Aging and Other Determinants on the Healthcare Burden: A Comparative Analysis of China, Indonesia, Malaysia, and Thailand

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Abstract

The Asia-Pacific region is undergoing a rapid demographic transition, with the population aged 60 and over projected to double from 630 million in 2020 to 1.3 billion by 2050. This shift presents significant challenges for healthcare systems in China, Indonesia, Malaysia, and Thailand, which face increasing pressure from aging populations, urbanization, and evolving socioeconomic conditions. This paper investigates how aging and other determinants contribute to increasing healthcare burdens in these four nations. It specifically examines the influence of demographic transitions on healthcare spending patterns and the effectiveness of respective financing reforms. The study utilizes a comparative analysis of empirical evidence regarding healthcare financing and policy reforms across the four countries. The theoretical framework incorporates the Health-Led Growth Hypothesis (HLGH), Willingness to Pay (WTP), and the relationship between permanent income and household healthcare expenditure. While each country has adopted unique reform strategies, common challenges persist regarding the rising healthcare burden caused by aging societies. Policymakers must prioritize innovative financing mechanisms and expand insurance coverage to ensure sustainable healthcare systems.

Keywords: Aging societies, Healthcare Burdens, Healthcare Policies, and Innovative financing.

Introduction

The Economic and Social Commission for Asia and the Pacific (ESCAP) has reported that the Asia-Pacific region is undergoing rapid changes and an increase in the proportion of older persons. In 2020, approximately 13.6 percent of the population in Asia and the Pacific was aged 60 years or over but this is projected to increase to more

than double, from 630 million in 2020 to about 1.3 billion by 2050. According to the Asia Development Bank (ADB) has reported recently which is in some countries such as the People's Republic of China, Thailand, and Vietnam, this transition will happen very rapidly, and in Indonesia, it will not be as quick but they will end up with very large populations of older persons. Such a change in the population age structure has resulted in wide social and economic consequences like a smaller working-age population, higher dependency among older persons, and a greater demand for welfare and health services. The healthcare systems of China, Indonesia, Malaysia, and Thailand face increasing pressure from aging populations, rapid urbanization, and evolving socioeconomic conditions. Furthermore, Aging is a central determinant of healthcare burdens. Older populations experience higher incidences of chronic diseases and require long-term care services. The mainly analytical question in this paper, how do age and other determinants cause increasing healthcare burdens in these 4 countries? Therefore, this paper will focus on the studies from China to highlight the significant influence of demographic transitions on healthcare spending patterns. Similarly, Indonesia Malaysia and Thailand, with their relatively robust public health systems, face rising challenges in managing aged care and chronic conditions. The first section presents the theory and methodology explaining the link between age, other determinants, and healthcare burdens, the second section presents the empirical evidence there explain to healthcare financing and policy reforms in 4 countries, and the last section presents challenges and future outlook.

This paper addresses the analytical question of how age and other determinants cause increasing healthcare burdens in these four countries? It reviews empirical evidence from China, Indonesia, Malaysia, and Thailand to highlight the influence of demographic transitions on healthcare spending and the challenges in managing aged care and chronic conditions.

Content

1. Theory: the link between age, other determinants and healthcare burdens.

To illustrate the effects of age and other determinants, knowing the channels by which health affects economic growth in general and the extent to which these channels differ between rich and poor countries is important (David E. Bloom et.al,2022) also,

(ALBERT A. OKUNADE et,al 2010) using the household healthcare expenditure (HHEXP) models typically include current (or absolute) income, rather than the theoretically more correct permanent (or long-run) resources, as a core determinant. This practice may arise from difficulties of obtaining an empirically sound proxy or instrument for long-run income. Nonetheless, economic theory posits that household spending decisions rely on their estimated permanent, and not transitory, incomes. Specifically, microeconomic agents tend to consume a constant proportion of permanent income, low income earners have a higher propensity to consume, and higher income earners have a higher transitory income component and a lower than average propensity to consume Microeconomic survey data of individuals and households in advanced and developing countries have been used to study household healthcare expenditure (HHEXP) behaviors.

