United Nations Workshop on the Production of Population Estimates
and Demographic Indicators
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Hands-on Exercise – Population Estimation

1. **Cohort Component Method (CCM)**
   Using the population by age and sex that was enumerated during the first census, the age patterns of fertility and the mortality levels for each sex that you have computed in the exercises on fertility and mortality:
   a. Project the population of your country to the date of the most recent census using the application PROJCT in MORTPAK;
      i. Enter the appropriate base year, month and day;
      ii. Enter the appropriate year of the end of the projection;
      iii. Set the appropriate open-age group of the base population;
      iv. Provide a sex ratio at birth;
      v. Select the appropriate Model life table or use the mortality pattern given in the first census;
      vi. Enter the base year population by age and sex;
      vii. Enter the age-patterns of fertility for the base year and end year of the projection (the intermediary values will be interpolated linearly by MORTPAK)
      viii. Enter the chosen levels for fertility, mortality and net migration (for the **first projection**, set the **net migration to zero**);
   b. Run the application PROJCT;
   c. Check the results;
   d. Copy the population by age and sex obtained on the date of the most recent census and save it in an Excel file;
   e. Open the Excel template "UNPD_Migration Age Patterns.xls"
      i. Turn on the macros feature;
      ii. Enter a value of net migration that you estimate realistic, select the appropriate Migration Model ("Labour Migration" "Family Migration"…) and copy the estimates of net migration by age and sex (number, not percentage);
   f. Paste the net migration estimates by age and sex in the appropriate cells in the application PROJCT in MORTPAK;
   g. Enter the appropriate net migration levels in the cells in PROJCT in MORTPAK;
   h. Run the application PROJCT;
   i. Check the results;
   j. Copy the population by age and sex obtained on the date of the most recent census and save it in the same Excel sheet as previously

2. **Discussion/Conclusion**
   Create a figure including the two populations by age and sex projected to the date of the most recent census, together with the population by age and sex enumerated in the most recent census.
   How do the size of the total population projected under the two variants (no migration and including net migration) compare to the population enumerated in the most recent census?
   What can you conclude on the possible intercensal population development in your country?