



Discrepancy of financial burden among elderly visiting a private general hospital in Phnom Penh, Cambodia: A three-year cross-sectional study

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ABSTRACT

Objectives: This study aims to clarify the financial burden of health on the elderly. Out-of-pocket payment (OOPP) in a major private general hospital in Phnom Penh was considered an indicator of financial burden.

Study design: This study is a three-year cross-sectional study.

Methods: To investigate the characteristics of patients who visited the Sunrise Japan Hospital (SJH), their data were obtained from the electronic reception database.

Results: A total of 119,938 patients who visited SJH from January 2017 to September 2019 were included. The median age (25th, 75th centiles) was 52 years (36, 66) and 38.31% of patients were aged over 60 years. The OOPP median (25th, 75th centiles) was 73.78 USD (32, 161.89). The median OOPP was the lowest in the 20s and highest in the 90s. The OOPP of an emergency patient was the highest in the consultation classifications.

Conclusions: The need to raise public awareness regarding the financial burden on the elderly is becoming increasingly urgent. It is vital to establish a social system to prevent the medical catastrophes.

1. Introduction

Health equity is crucial on ethical grounds and to prevent negative social and economic consequences on a national scale [1]. Healthcare disparity is thought to emerge due to a weak health system and individual factors: race, sex, sexual identity, age, disability, socioeconomic status, geographic location, environmental barriers, and stigmatization; [1,2]. Notably, increasing the disease burden among the elderly is a crucial result of increasing health disparity [3]. World Health Organization (WHO) promotes the development of health policies and the delivery of quality health services covering the elderly of all economic statuses without them having to face a financial catastrophe [3].

Nonetheless, there is a need to fill the current gap, specifically regarding the financial burden of the elderly. Thus, reducing it to decrease healthcare disparity is a vital public health issue.

The social environment and security system of the elderly have been fostered in a developed country that has extensively experienced population aging to reduce their medical care burden. Specifically, medical care requires affordable access to integrated services as the elderly's health needs tend to become more chronic and complex [4]. Gaining insights from population developed countries is useful; however, health disparities are different across populations [5]. Therefore, regional and local information is needed. Specifically, the aging population is also severely high in developing countries. It is estimated that one in five

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people will be aged 60 years or older in 2050 [6,7]. Nonetheless, it was reported that data about the older adults' health from low-income countries are sparse [7]. Moreover, blindsided by battling diseases in youth and middle age, many developing countries are unprepared for the developments in the next two decades [6]. Regarding the first step, it is important to acknowledge the widening disparity of financial burden related to health among the elderly compared with the youth in a developing country. Thus, there is an urgent need to gather information on indicators of the medical financial burden. However, only a few studies have been conducted in this area [7,8].

Cambodia is classified as a low and middle-income country (LMIC) by the World Bank [9,10]. However, 16.3 million nationals have witnessed considerable improvements in public health over the last 20 years, with the country achieving most of the health-related Millennium Development Goals by 2015 [11]. The proportion of the elderly is estimated to increase from 6.5% in 2010 to 11.0% in 2030 [12]. In Cambodia, a social system called the "equity fund" supports people who have financial problems; however, there is no social system that caters to the elderly. As in many other developing countries, care and support for the elderly are left to their families, with 97% relying on their children for financial support [13]. However, the proportion of elderly who are in a position to receive family support is declining due to the decrease in the number of children and households living with the children, and the concentration of young people in urban areas [12]. Besides, a previous survey reported that 70.1% of the elderly answered that self-assessed health status was poor or significantly poor indicating that the health problems are becoming severe. Therefore, Cambodia is an advantageous area for conducting studies on the health-related financial burden of the aging population, which would provide vital information to foster the environment for aging individuals in other developing countries.

This study aims to clarify the financial burden of health among the elderly to prevent an increase in Cambodia's health inequality, where the elderly's health problems are becoming severe. OOPP in a private general hospital in Phnom Penh was considered an indicator of health-related financial burden.

2. Method

This study was a retrospective observational study.

