DETERMINANTS OF OUT-OF-POCKET EXPENDITURE FOR HEALTH CARE: A SYSTEMATIC REVIEW

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ABSTRACT

Background: Out-of-pocket (OOP) expenditure is a cost for health care that are paid by individuals at the time of treatment through user fees, co-payments and direct payments. It is the most common way of paying for health services in developing nations particularly in low and middle-income countries. OOP payments are typically perceived to be the most regressive instrument of health finance and high reliance to it create a significant financial barrier in accessing health care.

Objectives: To assess the determinants of OOP expenditures for health care.

Materials and Methods: Journal and articles related on determinants of OOP health expenditures were compiled using a major online database, PubMed and Science Direct. The search was limited to full-text papers published in English and studies conducted within the last 10 years (2007-2017). The selection of articles to be reviewed is done according to the PRISMA checklist.

Result: The main determinants of OOP health expenditure identified were age, gender, place of living, education and income level, household size and presence of comorbidities. Other determinants were marital status, insurance status, payments for medical supplies and pharmaceuticals and distance to health facilities.

Conclusion: OOP payments is not an equitable nor efficient financing mechanism. A government need to formulate the best health financing mechanism to achieve a complete universal health coverage status. This review can help policy-makers in identifying the determinants of OOP, focussing on the mechanisms driving them, and formulate policy options for building stronger health financing mechanisms.
1.0 Introduction

The financing of health services is a subject of major concern throughout the world. By definition, health care financing is the activity of raising or collecting to pay for the operation of a health care system (Hurley et al., 1998). Strong and sustainable health financing leads to better equity in access to health care, and to achieve the best financing strategies, remains a challenge to a policy maker worldwide. The traditional categorisations of finance sources for health care are from general taxation, social insurance, private insurance and out-of-pocket (OOP) payments (Yu et al., 2006).

OOP expenditure is a costs for health care that are paid by individuals at the time of treatment through user fees, co-payments and direct payments for example for medicine (WHO, 2009). Household incur OOP payment directly from their household’s budget, which is not reimbursed by their public of private health insurance. This is the most common way of paying for private health services in developing nations particularly in low and middle-income countries, and is also used as a component of financing for public sector services (Bennett & Gilson, 2001). OOP payments are typically perceived to be the most regressive instrument of health finance (Whitehead et al., 2001). High reliance on OOP payments create a significant financial barriers in accessing health care, and low-income households frequently face catastrophic health costs when OOP payments are more than 30% of total health expenditures (Xu et al., 2007).

It is estimated that as many as 178 million people could suffer financial catastrophe as a result of OOP health payments each year, and that 104 million could be forced into poverty simply because of health payments (Yardim et al., 2010). Prominent Asian countries with a big population like Bangladesh, China, India and Vietnam still relying heavily on OOP financing, and having a high prevalence of catastrophic payments and a large poverty impact of these payments especially to the poor (Van Doorslaer et al., 2005). The aim of this paper is to systematically review the existing literature surrounding the OOP expenditures for health care and its determinants, based on published articles for the past 10 years.

2.0 Materials and Methods

2.1 Literature search

Journal articles between the years 2007-2017 related on determinants of OOP health payments were searched using a major online database, namely PubMed and Science Direct. The search was limited to papers published in the last 10 years, in English language and with full-text available. Based on the objectives of the study, the search strategy was developed, and the following search terms was used:
‘Determinants’ OR ‘Contributing factors’ OR ‘Cause’

AND

‘Out-of-Pocket’ OR ‘Out of Pocket’ OR ‘OOP’

AND

‘Payments’ OR ‘Expenditures’ OR ‘Spending’ OR ‘Expenses’

AND

‘Healthcare’ OR ‘Health care’ OR ‘Health services’ OR ‘Health access’

Studies that are included are cross sectional study design from household or individual surveys. Some study with cross sectional study design but using a secondary data from other than cross sectional (eg. previous prospective cohort study) were also accepted. Studies selected were limited within 10 years period, from the year 2007 until 2017, in English language and with full-text available to ensure relevance of the studies. Ethics review are not needed as no human subjects or primary data collection was involved.

2.2 Exclusion criteria

Studies that does not meet the requirement of determinants of out of pocket health payments (paid or non-full-text literature, non-English literature, literature more than 10 years old and literatures pertaining to non-out of pocket health financing methods)

2.3 Study selection

The entire database was accessed from major databases namely PubMed and Science Direct. A refined search strategy identifies 4213 literatures. After excluding non-free full text articles, duplicate articles, non-English literature and publication limited from year 2007 onwards, 1090 articles were screened for relevance based on the title of the articles. Subsequently, 66 relevant publications were identified and abstracts from these publications were read. 10 articles were identified for final review after applying exclusion criteria. Study selection and search strategy for this systematic review were simplified in a flow diagram according to PRISMA statement (Moher et al., 2009) as shown in Figure 1. Summary of the determinants of OOP expenditure for health care from year 2007 to 2017 is shown in Table 1.
Figure 1: PRISMA statement flow diagram for study selection
Table 1. Summary on Determinants of Out-of-Pocket Expenditures for Health Care

