



**United
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Department of
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Social Affairs



UNITED NATIONS
ESCAP
Economic and Social Commission for Asia and the Pacific

Asia-Pacific Workshop on Measuring Population Ageing and Assessing its Economic and Fiscal Consequences

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**United
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Department of
Economic and
Social Affairs

Session 3:

“Future-proofing” sustainable development: The need for projections

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Sustainable development

- Sustainable development is development that meets the needs of the present, without compromising the ability of future generations to meet their own needs.
- Need to look at the future.

Future-proofing

- the process of anticipating the future and developing methods of minimizing the effects of shocks and stresses of future events.

Future-proofing

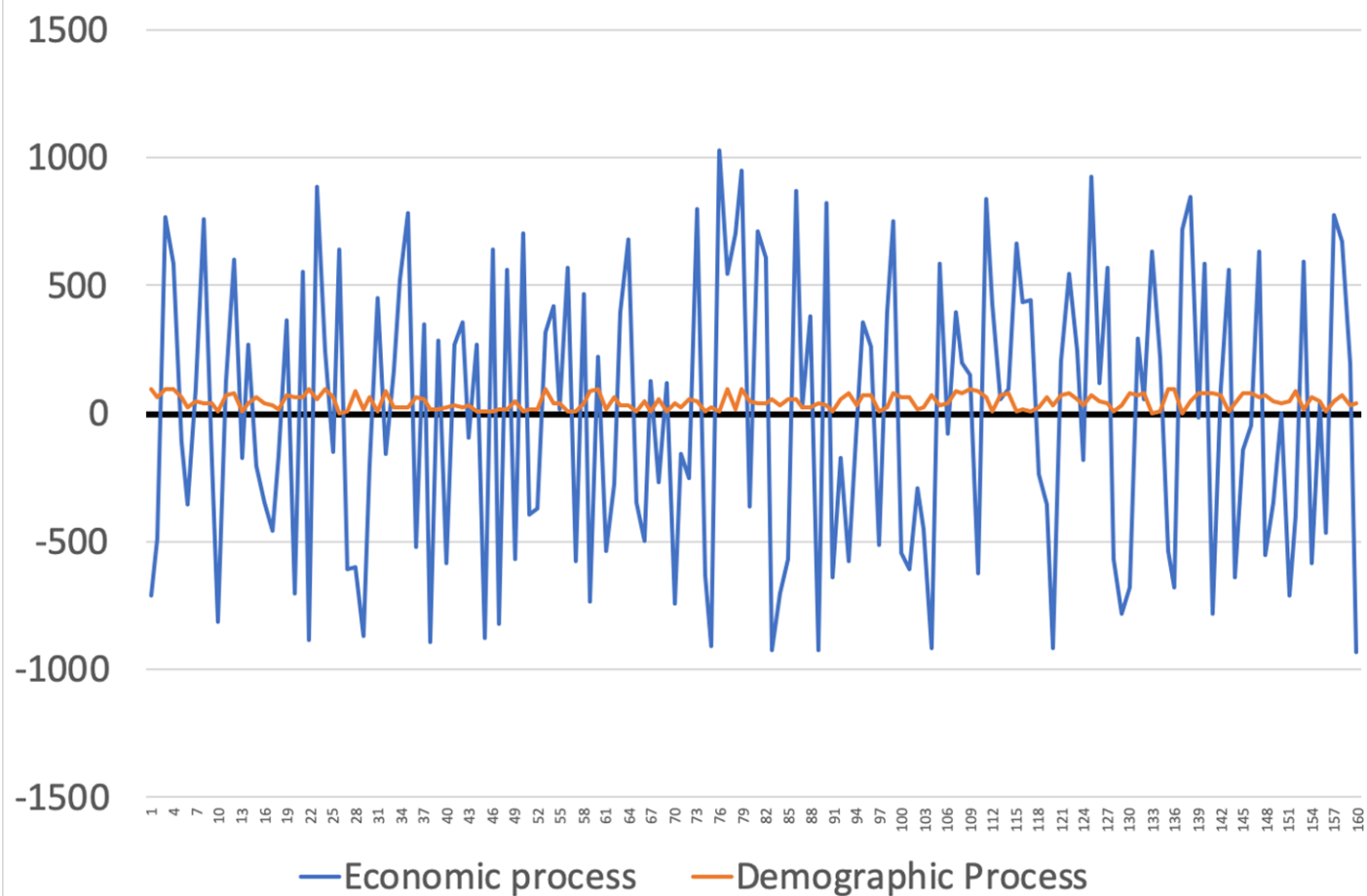
Two parts:

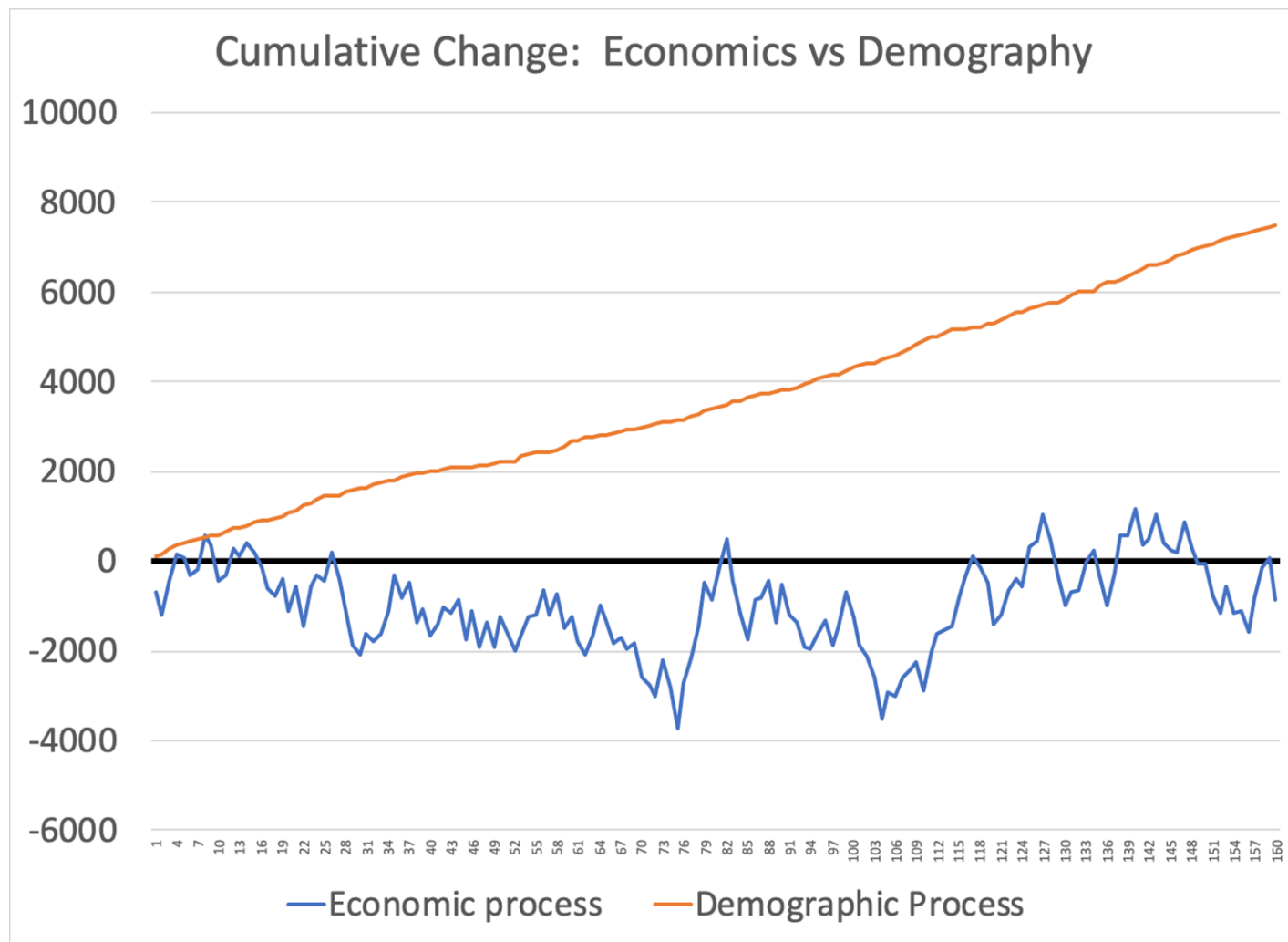
1. Anticipating the future
2. Building in flexibility to respond
 - Examples of future-proofing from architecture or technology
 - Automatic adjustment mechanisms for pension systems
 - Counter-cyclical spending

Anticipating the future:
**When we think about the future,
we need to think about population change.**

- Slow but cumulative processes lead to dramatic transformations.

