Actuarial Perspectives on Inequality

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About the speaker

- **Assia Billig**
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- Assia Billig is a Fellow of the Society of Actuaries and the Canadian Institute of Actuaries. She is a vice-chair of the Technical Commission on Statistical, Actuarial and Financial Studies of the International Social Security Association. Ms. Billig is the vice-chair of the IAA Social Security Committee and the chair of the IAA Population Issues Working Group.

- IAA Population Issues Working Group
- The mandate is to identify population issues of particular interest to actuaries and in respect of which the actuarial profession, at an international or national level, could make a useful contribution to the public interest.

IAA Population Issues Working Group

- Project of Population Issues Working Group: “Actuarial Perspective of Inequality”
- Published papers:

Determination of Retirement and Eligibility Ages: Actuarial, Social and Economic Impact

Long-Term Care: An Actuarial Perspective on Societal and Personal Challenges

Harmonization of pensions and housing

- Research in progress: basic universal guarantees

Please visit our webpage
https://www.actuaries.org/index.cfm?lang=EN&DSP=CTTEES_PIWG&ACT=INDEX

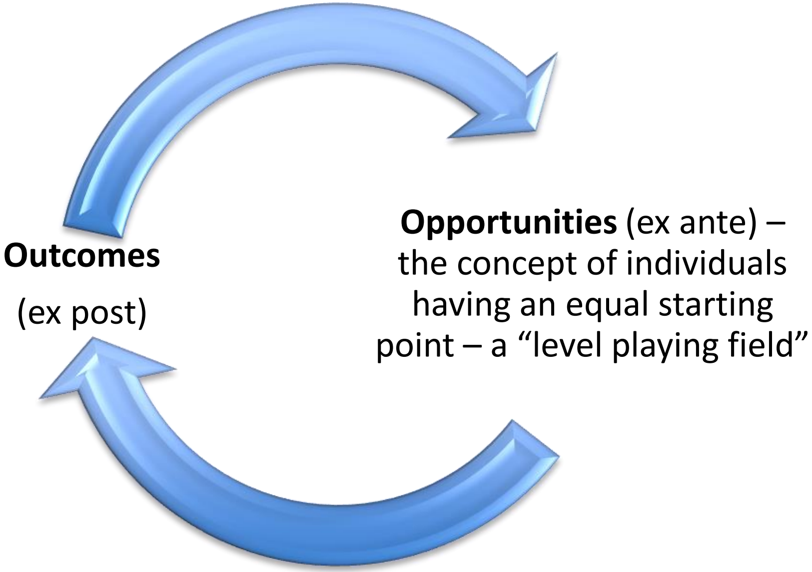
Outline

- Concept of inequality
- Drivers of inequality
- Trends in inequality
- Actuarial work and inequality
- Poverty and social security

Being unequal simply indicates that there is a difference between two or more items

- Inequality, by definition, has and will always exist.
- Inequality represents the distribution or relative lack of a specified item (such as income, resources or health), no matter what the cause(s).
- It is not necessarily good or bad
  - it is up to each society to decide upon and take appropriate action to remedy, if desired.
- This issue is multi-dimensional and is more complex than it appears on the surface.

Ex-ante and ex-post concepts of inequality



- Majority of the concerns are related to opportunities

BUT

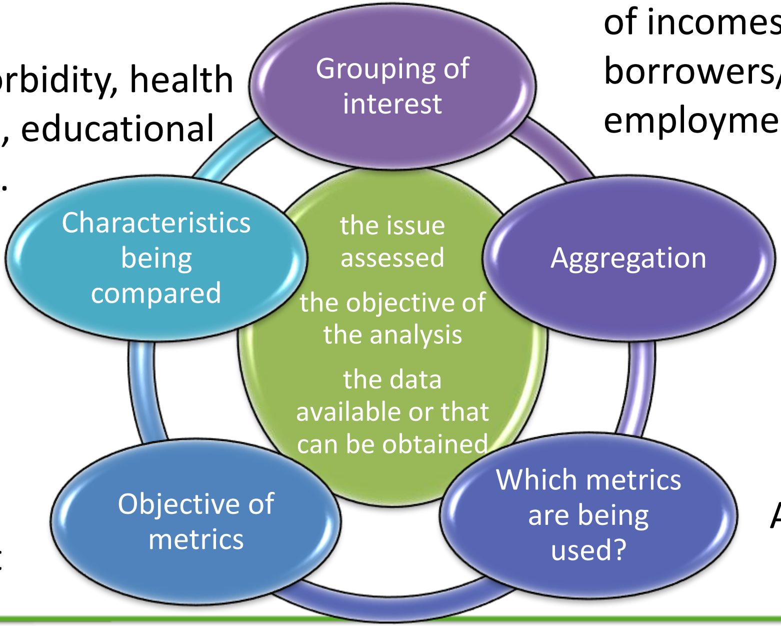
- Society and many of the institutions that actuaries provide service to are also concerned with outcomes

Often, on an aggregate basis, inequality of outcomes can serve as a surrogate measure of the inequality of opportunity for a specific group of individuals.