2.1. Healthcare systems in Cambodia

Cambodia has a regulated public and an unregulated private health sector. A referral system has been developed among public hospitals and facilities (e.g., provincial hospitals and health centers), but it has not been adopted in private hospitals [14]. Public hospitals and health centers are required for each district and are dependent on the number of residents, while private hospitals are concentrated in urban areas [15]. Recently, the government focused on improving the public sector to enhance residents' health and reduce health disparity. Specifically, health equity funds (HEFs) cover health costs for poor people. The poor living below the national poverty line are protected by HEFs; the HEFs coverage was approximately 90% in 2014 [10]. Moreover, employees are widely covered by health insurance. While these systems work for public hospitals, the health expenditure in private hospitals is not generally covered by insurance. However, due to the high quality of medical care in private hospitals, people—specifically wealthier individuals—tend to prefer to go to these hospitals even though medical costs are higher. Therefore, it is essential to investigate OOPP in private hospitals. The OOPP per person in Cambodia in 2017 was 49.60 USD [16]. The ratio of individual health expenditure to total health expenditure in the private sector is 61.13%, considerably higher than 23.80% in the public sector [16].

2.2. Site detail

The Sunrise Japan Hospital (SJH) is an international private general hospital, which provides various types of medical facilities, including emergency care, surgery, outpatient treatment, and others, in Phnom Penh, the capital city of Cambodia. It consists of 14 medical departments, including an intensive care unit, and is equipped beds for inpatients, and various treatment facilities, such as endovascular. SJH, which opened in 2016, aims to provide Japanese-standard quality medical care in Cambodia. SJH offers the original three membership plans: (1) Bronze members are required to pay a \$10 annual membership fee and are provided with health seminars; (2) Silver members are required to pay a \$120 annual membership fee, are given a discount of 10% of their medical expenditure, and get free health checkup packages; and (3) Gold members require to pay a \$320 annual membership fee, are given a discount of 20% of their medical expenditure and can avail of free advanced health checkup packages. The total amount includes all expenditures in SJH such as tests, drugs, and others; however, the annual membership fee is not included in the OOPP in this study.

Most patients are local Cambodian residents whose economic status ranges from middle-income to high-income. The majority are from Phnom Penh; however, some are from rural areas. SJH is a major private general hospital in Phnom Penh, run with foreign capital, and widely visited by residents in Cambodia. Therefore, patients have various backgrounds, including those with mild to severe diseases, and with average-to high-income economic status, making it suitable for researching OOPP as an indicator of the medical financial burden to clarify the health disparities in each aging group in Cambodia.

2.3. Data used

The data of patients who visited SJH, which is a major general hospital in Phnom Penh, was investigated from January 2017 to September 2019. The patient data were obtained from an electronic reception database comprising essential characteristics, such as age, gender, consultation classification, next plan classification, doctor's order amount, patient's total OOPP, first language, and insurance availability (Table 1).

2.4. Primary outcome

The primary outcome was set as OOPP, which was used as an indicator of the medical financial burden to investigate the disparities between participants. This study discussed OOPP for outpatients and inpatients. OOPP is part of the health financing landscape in all countries [17]. There is a robust correlation between OOPP levels and the two indicators: the incidence of catastrophic and impoverishing health expenditures currently used to monitor how well a health system is performing regarding financial protection [17]. Moreover, OOPP was used for the research on the inequality of financial burden among the elderly [18]. We defined the aging population as over 59 years.

2.5. Analysis

First, the age distribution was shown to clarify the patients' characteristics. Next, OOPP in each group was descriptively analyzed to clarify the differences. After a Kruskal-Wallis H test, the Steel-Dwass test was performed to statistically analyze the difference in the mean value of OOPP for each group to determine which group had a significant difference.