Annual Change: Economics vs Demography



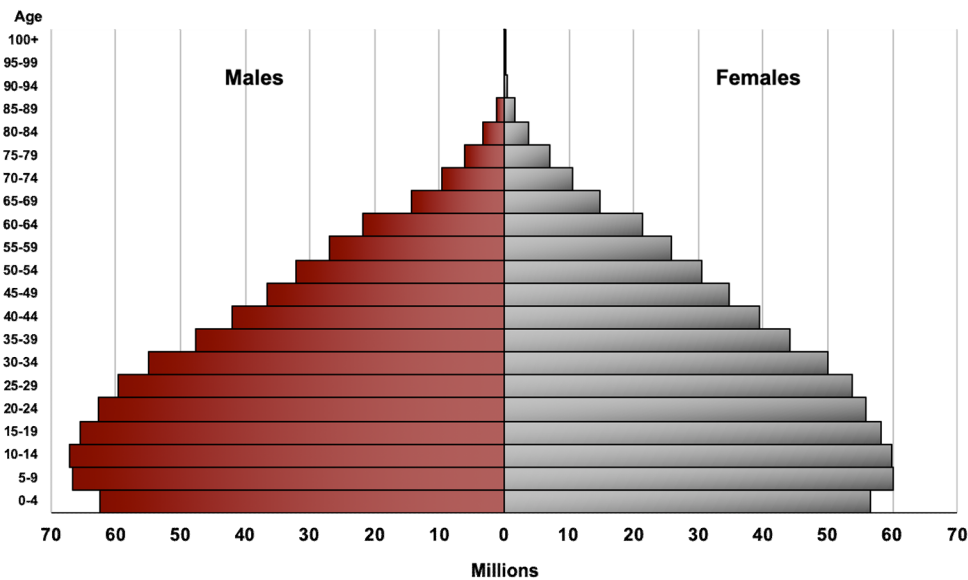


Problem in paying attention to slow but cumulative processes



2015

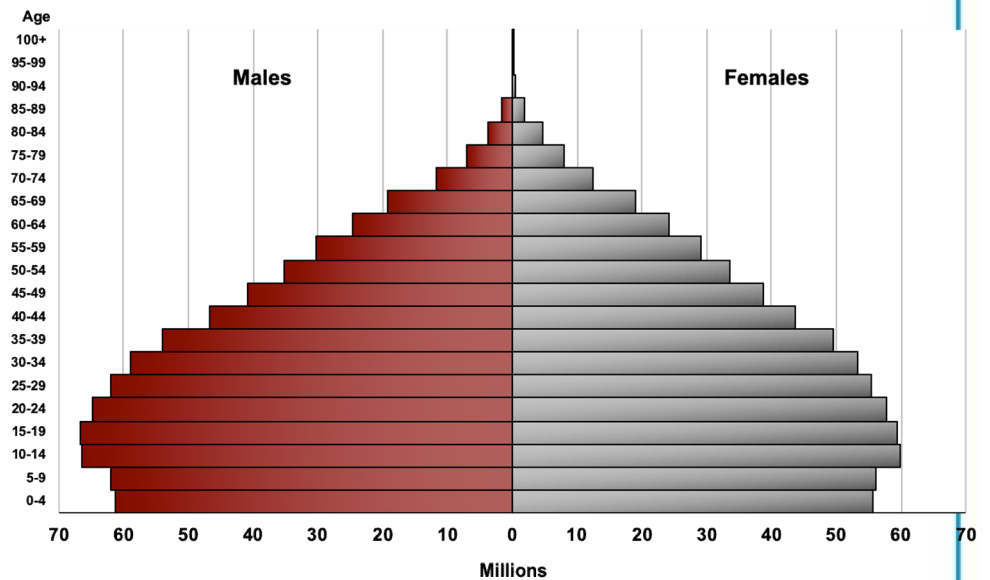
Population of India by Age and Sex, 2015



Source: UN DESA, World Population Prospects 2019.

2020

Population of India by Age and Sex, 2020



Source: UN DESA, World Population Prospects 2019.

Problem in paying attention to slow but cumulative processes

Problem in paying attention to slow but cumulative processes



1955

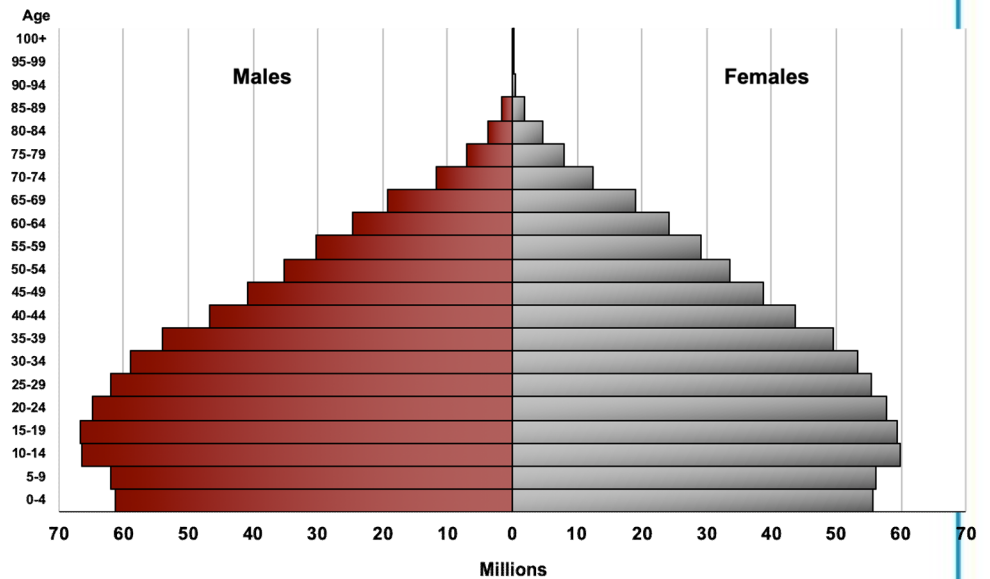
Population of India by Age and Sex, 1955



Source: UN DESA, World Population Prospects 2019.

