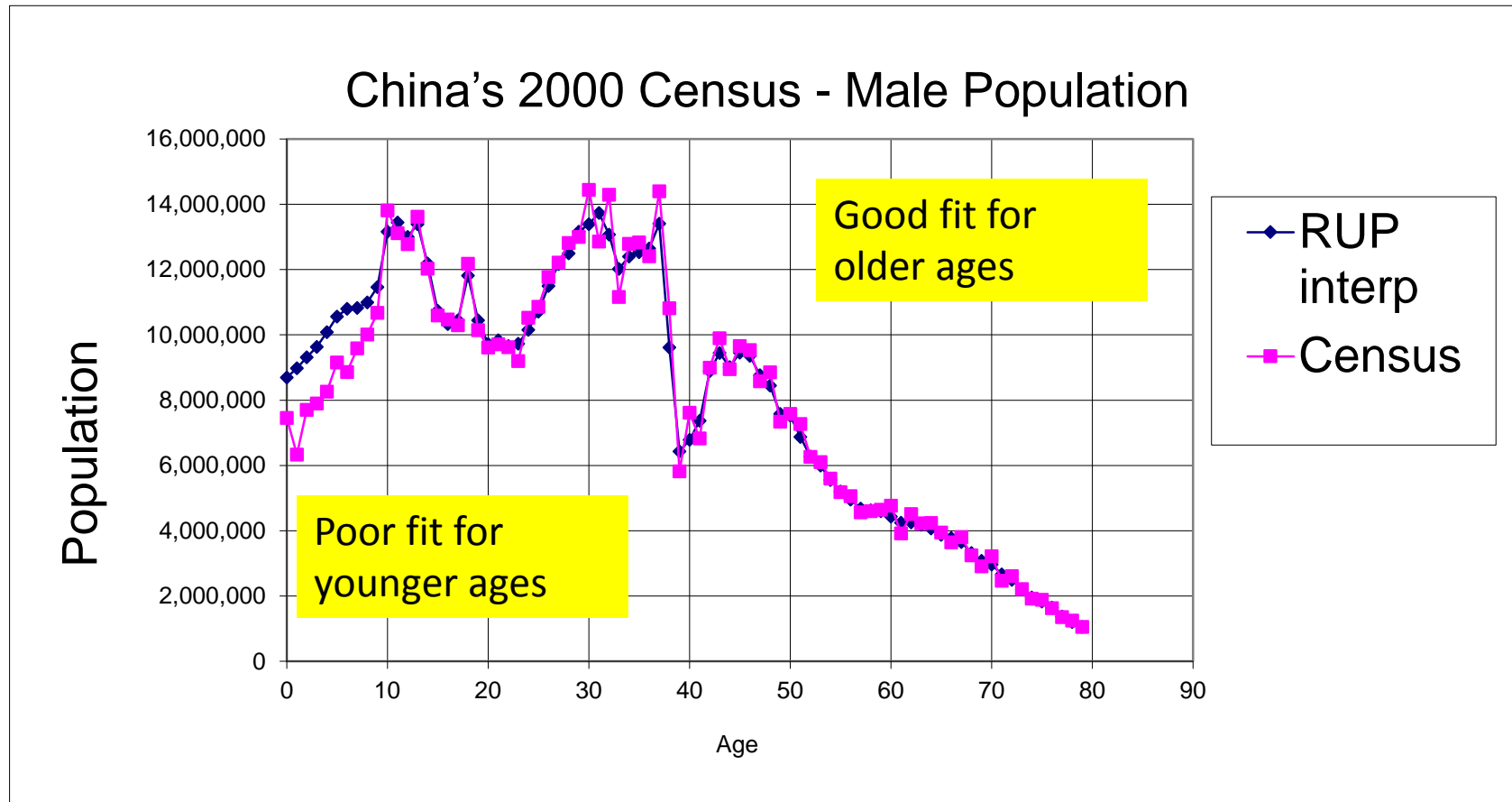
- Why do projections imply that components of the balancing equation fit together perfectly?
- How can projections help us to evaluate census results?
- How can projections help us to evaluate other demographic estimates?