Besides, the Willingness to Pay (WTP) theory is a central concept in health economics. It represents the maximum amount individuals or societies are prepared to pay for a health improvement or to avoid a health risk. WTP integrates economic behavior, preferences, and constraints to understand how people value health and healthcare services. The willingness to Pay (WTP) is often used to measure the value individuals place on health outcomes, such as reduced mortality risk, improved quality of life, or access to healthcare services. Income levels influence WTP with low-income constraints, individuals may prioritize immediate consumption needs (e.g., food, shelter) over healthcare, even if the health benefits are significant. Also, Individuals' preferences for out-of-pocket spending on personal health interventions can be applied with Private Willingness to pay and societal valuation of public health interventions, often mediated through government as Public Willingness to Pay. In conclusion, Willingness to pay (WTP) is a key conceptual framework in evaluating the economic efficiency of healthcare interventions. For instance, (David E. Bloom et.,al, 2022) found that if the societal WTP for a vaccine exceeds its cost, the intervention is considered economically viable. Conforming to the study's (Caroline Steigenberger et.,al, 2022) WTP also determines the demand curve for healthcare services as for essential services such as emergency care, demand tends to be inelastic, indicating that people are willing to pay more regardless of price.

In the design of health insurance premiums, WTP plays a pivotal role, enabling insurers to assess how much individuals are prepared to pay for coverage against specific risks. In the field of environmental health which based on studied of (Michael Greenstone and B. Kelsey Jack 2015), such as efforts to reduce air pollution, WTP is often employed to estimate the value individuals place on cleaner environments and reduced health risks. Furthermore, preventive measures, including vaccines, frequently rely on public WTP to justify investments. However, the determinants of healthcare spending at the macroeconomic level found the previous studies Gross domestic product (GDP) per capita strongly correlates with healthcare expenditure shows income elasticity near unity in OECD countries (Hansen & King, 1996) and Inflation affects the real value of healthcare spending and accessibility. Wealthier countries often have higher public healthcare spending, while developing economies rely more on out-of-pocket payments. Xu Penghui et al. (2022) found that the health expenditures in China contribute directly to economic growth and produce spillover benefits for neighboring regions and healthcare investments in one region can benefit neighboring regions through increased economic activity as well. At the macroeconomic level, healthcare expenditures are both a result of economic growth and a driver of productivity and development. Understanding the interplay between healthcare spending and economic performance helps policymakers design effective strategies to achieve sustainable growth and equitable health outcomes. Investing in health not only improves individual well-being but also strengthens national economic resilience.

2. Methodology

The health-led growth hypothesis (HLGH) is widely discussed in the existing literature, which suggests a positive correlation between healthcare spending and economic growth. The theory asserts that healthcare expenditures contribute to economic growth by conceptualizing health as a form of capital; investments in health are posited to enhance the accumulation of both human and physical capital, thereby promoting overall economic development since a healthier population implies an increase in the total factor productivity (TFP), a healthier population can work longer, be more productive, secure higher earnings, have higher learning abilities and, in general, enhance the efficiency of the economy's human capital. (Emre Atilgan et,al 2017)

studied in the dynamic relationship between health expenditure and economic growth. (Hao Zhang et al,2022) studies environmental and development economics to address the critical question of why developing nations often suffer from poor environmental quality despite significant health and productivity consequences with using a utility-based framework to analyze consumption, health, and environmental quality trade-offs, focus on quasi-experimental designs, randomized control trials (RCTs), and observational data and found the key findings is Low Marginal Willingness to Pay (MWTP) Despite high environmental costs, households in low-income settings show a surprisingly low willingness to pay for environmental improvements, often due to tight budget constraints and immediate needs. Poor environmental quality leads to severe health issues, reduced life expectancy, and lowered productivity, particularly in developing countries. (Jing Zhao et.,al 2023) studies more economic growth with the better public health? evidence from Western China using utilized the health production function (HPF) to link economic, environmental, and healthcare factors with health outcomes to examined direct and indirect effects via interaction terms with panel data analysis (2003–2020) from Western China. Spatial econometric models (e.g., Spatial Durbin Model, Moran's I index) were used to account for spatial dependence across provinces. Conforming to the studied of (Alfredo R. Paloyo et.,al 2014) with using Randomized Controlled Trials (RCTs) to emphasized as the "gold standard" for evaluating causal effects, RCTs were prioritized for review include both positive (rewards) and negative (penalties) incentives and their impact on weight loss which financial incentives are proposed as mechanisms to align short-term actions (like weight loss efforts) with long-term goals by modifying immediate payoffs. The study (Wuhua Yao et,al 2019) using system-GMM (Generalized Method of Moments) to address potential endogeneity issues and to ensure efficient and unbiased estimation. Based on Grossman's health demand function, which models healthcare expenditure as a function of age and other relevant factors, and further adapts it into a dynamic panel model for analysis.