Inequality analysis framework

Mortality, morbidity, health status, wages, educational attainment, …

Age, gender, marital status, range of incomes or wealth, location, borrowers/debtors, disability or employment status, …



National, international,…

Numerical or statistical comparison, an assessment of causes or effects of the extent of inequality, a comparison of the effect of a distribution or an assessment of inequity (fairness),…

Average, median, slope, …

Example

Grouping of interest

Provinces

Countries

Aggregation

Country

World

Which metrics are being used?

Life expectancy at birth

Objective of metrics

Numerical comparison

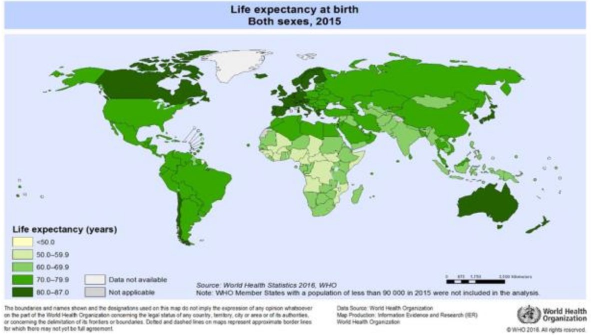
Characteristics being compared

Mortality rates

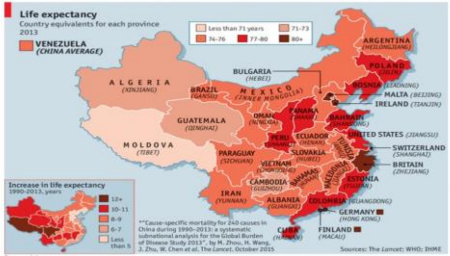
the issues assessed

the objective of the analysis

Multiple issues could be assessed



Life expectancy (LE) at birth 2013 by province in China



Source:http://www.economist.com/news/china/21677267-new-study-casts-new-light-chinas-progress-noodles-longevity

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Drivers of inequality might have either positive or negative effect

- **Individuals**
  - Age, genes, health
  - Socio-economic status
  - Education
  - Employment status
  - Immigration status
  - Income
  - Life style

- **Society**
  - Political: wars, revolutions
  - Structural: urbanization, industrialization, globalization
  - Ageing

Example: Mortality and morbidity outcomes differ by socio-economic status

ENGLAND						
	Male			Female		
	Most Affluent	Least Affluent	Range	Most Affluent	Least Affluent	Range
	At birth					
Life expectancy	83	74	9	86	79	7
Healthy life expectancy	70	52	18	71	52	19
Proportion in "good" health	84%	70%	14%	83%	66%	17%
	At age 65					
Life expectancy	21	16	5	23	19	4
Healthy life expectancy	13	6	7	15	7	8
Proportion in "good" health	64%	39%	25%	65%	37%	28%

Classification is based on UK Index of Multiple Deprivation. Most Affluent: Upper Decile. Least Affluent: Lowest Decile

Source: Health state life expectancies by national deprivation deciles, England and Wales: 2014 to 2016. Office for National Statistics, UK, 2018

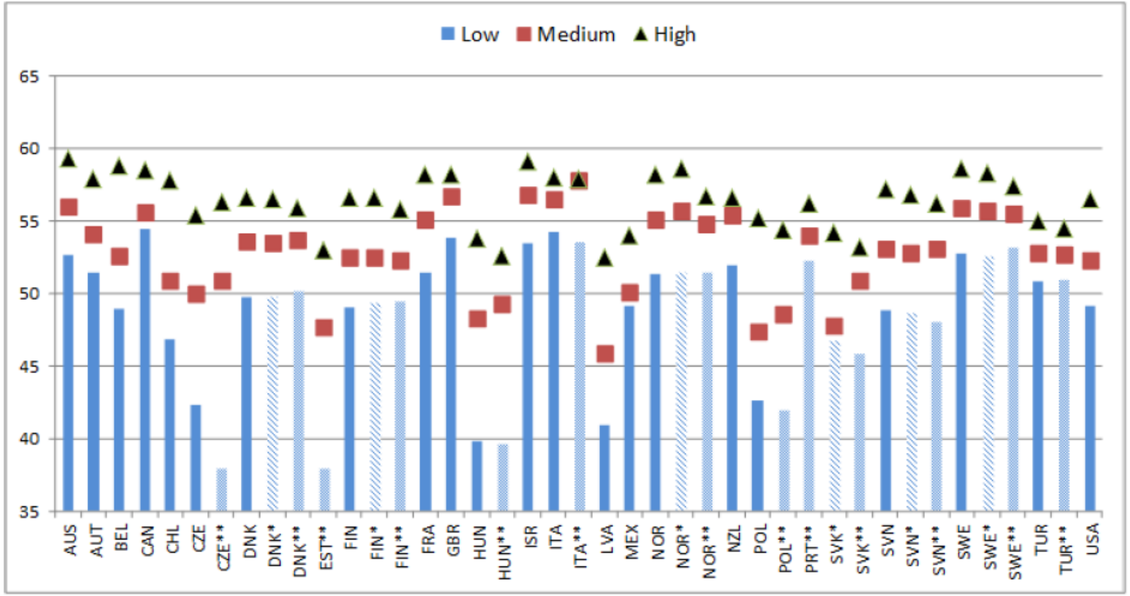
Example: Access to quality education may depend on socio-economic status

