

Methods for Estimating International Migration and Characteristics: A Roadmap for the 2020 Demographic Analysis

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Background

- Net international migration is a key measure of demographic change for postcensal population estimates, population projections, and coverage evaluation programs at the U.S. Census Bureau
- Uncertainty in net international migration:
 - Input data are less complete compared to vital records
 - The same person can experience multiple migration events
 - Migration patterns may vary by age, sex, race, and ethnicity
 - International migration occurs under various legal statuses (e.g., legal, temporary, undocumented)
- Post-2010 research from Demographic Analysis (DA) showed that a subcomponent of net international migration caused implausible sex ratios. This is a major impetus for revising the methodology for 2020

Table 1. Contribution of Demographic Subcomponents: 2000 DA

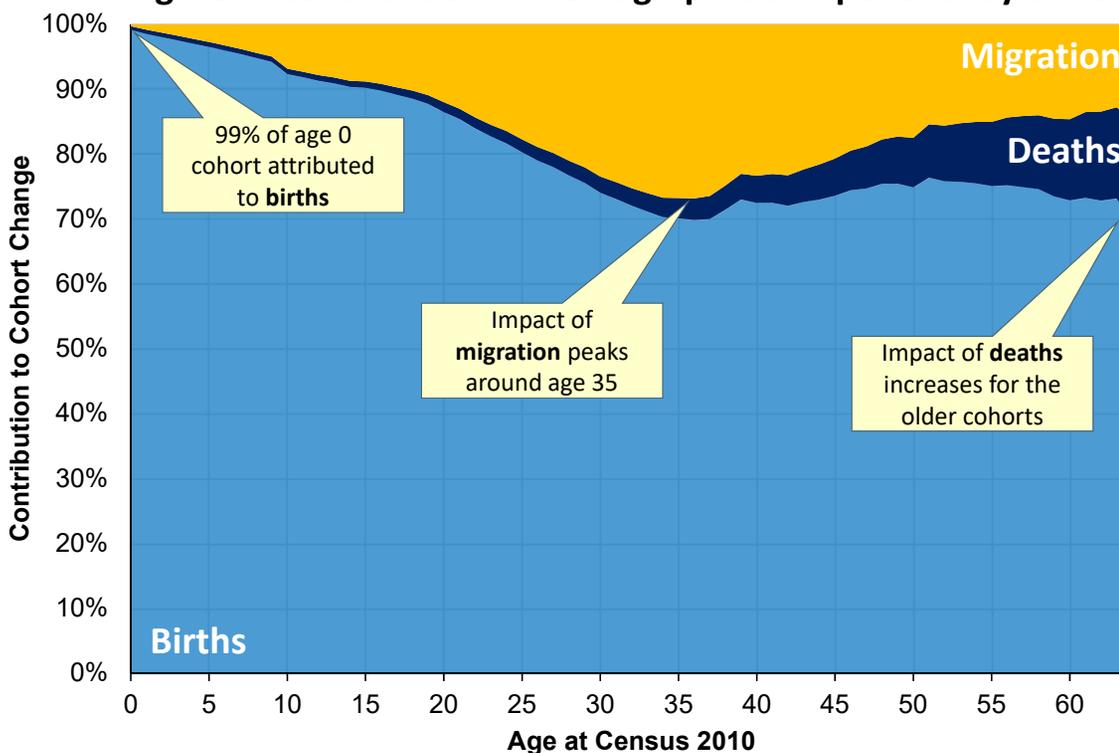
DA Component	Estimate (Absolute Value)	% of Total
Sum	322,912,000	100%
Natural Increase		
Births	234,860,000	73%
Deaths	14,767,000	5%
Net International Migration		
Legal Immigration	20,332,000	6%
Residual Foreign Born	9,983,000	3%
Emigration of Legal Immigrants	5,485,000	2%
Net Puerto Rico Migration	906,000	< 1%
Net Civilian Citizens	892,000	< 1%
Temporary Migrants	776,000	< 1%
Armed Forces Overseas	324,000	< 1%
Population Age 65 and over		
Medicare Population	33,245,000	10%
Not Enrolled in Medicare	1,342,000	< 1%

Birth records are the foundation of the DA estimates

Background (cont.)

