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Population estimates metadata: Improvements to current situation

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The need for consistent population estimates
(for the United Nations Population Division (UNPD))

World Population Prospects (WPP)

- Comprehensive, standardized demographic dataset for all countries/areas Internally consistent prospective **population reconstruction** from 1950 to 2020 using all available data (i.e. population by age and sex, mortality, fertility and migration) using the cohort component method

- Population estimates are used to check consistency of WPP estimates (…and WPP allow to detect problems in population estimates)

>> Important to obtain **accurate/consistent** national estimates of population size and composition by age and sex

  o WPP used as "denominator" in several SDG indicators

Consistent population estimates

Several methods exist to produce population estimates

- Basic requirements:
  - An initial/base population count (recent and adjusted);
  - A method of time adjustment to update the initial population count

"Gold standard" methods

- Continuously updated population registers
- Cohort-component method applied to census data

→ Population data consistent by age, sex and along cohorts

For further details, see Spoorenberg (2020)

Official population estimates: Current practice

Base population

- In majority of the regions, full (or partial) population census, or population register serve as base population for population estimates

Method of time adjustment

- Situation varies by region
- Practice of not bringing up to date the initial population still prevalent in few countries
- Not all methods produce consistent population estimates by age, sex and cohort

Adjustment to base population

- In many countries, no adjustment is made to census data
- Under-enumeration is not systematically corrected

>> Improper method of time adjustment and/or unadjusted base population produce national population estimates that are inconsistent and different from WPP estimates

Metadata information: Further improvements

In 2008, the United Nations Task Team on Population Estimates had called upon the UN statistical system to reinforce its efforts to improve the availability of metadata for censuses, surveys and basics statistical indicators.

Despite progress, further improvements are required:

1. Dissemination of metadata information
2. Territorial and population coverage issues
3. Usual resident
4. Population register in DYB database
5. PES results and adjustments
6. Intercensal and post-censal estimates
7. Validation step

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Metadata information: Further improvements

1. Disseminate publicly the metadata obtained from the Population Estimates Questionnaire

- o Important information on total population and population by age and sex
  (Type of base data used; Type of adjustments applied to base population; Type of method of time adjustment)

- o Better understanding of the quality and reliability of the underlying data and methods used to derive population estimates

>> Need to have this information published online in structured tabular format for analytical purposes, and as technical reference material

Metadata information: Further improvements

2. Issues with territorial and population coverage

- o How **territorial coverage issues** get treated and reflected in the time series have major implications for analyzing change over time

- o Use of footnotes can be helpful, but key issues/limitations should also be **codified through a standard typology for easier analytical purposes** (e.g., geographic coverage, population coverage, methodological issues, PES results/adjustments)

- o Tabulations only available for sub-populations should be coded appropriately rather than as for the whole population with a footnote about population coverage

- o In addition to data from population censuses, collect population estimates by age and sex disaggregated by migratory status for **native and foreign-born populations** when national statistical authorities produce such estimates (e.g., special situation of GCCs or various territorial enclaves/islands with substantial foreign-born populations)

Metadata information: Further improvements

3. Add/keep "Usual resident" statistical concept to the DYB database

- o Data submitted under "Usual resident" are currently recoded as "de-jure"
- o Eurostat/NSO maintains some distinctions between these concepts
- o P&R for vital statistics call for the use of the "Usual resident" population concept for the denominator of vital rates

4. Expand/update the coding of the record type in the DYB database to store population estimates based on population register (instead of a census/survey, or estimates)

- o Currently, not possible to identify which countries/years the population data are based on population registers
- o More countries use population registers for official population estimates, so need to make this information available (n > 80 with 32 in DYB questionnaire + 11 in Eurostat + 7 in IMAGE Asia project + 25 in WB ID4D)
- o Need to assess the quality and completeness of population registers, especially in respect to updates for international migrations

Metadata information: Further improvements

5. Consolidate and make publicly available information on Post-Enumeration Surveys (PES) or other adjustments made

- o Currently, some of this information is available only as footnotes with some of the tables
- o Need to make available in a structured tabular format the key results of the PES (for total population, and by age and sex if available) or adjustments made based on analytical methods
- o Eventually request adjusted and non-adjusted population data

>> From the *Principles and Recommendations on Population Census* (2017):

"It is universally accepted that a population census is not perfect, […], but these errors should be measured." (p. 118)

"The final publication of census results should include an estimate of coverage error, together with a full indication of the methods used for evaluating the completeness of the data." (p. 119)