Cohort Component Projections and Intercensal Analysis

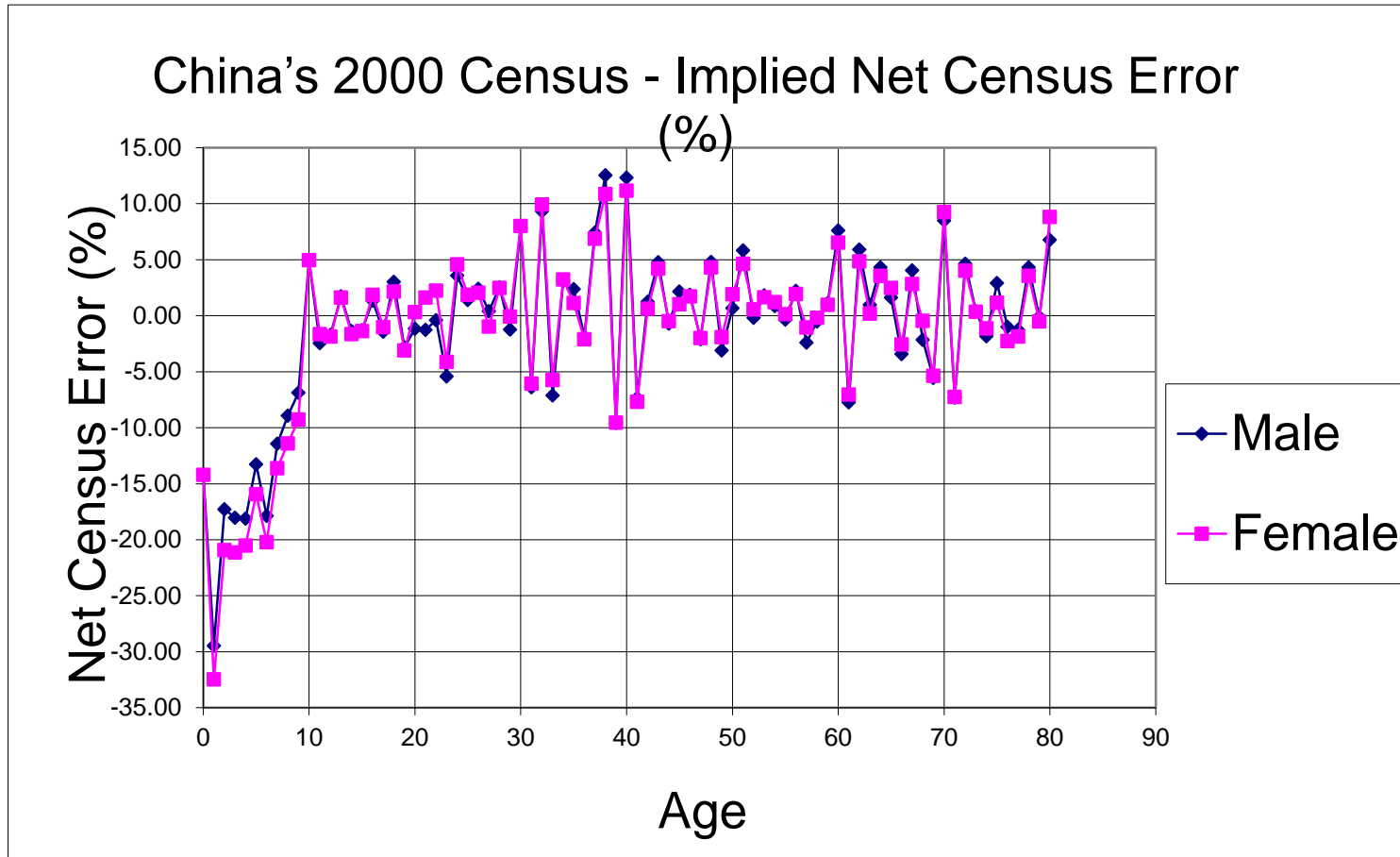
Fitting it All Together - here is the basic idea

- A census count by age and sex can be projected to the time of the next census via the cohort component method
- The projection provides a **standard** against which the new census results can be evaluated
- However, why does a new census count never match the projected count exactly?
 - Coverage error in the new census
 - Errors in the earlier census “base population”
 - Errors in projection parameters (fertility, mortality, migration)

