Population Aging and Economic Polarization in Asia

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Abstract

This essay makes four points about the interplay of population aging and economic inequality among low- and middle-income countries in Asia.

First, we argue that population aging is a salient driver of measured economic inequality (a) because inequality tends to be higher in older age groups than in younger adult ones and (b) old-young disparities tend to contribute more to overall inequality as the population share of older individuals rises. We also discuss the proposition (and related evidence) that the negative effect of inequality on healthy aging magnifies the positive association between aging and inequality.

Second, we argue that measured economic inequality is an imperfect indicator of true economic inequality because it neglects the relatively large value that older people create for themselves and others through productive non-market activities (e.g., caring for others, looking after grandchildren, and doing volunteer work).

Third, we note some ways in which older people's vulnerability to COVID-19 and to related social and economic policies are sharpening the association between population aging and economic inequality.

Finally, we discuss public and private health and non-health interventions that can disrupt the link between population aging and economic inequality. The health interventions include disease prevention, universal health care, and implementation of supportive care models. The non-health interventions involve social protection programs (especially pensions, unemployment and disability insurance, and reskilling), immigration policy, housing and urban design, and non-ageist policies and practices.

Introduction

Population aging is the dominant demographic trend of our era. The number of older adults is rising rapidly worldwide, both as a proportion and as an absolute number. Globally, the proportion of people older than 65 years was 9.1% in 2019 and is projected to be nearly 16% by 2050.[1] This proportion is expected to rise even faster in Asia, with 8.6% of the 65+ population in 2019 rising to 18% by 2050.[2] This challenges continued economic growth and simultaneously requires societies and governments to consider how to best care for their elders.[3]

Rising socioeconomic inequality is another major issue of our era. Figure 1 shows trends in the Gini index for selected countries in Asia as reported by the World Bank. Overall, inequality both within and between countries in Asia has risen since the 1990s.[4] Currently, roughly one third of countries in Asia have Gini indices greater than 40, with China's and India's both exceeding 50. Rising inequality is occurring worldwide and has many drivers, with troubling implications for reduced economic growth and greater social unrest.

Furthermore, rising socioeconomic inequality hinders the well-being of older adults. People live longer, but some have experienced longer periods of unemployment and lower wages, have accumulated fewer assets, and have invested fewer resources in their education and health. Meanwhile, others enter old age with higher accumulated wealth and better health. Accumulating disadvantages over a lifetime implies that inequality increases with age. And the increase in the share of older people fuels further increments in overall socioeconomic inequality.

The link among overall inequality, unhealthy aging, and inequalities among the elderly is particularly troublesome for some Asian countries because of a combination of rapid aging, and weaker social safety nets.

This paper discusses the interplay between aging and inequality in Asia and presents some measures to break this cycle. We will focus mainly on interventions targeting the elderly, which aim to improve and sustain the well-being of older people, so that no one is left behind. By reducing inequality among the elderly, the interventions discussed here may also contribute to reducing overall inequality and the societal burden of population aging.

The Interplay of Aging and Inequality

The trends of aging and socioeconomic inequality do not exist in isolation from one another. Rather, aging accentuates worrying trends in inequality, while inequality is associated with many of the difficulties that come with aging.

Socioeconomic inequalities from earlier in life tend to persist into old age. Inequalities in education, health, employment, and earnings when young affect a person's aging process and determine overall quality of life when the person becomes old. Across Organisation for Economic

[1] United Nations Department of Economic and Social Affairs Population Division (2019).
[2] Ibid.
[3] Ha and Lee (2018).
[4] Huang et al. (2019).

Co-operation and Development countries, a 25-year old university-educated man can expect to live 7.5 years longer than his less educated peer; for women, the difference is 4.6 years.[5] A similar educational gradient in health also appears in Asian countries. For example, a recent study of biomarker data found that older Indian adults with no formal education are considerably more at risk of anemia than older adults with some schooling.[6]

Throughout the life cycle, unhealthy individuals tend to participate less in the labor force and earn lower wages. Because poor health often persists, it leads to lower wealth accumulation[7] and lower lifetime earnings, thereby increasing the risk of poverty when the individual enters old age. Additionally, the income gradient of health is well-established and is reinforced at old ages. Thus, not only health affects income/wealth, but also the opposite is true: income/wealth affects health. Among recent findings, lower socioeconomic status is associated with slower gait speed, a key predictor of poor health outcomes among older adults.[8] It is also associated with poorer physical function, greater age-related increases in blood pressure, and accelerated biological aging.[9] Among older adults in China, inequalities in health and differences in self-rated health have been attributed in large part to socioeconomic differences.[10]

