SOCIETY OF ACTUARIES

LIVING to 100
SOCIETY OF ACTUARIES INTERNATIONAL SYMPOSIUM

Mortality and Longevity

Aging and Retirement

2020 Living to 100 Discussant Comments
3B: Mortality Improvement

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Discussant Comments Session 3B: Mortality Improvement

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I am going to provide some comments and thoughts that will hopefully spur some additional questions. Although my experience and expertise better align with the second paper, I am going to provide more comments on the first paper.

Does Migration Result in Mortality Improvement: A Case Study in Taiwan – *Chih-Kai Chang, FSA, CERA, Feng Chia University; Jack C. Yue, ASA, National Chengchi University; Yen-Wen Chen, Feng Chia University*

The first paper is entitled "Does Migration Result in Mortality Improvement: A Case Study in Taiwan". My agenda for this discussion is:

- I will start with some introductory comments.
- I will then provide some definitions so we are all on the same page.
- Next I will discuss some of the important issues related to the paper.
- Then I will suggest some other considerations that may not have been thought of on this paper that will apply not just to this paper but other work on migration as well, and
- Then I will offer some suggestions.
- Finally, I will provide some concluding thoughts.

Introduction

- While I believe more work is being done on immigration rather than migration, migration is important with respect to projecting mortality and understanding it from a social insurance standpoint.
- I agree that the impact of migration on mortality is an important consideration in building models and making mortality projections, whether at the population level, for social insurance, or any other area where there is a need to understand the mortality of a segment of the population.
- I think this paper gives us a good start and that the authors provided some good suggestions.
- My focus will be on some possible insights into the findings of the authors and on some other considerations for the authors and anyone else who may be studying this topic.
- The opinions expressed herein are mine and do not necessarily reflect the opinion of my employer, the SOA, or the Living to 100 organizing committee.

I am going to provide several definitions. These are my definitions.

- Migration is the movement from one part of a country to another.
- Immigration is the movement from one country to another.

I believe these definitions are clear to everyone. However, I think there are different opinions on the next several definitions. For me:

- Urban refers to those within a large city, town, etc.
- Rural means one living in a small community or in no community and is a fair distance outside of a city, town, and suburban area.
- And, suburban refers to one living in a community that surrounds or is nearby a city, town, etc.

The reason I am providing these definitions is that I believe the authors use "rural" to mean my definition of "suburban" and at least in the U.S., suburban mortality is usually best among the three populations I just described, while in Taiwan, "rural", appears to have the worst mortality.

I would like to start my discussion of the paper with some important issues that I believe may have impacted the results of the study. These issues may or may not be relevant to other similar studies.

- My first issue is the eligible population. My concern is that the population was limited, since it excluded labor, civil service, military servant, and farmer insurance social pension programs. About one-third of the population was involved. Hopefully, in other programs, a larger portion of the population can be included.
- My second issue is how the health/mortality of the eligible and ineligible groups compare to each other.
- Third, it was indicated that there was a decreasing participation rate.
    - Why is that happening? It wasn't clear to me from the paper.
    - Can it be reversed?
- What is the right level of disability and income level for the government support and should this change over time?
    - I believe this is in an important issue that will likely impact the viability and sustainability of the program overall.
    - How much can the government support?
    - Should it change over time?
- The paper showed that over the next couple of years there would be an increase in the percentage of salary that needs to be contributed.
    - This may impact the participation rate as well.
    - How many more increases can there be?
    - These increases are needed to maintain the sustainability of the program, but they cannot continue indefinitely. If they do, at some point the program may no longer be sustainable.

- NPI should not be considered “substandard insurance”.
    - Maybe it is because there is an increasing number of people needing coverage from the government.
    - If this is true, it will likely lead to a worsening of the health of the overall population and create an unsustainable situation.
- Can the program become mandatory for all?
    - This was mentioned in the presentation and is a good question.
    - It was also asked if the programs could be merged. I believe this could help the program overall and benefit the government.

The following are some other considerations that could potentially be used to provide additional insights into this study, or for the future of this study or other studies.

- Slow economic growth leads to income levels which are generally flat. If prices for goods keep going up and income remains level, this means there will be limited disposable income and it will become harder for people to continue at the same participation level, possibly leading some to not join the program or later drop out, possibly when the additional lives are most needed.
- Could individuals opt out of the program or are dropouts only allowed for later unemployment? There are a couple of considerations here:
    - If the economy worsens, this will typically lead to more unemployment. If a person is unemployed, they typically have less income and potentially less accessibility to care, potentially leading to higher mortality.
    - Could some of those leaving the program be less healthy, and this be some or all of the explanation for the mortality improvement seen in the program?
- Publicity of the program was not addressed and could attract or detract from participation in certain populations.
    - The government could take advantage of publicity.
    - Were the benefits clearly communicated to all who were eligible? This could attract more people who understand the benefits of the program.
    - A simple tool could be put together to demonstrate the benefits, e.g., that you cannot outlive the payments (assuming the program is sustainable).
- The low interest rate environment is likely to stay and may even turn negative.
    - What impact would negative interest rates have on participation, benefits, and the sustainability of the program?