The OOPP by gender was figured for each of the three age groups (19 years and under, 20 to 59, 60 and over), and the Wilcoxon rank-sum test was performed for statistical analysis of the mean value of OOPP by gender. Next, OOPP by the consultation and the next plan classifications for each age group (19 years and under, 20 to 59, 60 and over) were described using figures, and the Steel-Dwass test after a Kruskal-Wallis H

Table 1
Participants' characteristics (N = 119,877).

| | |
|--|-----------------------|
| Gender (n [%]) | |
| Male | 57,683 (48.12) |
| Age (median [25th, 75th centiles]) (years) | |
| | 52.00 (36.00, 66.00) |
| Consultation classification (n [%]) | |
| First visit | 28,178 (23.51) |
| Health check up | 13,473 (11.24) |
| Emergency | 7517 (6.27) |
| Revisit | 45,366 (37.84) |
| Exam only | 2568 (2.14) |
| Rehabilitation | 8667 (7.23) |
| Vaccination | 1538 (1.28) |
| Medicine only | 6520 (5.44) |
| Other and Unknown | 6050 (5.05) |
| Language (n [%]) | |
| Cambodia | 108,439 (90.46) |
| Japanese | 3236 (2.70) |
| English | 2077 (1.73) |
| Chinese | 1174 (0.98) |
| Unknown | 4951 (4.13) |
| Member ship status | |
| Bronze | 74,580 (62.21) |
| Silver | 15,072 (12.57) |
| Gold | 21,797 (18.18) |
| Staff | 3491 (2.91) |
| Staff family | 3953 (3.30) |
| Unknown | 984 (0.82) |
| Insurance (n [%]) | |
| Yes | 2395 (2.00) |
| No | 117,482 (98.00) |
| Order amount by doctor (median [25th, 75th centiles]) (USD) | |
| | 107.93 (52.04, 196.3) |
| Out of pocket payment (median [25th, 75th centiles]) (USD) | |
| | 73.78 (32.00, 161.89) |
| Next plan classification (n [%]) | |
| Consultation finish | 45,178 (37.69) |
| Revisit for medicine | 6128 (5.11) |
| Revisit for consultation | 36,319 (30.30) |
| Admission | 2081 (1.74) |
| Transfer | 117 (0.10) |
| Unknown | 30,054 (25.07) |

test was performed for the statistical analysis of the difference in the mean value of OOPP by consultation classification for each group to examine which had a significant difference.

A statistically significant p-value was set at 0.05. STATA IC (Lighthouse, Texas USA, version 15) was used for statistical analysis. As numeric data was not normally distributed, we used median to summarize the data. All procedures were conducted according to the STROBE guidelines. The National Ethics Committee for Health Research in Cambodia approved all the experimental protocols (Ethics Committee, ID: 079NECHR). Individual informed consent was waived by the Committee because the opt-out consent process was used.

3. Result

The demographic characteristics of the participants are shown in Table 1. A total of 119,938 patients who visited SJH from January 2017 to September 2019 were included Of these, 48.12% were male, and the median age (25th, 75th centiles) was 52 years (36, 66). The most substantial proportion in consultation classification was "Revisit" (37.84%), and that in the next plan classification was "Consultation finish" (37.69%). Approximately 90% spoke the Khmer (Cambodian) language; this proportion was similar to the fact that approximately 90% of Cambodian residents and approximately 10% of foreigners comprise the total population. Only 2% of the patients used insurance, and the OOPP median (25th, 75th centiles) was 73.78 USD.

Fig. 1 shows the patients' age distribution. The line shows the population pyramid in Cambodia in 2018. The proportions of 0–19 years, 20–59 years old, and 60 years and above were 8.22%, 53.47%, and 38.31%, respectively. The population decreasing Notch was admitted around the 40s, affected by the severe war under the Khmer Rouge. Supplemental Fig. 1 shows the age distribution of each consultation classification, and Supplemental Fig. 2 shows the age distribution of each next plan classification.

