Workshop on Demographic Analysis and Population Projections

Welcome & Introductions

First Matters

- Welcome!
- Schedule and materials
- Workshop overview
- Instructors: Daniel Goodkind and Nobuko Mizoguchi
- Introduction to demographic analysis
- Introduction to population projections

Later:

- Introduction to the software
- Software installation and data storage

Goals of this Workshop

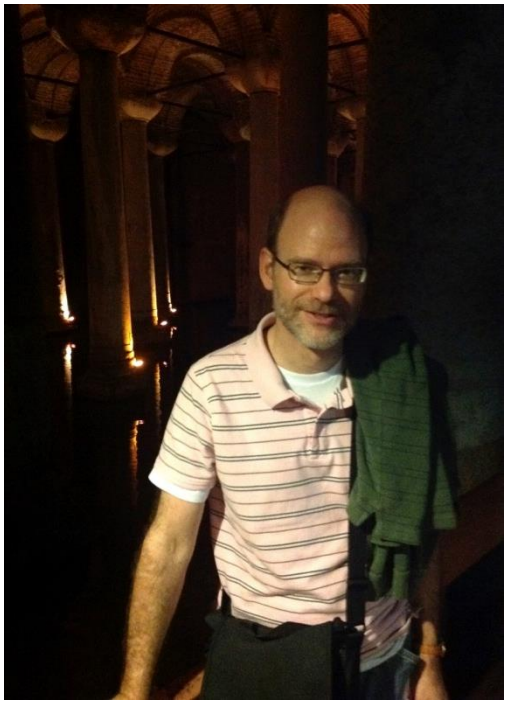
1. **You understand basic concepts to make sense of your demographic data – balancing equation, intercensal comparisons, etc.**
2. **Become more familiar with software to make estimates from population censuses and surveys (population data by age & sex, mortality, fertility, and migration)**
3. **You feel more confident to *choose among* analytic techniques to evaluate demographic data**

General Structure of Workshop

- Lectures and demonstrations
- Exercises and activities – as individuals and in groups
- Comparison of results and discussions
- Questions? Yes!
- Participant presentations