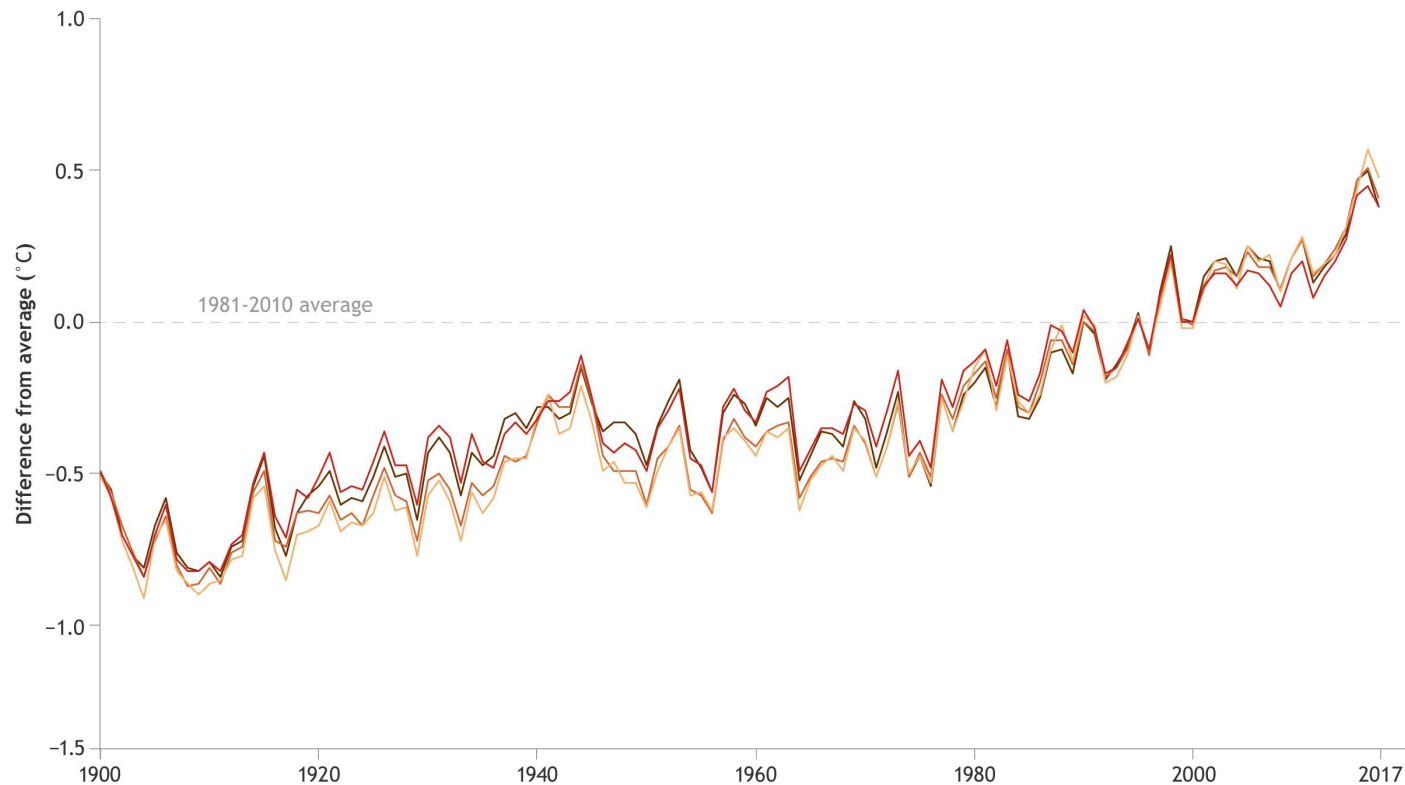
2020

Population of India by Age and Sex, 2020



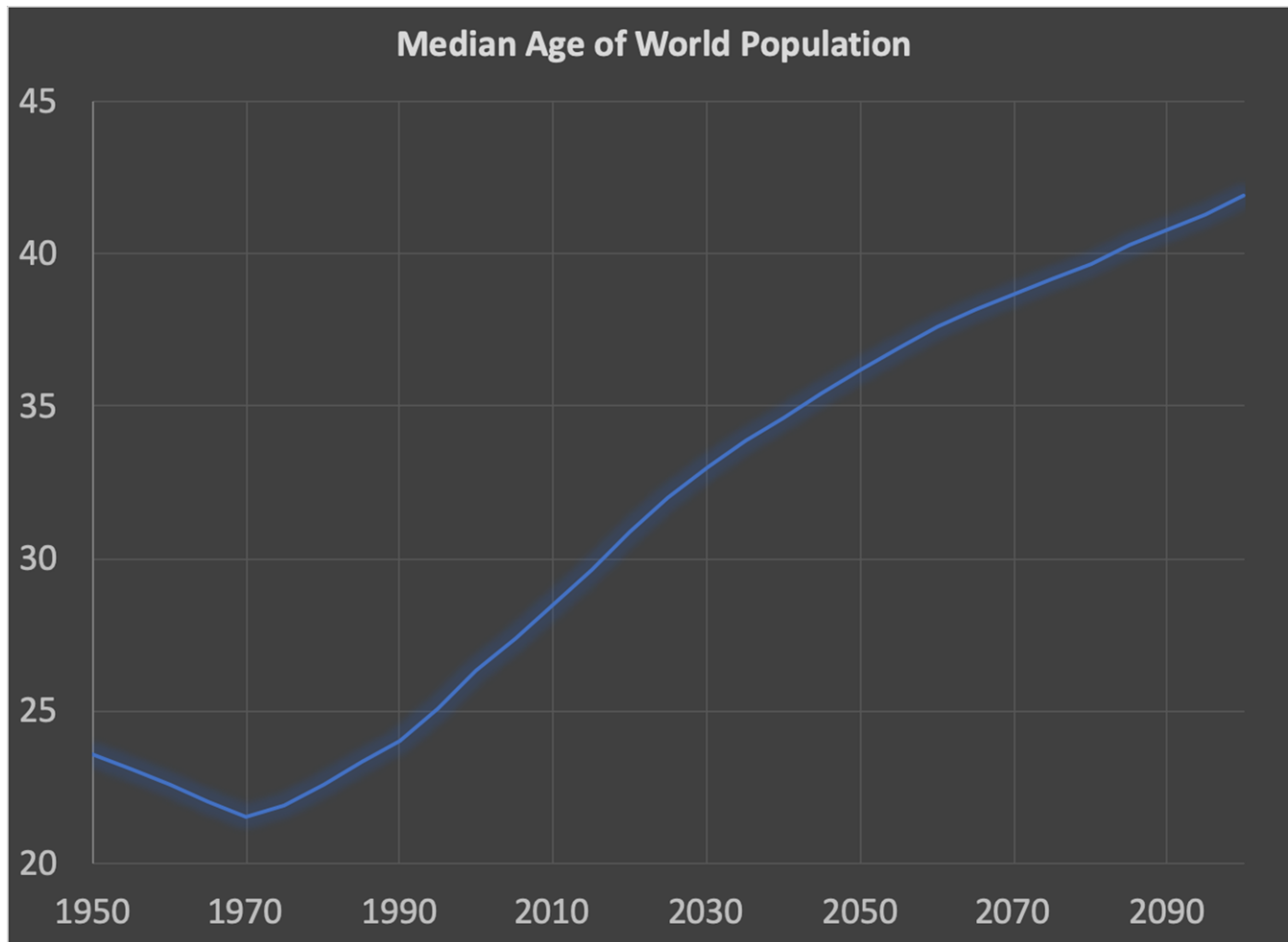
Source: UN DESA, World Population Prospects 2019.