Fig. 2 shows the sequential change in the number of participants in each age group. The median age in years (median [25th, 75th centiles]) in each three-month period is 57 (41, 69), 59 (45, 70), 58 (41,70), and 58 (42, 69) in 2017; 53 (38, 67), 52 (36, 66), 51 (36, 66), and 51 (35, 66) in 2018; and 51 (34, 65), 48 (31, 64), and 49 (32, 64) in 2019. The proportion of elderly people aged 60 years and above was 45.66% for the first three months of 2017. However, this decreased to 32.41% in the last three months of 2019. Supplemental Fig. 3 shows the sequential

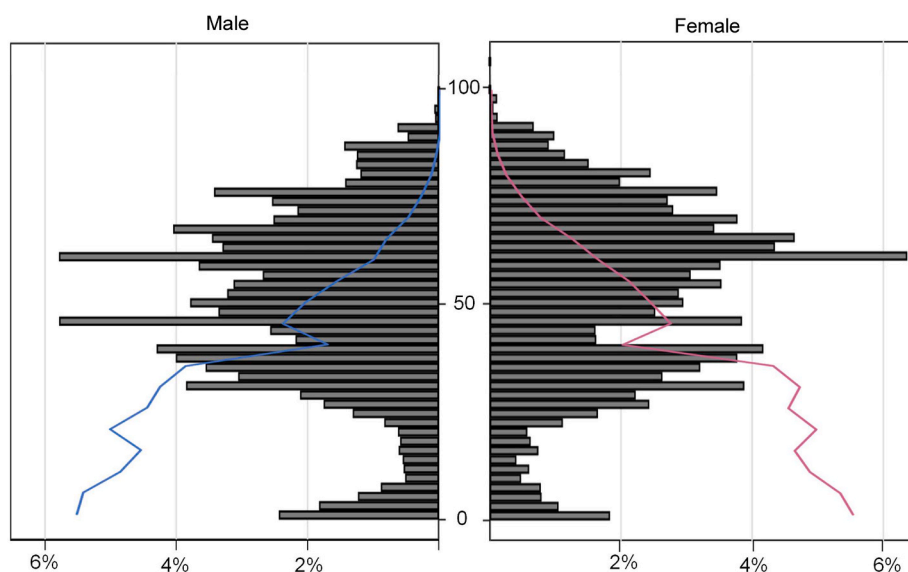


Fig. 1. Age distribution of patients in Sunrise Japan Hospital Phnom Penh (%) and population pyramid in Cambodia in 2018. The blue and pink lines showed the distribution of the entire population in Cambodia in 2018. The Notch showed the decrease in population under the Khmer Rouge between 1974 and 1979.

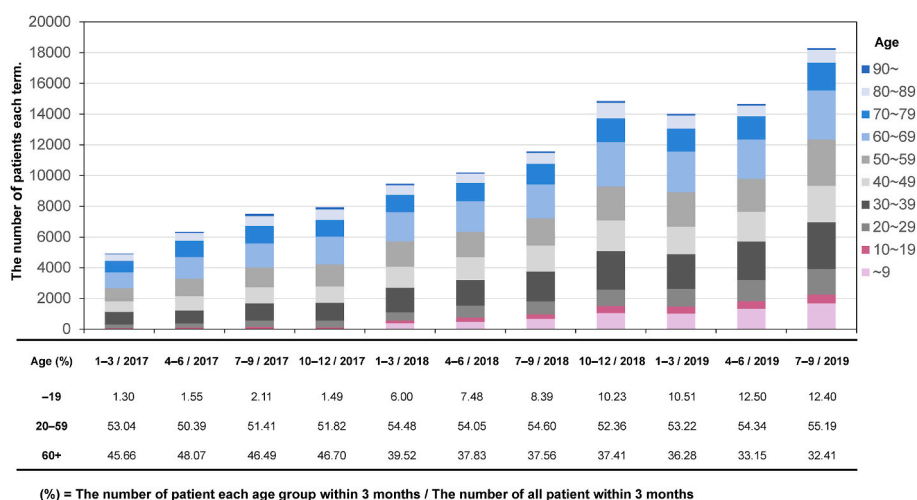


Fig. 2. The number of patients in each age group every three months.

change in the number of participants in each consultation classification.

OOPP for each age, gender, consultation classification, and next plan classification is shown in Table 2. OOPP of those aged over 60 years was higher. The OOPP of an emergency patient was the highest of all consultations. OOPP of those who needed admission was the highest of all next plan classifications.