Introduction of Instructors

Daniel Goodkind

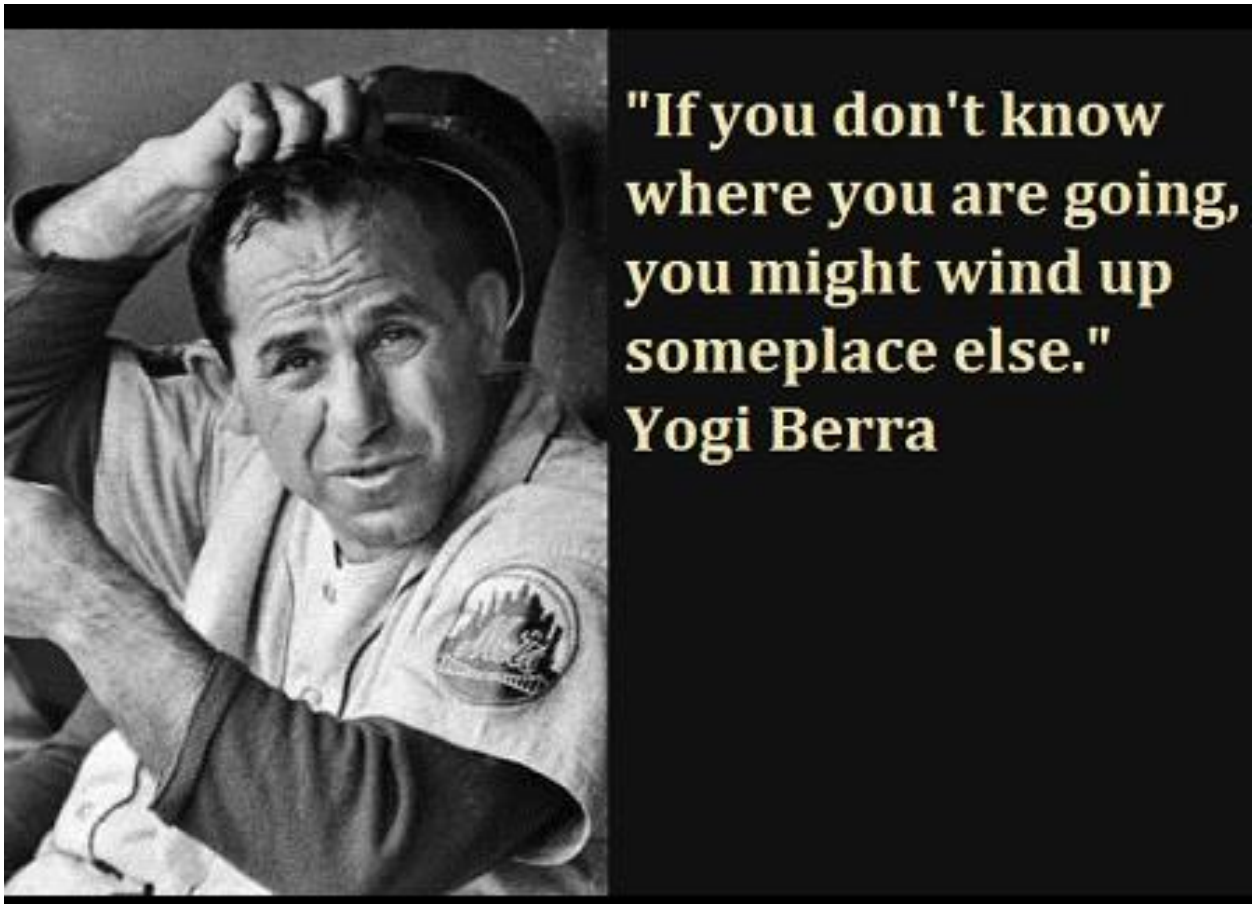


Nobuko Mizoguchi

Introduction of Participants

- Help us to know a bit about you
  - Your name
  - Where you work
  - What you do
  - Familiar with excel? - A lot, somewhat, little, none
  - Any classes/training in demography?
  - Ever done a population projection?
  - Hobbies, interests, or fun things you want to share?

حسنا، على الأقل كان تبذل جهدا للتواصل



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Introduction to Demographic Analysis

Let's think about what we are doing here by asking some basic questions

- **WHAT** is demographic analysis?

Demographic Analysis *(n.)*

1. *(MeSH)* Statistical interpretation and description of a population with reference to distribution, composition, or structure.

Wikipedia

Demographic analysis

From Wikipedia, the free encyclopedia

> This article includes a list of references, related reading or external links, but its sources remain unclear because it lacks inline citations. Please improve this article by introducing more precise citations where appropriate. *(October 2009)*

Demographic analysis includes the sets of methods that allow us to measure the dimensions and dynamics of populations. These methods have primarily been developed to study human populations,

Demographic Analysis – our definition

- Ways to understand and evaluate demographic data, levels, and trends based on *comparisons*
  - Often based on the ***balancing equation***
    (Pop. Change = Births - Deaths + Net Migration)
  - Often involves choices about the quality of various data sources and the most appropriate methods
  - Sometimes interpreted through broader comparisons (e.g. how do measurements in a country compare to regional/world patterns)

The Key to Data Evaluation: The Comparative Method

Assessments of the reasonableness of data usually require a comparison to other data.