Pensions are crucial to addressing socioeconomic inequality at old ages, as the less wealthy often rely on them for economic security.[11] In Asia, pension access varies widely: more than 70% of people above retirement age in Eastern and Southeastern Asia receive pensions, while less than 25% do in Southern Asia.[12] However, even high coverage rates belie restrictive age coverage and inadequacy of benefits to meet household needs. Overall, only 1.4–5.8% of gross domestic product across the region goes toward social protection for older adults, compared with 6.9% globally and 6.8% and 10.7% in North America and Western Europe respectively.

Access to these pension systems largely depends on labor force participation and employment history. Vulnerable groups, such as women, informally employed workers, and people in rural areas, have limited access or lower benefits because of uneven employment histories or longer unemployment spells. Older women disproportionately experience income insecurity because they are more likely to have worked in informal sectors and to have career interruptions and lower wages due to childbearing and care giving. The longer life expectancy of women aggravates this issue.

Aging has played a role in growing inequality in many economies.[13] Snowballing inequalities as people age combined with more older people partly explain the observed increase in overall inequality. This is primarily a mechanical result due to the changing population age structure (more old people and higher inequality among the old than the young imply more overall inequality).

[5] Organisation for Economic Co-operation and Development (2017).
[6] Lee et al. (2015).
[7] Poterba et al. (2017).
[8] Stringhini et al. (2018).
[9] Hoogendijk et al. (2018); Diez Roux et al. (2002); Fiorito et al. (2019).
[10] Gu et al. (2019); Pan et al. (2019).
[11] U.S. Government Accountability Office (2019).
[12] International Labour Organization (2017).
[13] Zhong (2011).

Behavioral channels are also at play, because increased life expectancy implies that people tend to save more for the future. However, not everyone can invest equally in his/her future, and as people age this heterogeneity increases leading to higher inequality.[14]

The Measurement of Inequality

An important issue when analyzing the interplay between aging and inequality is the measurement of inequality. Income is generally used as a proxy for people's well-being and prosperity. Although correlated with well-being and overall quality of life, income is not a perfect measure of a person's life situation. For example, some individuals/households may have no income of their own, but other family members provide for them. If accumulated wealth passes through generations, income is an incomplete measure of a person's resources. Individuals tend to smooth consumption over time through borrowing, lending, and investments; transitory drops in income may overstate the impact on individuals' well-being and changes in inequality. Consumption expenditures is a better proxy for well-being,[15] but lack of reliable data often undermines its use.

Income (and also consumption) imperfectly captures individuals' levels of well-being, especially that of older adults, in another way, which is revealed by the relatively large value created through productive non-market activities (e.g., caring for family members or volunteering in community organizations). Non-market activities represent time, which is a resource for individuals, and failing to capture its use biases any account of well-being and inequality in well-being.

Individuals derive utility from the consumption of goods and services, but also from spending time in activities that they enjoy doing. These include leisure activities (e.g. hiking) and productive non-market activities. Some reasons why the latter create value are increased feeling of purpose, joy in helping others and in knowing onself to be a useful member of society. Since older adults participate less in the labor market than younger people, they have more time to devote to leisure and non-market activities. In a recent analysis of older adults in Europe and North America, the value of non-market activities constituted half—and in Europe 84%—of the value of older adults' productive contributions.[16] Measures of inequality should be based on full consumption, which includes not only consumption of goods and services, but also consumption of time. Neglecting the time spent in leisure and non-market activities excludes a potentially sizable source of well-being for older adults.

Additionally, measures of individuals' standards of living and inequality are often based on household income and consumption to capture the partial pooling of resources that occur within a household. Neglecting the time that household members spend in non-market activities such as childcare can lead to underestimating the full income of a household. For instance, a household where the grandparent can help the children with school homework is likely better off than another similarly situated family (same number of individuals, same household income, etc.) where the grandparent is not able to participate in the children's education (e.g., because of an illness or

[14] Goldstein and Lee (2014).
[15] Chen and Ravallion (2010); Deaton and Paxson (1994) .
[16] Bloom et al. (2020).

because of illiteracy). Not only does the latter household not benefit from contributions the grandparent could have made, but they may incur additional (unvalued) costs from caring for an unwell relative. Measures of overall well-being and inequality should account also for the non-market productive contribution of the population, especially older adults.