Therefore, the methodological approaches in microeconomic studies can be used regression models, randomized controlled trials (RCTs), and causal inference methods dominate such as evaluating how changes in insurance premiums affect individual healthcare utilization, and estimating willingness to pay with out-of-pocket policy. In

macroeconomic studies, Time-series analysis, computable general equilibrium (CGE) models, and growth accounting would be appropriated for examining the impact of GDP growth on national healthcare spendings and the intermediate studies were used spatial econometrics, input-output modeling, and analysis of spillover effects for example to investigating how healthcare reforms in one province affect neighboring regions.

The Empirical Evidence

There is a large empirical literature on the age and other determinants link, which we review in this section. As elderly people, they typically require more frequent and specialized medical care, including hospital visits, surgeries, and rehabilitation services especially in long term with aging populations often require support services like assisted living, home care, and nursing facilities. In these countries, they current healthcare system and social support structures may not yet be fully equipped to handle these higher demands for health services. We separate the healthcare financing for 4 countries to explore the empirical evidence.

1. Healthcare Financing and Policy Reforms in China

(Guangya Sun et.al 2024, p3-4) emphasizes, before reforms era in 1949-1978 the Healthcare in China was predominantly state-financed under the planned economy model. The public healthcare was delivered through the "Cooperative Medical Scheme" in rural areas and free medical services for urban workers and civil servants. Chinese government subsidies ensured basic health services, improved life expectancy, and reduced infectious diseases. Next, the economic reform period (1978–2000) with the transition to a market-oriented economy reduced state funding for healthcare. Many hospitals and providers relied on user fees, led to high out-of-pocket (OOP) expenses and disparities in access to healthcare. Unfortunately, the rural cooperative medical scheme in China had collapsed, leaving most rural residents without insurance. After that, solving the problem in reforms era the government reinstated healthcare financing as a priority, introducing public insurance schemes New Rural Cooperative Medical Scheme (NCMS) was launched in 2003 to provide coverage for rural populations. Urban Employee Basic Medical Insurance (UEBMI) was started in 1998 for urban workers and the program to Urban Resident Basic Medical Insurance (URBMI) was introduced in 2007 for

non-employed urban residents to coverage Chinese people by 2011, more than 95% of the population had basic health insurance. To achieve comprehensive governance of China's HCS, a holistic healthcare reform pilot program, known as the Comprehensive Medical Reform (CMR), was initiated in 2015 to address systemic challenges like unequal access, high Out-Of-Pocket healthcare burdens, and inefficiencies in service delivery. (Guangya Sun et al,2024) The empirical results demonstrate that the implementation of CMR does not have a statistically significant influence on the overall medical expenditure and the total medical expense ratio. However, it significantly reduces the out-of-pocket medical expense and the out-of-pocket medical expense ratio, while also improves the health status of individuals. Further analysis reveals that CMR has a positive effect on medical satisfaction and level, as well as an increased likelihood of choosing lower-grade hospitals and expanding the coverage of health insurance. The medical or healthcare burden is an important indicator of residents' ability to pay for medical services and is closely related to economic inequality, which in turn affects health inequality. The literature has focused on residents' medical burden from the perspective of medical expenditure, with many scholars suggesting that insurance can reduce the healthcare burdens. In long term strategy for the Chinese government to ensure universal health coverage and promote public health will focus on disease prevention, health education, and integration of traditional Chinese medicine also financial incentives and insurance policies support the redirection of healthcare demand to primary care providers.

(Jing Zhao et,al 2023) emphasizes that the economic growth significantly improves public health outcomes, notably reducing human mortality in Western China. Also, an "inverted U"-shape curve exists between human mortality and GRP per capita in Western China. Particularly, economic growth will significantly reduce human mortality during the range of sample data besides the public health improvements in one province positively affect neighboring provinces, showcasing strong spatial spillover effects.