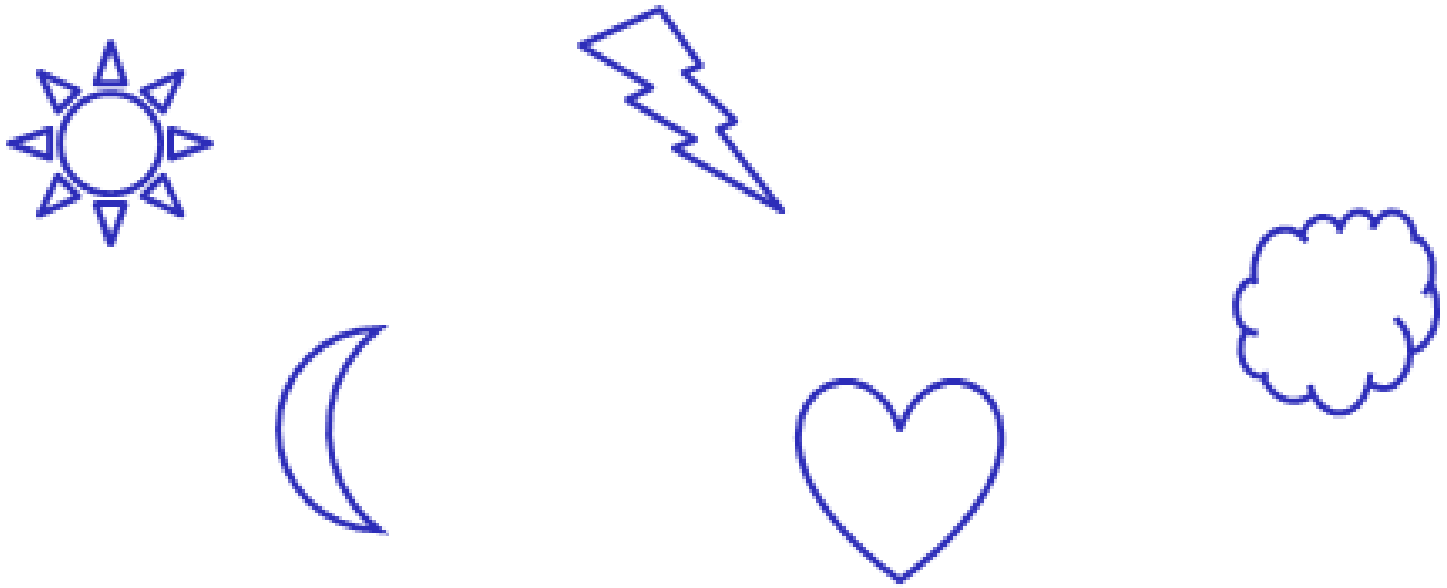
We have expectations about demographic data, including census results. Do the new data show what we thought they would show?

If not, why not?

"One of these things is not like the other …"

Comparative methods

"All I Really Need to Know I Learned in Kindergarten" by Robert Fulghum (1990)