The impact of time use on measures of economic inequality is still an open question. A recent study has found a negative relationship between consumption and some non-paid work activities (leisure activities and some non-market productive activities) in the U.S.; accounting for time use thus reduces inequality.[17] On the other hand, some productive non-market activities might be a burden to individuals (e.g. some household chores), limiting their access to other opportunities. Differences in workload, in particular gender differences, will thus increase economic inequality. Additionally, the ability to devote time to enjoyable productive activities is closely linked to health. Thus, processes that negatively affect older adults' health may also negatively affect this important source of well-being, and potentially increase inequality.

COVID-19, Aging, and Inequality

The COVID-19 pandemic has exacerbated many lingering inequalities. In the U.S. context, for instance, this notably includes higher risk for COVID-19 infection and severe disease among people in lower socioeconomic classes,[18] as seen in increased rates of infection in areas with higher levels of poverty.[19] Where older adults are more likely to be poor or have to work in high-risk occupations, such as the service sector, they may be particularly vulnerable to adverse outcomes from COVID-19. Because the fatality rate from COVID-19 increases with age, older adults in low socioeconomic groups face the worst prospects.

The economic downturn due to COVID-19 may also exacerbate inequalities among the elderly. While those who are poorer and must continue to work to make ends meet will likely find reduced income, those with assets can absorb losses and maintain their standard of living. People employed in formal jobs (who can claim unemployment insurance and have better prospects of receiving a pension) are more protected from the economic costs of the pandemic. Because of labor market barriers, older adults that lose their job are less likely than their younger peers to be re-employed. The pandemic might further increase this heterogeneity because older adults face a higher risk of severe COVID-19 outcomes, and, as a result, constitute a higher cost for the employers (e.g. in terms of replacement expenses if they fall sick, or health insurance and paid sick leave).

The long-term consequences of COVID-19 are unknown. A World Bank report estimates that COVID-19 will push more than 80 million people into extreme poverty.[20] Most of the increase is concentrated in South Asia due to the fast-growing infection rate and large number of people close to the poverty line. Although the report does not account for age differences, many of those falling into poverty are among the vulnerable groups, including older adults.

[17] Han et al. (2020).
[18] Baylis et al. (2020).
[19] Wadhera et al. (2020); Vahidy et al. (2020).
[20] Lakner et al. (2020).

The Way Forward

The links between population aging and inequality require that solutions to one issue also address the other. Without considering how aging affects distribution of income and wealth, reducing inequality within societies will be challenging. Without reducing the health and aging consequences of inequality, healthy aging of populations becomes more challenging to achieve and the costs of demographic change will mount.

Solutions that address both aging and inequality can come from the public sector or from the private sector, and they can either directly target health outcomes and healthy aging, or they can focus on non-health areas.

Health-related interventions begin early in life. Efforts around so-called "primordial prevention" that ensure healthy diets, physical activity, and social well-being have long-term benefits.[21] Even in mid and late life, healthy lifestyles can improve or maintain health, function, and life expectancy,[22] including reducing risk for dementia.[23] Clinical interventions can also mitigate health risks with older age. Vaccination is an inexpensive and effective way to reduce the burden of infectious diseases in older adults; the high-dose influenza vaccine and the herpes zoster subunit vaccine (Shingrix) are two recent examples.[24] At the systems level, care delivery should promote aging in place where possible, including providing adult day care and home-based care to older adults: the Program of All-Inclusive Care for the Elderly in the United States is one example that has reduced costs and improved quality of life.[25] Those who can no longer safely remain at home need affordable and adequate long-term care facilities. Health care workers need to be trained specifically in the needs of older adults and how they differ from younger adults. Finally, insurance and payment systems need to be in place to ensure access to care at all levels of wealth and to mitigate the costs of catastrophic events.

Non-health interventions relate to social security systems, education, housing and urban design, and immigration policies. Ensuring financial security at older ages requires pension schemes that cover both the formal and informal sector and are generous enough to maintain adequate standards of living. The aging process might undermine the financial sustainability of pension schemes. However, the system must guarantee a minimum level of social protection for all older adults, especially the most vulnerable ones like women and the poor. Likewise, some forms of unemployment insurance that cover not only the formal sector, but also the informal one, are advisable, because many older workers are employed in informal jobs. Relaxing institutional and attitudinal barriers to international migration can also promote financial security at older ages.

