

Task 1.4.3 Household Survey MIC

Inputs

Survey data base.

MIC report.

Processing

Examples of MIC issues are:

- missing travel diaries
- missing key items (where there should be no missing values); eg:
 - household: size, number of cars
 - person: age, employment status, work address, study address
 - stage: start and end addresses, start and end times, purpose, mode
- missing items of lesser importance.

Missing travel diaries

Tasks are:

- review occurrence of missing diaries,
- specify bias correction factor,
- implement and verify results.

For missing travel diaries, three bias correction options might be considered:

- apply an additional expansion factor to the trips by other members of the household,
- apply additional expansion factors to clusters of households (in small geographic areas),
- develop additional expansion factors by person characteristics, which would be applied as overall factors for the whole sample.

In the Wellington study, a combination of the last 2 methods was preferred based on the following correction factors:

- compute the number of persons out of each geographic cluster 'c' in age categories 'a' (eg 6-21, 21-64 full time employed, 21-64 other, >64): N_{ca}
- compute the number of diaries which are missing in each cluster by age: n_{ca}
- compute correction factor to be applied to all trip records: $1/(1 - n_{ca}/N_{ca})$

This factor ensures that the locational characteristics of the missing travel are not lost but also is sensitive to the idea that some persons are more likely to be missing than others.

Missing key items/Imputation

Tasks are:

- review occurrence of missing values;
- specify action to take on each (either code as missing, or substitute artificial data, the process of estimation to be specified),
- implement.

Imputation is a term used to describe methods for synthesising missing values. For the Wellington work, the household survey contractor ensured that key values were not missed, with the single exception of income. But in other studies it may make more sense to impute missing values where they are important for the later modelling activities.

The literature (particularly work by Tony Richardson) offers many imputation techniques. In Wellington, personal income was imputed as follows: persons who did not report their income were allocated randomly the income of someone else in the household sample who had the same characteristics in regard to:

- home location,
- age (15-20, 21-30, 31- 40, 41-65, 65+),
- occupation, and
- employment status - full-time, part-time, retired.

Outputs

Trip Correction Factors in the data base.

Synthesised values for some questions in data base (it is wise also to include a 'flag' in the data base identifying synthesised values, enabling them to be excluding from analyses if required).

Note.