Comparative methods

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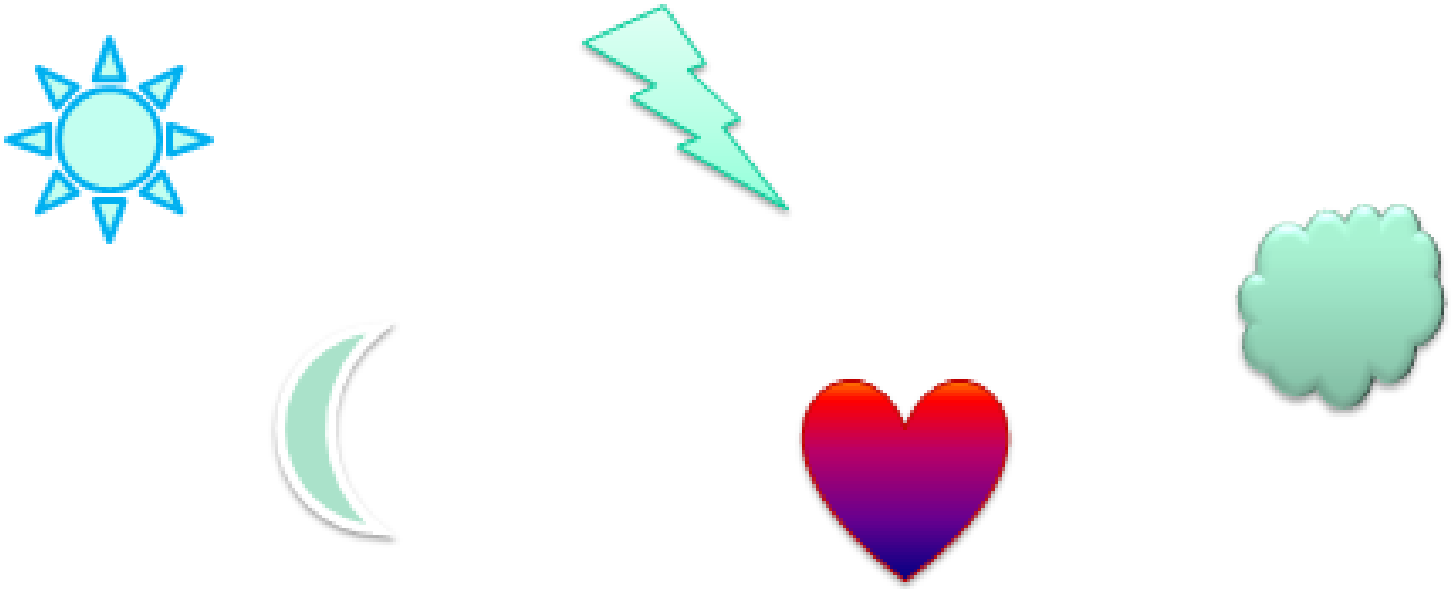

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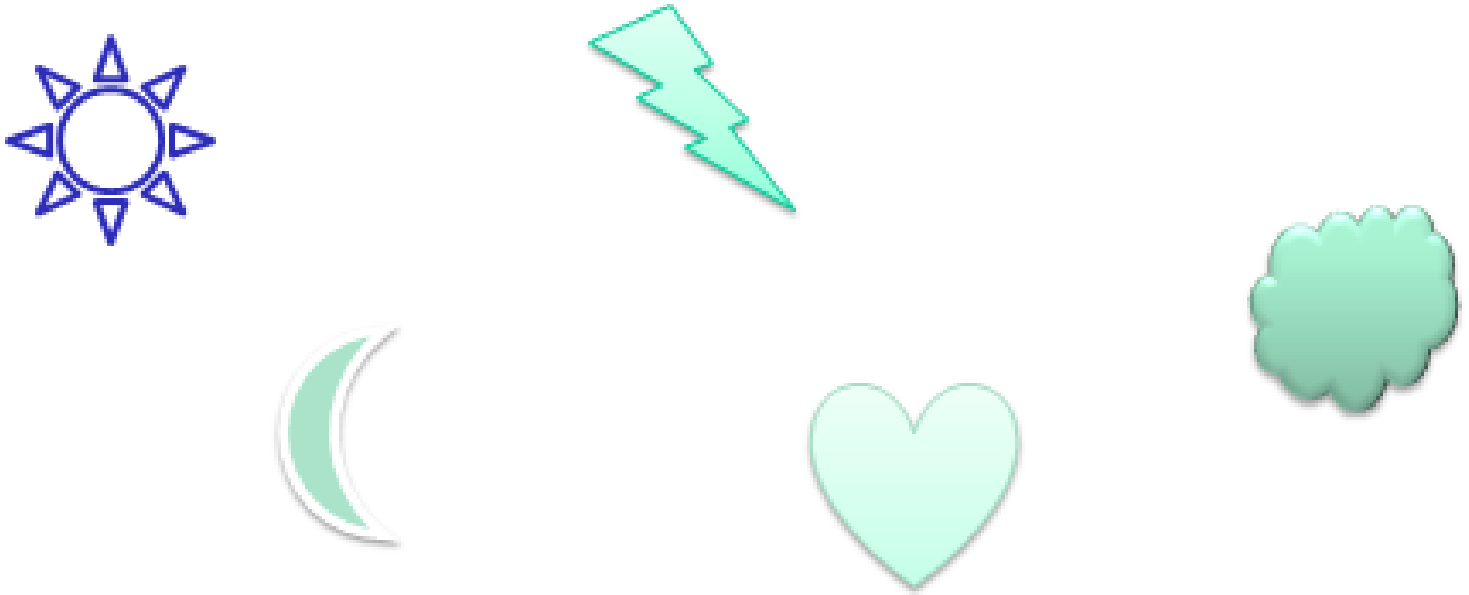