Measures to break barriers to entering the labor force or being re-employed will help older adults achieve financial security. Investing in education for older adults or reskilling can also have a sizable impact. Some of these measures can be very cheap and low-tech, yet produce astonishing results. Take for instance same-language subtitling. The idea, which originated with Indian

[21] Gillman (2015).
[22] Li et al. (2018); Khera et al. (2016); McPhee et al. (2016); Jacob et al. (2016).
[23] Amakye et al. (2019); Dhana et al. (2020); Hunt et al. (2020).
[24] Lal et al. (2015); DiazGranados et al. (2014).
[25] Eng et al. (1997).

academic Brij Kothari, is to subtitle popular movies in the same language as the audio tracks that people know and love.[26] Through this mechanism, illiterate or semi-literate Indians effectively get a Hindi lesson every time they watch a Bollywood movie. The method has been effective in accelerating the population's functional literacy.

Another set of useful policies includes infrastructure investments that can promote activity and socialization throughout the life course. Examples include ensuring that all older people have access to an adequate, affordable place to live; encouraging the development of age-friendly housing where older adults can live independently; providing affordable public transportation for older people and people with disabilities to promote autonomy and facilitate movement; and redesigning urban settings to make roads safer and to increase the opportunities for people to meet and socialize.

Automation is often considered an effective way to alleviate the pressure of population aging and declines in the labor force.[27] However, automation has its own challenges, primarily the displacement of workers, with the consequent rising unemployment among some skill groups—especially among less-educated older workers. This is expected to eventually exacerbate existing inequalities, both between the younger and the older generations and among the elderly. In light of these trends, pre-emptive investments to protect the standards of living of older people are a first-order concern.

[26] Kothari et al. (2002).
[27] Abeliansky and Prettner (2020).

Works Cited

Abeliansky, Ana Lucia, and Klaus Prettner. "Automation and Demographic Change." Essen: Global Labor Organization (GLO), 2020. http://hdl.handle.net/10419/215800.

Amakye, William Kwame, Maojin Yao, and Jiaoyan Ren. "Healthy Diet and Risk of Dementia in Older Adults." *JAMA - Journal of the American Medical Association*. American Medical Association, December 24, 2019. https://doi.org/10.1001/jama.2019.17942.

Baylis, Patrick, Pierre-Loup Beauregard, Marie Connolly, Nicole Fortin, David Green, Pablo Gutierrez Cubillos, Sam Gyetvay, et al. "The Distribution of COVID-19 Related Risks." Cambridge, MA, October 2020. https://doi.org/10.3386/w27881.

Bloom, David E., Alex Khoury, Eda Algur, and J. P. Sevilla. "Valuing Productive Non-Market Activities of Older Adults in Europe and the US." *De Economist (Netherlands)* 168, no. 2 (June 1, 2020): 153–81. https://doi.org/10.1007/s10645-020-09362-1.

Chen, Shaohua, and Martin Ravallion. "The Developing World Is Poorer than We Thought, But No Less Successful in the Fight Against Poverty." *The Quarterly Journal of Economics* 125, no. 4 (October 9, 2010): 1577–1625. http://www.jstor.org/stable/40961014.

Deaton, Angus, and Christina Paxson. "Intertemporal Choice and Inequality." *Journal of Political Economy* 102, no. 3 (June 1, 1994): 437–67. https://doi.org/10.1086/261941.

Dhana, Klodian, Denis A. Evans, Kumar B. Rajan, David A. Bennett, and Martha C. Morris. "Healthy Lifestyle and the Risk of Alzheimer Dementia: Findings from 2 Longitudinal Studies." *Neurology* 95, no. 4 (July 28, 2020): e374–83. https://doi.org/10.1212/WNL.0000000000009816.

DiazGranados, Carlos A., Andrew J. Dunning, Murray Kimmel, Daniel Kirby, John Treanor, Avi Collins, Richard Pollak, et al. "Efficacy of High-Dose versus Standard-Dose Influenza Vaccine in Older Adults." *New England Journal of Medicine* 371, no. 7 (August 14, 2014): 635–45. https://doi.org/10.1056/NEJMoa1315727.

