Episode 3. P/F Ratios Method for Synthetic Cohorts

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Module 4. Episodes

- Episode 1. Introduction
- Episode 2. Standard P/F ratios using data from one census
- **Episode 3. P/F ratios for synthetic cohorts using data from two censuses**
- Annex 1. Details on Standard P/F Ratios method
- Annex 2. Details on Synthetic Cohorts P/F Ratios method

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Goal

- To provides a basic description of the P/F Ratios method for *synthetic cohorts* and its use in evaluating coverage of birth recordings when fertility changes.

Road Map

- Data requirements.
- Assumptions of the P/F Ratios Method for Synthetic Cohorts.
- Logic behind P/F Ratios Method for Synthetic Cohorts.
- Description of the P/F Ratios Method for Synthetic Cohorts.
- Estimation of Adjustment Factor.
- Advantages and Comparison.
- Learning Assessment.

P/F Ratios for Synthetic Cohorts Require Data from Two Censuses Taken 5 or 10 Years Apart

- Children ever born classified by five-year age group of mother for each census.
- Births in the year preceding each census classified by five-year age group of mother.
- Women by five-year age group for each census.

Assumptions

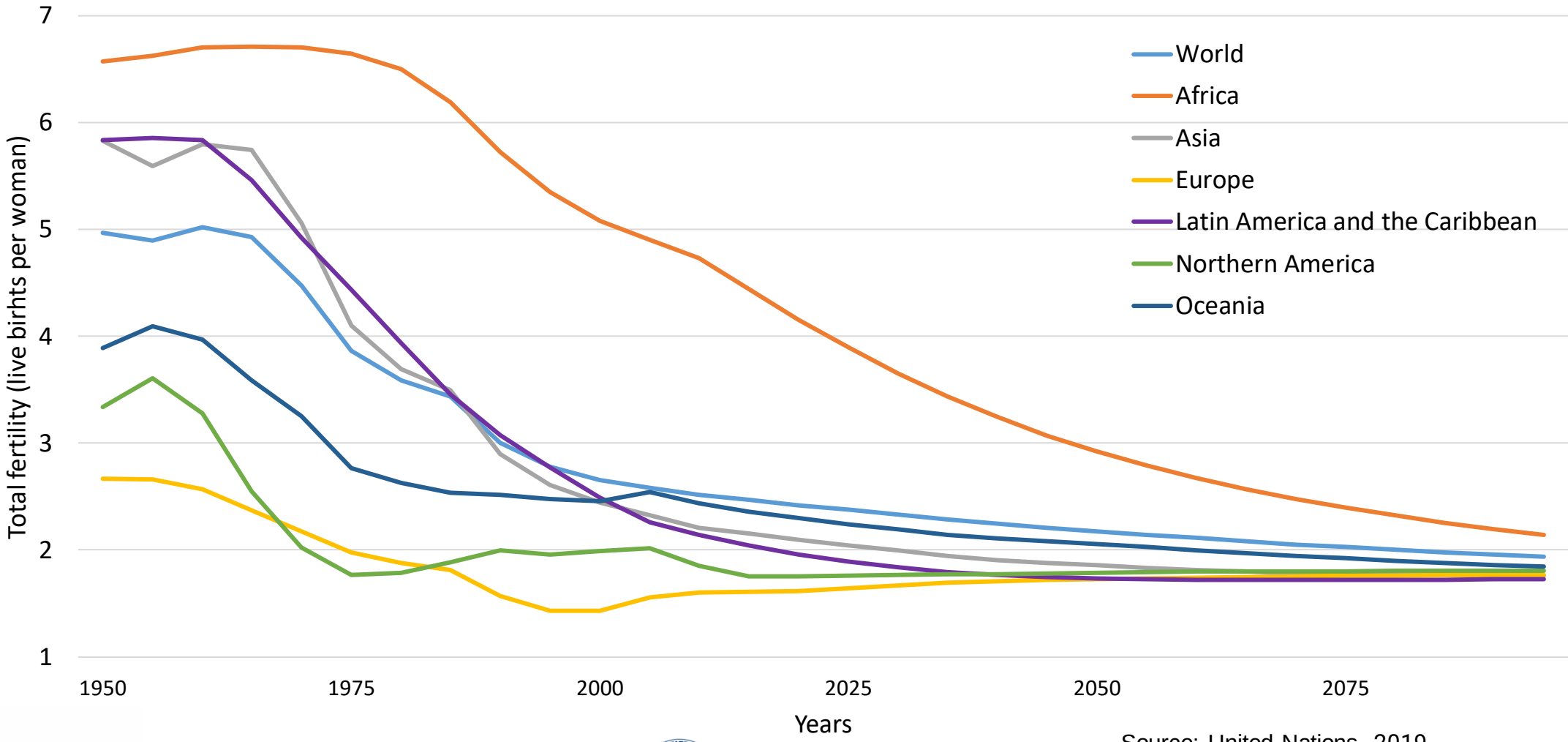
- The reporting of the average number of children ever born is complete (at least for younger women, under 30 years or 35 years of age), and represents the level of cumulative fertility up to these ages in two consecutive censuses.
- The proportion of births underreported in age-specific fertility rates is the same at all age groups.
- Mortality and migration have no effect on actual parity distributions.