Introduction to Demographic Analysis

- **WHY** do we do Demographic Analysis?
  - General knowledge about population and demographic trends
  - Better planning and allocation of government resources
  - Improve knowledge about the *past/present/future*
  - Our boss asks us to do it
  - Other reasons?


MR. BIG
NUMBER ONE
BIG MAN ON CAMPUS
HEAD MAN
TOP GUN
BOSS
Zahn

Demographic Analysis

HOW does one do demographic analysis?

1. Consider the questions and data at hand
2. Consider possible options
3. Get the results
4. Think about the results
5. Validate results
6. Compare, compare, compare
7. Repeat

The pieces of the system **MUST** fit together,
and what are those pieces? …

From Estimates to Projections

The four KEY ELEMENTS of 1) demographic analysis 2) population growth, and 3) **cohort-component projections** all come from the balancing equation:

1. Population age and sex structure
2. Fertility
3. Mortality
4. Migration

The Fundamental Demographic Accounting Principle –

The Balancing Equation Can Project a Population from Time 0 to Time 1

Projected Population

$$\text{Population}(t_1) = \text{Population}(t_o) + \text{Births} - \text{Deaths} + \text{Net Migration}$$

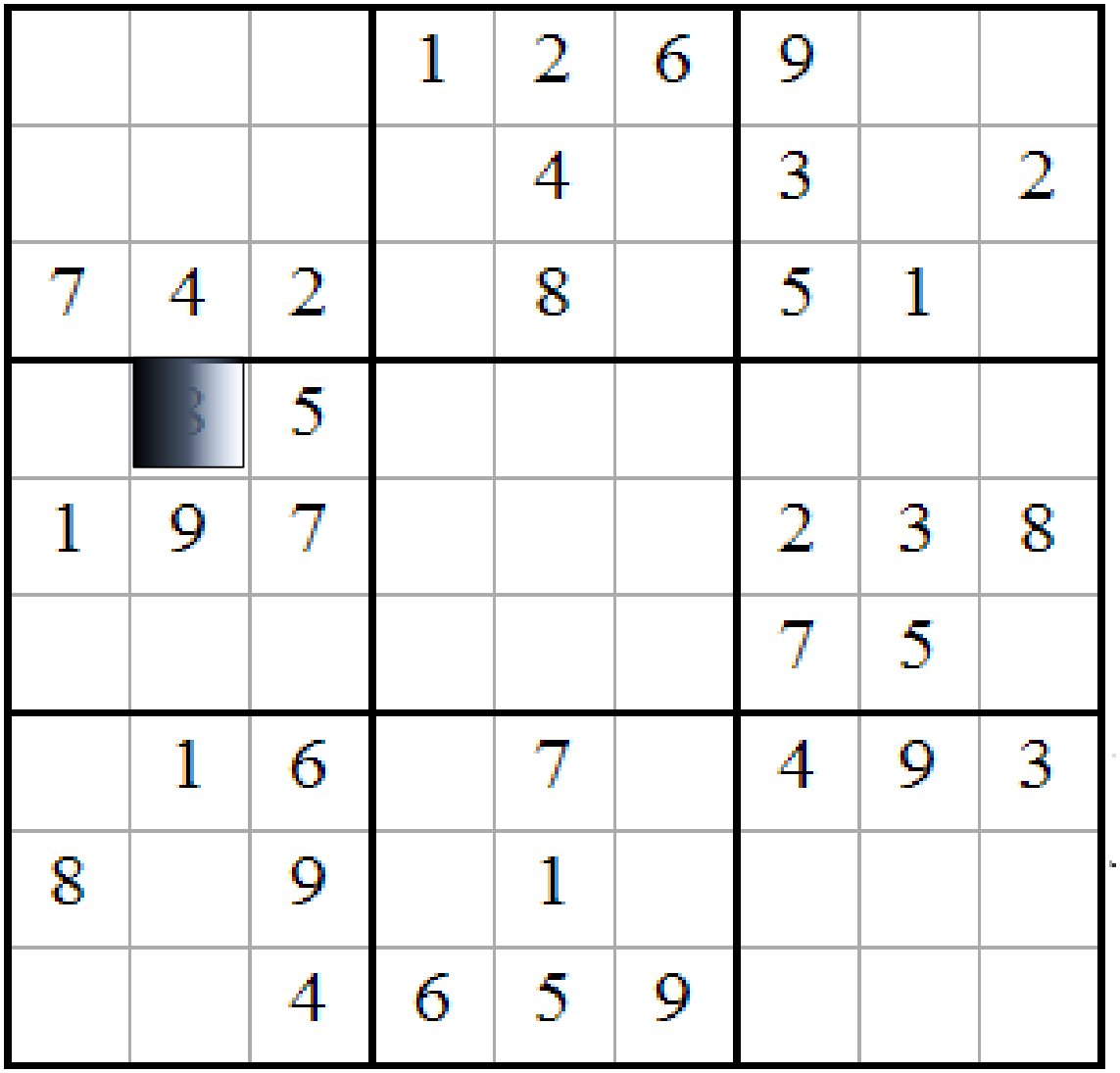
The balancing equation can also project populations by age …