Problem in paying attention to slow but cumulative processes



**Problem in
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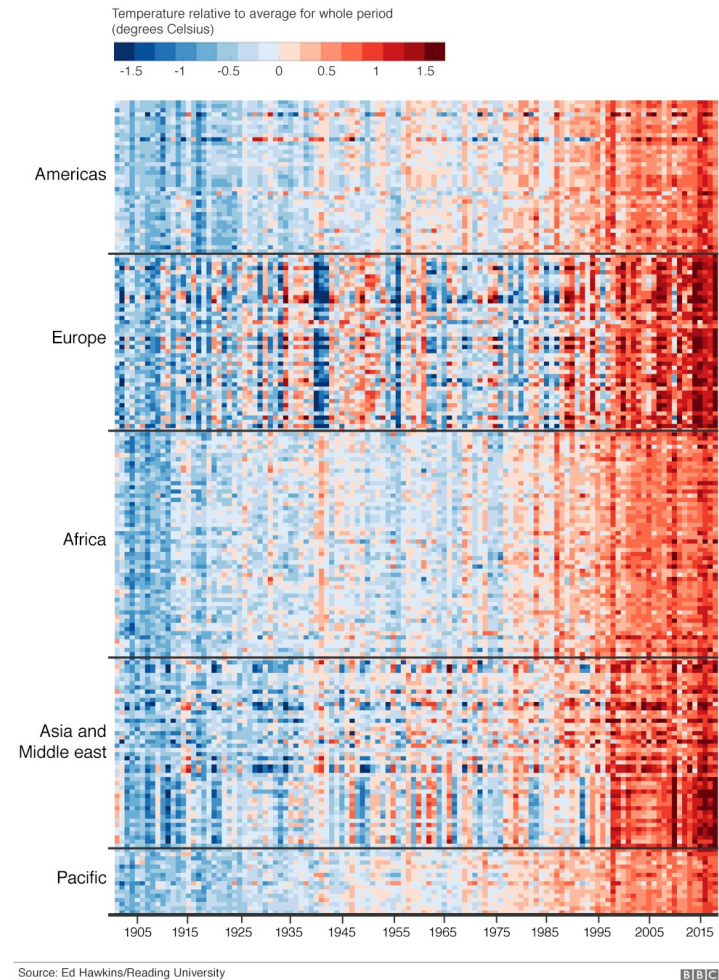




**Problem in
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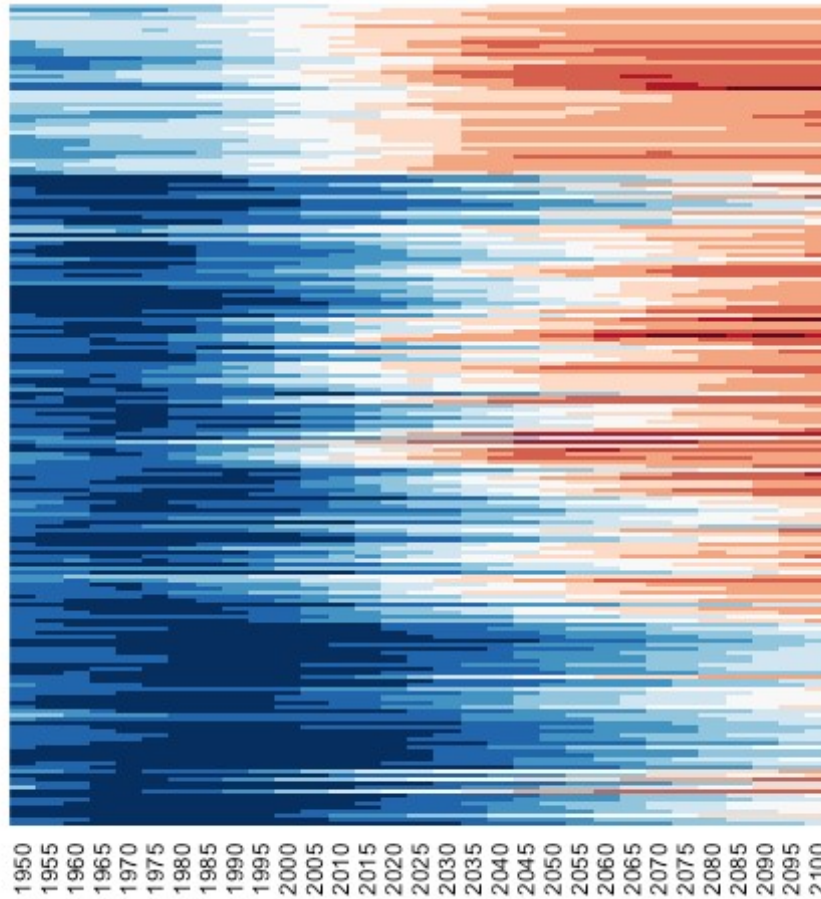
Problem in paying attention to slow but cumulative processes

Temperature changes around the world (1901-2018)

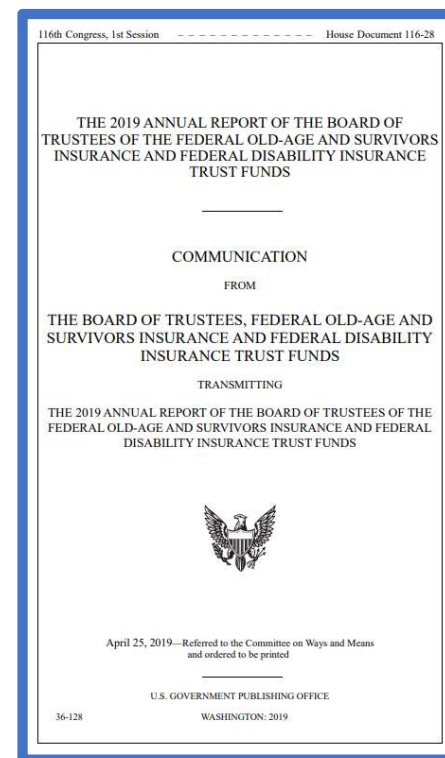
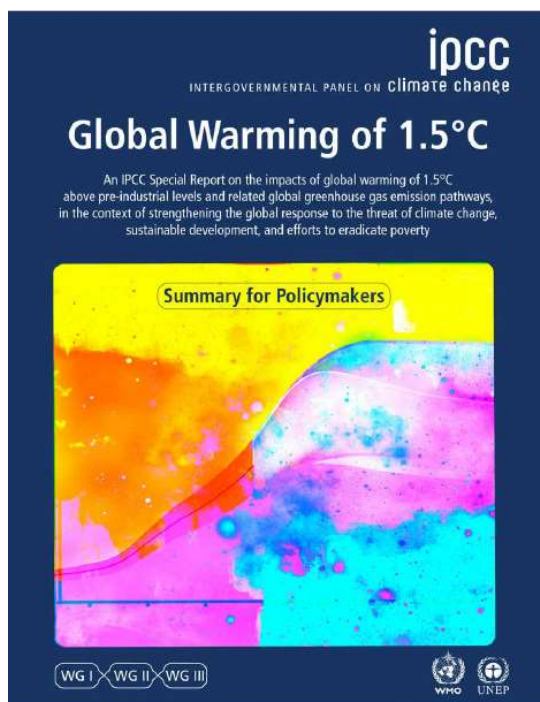


Median age by country, 1950-2100

**Problem in
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Why do we need long-run population projections?



Medium- and long-run forecasts

- US Social Security Administration:
 - Annual report on future financial status of Social Security system over a 75 year time horizon.
- Australia's Intergenerational Report
 - Every 5 years. Contains forecast over a 40 year time horizon for population, economic growth, and government budget. 2002, 2007, 2010, 2015.

Medium- and long-run population forecasts

Envisioning alternative futures

- The Variants Approach
- The Integrated Scenarios Approach
- The Probabilistic Approach

Envisioning alternative futures

- The Variants Approach

In this approach, there is usually a baseline forecast from which variants are derived.

Often, each variant differs from the baseline by changing one component. For example, in the UN “High Fertility variant”, fertility is projected to reach a level that is 0.5 births higher than the medium variant.

The variants are used to assess the impact of each demographic assumption on the projected outcomes.

The UN Population Division produces 9 variants.

Envisioning alternative futures

The UN Population Division produces 9 variants.

TABLE II.3. PROJECTION VARIANTS IN TERMS OF ASSUMPTIONS FOR FERTILITY, MORTALITY AND INTERNATIONAL MIGRATION

<i>Projection variants</i>	<i>Assumptions</i>		
	<i>Fertility</i>	<i>Mortality</i>	<i>International migration</i>
Low fertility	Low	Normal	Normal
Medium fertility	Medium	Normal	Normal
High fertility	High	Normal	Normal
Constant-fertility	Constant as of 2010-2015	Normal	Normal
Instant-replacement-fertility	Instant-replacement as of 2015-2020	Normal	Normal
Momentum	Instant-replacement as of 2015-2020	Constant as of 2010-2015	Zero as of 2015-2020
Constant-mortality	Medium	Constant as of 2010-2015	Normal
No change	Constant as of 2010-2015	Constant as of 2010-2015	Normal
Zero-migration	Medium	Normal	Zero as of 2015-2020



Envisioning alternative futures

- The Integrated Scenario Approach

Integrated scenarios are used to tell stories about the future.

In contrast to variants where typically a single component is changed, in this approach multiple components are changed.

In the variant approach, projections are used to “test” the model – to evaluate the impact of the demographic inputs. In the integrated scenario approach, projections are used to answer questions about events.

What if Thailand achieves the SDG goals? How would that affect its future population?

Envisioning alternative futures

- The Probabilistic Approach

In this approach, thousands of projections are produced.

Attention is focused on the distributions rather than on single projections.

The core idea is that the variability observed in the past is our best guide to uncertainty in the future.

In the integrated scenario and variant approaches, the analyst chooses the future trajectories of fertility, mortality, and migration. In the probabilistic approach, the analyst builds a statistical model which generates distributions from which future trajectories are chosen.