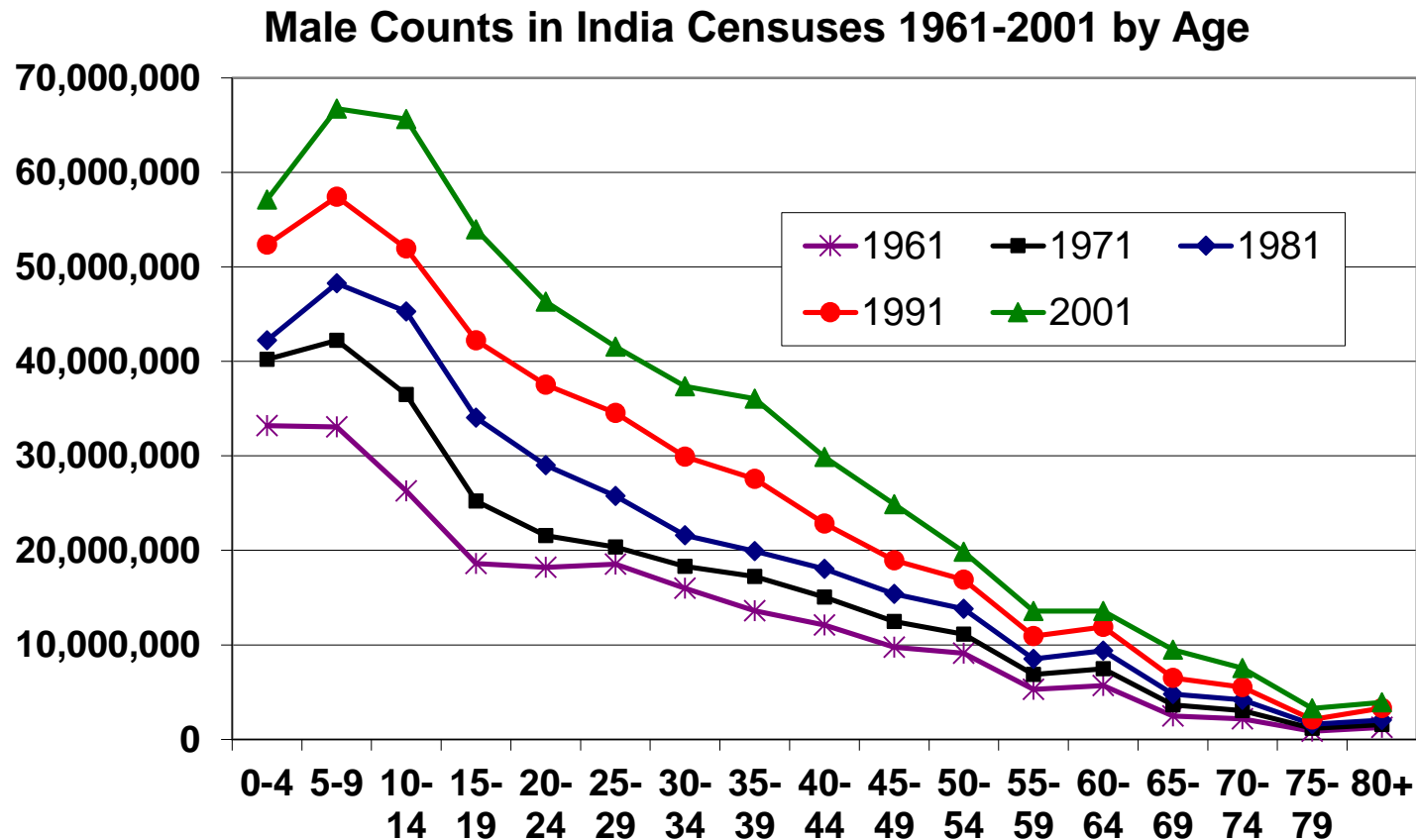
Example from China: 2000 Census vs. Projection from the 1990 Census