Example of Output from Cohort Component Projection Based on a 1989 Census Count by Single Years of Age

Age

Female

	Year	0	1	2	3	4	5	6	7
Census	1989	64,581	62,550	62,257	60,514	58,836	56,486	54,070	52,128
Projections By Age	1990	65,294	63,525	62,062	61,918	60,244	58,607	56,266	53,874
	1991	64,707	64,242	62,969	61,606	61,501	60,032	58,431	56,083
	1992	64,185	63,452	63,546	62,377	61,055	61,109	59,826	58,242
	1993	60,717	62,601	62,448	62,649	61,531	60,404	60,618	59,356
	1994	56,326	59,325	61,677	61,645	61,880	60,913	59,978	60,202
	1995	56,555	55,341	58,776	61,229	61,236	61,584	60,757	59,840
	1996	55,925	55,791	54,972	58,498	60,979	61,067	61,530	60,716
	1997	52,120	55,292	55,522	54,790	58,333	60,869	61,035	61,512
	1998	51,420	51,476	55,042	55,352	54,650	58,246	60,839	61,016
	1999	52,102	50,873	51,188	54,849	55,196	54,527	58,177	60,780
	2000	50,310	51,594	50,590	50,996	54,674	55,044	54,405	58,057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7 4 2 8 5 1
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1 9 7 2 3 8
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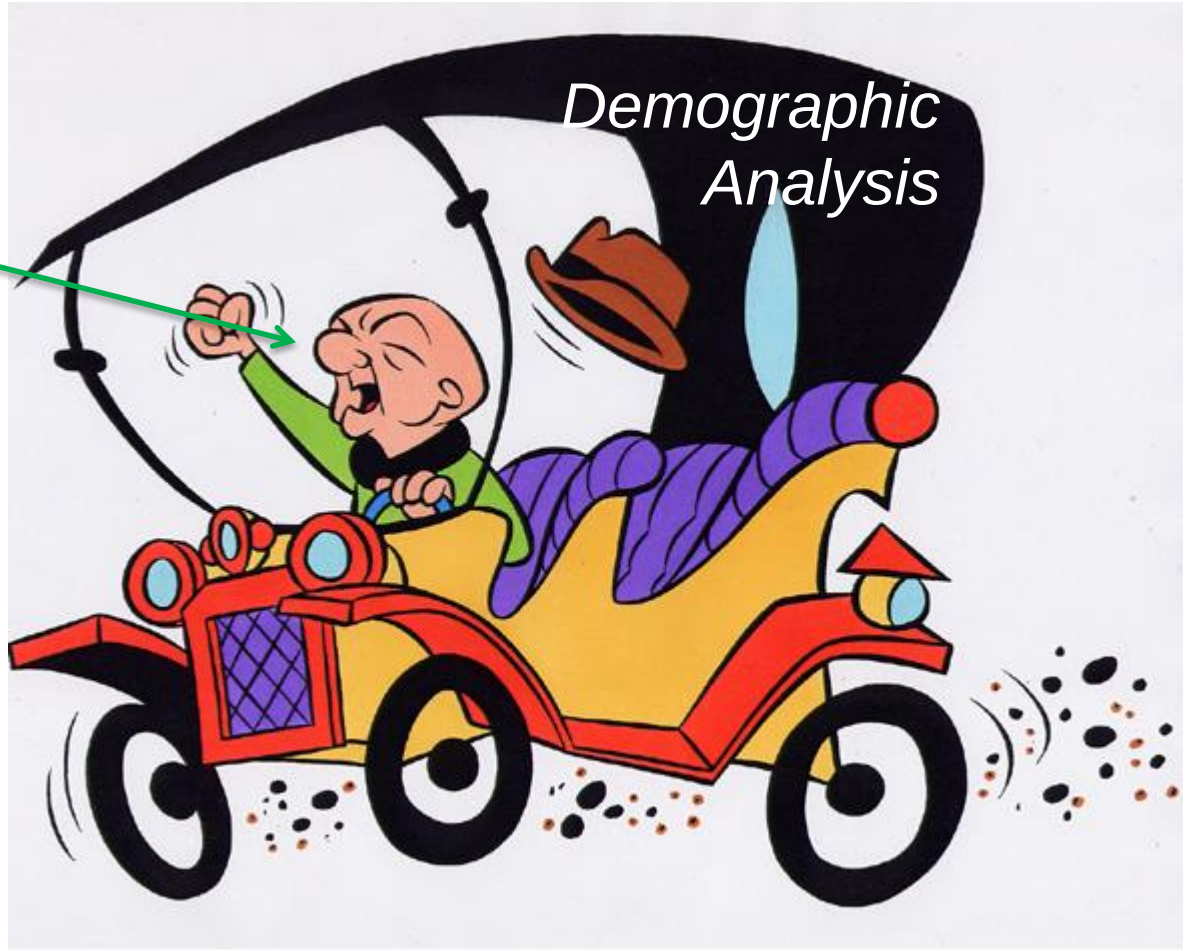
Demographic Analysis



No perfect fit? As an analyst, *you* make decisions which drive demographic analysis

From Estimates to Cohort Component Projections: U.S. Census Bureau Tools

Week 1

Demographic Analysis

P
A
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Population by Age & Sex

Mortality

Fertility

Migration

Week 2

Population Projections

- Base Population by age and sex
- Estimates and projections of mortality, fertility, and net migration
- Outputs – Tables and Graphics

DAPPS/RUP

Special Focus on Migration

We will briefly consider migration issues indirectly as we cover base population, mortality and fertility. Then, we will focus on migration as follows:

Week 1 (last 2 days)

1. Assemble available sources of migration data
2. Consider the types of migration they refer to
3. Consider the quality and completeness of those sources to come up with *initial migration estimates & projections*

Week 2

1. Evaluate those estimates and projections using intercensal analysis and the balancing equation
2. Think about the results, and compare, compare …
3. Repeat ……