Envisioning alternative futures

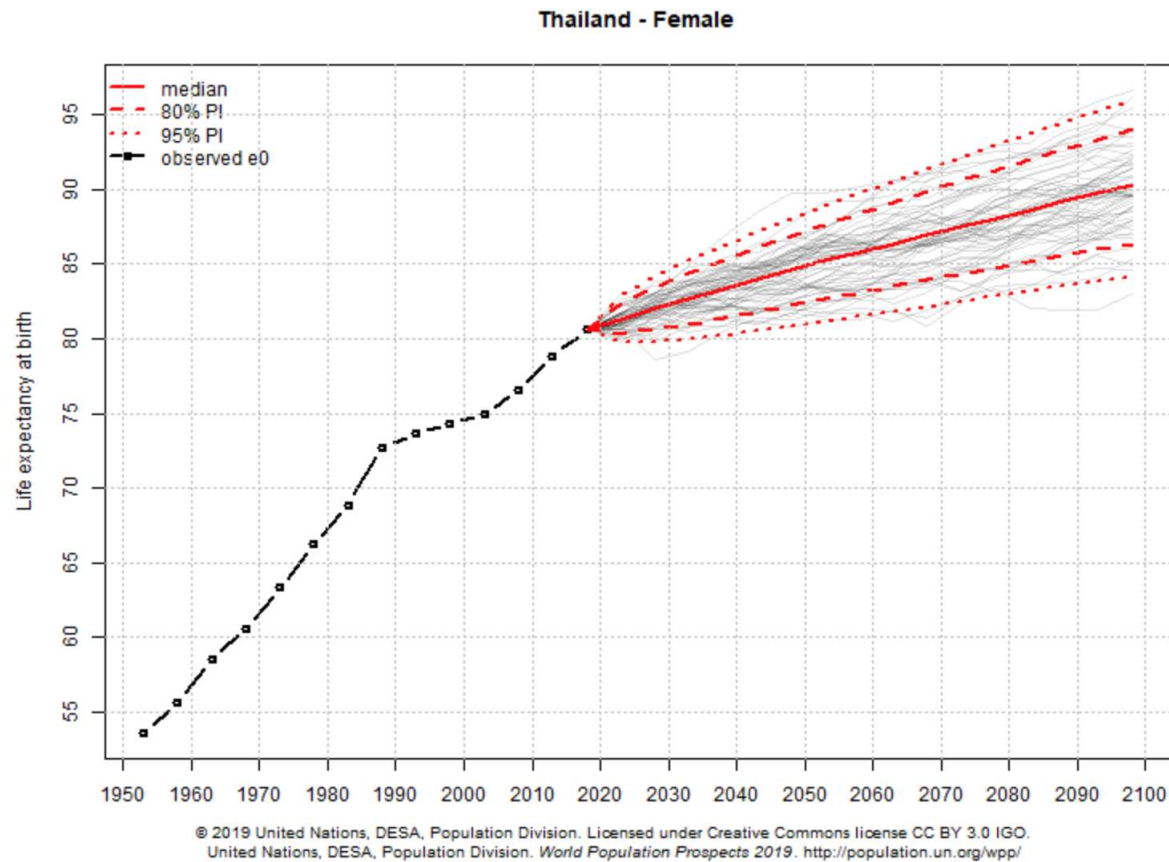
- The Probabilistic Approach

It shows the different levels of uncertainty associated with different outcomes: we are more certain about the population of elderly in 2050 than the population of children.

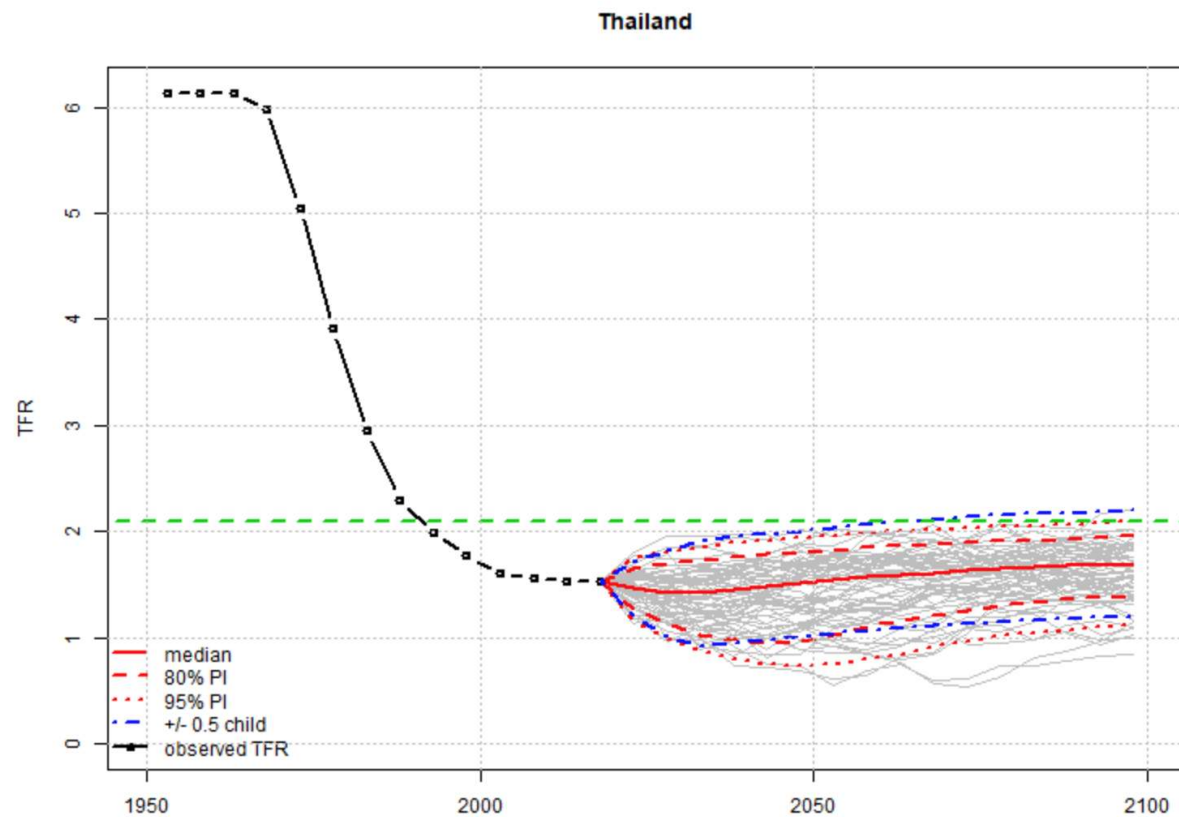
The distributions of projections are best viewed as our “null hypothesis” about the future. If the future is like the past, then certain outcomes are more likely than others. The distributions show us which ones.

They can be used as a “background” against which to judge the stories we tell in Integrated Scenarios.