Logic Behind the P/F Ratio Method for Synthetic Cohorts

The standard P/F ratio method described in episode 2 of this module, assumes that fertility has been constant during the last 15 to 20 years before the census.

- However, fertility levels have declined on average in all world regions.

Total Fertility Trajectories for the World and Regions
1950-2020 Estimation and 2020-2100 Medium Variant Projection



Source: United Nations, 2019 Revision of World Population Prospects

Logic Behind P/F Ratios for Synthetic Cohorts

- The logic behind the synthetic cohort P/F ratio and the standard P/F ratio methods is the same: there should be consistency between information on parity and cumulated current fertility across women's age groups.
- In the P/F ratio method for synthetic cohorts changing fertility is addressed by
  - Using cumulated cohort increments of lifetime fertility between two censuses.
  - Using age-specific fertility rates averaged across the two censuses to calculate parity equivalents.

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Core Concept: Synthetic Cohort

- It this case, it can be described as a fictional group of women of reproductive age subject to average intercensal fertility conditions.
- Fertility and parity rates are not observed from the census data, they are estimated averages based on changes observed between two points in time.
- These rates are used to simulate the effects of changing fertility conditions within the intercensal period on a group of women of reproductive age.
- See annex 2 for a detailed explanation of estimation of averages.

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Logic Behind the P/F Ratio Method for Synthetic Cohorts

To avoid the assumption of constant fertility we can:

- Estimate intercensal parities that refer to the fertility experience during a specific period (between two censuses).
- Compare intercensal parities (P) with lifetime fertility equivalents (F) measured during the same period.

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Logic Behind the Method: Intercensal Parity

Average parities referring to an intercensal period can be computed from tabulations on children ever born by age of mother from two censuses.

- With an interval of 10 years between two censuses, survivors of a cohort of women at the first census can be identified at the second.
- Estimations of intercensal parity are based on changes in the average parity of the cohort.