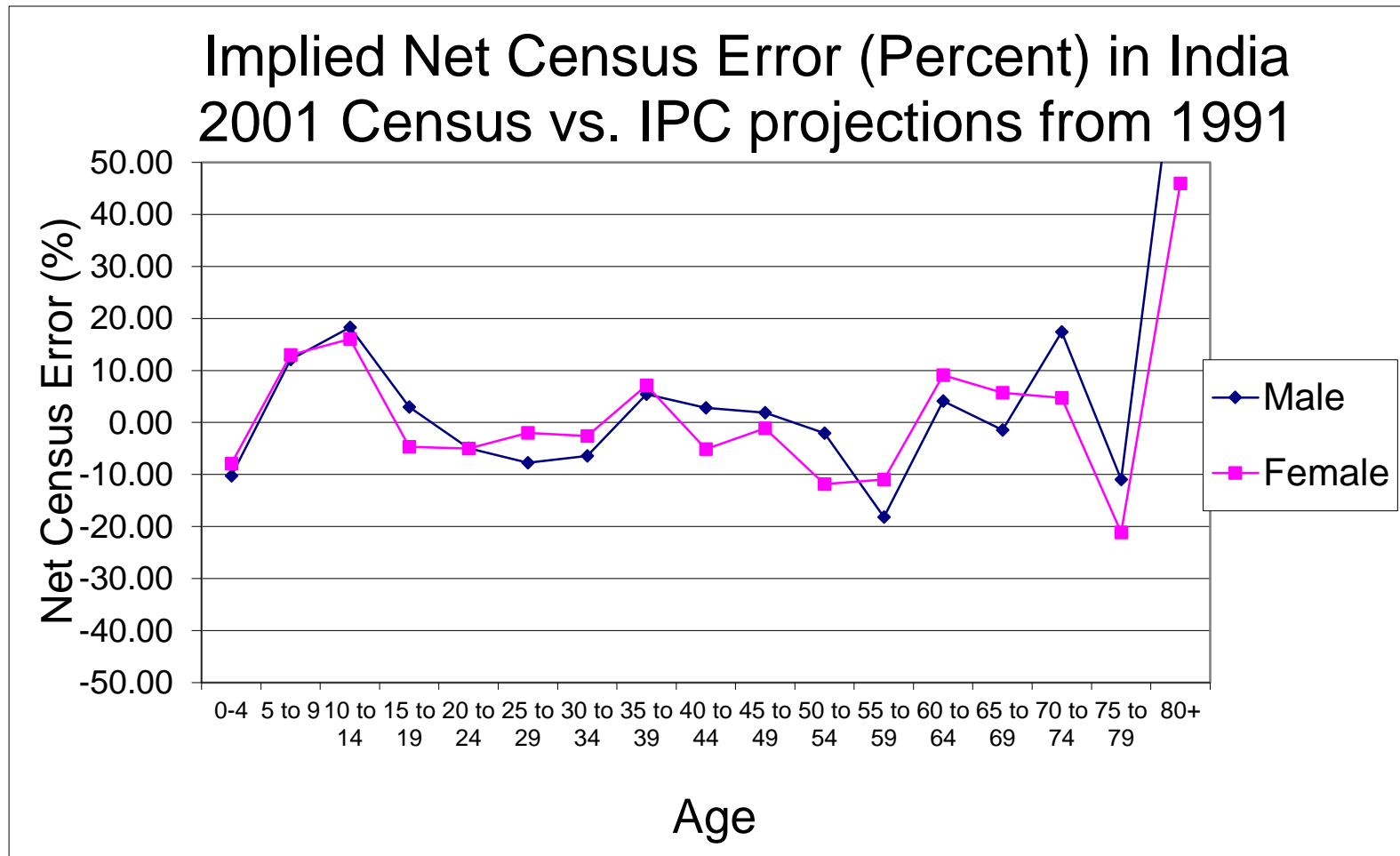
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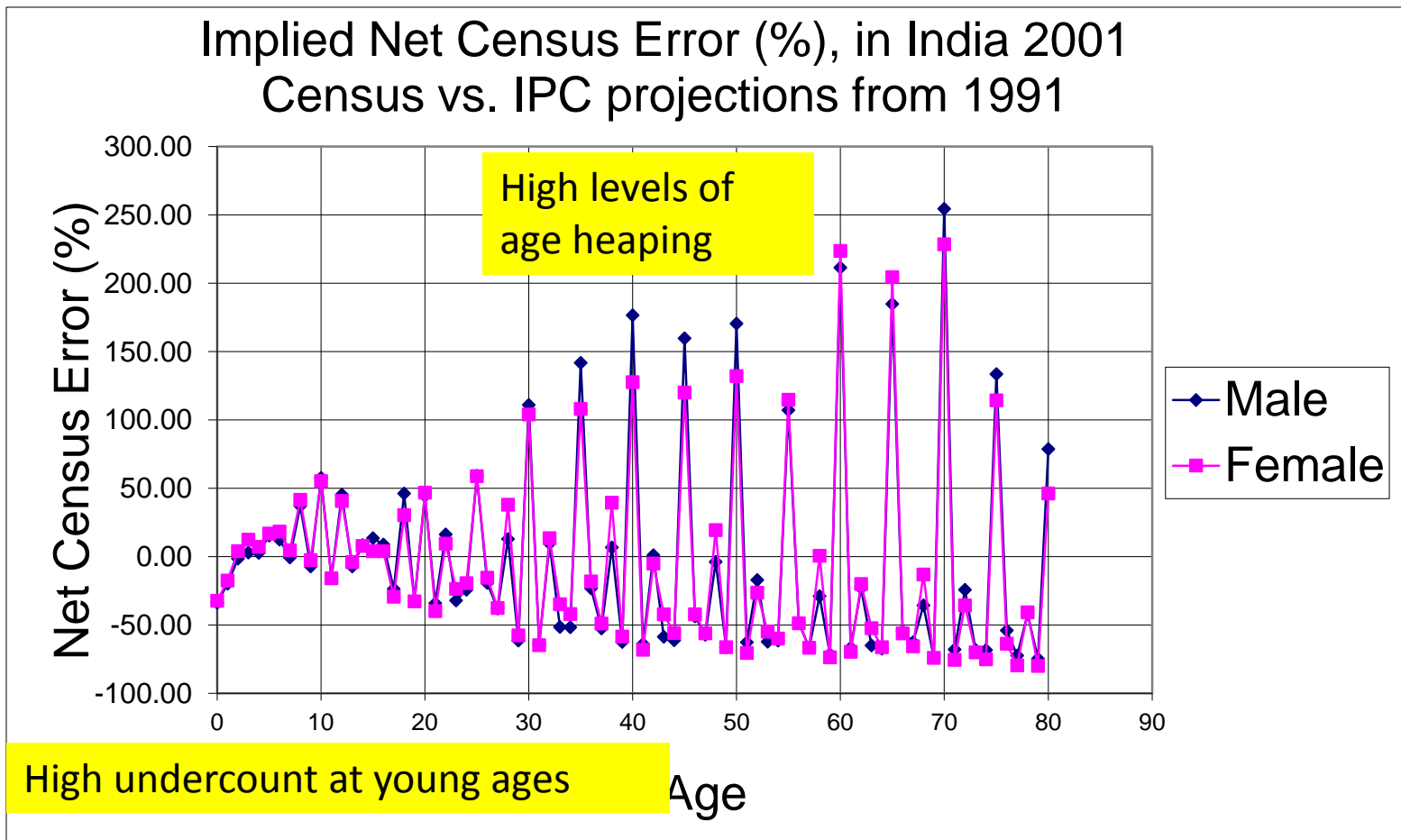
Example from India: Successive Census Counts, 1961-2001