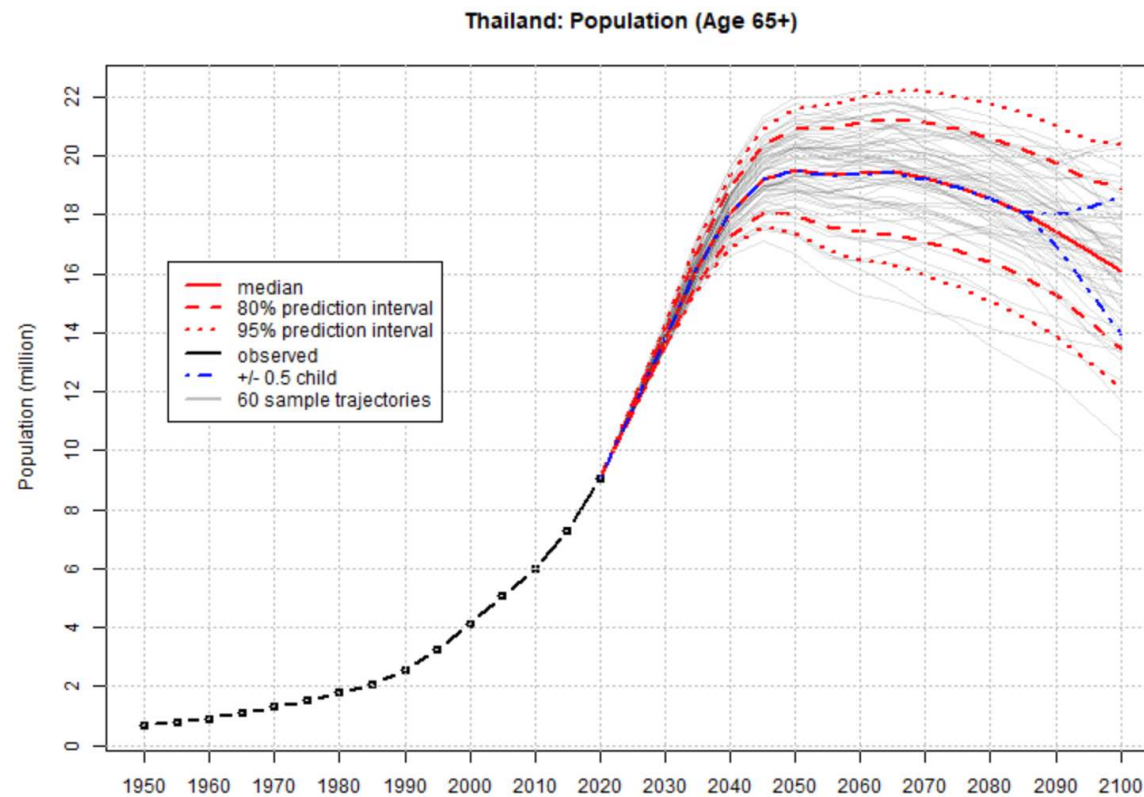
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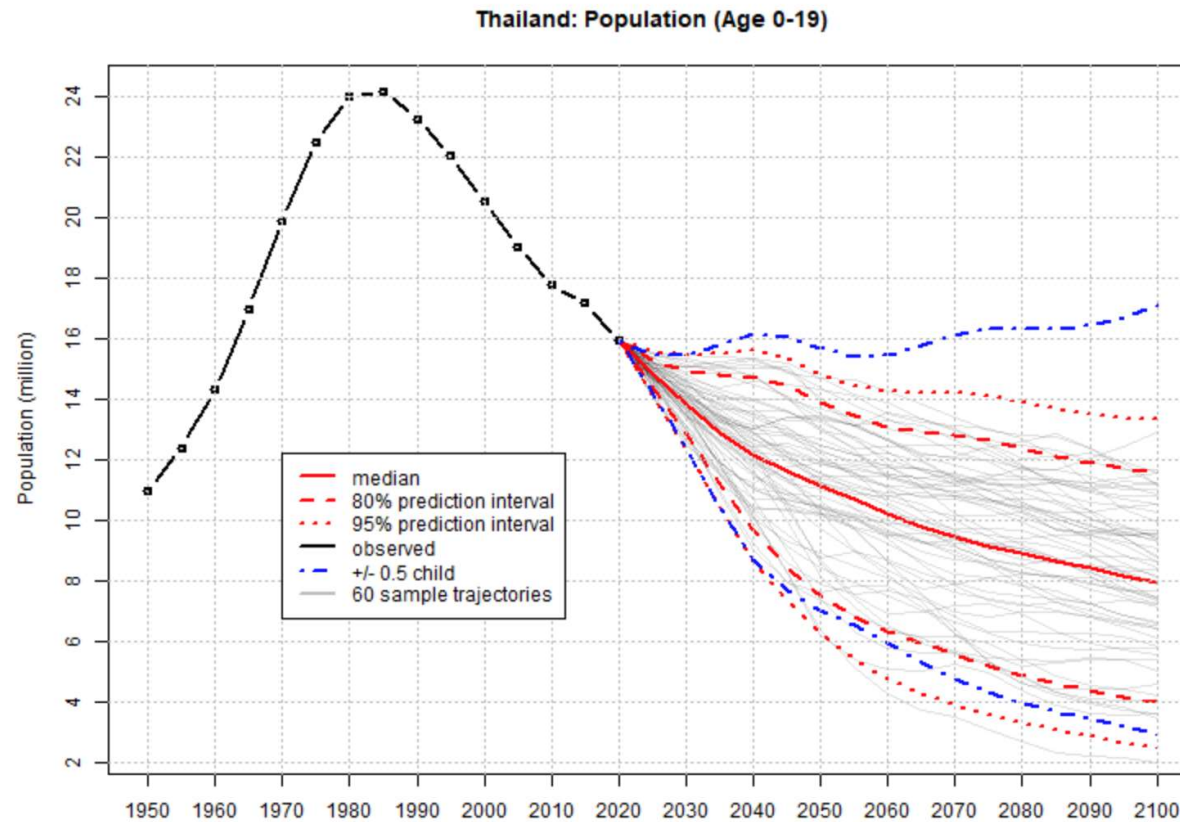
Envisioning alternative futures



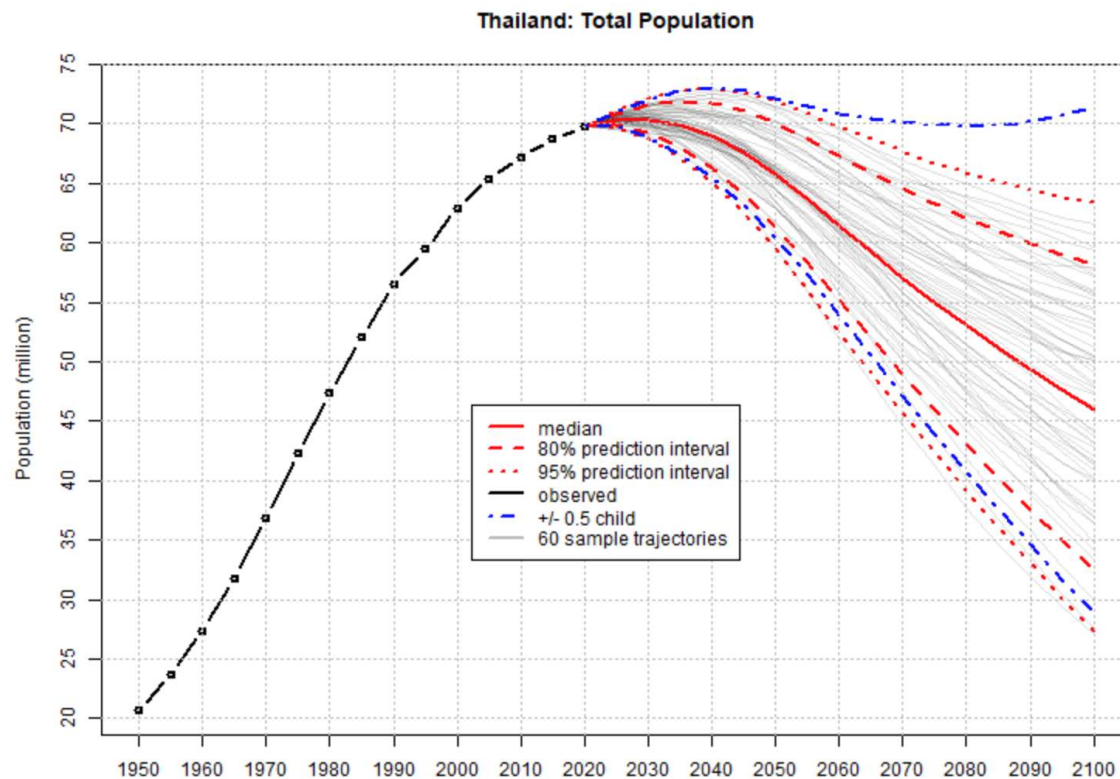
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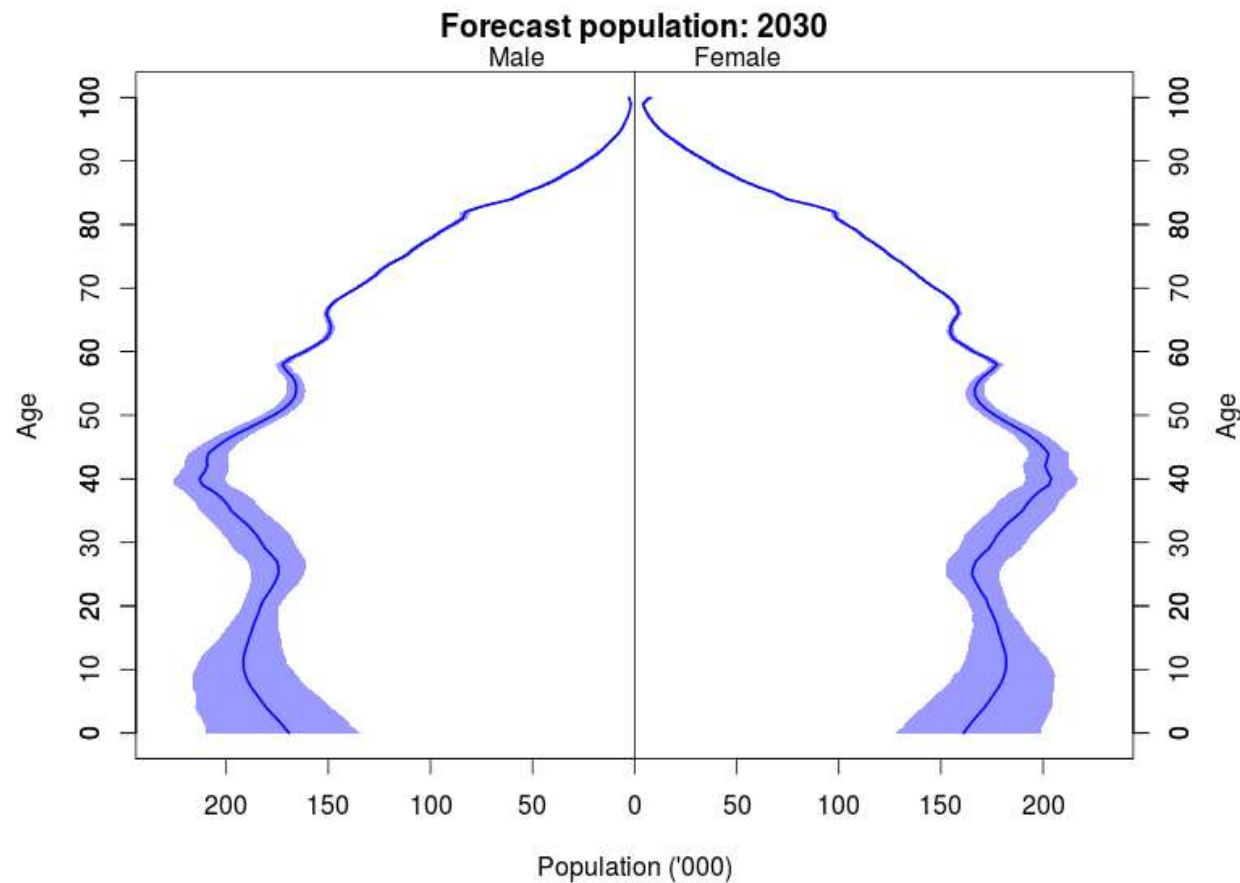