- Migration mortality rates may start out worse over time due to the stress of getting acclimated to a different environment, culture, etc., whether moving from less healthy to healthy or vice versa. I believe this to be true at least for a short period of time immediately after the move, unless someone is moving from a really bad situation. However, I don't believe the authors saw this pattern in the data.

  Migration mortality will be impacted by some or all of population density, more/less pollution, better/worse access to healthcare, similar/different cultures, and the ability of the individual to acclimate mentally and physically to new situations/environments.

  There will also likely be some differences between moving from healthy to unhealthy vs. moving from unhealthy to healthy.

The following are some suggestions for improving the study, if it is done again.

- Split the vulnerable between low income levels and disability as I believe there will likely be mortality differences between these groups.
- Split the regions further into urban and rural within each region.
- When studying migration, split between those migrating to and from Northern Taiwan, as the results will likely be different. These were combined to have a greater number of migrating lives.

My concluding thoughts on this paper are:

- It is difficult to create the perfect study, primarily because the desired data and measurements are not available. Hopefully, over time, we get the needed data.
- My hope is that studies like this and the recommendations from it can help guide governments with program improvements, i.e., better program design/benefits, better participation rates and persistence, and sustainability of the programs.

The following are some additional sources of information on migration-related issues:

- Nauman E, VanLandingham M, Anglewicz P, Patthavanit U, Punpuing S. Rural-to-Urban Migration and Changes in Health Among Young Adults in Thailand. *Demography*. 2015;52(1):233–257. doi:10.1007/s13524-014-0365-y https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4372468/
- Potts D, Rural-Urban and Urban-Rural Migration Flows as Indicators of Economic Opportunity in Sub-Saharan Africa: What Do the Data Tell Us? Migrating Out Of Poverty Research Programme Consortium. http://www.migratingoutofpoverty.org/files/file.php?name=wp9-potts-rural-uban-and-urban-rural-migation-flows.pdf&site=354
- Rees P, Bell M, Kupiszewski M, Kupiszewska D, Ueffing P, Bernard A, Charles-Edwards E, Stillwell J. Impact of Internal Migration on Population Redistribution: An International Comparison, *Population, Space, and Place*. 2017;23:e2036. doi:10.1002/psp.2036 https://onlinelibrary.wiley.com/doi/epdf/10.1002/psp.2036
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Mortality Trends: An International Perspective – *Adrian Gallop, FIA, Government Actuary's Department*

The second paper, or really the presentation, that I reviewed was entitled "International and National Mortality Trends". My agenda is a short one:

- My observations
- Approaches to mortality improvement projections
- Concluding thoughts

I will also provide some additional information that I am aware of on a few of the items that were mentioned in the presentation.

My observations include the following:

- While some countries saw mortality changes earlier than 2015, it is interesting to see that so many countries had a slowing or deterioration in mortality in the same year, 2015. I don't know why this happened, but I have studied some of the reasons and they vary by country.
- Because of this sudden change in mortality, a number of the projection models, e.g., CMI (Continuous Mortality Investigations) in the UK and the Canadian system, were changed to be able to better project this type of change in the future.
- In the U.S., subsequent to 2015, there was also deterioration in 2016 and 2017, followed by improvement in 2018 and preliminarily in 2019, but what can we expect in the future?
- Most of the discussion was regarding population mortality improvement (MI). It would be interesting to see how these results compare for annuities, life insurance, public and private pension plans, and social security. There likely would be some different results.
- A dip in U.S. population mortality improvement was shown at ages 60-65. I have seen this dip in insured data as well.
- I found the information on behaviors interesting and hopefully this can be expanded beyond the U.S. and UK to other countries as I believe it can be used to better project future mortality improvement (MI) and/or deterioration.
- Opioids were commented on. There was a big paper recently completed by the SOA, which shows that fortunately opioid deaths are beginning to decrease starting in 2017.

Next I would like to discuss some of the approaches to mortality improvement projections.

- I think we rely too much on the past numbers and drawing lines through these generally does not produce the right result long term, unless one is lucky.
- The current approach by many is to extrapolate the past mortality improvement for short term rates, set long term mortality improvement rate using expert opinion, and extrapolating between the two.
- Another approach (that I like), and was actually commented on in the presentation, is to:
    - Determine the drivers of the past results and whether these will continue into the future, and if so, at what rate. An example of this is whether the impact of the reduction in smoking prevalence has been partially or fully reflected in past mortality improvement rates.
    - Determine what new impacts there will likely be, both short and longer term, and the level of these impacts. Examples of this include immunotherapy and CRISPR on the positive side and the increasing levels of pollution and stress on the negative side.

My concluding thoughts are:

- I have personally been involved with some of this international research and hope that it continues and expands in terms of both the people involved and the research involved.
- With a broadening of those involved and the learnings, hopefully some best practices can emerge.

I hope I have given you enough issues to think about that it helps to spur some questions for our speakers. Thank you for your attention.

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