Diez Roux, Ana V., Lloyd Chambless, Sharon Stein Merkin, Donna Arnett, Marsha Eigenbrodt, F. Javier Nieto, Moyses Szklo, and Paul Sorlie. "Socioeconomic Disadvantage and Change in Blood Pressure Associated with Aging." *Circulation* 106, no. 6 (August 6, 2002): 703–10. https://doi.org/10.1161/01.CIR.0000025402.84600.CD.

Eng, Catherine, James Pedulla, G. Paul Eleazer, Robert McCann, and Norris Fox. "Program of All-Inclusive Care for the Elderly (PACE): An Innovative Model of Integrated Geriatric Care and Financing." *Journal of the American Geriatrics Society*. Blackwell Publishing Inc., February 1, 1997. https://doi.org/10.1111/j.1532-5415.1997.tb04513.x.

Fiorito, Giovanni, Cathal McCrory, Oliver Robinson, Cristian Carmeli, Carolina Ochoa Rosales, Yan Zhang, Elena Colicino, et al. "Socioeconomic Position, Lifestyle Habits and Biomarkers of Epigenetic Aging: A Multi-Cohort Analysis." *Aging* 11, no. 7 (April 15, 2019): 2045–70. https://doi.org/10.18632/aging.101900.

Gillman, Matthew W. "Primordial Prevention of Cardiovascular Disease." *Circulation*. Lippincott Williams and Wilkins, February 17, 2015. https://doi.org/10.1161/CIRCULATIONAHA.115.014849.

Goldstein, Joshua R, and Ronald D Lee. “How Large Are the Effects of Population Aging on Economic Inequality?” *Vienna Yearbook of Population Research* 12 (October 9, 2014): 193–209. http://www.jstor.org/stable/43773391.

Gu, Hai, Yun Kou, Hua You, Xinpeng Xu, Nichao Yang, Jing Liu, Xiyan Liu, Jinghong Gu, and Xiaolu Li. “Measurement and Decomposition of Income-Related Inequality in Self-Rated Health among the Elderly in China.” *International Journal for Equity in Health* 18, no. 1 (January 8, 2019): 4. https://doi.org/10.1186/s12939-019-0909-2.

Han, Jeehoon, Bruce D. Meyer, and James X. Sullivan. “Inequality in the Joint Distribution of Consummption and Time Use.” *Journal of Public Economics* (available online 13 January 2020, in press) https://doi.org/10.1016/j.pubeco.2019.104106.

Hoogendijk, Emiel O., Martijn W. Heymans, Dorly J.H. Deeg, and Martijn Huisman. “Socioeconomic Inequalities in Frailty among Older Adults: Results from a 10-Year Longitudinal Study in the Netherlands.” *Gerontology* 64, no. 2 (February 1, 2018): 157–64. https://doi.org/10.1159/000481943.

Hunt, Jack F V, William Buckingham, Alice J Kim, Jennifer Oh, Nicholas M Vogt, Erin M Jonaitis, Tenah K Hunt, et al. “Association of Neighborhood-Level Disadvantage With Cerebral and Hippocampal Volume.” *JAMA Neurology* 77, no. 4 (January 6, 2020): 451–60. https://doi.org/10.1001/jamaneurol.2019.4501.

International Labour Organization. *World Social Protection Report 2017-19: Universal Social Protection to Achieve the Sustainable Development Goals*. Geneva: International Labour Organization, 2017. http://www.ilo.org/global/publications/books/WCMS_604882/lang--en/index.htm.

Jacob, Mini E., Laura M. Yee, Paula H. Diehr, Alice M. Arnold, Stephen M. Thielke, Paulo H.M. Chaves, Liana Del Gobbo, Calvin Hirsch, David Siscovick, and Anne B. Newman. “Can a Healthy Lifestyle Compress the Disabled Period in Older Adults?” *Journal of the American Geriatrics Society* 64, no. 10 (October 1, 2016): 1952–61. https://doi.org/10.1111/jgs.14314.

Khera, Amit V., Connor A. Emdin, Isabel Drake, Pradeep Natarajan, Alexander G. Bick, Nancy R. Cook, Daniel I. Chasman, et al. “Genetic Risk, Adherence to a Healthy Lifestyle, and Coronary Disease.” *New England Journal of Medicine* 375, no. 24 (December 15, 2016): 2349–58. https://doi.org/10.1056/NEJMoa1605086.