Example from India: Evaluation of 2001 Based on Projection from 1991



Example from India: Evaluation of 2001 Based on Projection from 1991



Census Results vs. Cohort Component Projections

1. Look carefully at any differences between census counts and expected counts, by age and sex
2. Which components of the **projection** might be inaccurate, such as
 - Base population
 - Fertility estimates (affects counts of children)
 - Sex ratio at birth (affects sex ratio of children)
 - Migration (particularly common among young adults)
 - Mortality (may affect oldest ages)
3. Consider whether new census reporting may be faulty (misreporting, under/over counting, etc.)

Use of RUPCEN (DAPPS ProjCen) to Estimate Net Migration by Sex and Age

- Can be used for this purpose if
 - The two censuses are relatively well enumerated
 - Fertility is well measured
 - Mortality is well measured
- Estimates cohort differences (Lexis parallelograms)
 - Need to convert to Lexis squares for input into the projections

Alternative Template: NewPAS>ResidualMigBetaZA.xls

- Integrated application of RUPCENS-like analysis
- Interpretation of resulting differences as net migrants rather than census error
- Conversion of the cohort differences to annual numbers by age and sex
- Simulated reprojection of the population including the newly estimated net migrants

Alternative Template: NewPAS>ResidualMigBetaZA.xls

- Optional absolute or relative levels of net migration
- Options for estimating the migration of children