Envisioning alternative futures



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United Nations, DESA, Population Division. *World Population Prospects 2019*. <http://population.un.org/wpp/>

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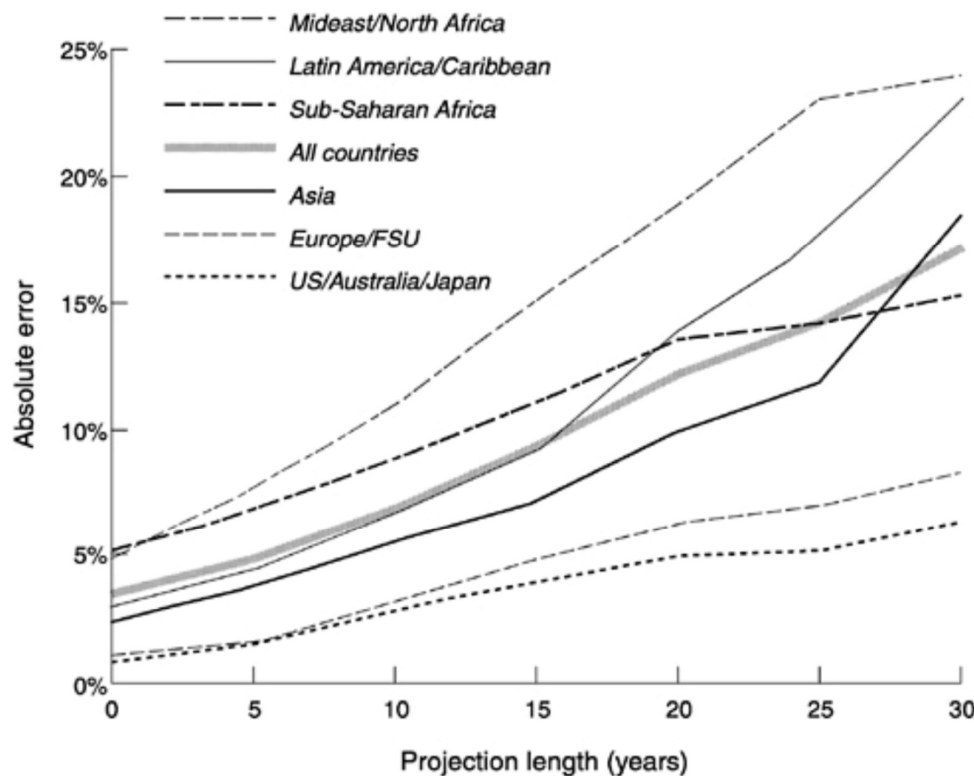


How accurate are population projections?

How accurate are population projections?

Assessment of UN population projections.

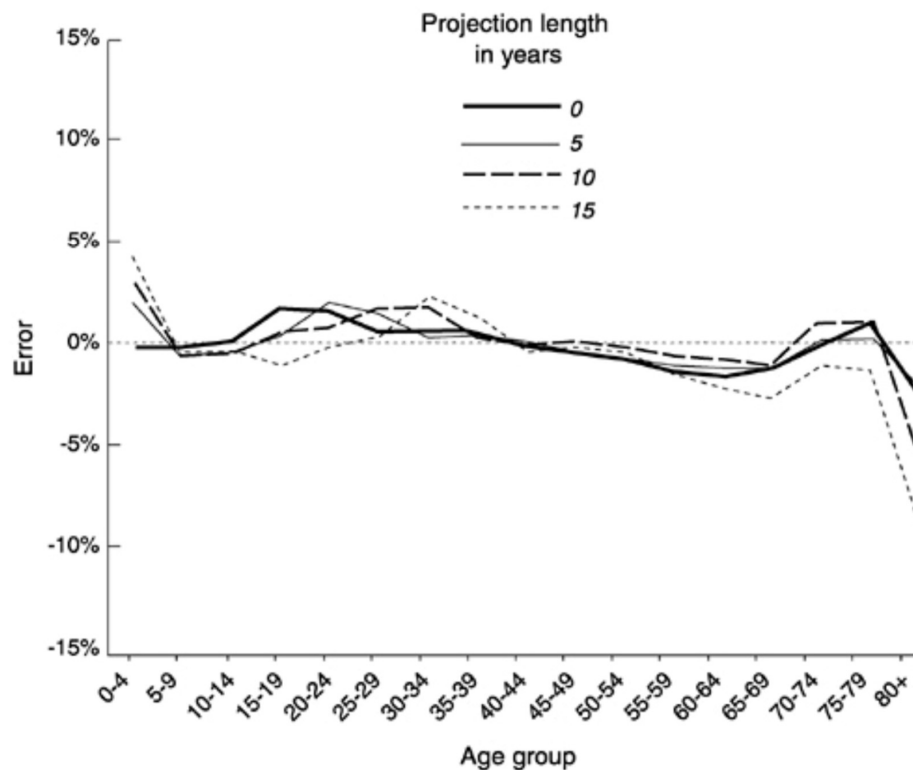
- Decreasing accuracy with projection length.
- On average, about 15% error in total population size of country 30 years in future.



How accurate are population projections?

Assessment of UN population projections.

- Better at middle age range.
- Worse at older ages (too low) and younger ages (too high).