(Wuhua Yaoa,2019) emphasizes whether education influences healthcare expenditures in China, considering the country's rapid educational expansion and low healthcare spending relative to GDP. They founded that the education quantity has an insignificant impact; otherwise, education quality positively influences healthcare expenditures.

2. Healthcare Financing and Policy Reforms in Indonesia

Indonesia faced a critical healthcare crisis its less than half its population was financially protected, out-of-pocket spending was high, comprising 45 percent of the current health expenditure rendering healthcare unaffordable for many, and worsening health disparities. To address this, the Government of Indonesia launched the National Health Insurance, Jaminan Kesehatan Nasional (JKN), scheme to achieve universal healthcare coverage (UHC). The JKN scheme saw remarkable expansion over short span of time, covering over 260 million people, or more than 95 percent of the population, by December 2023. Physical access to health services in Indonesia is considered adequate, although there are shortages in the number and distribution of health professionals. With more than 8,000 public health centers (1 for every 23,000 people), a wide outreach system, and more than 1,250 public and private hospitals, access to services is good in all but remoter areas. However, the quality of infrastructure, functionality of equipment, and availability of supplies are often key problems. There are too few doctors, especially specialists, and this will be a major issue with future noncommunicable disease (NCD) needs expanding rapidly. Not only are there too few doctors and specialists, they are also very inequitably distributed across Indonesia. This transformed Indonesia's healthcare landscape, reducing financial barriers to healthcare, and lowering out-of-pocket expenses to 27.5 percent of current health expenditure (Augustine Asante and et al ,2023) After policy reforms, the findings are the overall financing system shifted from moderately progressive in 2018 to mildly regressive in 2019. Indirect taxes and social health insurance were regressive in 2019, to place a greater burden on lower-income groups. Not only, out-of-pocket payments were progressively distributed but indicated potential unmet healthcare needs among low-income groups but also, People with low income had higher financial burdens but received fewer healthcare benefits compared to wealthier groups. In healthcare access, especially in rural areas, remained a significant challenge. Conform to the findings (Riska Dwi Astuti et al, 2022) an evaluation analysis of the subsidized health insurance program impact in this study indicate that the program has little impact on the utility of health facilities by its recipients the average difference between outpatient and inpatient visits between poor people who are subsidized insurance recipients and poor individuals without insurance is less than 1 visit.

The reform roadmap in Indonesia, particularly in the context of healthcare financing, outlines the strategic direction and policy measures required to transition toward universal health coverage (UHC) while addressing challenges in equity, efficiency, and sustainability.

3. Healthcare Financing and Policy Reforms in Malaysia

Malaysia is coming under increasing pressure to control the escalating healthcare burden to ensure the adequacy of future healthcare funding. Malaysia, therefore, is considering a new national health financing scheme in order to strengthen health financing and to face future challenges. (Kevin Croke et al, 2019) examined efforts at health financing reform in Malaysia over 35 years, seeking to identify why health financing reforms were continuously proposed by the government but consistently blocked by opponents and the findings are Malaysia has achieved near-universal access to public healthcare funded through general taxation, ensuring significant financial protection, particularly for the rural poor and public services are highly subsidized, with minimal out-of-pocket costs, symbolized by the low RM 5 (~$1) fee for public healthcare services. Otherwise, the multiple attempts to introduce comprehensive financing reforms, including insurance-based systems such as the one care initiative, were blocked due to public resistance and interest group opposition, and public perception, shaped by historical successes in affordable healthcare, views reforms as a potential threat to the low-cost system, creating political resistance to change caused to failed to reforms in Malaysia

4. Healthcare Financing and Policy Reforms in Thailand

The 1997 Asian financial crisis had a profound effect on healthcare spending, with reduced household incomes lead to a significant decline in Out-Of-Pocket healthcare expenditures in Thailand, and the major source of personal healthcare financing in most developing countries, is notably burdensome for poor households (ALBERT A. OKUNADE 2010) found that out of pocket payments are the main method of healthcare financing in Thailand, disproportionately burdening lower-income households especially, in poor households often liquidate assets or incur debts to meet essential healthcare needs, underscoring the need for improved financial risk protection. The health care system is financed through a mix of sources, namely, general taxes, social health insurance