Fig. 3 shows the OOPP for every 10-year age group. A Kruskal-Wallis H test confirmed a statistically significant difference in the average value of OOPP (USD) in each classification ($p < 0.01$). There were no significant differences between the teens and the 50s age group ($p = 0.3716$) and between the 80s and the 90s age groups ($p = 0.0920$) with the Steel-Dwass test. In contrast, a significant difference was observed between all other age groups ($p < 0.01$) with the Steel-Dwass test. The median OOPP was the lowest in the 20s age group and highest in the 90s.

Fig. 4-a shows the OOPP by gender for each of the three age groups (19 years and under, 20 to 59, and 60 and over). A significant difference was observed in the 20–59 years age group with the Wilcoxon rank-sum test ($p < 0.01$, higher in males). No significant difference was observed in the other age groups.

Fig. 4-b shows the OOPP by consultation classification for the three

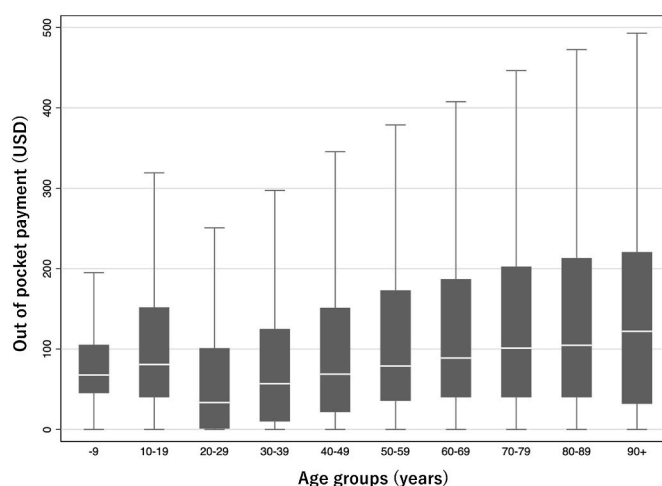


Fig. 3. Out-of-pocket payment (USD) by every age group (10-year intervals).

Table 2
Out of pocket payment of each group.

| | Out of pocket payment (median [25th, 75th centiles]) (USD) |
|------------------------------------|--|
| Gender | |
| Male | 75.30 (32.00, 168.64) |
| Female | 73.04 (32.00, 157.50) |
| Age (years) | |
| 0-19 | 70.54 (44.17, 117.61) |
| 20-59 | 65.00 (10.00, 144.66) |
| 60+ | 96.66 (40.00, 197.48) |
| Consultation classification | |
| First visit | 121.94 (71.16, 198.09) |
| Health-check up | 10.00 (0.00, 50.00) |
| Emergency | 206.16 (92.00, 349.52) |
| Revisit | 101.16 (54.88, 184.70) |
| Exam only | 21.58 (0.00, 80.00) |
| Rehabilitation | 40.00 (32.00, 40.00) |
| Vaccination | 17.24 (0.00, 50.7) |
| Medicine only | 23.19 (8.34, 54.04) |
| Next plan classification | |
| Consultation finish | 76.70 (37.70, 147.88) |
| Revisit for medicine | 115.36 (73.43, 184.10) |
| Revisit for consultation | 125.72 (64.95, 213.00) |
| Admission | 342.19 (202.70, 494.68) |
| Transfer | 274.04 (149.25, 427.90) |

age groups (19 years and under, 20 to 59, 60 and over). A significant difference was observed in all age groups with the Steel-Dwass test ($p < 0.001$).

Fig. 4-c shows the OOPP by the next plan classification for each of the age groups (19 years and under, 20 to 59, 60 and over). A significant difference was observed among all age groups with the Steel-Dwass test ($p < 0.001$).

Moreover, the median ages were higher in the revisit population, emergency department, rehabilitation department, and admission department (S Fig. 1, S Fig. 2).

4. Discussion

To clarify the health disparity in developing countries, it is crucial to research OOPP as an indicator of the financial burden related to health. This study's novelty is the provision of detailed OOPP information of patients visiting a private general hospital in Cambodia.