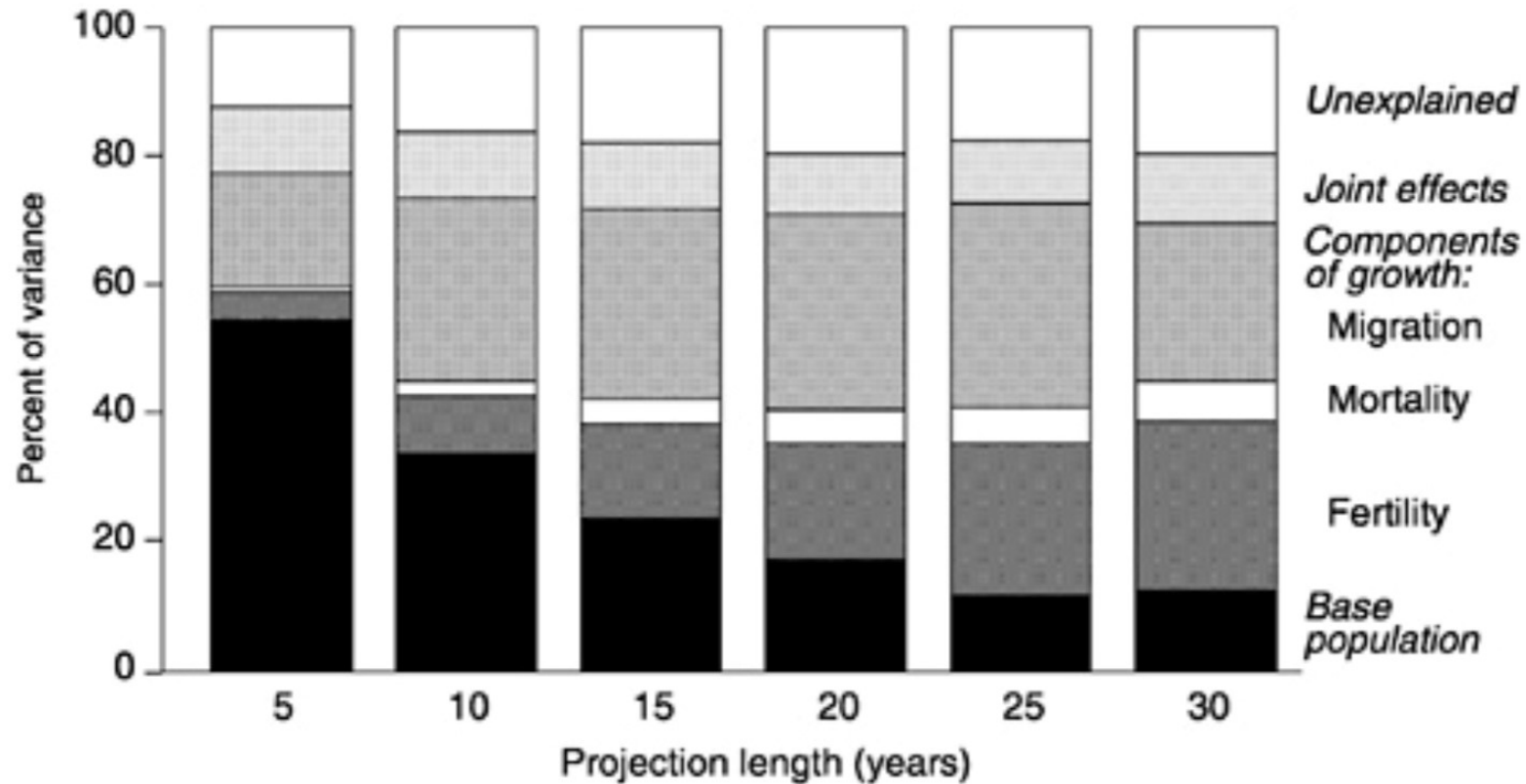
Sources of error in projections

Sources of error

- Base population.
- Fertility: Generally has declined faster than forecast.
- Mortality: Generally has declined faster than forecast.
- Migration: very difficult to predict international flows.

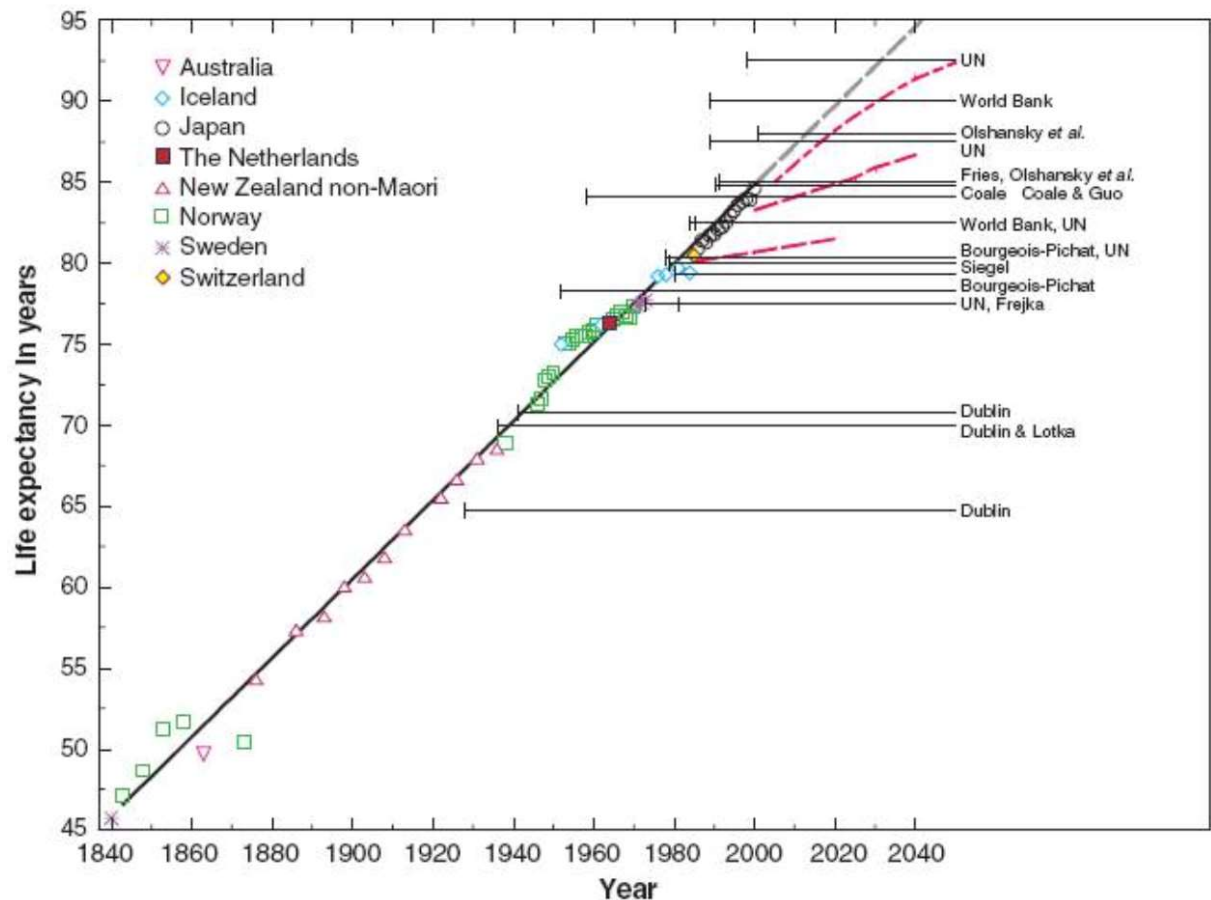
These vary in importance with the length of the projection horizon.

Sources of error in projections



Another example.

During the last half of the 20th century, rapid increases in life expectancy meant that demographers had to continually revise their view on the upper limit to life expectancy.



Population Projections

“When you make use of divination, remember that you do not know what the outcome will be, but you have come to learn it from the diviner. ... Do not come before the diviner either hoping the event will happen or hoping the event will not happen – else you will approach with fear. But first determine in your mind that every event is indifferent and nothing to you, whatever it may be – because it will be within your power to make good use of it and no one can hinder you.”

-- Epictetus, The Manual, Chapter 32, 135 A.D.



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Any questions?

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Next up

Session 4: New measures of ageing