contributions, private insurance premiums, and a low level of direct out-of-pocket payments constituting approximately 18 percent of total health expenditure in 2008. Completing geographical coverage of the healthcare infrastructure was achieved through intensive investment in public healthcare infrastructures by the early 2000s, although an inequitable distribution of health resources remains a problem. Public hospitals, are mainly owned by the Ministry of Public Health. In the 2000s, Thailand's healthcare financing and policy reforms stand out as a global example of achieving universal health coverage (UHC) in a lower-middle-income country. Over the decades, Thailand transitioned from targeted programs for low-income and vulnerable groups to a universal coverage scheme. This success was underpinned by strategic investments in healthcare infrastructure, human resources, and evidence-based policy reforms. The reforms have significantly improved health outcomes, particularly for rural and low-income populations, by ensuring access to essential healthcare services. The integration of various health financing schemes, including social health insurance for formal sector employees and tax-financed coverage for the informal sector, has reduced out-of-pocket expenses and financial barriers. Despite these successes, challenges persist. Demographic shifts, such as an aging population, and the growing burden of non-communicable diseases demand further innovation in healthcare delivery and financing. Additionally, ensuring the fiscal sustainability of the UHC system while maintaining equitable access remains a critical priority.

Challenges and Future Outlook

As the data launched recently show, Thailand is one of the countries with the lowest birth rate. If the government lets continuity be a determinant of healthcare expenditure, it captures the financial constraints and adaptive behaviors of households in the face of health liabilities. out-of-pocket (OOP) payments are the main of healthcare financing in Thailand, reflecting significant financial burdens, particularly for lower-income groups. There is a need for innovative financing mechanisms, including insurance and subsidies, to reduce reliance on Out-Of-Pocket payments and alleviate financial burdens on households. In addition, the healthcare policies should address the regional and demographic disparities in healthcare access and expenditure, ensuring equitable

healthcare services for all Thai people along with to investment in preventive care and health education can potentially reduce long-term healthcare burdens and improve overall population health. While the CMR in China effectively reduces medical burden and improves health outcomes, demonstrating that comprehensive, integrated healthcare reforms can address economic and health inequalities conform to (Guangya Sun et al, 2024). Also, the success of CMR pilot regions provides a scalable model for nationwide implementation and potentially for other countries with similar healthcare challenges. With elderly people in China, the reform must consider the rising demand for medical care among the elderly and address their specific needs without increasing their financial burdens. while retirement generally has positive effects on subjective health and healthcare utilization (Clémentine Garrouste et al, 2020), the refinement impacts on cognitive and physical health focus on the need for targeted policies. In case other determinants effect to healthcare burden which leading to NCDs diseased (Nathalie Mathieu-Bolh,2020) the findings links between income and obesity and nutrition patterns suggests that low- and high-income individuals make different food consumption choices and as a consequence, react differently to policy incentives.Also, (Alfredo R. Paloyo et,al 2014) emphasizes the obesity and overweight are linked to diseases that cost society a significant amount of resources. While behavior modification can reduce the problem, instigating such lifestyle changes is an uneasy task. One potential way to reduce the problem is through the use of financial incentives. The implications of age and other determinants on healthcare burdens, people who are concerned healthy issues will concern and realize have to be high income people with easily to access the healthcare services especially in the out of pocket payment countries as Indonesia and Thailand.

Conclusion

In conclusion, while each country's healthcare reforms reflect their unique contexts, lessons in stakeholder engagement, evidence-driven policymaking, and prioritization of equity can guide future efforts globally. The potential effects of health reform as (Martin Gaynor et al,2015) state that "the primary objectives of the ACA are to expand health insurance coverage and provide incentives for health-care providers to reduce costs. Changes in market structure introduced to support these objectives could

affect quality, prices, and costs through numerous mechanisms", several of which are suggested by the findings in the literature reviewed above. For example, Health Insurance Exchanges (HIEs) are being established to provide a forum where consumers who do not have access to large-or small-group health insurance through their employers can access health insurance with low search costs. In addition, they are intended to play a role in risk pooling and to facilitate competition between health insurers with the goal of generating reduced prices and increased coverage. In case of 4 countries are facing on aging society and other determinants tend to increase the healthcare burdens, if we would like to reduce the healthcare burdens or out-of-pocket payment, the policymaker should launch the program will coverage by insurance and prepare the healthcare system to be better.

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