In Cambodia, the median age of the national population was 25.7 years in 2019, and the proportion of elderly, that is over 60 years, was approximately 10%, which is relatively low. Nonetheless, 38.31% of patients who visited SJH were over 60 years. In Japan, one of the developed countries in East Asia, approximately half of the outpatients in 2017 were elderly people aged over 64 years [19]. The proportion of the elderly visiting SJH is low compared to their proportion in Japan.

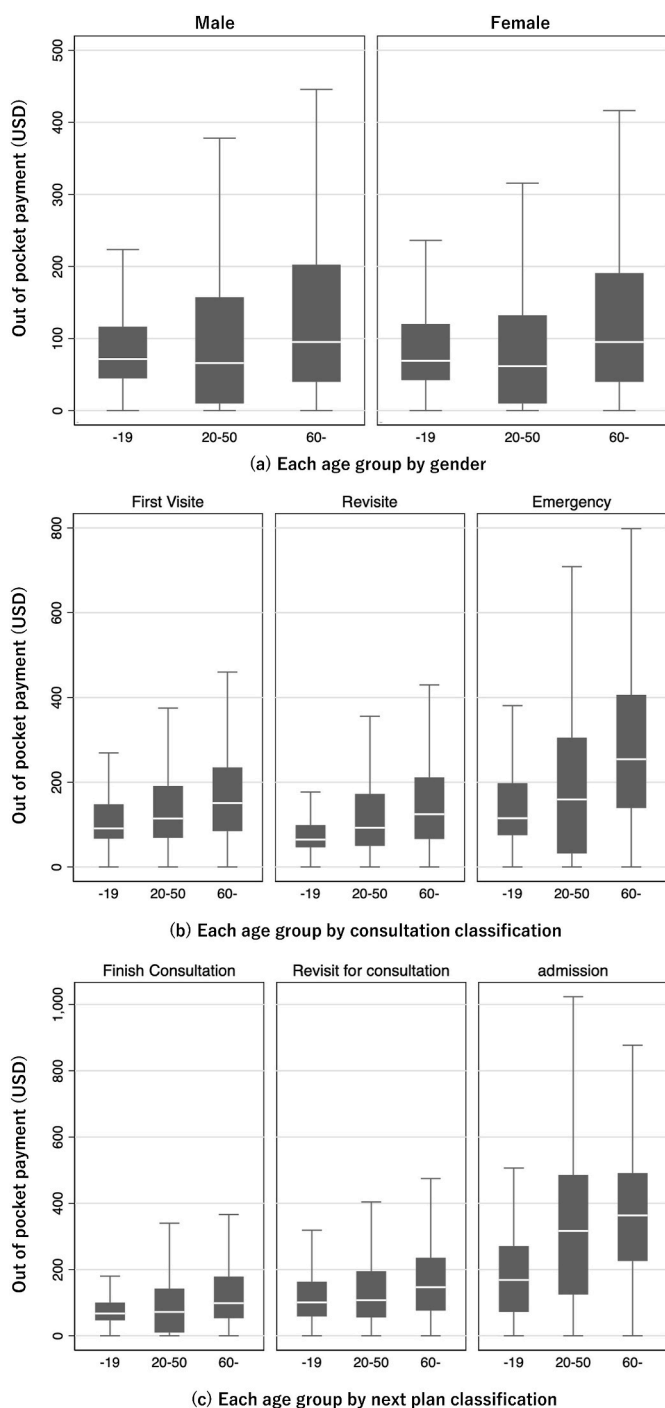


Fig. 4. Out-of-pocket payment (USD) for three age groups (0–19 age group, 20–59 age group, and over 60 age group). (a) by gender (b) by consultation classification (c) by next plan classification.

There is no public social security system specialized for the elderly, however, population aging has increased dramatically in recent years [20]. A previous survey reported that approximately 50% of individuals over 60 years and approximately 80% over 70 years depend on their children for financial support. Therefore, many elderly people with financial problems do not visit doctors [21]. Their financial burden is increasing, and there is an urgent need to raise public awareness regarding this.