- OECD (2012) :

"The reality is difficult to face: in most OECD countries, students' attainment is typically lower in schools where most of the students come from disadvantaged backgrounds. The reasons for this phenomenon are multiple but the primary ones are: students' socio-economic background has a strong impact on their performance; and many disadvantaged schools are unable to counteract its negative impact, and may indeed accentuate it".

Example: Education as a driver of longevity

Life expectancy at age 25 by education around 2011, Males

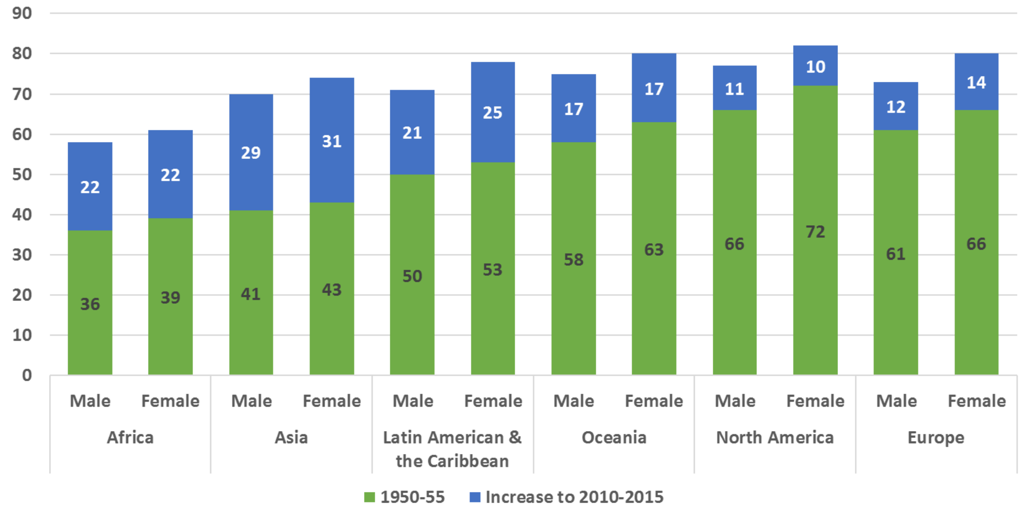


Source: Murtin, F., et al. (2017), "Inequalities in longevity by education in OECD countries: Insights from new OECD estimates", *OECD Statistics Working Papers*, No. 2017/02, OECD Publishing, Paris

Note: Countries without an asterisk correspond to estimates based on the country-data gathered for this paper and on authors' calculations. Estimates for the Slovak Republic (denoted with an asterisk *) are based on authors' calculation based on detailed Eurostat data; ** denotes Eurostat data and calculations.

Trends in inequality: need to understand why

Development of life expectancy from birth by region and sex over the last 60 years



Source: ISSA Demographic Megatrends.

<u>Trend: decrease of the gap in life expectancy at birth between countries</u>

Why?

- In less developed countries: the decrease in infant, young children and maternal mortality
- In more developed countries: mortality improvements at older ages

Will this trend continue?

Trends: underlying data, grouping and definitions are crucial

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Example: two US publications

Good news

Das Bild kann zurzeit nicht angezeigt werden.

Not so good news

Estimated and projected life expectancy at age 50 for individuals born in 1930 and 1960, by income quintile:

- For males, the gap have grown from 5 years to almost 13 years.
- For females, the gap have grown from 4 years to almost 13.6 years.

Source: The Growing Gap in Life Expectancy by Income: Implications for Federal Programs and Policy Responses. The National Academies of Science, Engineering and Medicine, 2015

Why actuaries?

- We work for institutions that address potentially adverse financial impacts of contingent events
- The extent of heterogeneity of risks depends on the target populations and its characteristics
- Relevant for almost all actuarial practice areas:
  - pension, insurance, health, social security, long-term care, etc.