Kothari, Brij, Joe Takeda, Ashok Joshi, and Avinash Pandey. “Same Language Subtitling: A Butterfly for Literacy?” *International Journal of Lifelong Education* 21, no. 1 (January 1, 2002): 55–66. https://doi.org/10.1080/02601370110099515.

Lakner, Christoph, Nishant Yonzan, Daniel Gerszon Mahler, R. Andres Castaneda Aguilar, Haoyu Wu, and Melina Fleury. “Updated Estimates of the Impact of COVID-19 on Global Poverty: The Effect of New Data.” World Bank Data Blog, October 7, 2020. https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty-effect-new-data.

Lal, Himal, Anthony L. Cunningham, Olivier Godeaux, Roman Chlibek, Javier Diez-Domingo, Shinn-Jang Hwang, Myron J. Levin, et al. “Efficacy of an Adjuvanted Herpes Zoster Subunit Vaccine in Older Adults.” *New England Journal of Medicine* 372, no. 22 (May 28, 2015):

2087–96. https://doi.org/10.1056/NEJMoa1501184.

Lee, Jinkook, Mark E McGovern, David E Bloom, P Arokiasamy, Arun Risbud, Jennifer O'Brien, Varsha Kale, and Peifeng Hu. "Education, Gender, and State-Level Disparities in the Health of Older Indians: Evidence from Biomarker Data." *Economics & Human Biology* 19 (2015): 145–56. https://doi.org/https://doi.org/10.1016/j.ehb.2015.09.003.

Li, Yanping, An Pan, Dong D. Wang, Xiaoran Liu, Klodian Dhana, Oscar H. Franco, Stephen Kaptoge, et al. "Impact of Healthy Lifestyle Factors on Life Expectancies in the Us Population." *Circulation* 138, no. 4 (July 24, 2018): 345–55. https://doi.org/10.1161/CIRCULATIONAHA.117.032047.

McPhee, Jamie S., David P. French, Dean Jackson, James Nazroo, Neil Pendleton, and Hans Degens. "Physical Activity in Older Age: Perspectives for Healthy Ageing and Frailty." *Biogerontology*. Springer Netherlands, June 1, 2016. https://doi.org/10.1007/s10522-016-9641-0.

Organisation for Economic Co-operation and Development. "Preventing Ageing Unequally." Paris, 2017. https://doi.org/https://doi.org/10.1787/9789264279087-en.

Pan, Changjian, Qiuyan Fan, Jing Yang, and Dasong Deng. "Health Inequality among the Elderly in Rural China and Influencing Factors: Evidence from the Chinese Longitudinal Healthy Longevity Survey." *International Journal of Environmental Research and Public Health* 16, no. 20 (October 2, 2019): 4018. https://doi.org/10.3390/ijerph16204018.

Poterba, James M, Steven F Venti, and David A Wise. "The Asset Cost of Poor Health." *The Journal of the Economics of Ageing* 9 (2017): 172–84. https://doi.org/https://doi.org/10.1016/j.jeoa.2017.02.001.

Stringhini, Silvia, Cristian Carmeli, Markus Jokela, Mauricio Avendaño, Cathal McCrory, Angelo D'Errico, Murielle Bochud, et al. "Socioeconomic Status, Non-Communicable Disease Risk Factors, and Walking Speed in Older Adults: Multi-Cohort Population Based Study." *BMJ (Online)* 360, no. 7 (March 23, 2018): 17. https://doi.org/10.1136/bmj.k1046.

U.S. Government Accountability Office. "Retirement Security: Income and Wealth Disparities Continue through Old Age." Washington, D.C., September 9, 2019. https://www.gao.gov/products/GAO-19-587.

United Nations Department of Economic and Social Affairs Population Division. "World Population Prospects 2019: Volume I: Comprehensive Tables (ST/ESA/SER.A/426)." New York City, 2019. https://population.un.org/wpp/Publications/.

Vahidy, Farhaan S., Ashley L. Drews, Faisal N. Masud, Roberta L. Schwartz, Belimat "Billy" Askary, Marc L. Boom, and Robert A. Phillips. "Characteristics and Outcomes of COVID-19 Patients During Initial Peak and Resurgence in the Houston Metropolitan Area." *JAMA - Journal of the American Medical Association* 324, no. 10 (August 13, 2020): 998–1000. https://doi.org/10.1001/jama.2020.15301.