The OOPP of patients who visit private general hospitals in Cambodia has increased with age. The OOPP of each consultation classification and next plan classification were significantly high among

patients over 60 years. A 2007 survey showed that health expenditure per year of people aged over 65 years was more than double that of other age groups in Cambodia [8]. The OOPP per capita per year was 224 riel among those aged over 64 years and 103 riel among those aged between 45 and 64 years in 2007 [8]. The same trend was observed in this study. Moreover, it is reported that the proportion of OOPP of the elderly tends to be higher in the low economic status group. To prevent personal catastrophe caused by OOPP for aging people and improve health disparities, further field research is required to identify the individual problems among aging people. It is vital to foster a social system that guarantees that the medical expenses of the elderly is shared by the individuals and the social system.

The fact that OOPP is associated with the consultation classification or the next plan classification is notable in discussing the prevention of personal catastrophe due to medical expenses. In this study, it was particularly high among emergency patients and those who needed to be admitted. In Cambodia, the incidence of medical catastrophes caused by OOPP in health expenditure was approximately 12% in 2007 and 6% in 2013, higher than in other Southeast Asian countries [8]. Medical-related financial catastrophes are a crucial problem even in developed countries. For instance, to prevent such catastrophes, a high-cost medical expense benefit system (eligibility certificate for ceiling-amount application) has been put in place in Japan. It is crucial to discuss social support for medical expenses, when medical expenses become extremely high, not only considering age and income, but also each individual situation.

SJH, a private general hospital in the capital of Cambodia, is favored by residents. The number of patients increased approximately 3.5 times between the first three months in 2017 and the last three months in 2019, and the area coverage expanded to rural areas, specifically in the first year after the opening (data not shown). Approximately 90% of patients' first language is the Khmer language. This could be because the quality of medical care, the education level of staff, and the degree of hospitality are high. According to previous research, the growth of private sectors negatively impacted universal health coverage (UHC) and increased health disparities in Cambodia [22]. However, to achieve UHC and improve health disparity, it is necessary to reduce the gap in an efficient way, such as by building a cooperative relationship for sharing knowledge and technology between private and public hospitals, and building a system that allows residents of all economic statuses to see doctors in private hospitals if necessary rather than restricting to the private sector.

When interpreting the findings, several limitations should be considered. First, this study is a private single-center study; hence, consultation bias should be considered. According to previous studies, the poor elderly in rural areas are mainly directed to the Health Center, which covers poor residents [13], while SJH mainly caters to the wealthy elderly. Therefore, this study might not reflect the actual situation in Cambodia. Moreover, information about social status, economic status, and family status was not obtained. In Cambodia, the majority of the elderly rely on their children for at least some financial support [13]; thus, family status has a great influence on patient consultations. Moreover, we could not capture expenditure beyond the SJH system. In addition, we did not have the data of individual expenditure in a year. We consider to accumulate suggested data to assess the representative of actual health expenditure. Finally, we included only SJH's data; thus, further study is required including data on public hospitals as well. The information on the private hospital was limited compared to that of the public hospital in Cambodia. Despite these limitations, this study, for the first time, could provide detailed information on OOPP in a private hospital in Cambodia and will be useful for the discussion on reducing the gap in health inequality. Furthermore, to clarify the disparity of the population in Cambodia, the OOPP survey of public hospitals and the comparison between public hospitals and private hospitals should be considered in the future.

5. Conclusion

The OOPP, an indicator of the financial burden among patients, is higher among the elderly in SJH—a major private general hospital located in the capital of Cambodia. To improve the health disparity and achieve UHC in Cambodia, it is crucial to establish a social security system to support the extremely high OOPP for health by the society so that the burden does not solely fall on the individuals.

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Author contributions

YK had full access to the data and had final responsibility for analysis. All the authors made a substantial contribution to this research. YK, MT, OA, YN contributed to the writing the paper, while all members contributed to the study design, data collection, and coordination with local stakeholders.

Declaration of interest

The authors did not declare any competing interest and personal relationships which influenced on the present work.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.puhip.2022.100306>.

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