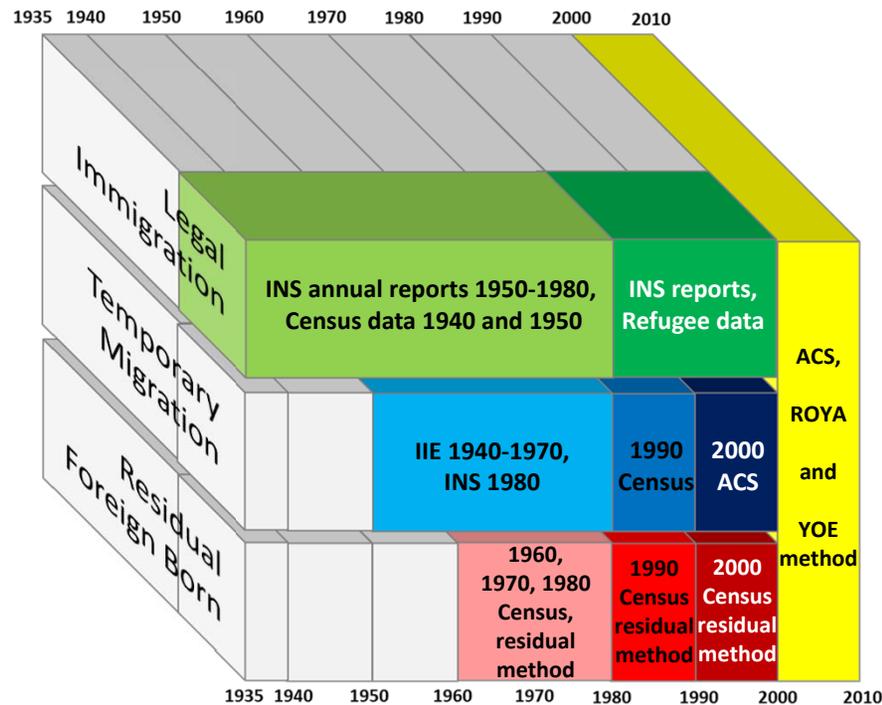
- Who is in the birth records but not present on Census Day?
- Who is not in the birth records but is present on Census Day?

Figure 1. Contribution of Demographic Components by Cohort



Data Source: 2010 Demographic Analysis (May 2012 Release).

Data Sources of Foreign-Born Immigration: 1935 to 2010



- Up to 2000, DA used **stock** and **change-in-stock** methods by legal status from administrative data and censuses
- After 2000, DA used a **flow** method from American Community Survey (ACS) data
- By 2010, the net international migration component was based on recent flow, in addition to legacy components from the 2000 DA Program

Challenges

- Current methodology would have to account for all immigration and emigration events between 1935 to 2020
- Time series must be cohortized:
 - If a person immigrated in 2010 at age 15, they will age into the age 25 cohort in 2020 unless they emigrated or died
 - DA must be able to measure multiple migration events of the same individual and assign to correct cohort
- Input data are lagged

Table 2. 2010 DA Accounting Ledger by Demographic Component and Age at Census

Age at Census on 4/1/2010	Natural Increase		Net International Migration											75+ Pop
	Births (Flow)	Deaths (Flow)	Legal Immigration (Flow)	Legal Emigration (Flow)	Temporary Migrants (Stock)	Residual Foreign Born (Stock)	Net Civilian Citizen Migration (Net Flow)	Born Abroad to U.S. Parents (Net Flow)	Net Puerto Rico Migration (Net Flow)	Net Native Migration (Net Flow)	Armed Forces Overseas (Net Flow)	Foreign-Born Immigration (Flow)	Foreign-Born Emigration (Flow)	Medicare (Stock)
0	N	N	.	.	.	.	.	N	N	N	N	N	N	.
1	N	N	.	.	.	.	.	N	N	N	N	N	N	.
⋮	N	N	.	.	.	.	.	N	N	N	N	N	N	.
9	N	N	.	.	.	.	.	N	N	N	N	N	N	.
10	N	N	N	N	N	N	N	N	N	N	N	N	N	.
⋮	N	N	N	N	N	N	N	N	N	N	N	N	N	.
74	N	N	N	N	N	N	N	N	N	N	N	N	N	.
75+	.	.	.	.	.	.	.	.	.	.	.	.	.	N

Note: Highlighted cells reflect changes since the 2000 DA
N is a non-missing value