Metadata information: Further improvements

6. Addition to the annual Population Estimates Questionnaire
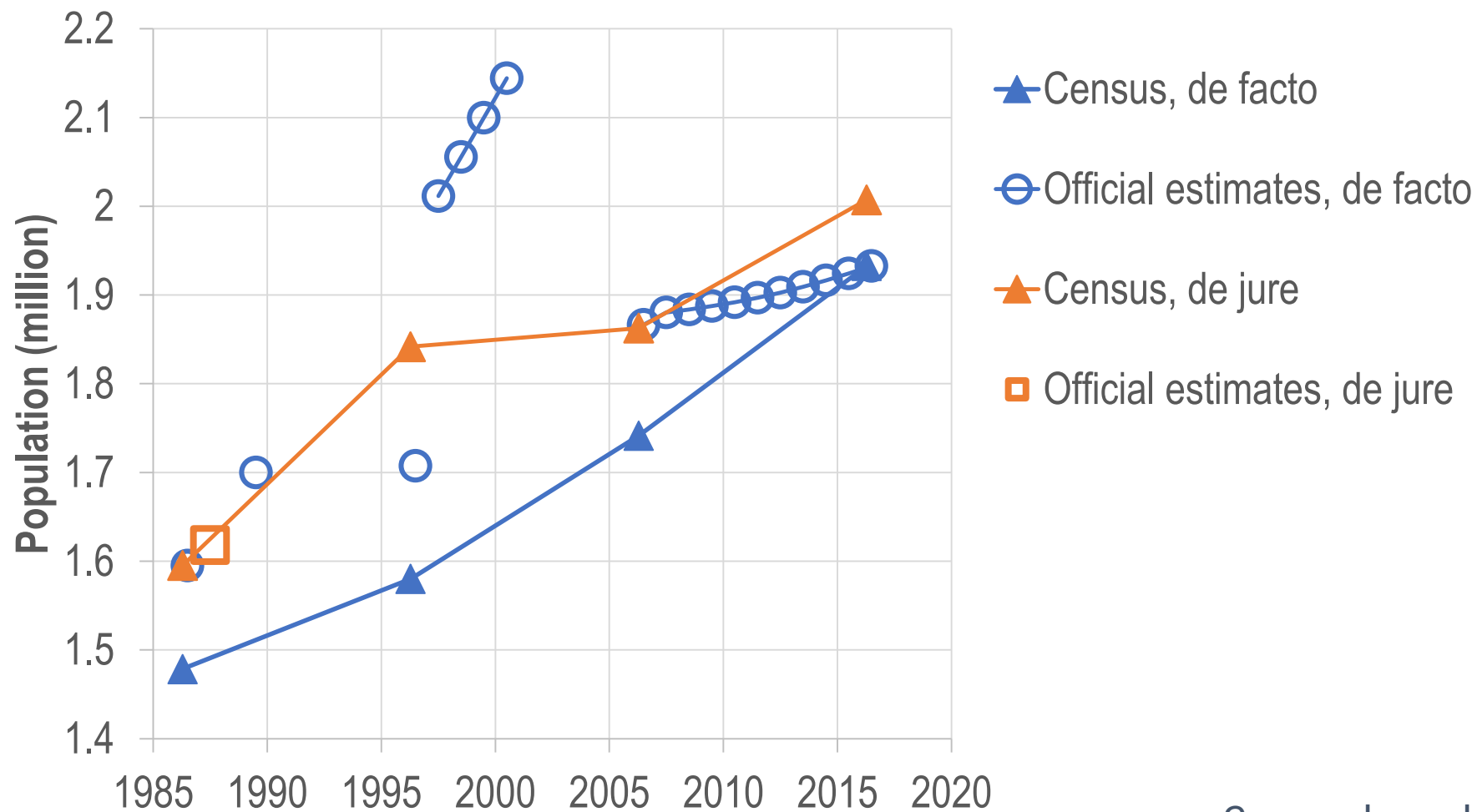(Section 2.2.2 Method of time adjustment for Population by age and sex)

- o Currently impossible to understand and know what method was used to create post-censal estimates

- o After each new census, a new set of intercensal estimates should always be recomputed and resubmitted to the DYB (European Commission 2003, USBC 2012)

- o Cohort-component method (CCM) is the gold standard that should be used to compute post-censal estimates in countries lacking population registers

- o Add the Cohort-component method (CCM) for population projection by age and sex among the list of methods (i.e. before "by other means")

7. Put in place a validation step to the estimates submitted

- o Are estimates submitted to DYB consistent? (definition/concept/value)

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Validation step of estimates submitted to DYB

Total population: Official and census estimates (*de facto* and *de jure*)

Population (million)

2.2
2.1
2.0
1.9
1.8
1.7
1.6
1.5
1.4

1985   1990   1995   2000   2005   2010   2015   2020

Census, de facto
Official estimates, de facto
Census, de jure
Official estimates, de jure

Source: based on Pelletier (2020)

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References

European Commission (2003), *Basic Methodology for the Recalculation of Intercensal Population Estimates,* Luxembourg: Office for Official Publications of the European Communities, Working Papers and Studies (3/2003/E/no 27).

Pelletier, F. (2020), *Census Counts, Undercounts and Population Estimates: The Importance of Data Quality Evaluation*, New York, United Nations, DESA, Population Division, Technical Paper No. 2020/02.

Spoorenberg, T. (2020), *Data and Methods for the Production of National Population Estimates: An Overview and Analysis of Available Metadata*, New York, United Nations, DESA, Population Division, Technical Paper No. 2020/01.

U.S. Bureau of the Census (USBC) (2012), *Methodology for the Intercensal Population and Housing Unit Estimates: 2000 to 2010,* Washington, D.C., U.S. Bureau of the Census, Revised October 2012.

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