Wadhera, Rishi K., Priya Wadhera, Prakriti Gaba, Jose F. Figueroa, Karen E. Joynt Maddox, Robert W. Yeh, and Changyu Shen. "Variation in COVID-19 Hospitalizations and Deaths Across New York City Boroughs." *JAMA* 323, no. 21 (June 2, 2020): 2192–95.

https://doi.org/10.1001/jama.2020.7197.

Zhong, Hai. “The Impact of Population Aging on Income Inequality in Developing Countries: Evidence from Rural China.” *China Economic Review* 22, no. 1 (March 1, 2011): 98–107. https://doi.org/10.1016/j.chieco.2010.09.003.

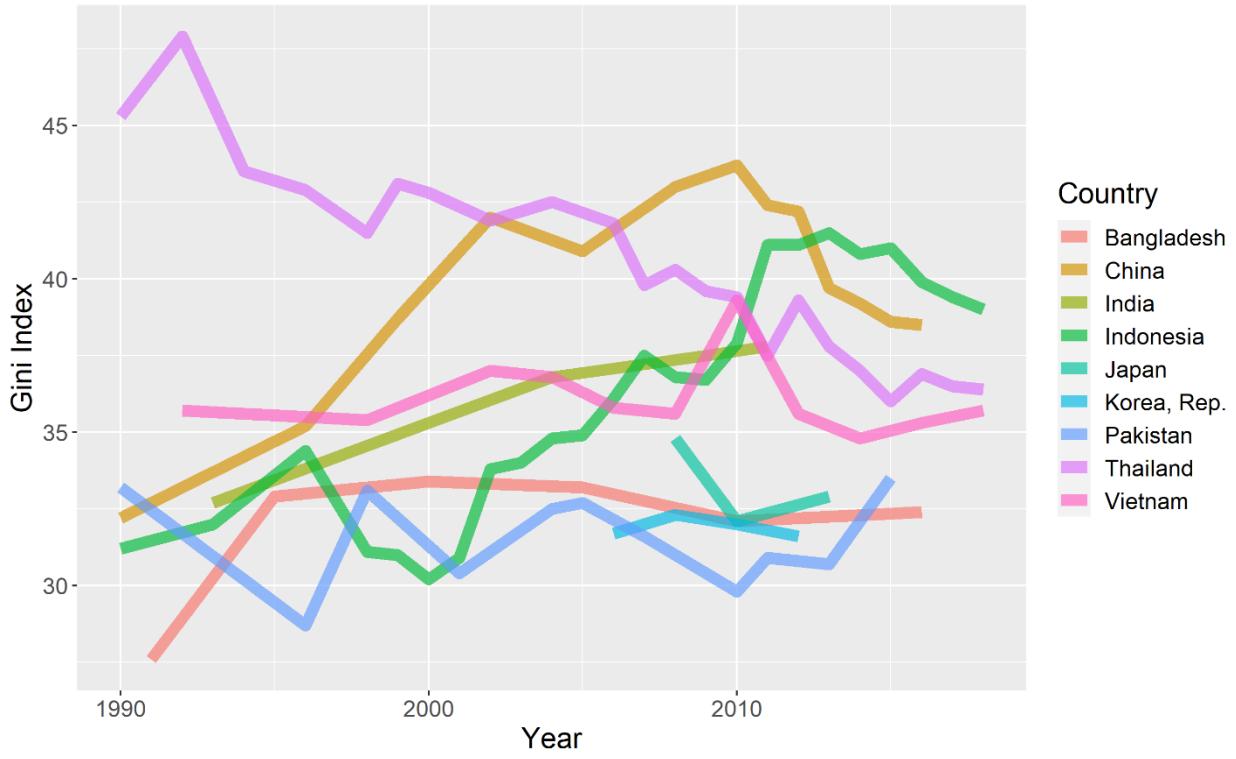

Figure 1. Gini index over time for selected countries in Asia. Data are from the World Bank.

Remarks

The research titled 'Population Aging and Economic Polarization in Asia' was conducted as part of a webinar on 'How can we reduce inequalities in later life as societies age?' held on 14 October 2020. The webinar was co-hosted by Asian Development Bank (ADB), ESCAP and HelpAge International.

This paper was produced with support from ADB TA 9111: Strengthening Developing Member Countries’ Capacity in Elderly Care, which is financed by the Japan Fund for Poverty Reduction and Republic of Korea e-Asia and Knowledge Partnership Fund.

The contents of this document do not represent the views of the United States government nor the U.S. Department of Veterans Affairs.