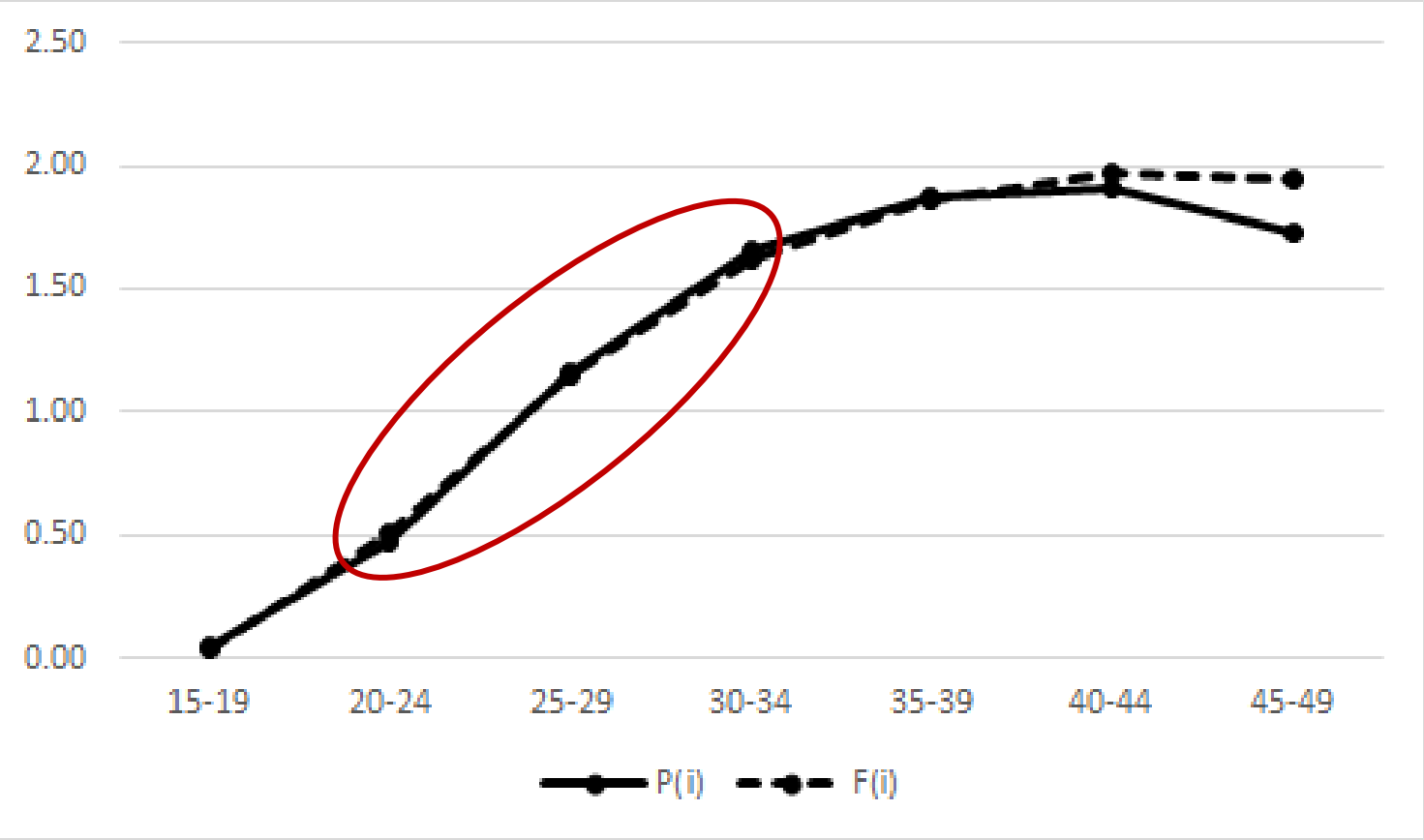
Description of the Method

- Intercensal Average Parity (P)
  - Calculate average parities for each census.
  - Calculate average parities increments for intercensal cohorts.
  - Calculate parities for synthetic cohorts.
- Intercensal Lifetime Fertility Equivalents (F)
  - Calculate average intercensal age specific fertility rates.
  - Cumulated and interpolated age specific fertility rates up to a certain age.

Description of the Method (Con.)

- Calculate P and F, and then estimate the ratios P/F.
  - Check that P(2)/F(2) and P(3)/F(3) are consistent.
  - Estimate adjustment factor (K).