In practice, the impacts are on:

- Assumptions:
  - Mortality rates
  - Mortality improvement rates
  - Disability rates
  - Utilisation rates
- Design features of the programs
  - Eligibility age
  - Cross-subsidisation
  - Health care program

Pensions: mortality assumptions

- Differences are recognized on the level of base mortality rates
  - RP-2014 (US): Total ,Blue Collar, White Collar, Bottom Quartile (based on salary),Top Quartile (based on salary)
  - CPM2014 (Canada): Adjustment factors based on size of pension
- Mortality improvement scales usually do not vary
  - usually not enough longitudinal data to derive credible assumptions

Design: Eligibility age for retirement benefits

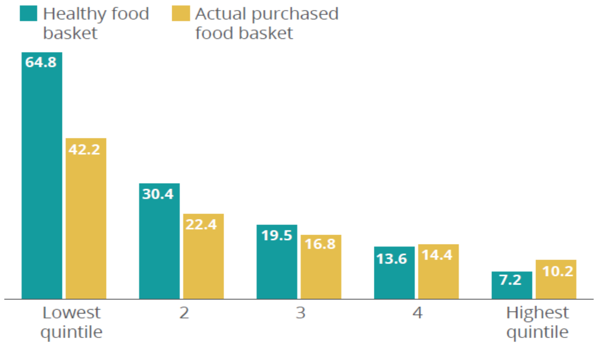
- Are lower socio-economic groups subsidizing the higher ones since they live shorter lives?
  - Should they be allowed earlier access to benefits?
  - Should eligibility age be different by socio-economic level?

- UK, Independent Review of the State Pension Age (SPA): "trying to account for socio-economic differences when setting a State Pension age would be complex"
  - means-tested benefit for pensioners should be payable from one year below SPA for a defined group of people who are unable to work through ill-health or because of caring responsibilities.

Many social concerns with inequality involve concerns with poverty and extreme poverty

- Greater poverty
  - exposure to environmental hazards
  - less access to quality prenatal care
  - poorer nutrition and education
  - fewer opportunities.

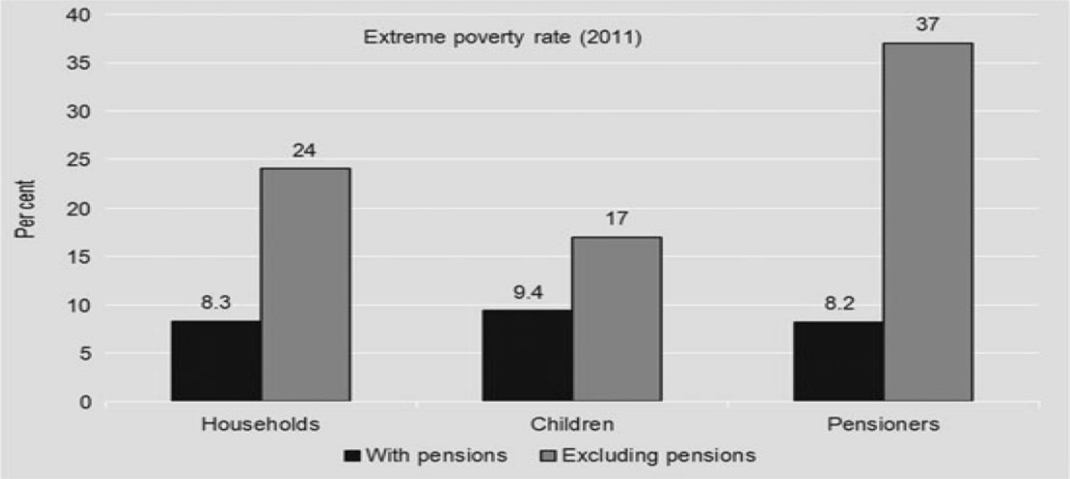
Household expenditure on food as a percent of monthly monetary income, Israel, 2014, by income quintile



Source: Taub Center.
Data: Central Bureau of Statistics, Expenditure Survey 2014.

Social security plays an important role in poverty reduction

Estimated effect of universal pension income on consumption poverty
Georgia (2011)



Source: UNICEF (2012).

Social security reaches all ages

OECD Social Expenditures Update 2016

“countries, that have both relatively high levels of social spending on working-age population and which are relatively successful in reaching low-income households tend to have less income inequality (as measured by Gini coefficient) among working-age population”

http://www.oecd.org/els/soc/OECD2016-Social-Expenditure-Update.pdf

Actuaries and social security

- Unemployment programs
- Work injury
- Social assistance
- Retirement
- Conditional and unconditional cash transfers programs – do we need to get more involved?

Traditionally strong actuarial involvement

Conclusion

- Inequality affects the work of actuaries in many ways
- Actuaries need to be aware of impacts of inequality
  - Assessing the financial sustainability of programs
  - Developing products
  - Assisting decision makers in policy discussions

Thank you very much for your attention!

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