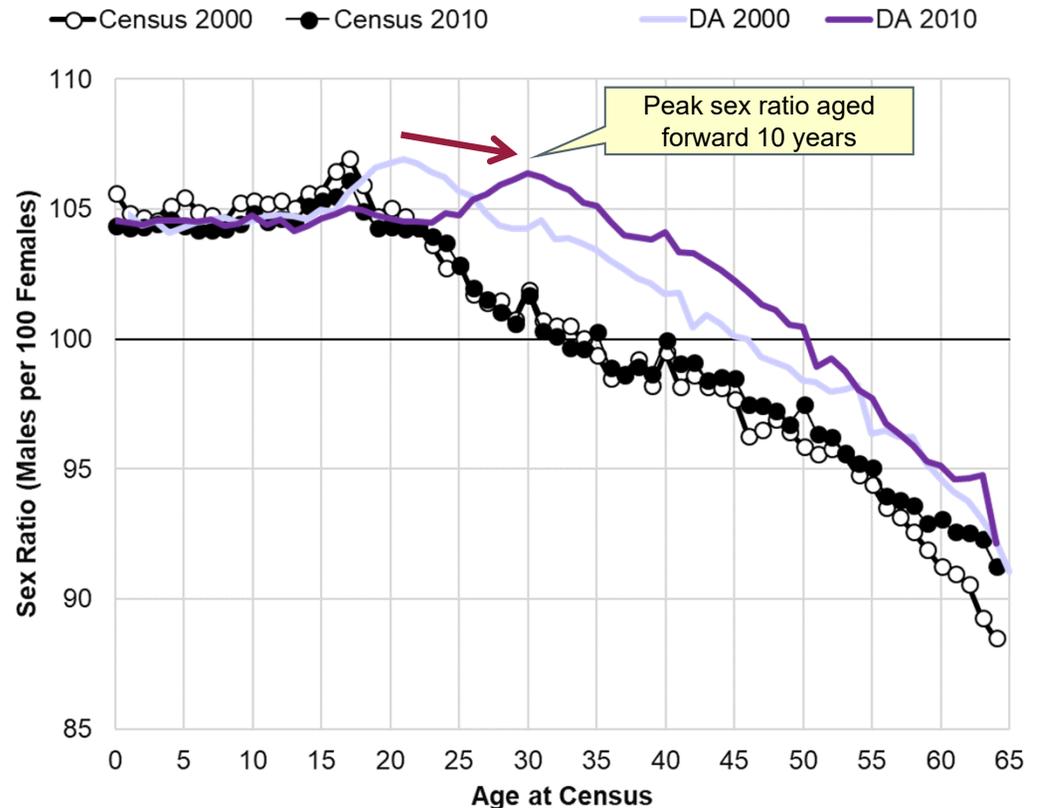
2010 DA Results

- 2010 DA Middle Series was close to Census 2010 national count, which may confirm validity of immigration and emigration flows to measure totals
- However, demographic composition of DA was inconsistent with Census 2010
- DA showed aging of peak sex ratios from age 20 to age 30 for Non-Black population between 2000 and 2010. This was not evident in the censuses

DA Sex Ratios

- 2010 showed cohort aging of the sex ratios by 10 years
- No such pattern in the censuses
- Residual Foreign-Born component contributed to sex ratio aging
- Components are becoming too complex to adequately estimate demographic characteristics of international migration

Figure 2. Census and DA Sex Ratios of the Resident Population



Source: Jensen, E.B. 2012. *International Migration and Age-Specific Sex Ratios in the 2010 Demographic Analysis*. Presented at the Applied Demography Conference. Jan 8-10. San Antonio, TX

Proposed Method Change for 2020 DA

Table 3. 2010 DA Accounting Ledger with Proposed Foreign-Born Stock Component

Age at Census (4/1/2010)	Natural Increase		Net International Migration				Foreign-Born Pop	Pop 75+
	Births (Flow)	Deaths to Native and PR Born (Flow)	Net PR Migration (Net Flow)	Net Native Migration (Net Flow)	Born Abroad to U.S. Parents (Net Flow)	Net Military Movement (Net Flow)	Foreign-Born Population (Stock)	Medicare (Stock)
0	N	N	N	N	N	N	N	.
1	N	N	N	N	N	N	N	.
2	N	N	N	N	N	N	N	.
⋮	N	N	N	N	N	N	N	.
74	N	N	N	N	N	N	N	.
75+	.	.	.	.	.	.	.	N

Note: Highlighted cells represent proposed changes to 2010 DA
N is a non-missing value

Foreign-Born Stock Estimates

U.S. Census Bureau Data

- 1-year ACS foreign-born stock projected to 2020
- Coverage adjustments
- Cohort change ratio (CCR) projection of ACS characteristics
- 2017 Population Projections Program foreign-born stock for 2020

External Data

- Office of Immigration Statistics population reports by legal status
- Non-governmental research centers and published reports
- Academic research
- Social Security Administration Numident file of foreign born
- Mexican censuses and surveys

Foreign-Born Stock Estimates (cont.)

Strengths

- Simplicity of estimating stock versus flows (no need to estimate emigration)
- Distributing demographic characteristics for a stock is more straightforward than a flow
- Projecting the stock to the Census Date is more straightforward than projecting separate flows and net flows
- Input data are available to test

Limitations

- Replaces vital records (a key strength of DA) with survey data to account for foreign-born deaths
- Unknown ACS coverage of the foreign born
- Input data on deaths by nativity begins in 1978. Proposal requires deaths by nativity starting with the 1934/35 cohort
- Overlaps net military movement, which contains foreign born

Timeline

- **June 2018:** research plan presented to research partners at the DA Conference in Suitland, MD
- **June 2019:** updated DA research partners on foreign-born stock method
- **June 2019:** consulted with demographers at Summer at Census Program
- **Ongoing:** consulted with National Center for Health Statistics on mortality of the foreign born
- **September 2019:** updated Federal-State Cooperative for Population Estimates members
- **Winter 2019-2020:** test method and produce preliminary estimates

Thank you

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