P(i) and F(i) for Synthetic Cohorts



Source: US Census Bureau with data from the Vietnam 1999 and 2009 censuses

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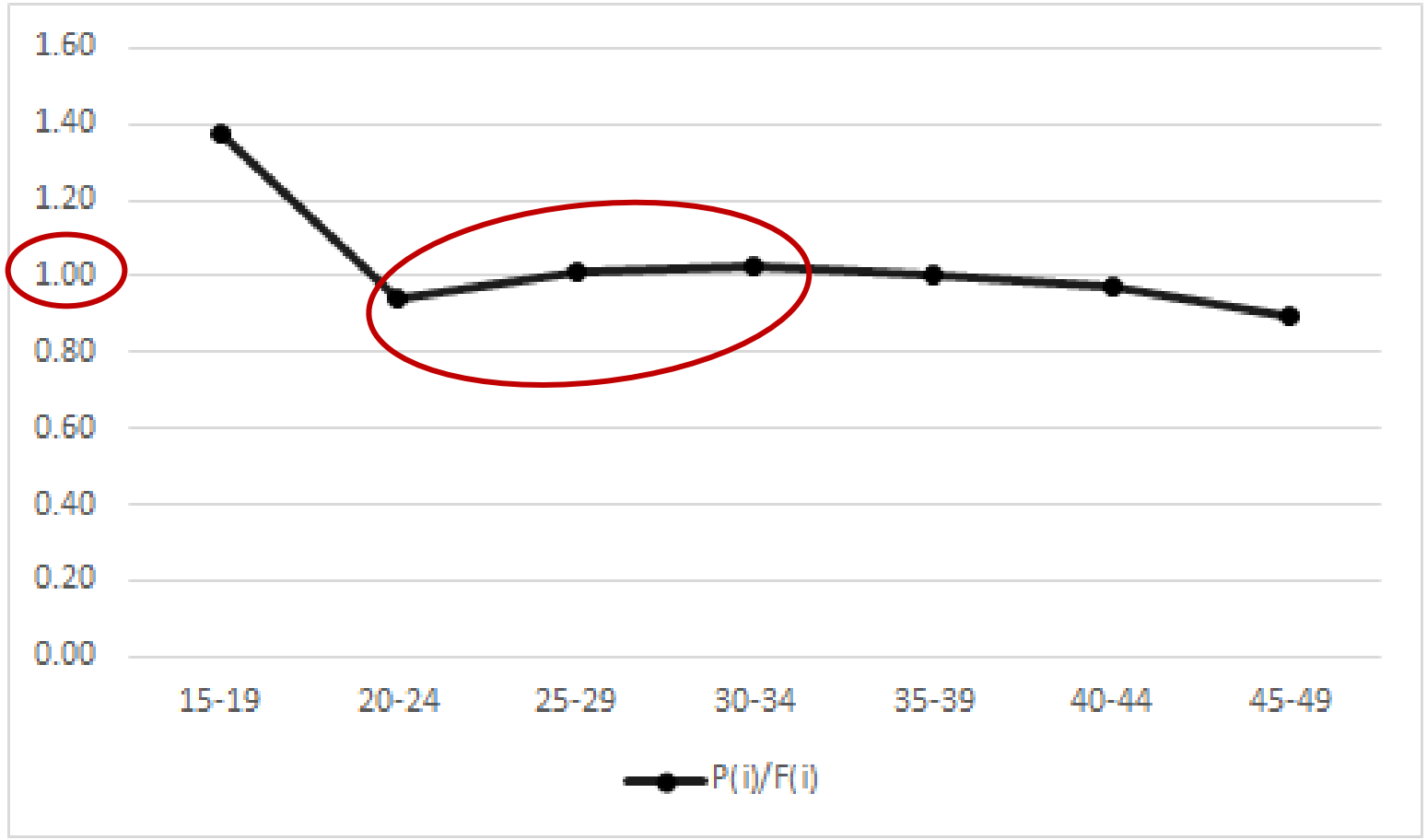
P(i)/F(i) Ratios for Synthetic Cohorts



Source: US Census Bureau with data from the Vietnam 1999 and 2009 censuses

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Advantages

- The method requires a relatively small amount of information, which is often available from fertility questions in censuses.
- The method uses observed patterns of fertility and does not assume constant fertility.
  - Only the pattern of the *inter-census* age-specific fertility rates is important.
- If you need additional details about this methodology, please go to Annex 2 in this module.

Comparing Both Methods

Source of Parity Data	Source of Recent Fertility Data	Methodology Used
Single census	Single census (or survey)	Standard P/F Ratios method
Two censuses (or recent census and earlier survey) 15 years apart or less	First census	P/F Ratios method for synthetic cohorts, using age-specific fertility rates from first census or survey (not common)
	Second census	Same, but age-specific fertility rates from second census
	Both censuses	Same, but averaged age-specific fertility rates used

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Learning Assessment

- True or False
  The advantage of the P/F ratios method for synthetic cohorts is that recent changes in fertility are incorporated in evaluations of coverage of births from censuses.

- True or False
  There is no advantage in estimating synthetic cohorts, it is just a more complex estimation.

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Learning Assessment

- True
  The advantage of the P/F ratios method for synthetic cohorts is that recent changes in fertility are incorporated in evaluations of coverage of births from censuses.

- False
  There is no advantage in estimating synthetic cohorts, it is just a more complex estimation.

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Learning Assessment

- Select the correct answer
- The underlying difference between the standard and the synthetic cohorts methods is that
  - A. The standard method assumes constant fertility over time.
  - B. The synthetic cohorts method assumes a stationary population model.
  - C. The synthetic cohorts method is based on modeled data.
  - D. There are not differences, it depends on the user preferences.

- True or False

The P/F ratios method for synthetic cohorts requires data from one census.

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Learning Assessment

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- False

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