<table>
<thead>
<tr>
<th>Authors</th>
<th>Country</th>
<th>Sample size</th>
<th>Study design</th>
<th>Data source</th>
<th>Determinants of OOPHE</th>
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</table>
| (Mahumud et al., 2017) | Bangladesh | 12400 households | Cross-sectional | Bangladesh Household Income and Expenditure Survey 2010 | - age  
|         |               |             |                   |                                                 | - gender  
|         |               |             |                   |                                                 | - marital status  
|         |               |             |                   |                                                 | - urban household  
|         |               |             |                   |                                                 | - income  |
| (Molla et al., 2017) | Bangladesh | 10701 households | Cross-sectional | Bangladesh Household Income and Expenditure Survey 2010 | - presence of chronic disease  
|         |               |             |                   |                                                 | - income  
|         |               |             |                   |                                                 | - urban household  
|         |               |             |                   |                                                 | - household size  |
|         |               |             |                   |                                                 | - education level  
|         |               |             |                   |                                                 | - income level  
|         |               |             |                   |                                                 | - rural household  
|         |               |             |                   |                                                 | - distance to health facility  |
| (Masiye & Kaonga, 2016) | Zambia | 12000 households | Cross-sectional | Zambian Household Health Expenditure and Utilization Survey 2014 | - household expenditure  
|         |               |             |                   |                                                 | - education level  
|         |               |             |                   |                                                 | - rural household  
|         |               |             |                   |                                                 | - income level  
|         |               |             |                   |                                                 | - distance to health facility  |
| (E. M. Brinda et al., 2014) | Tanzania | 8297 adult participants | Cross-sectional | Tanzania National Panel Survey 2008/2009 | - age  
|         |               |             |                   |                                                 | - gender  
|         |               |             |                   |                                                 | - comorbidity status  
|         |               |             |                   |                                                 | - use of alternative medicine |
|---|---|---|---|---|---|---|---|---|---|
| (Schwarz et al., 2013) | Tajikistan | 5379 individual who visited Tajikistan’s primary health care center | Cross-sectional | 4-year series of household surveys (2005-2011), by Tajik Ministry of Health | - income | - rural household |
| (Bock et al., 2014) | Germany | 3124 elderly individuals (aged 57-84) | Cross-sectional | Data from population-based prospective cohort study (ESTHER) 2008-2010 | - payments on medical supplies | - income level | - increasing illness level | - age | - gender |
3.0 Result and Discussion

From the articles reviewed, most of the studies were done in a developing country in Africa and South Asia. Possible motivation for such studies been undertaken is that OOP expenditure for health care is still widely used as a main financing means in accessing health services. OOP expenditures was mainly used to access modern health services, as well as informal care. Not many studies on the determinants and impact of OOP health payments to the populations, especially to the vulnerable groups were studied before. Such studies are crucial for the country’s policy-makers to identify the gap in the current health financing system and formulate a way for improvement.

Apart from developing countries, such studies on OOP health financing were also done in more developed countries such as China, Germany and United States. Study in Germany and United States were conducted not upon the general populations, as such in the developing countries, but more targeted on special populations such as among Rheumatoid Arthritis (RA) patients (Unites States) and on elderly population (Germany). Being a developed nation, the existing health financing employs a mix of financing method to achieve a complete universal health coverage status, usually through a tax-based revenue financing, social and private health insurance or a combination of any. Despite the presence of risk-pooling in health financing mix and low prevalence of OOP expenditure in the respected county, OOP expenditure for health care is still widely used in a form of co-payment to the health insurance or used to get health services or supplies (pharmaceuticals, medical devices etc.) that are not covered by the existing health insurance or government subsidy.

Most of the studies applied a cross-sectional study design and use a secondary data from a nationally-representative survey on household expenditure. Sample size for the reviewed studies ranged from 10000 to 15000 for households, while for individuals was from 1000 to 10000 participants.

3.1 Determinants of Out-of-Pocket Health Expenditure

3.1.1 Age

Age group is one of the factor associated with OOP healthcare expenditures in Bangladesh, where elderly spent more in OOP health payments, due to lack of health sector resources for the management of specific chronic diseases in the elderly, as Bangladesh has no special coverage programme for older citizens to mitigate excess healthcare costs at an affordable price (Mahumud et al., 2017).

Same finding was also reported in Tanzania, where older people had significantly higher OOP expenditure. Disabilities due to physical, functional, and psychiatric morbidities affect the nature of health service utilization and demand high OOP health expenses among older people. Lack of social security system also older people to suffer financial burden through OOP payments or remain disabled without seeking health care. (Ethel Mary Brinda et al., 2014)
Newly industrialised country in Asia like China also reported that elderly especially those who are above 65 years of age spent higher OOP expenditure on health (You & Kobayashi, 2011). This trend is expected to rise parallel with an increase in elderly population in the society due to longer life expectancy.

Among Germany’s elderly, age was associated significantly with a higher financial burden, as a result of decreasing income with higher age. Besides, older age is commonly associated with a lower health status, which lead to higher health service use and corresponding OOP payments (Bock et al., 2014).

Meanwhile in the United States, age correspond negatively to OOP payments, as the study on OOP payments was only among Rheumatoid Arthritis (RA) patients. From the study, the non-elderly patients with RA had more problems with OOP spending for medical bills than patients aged 65 years and above, as for the elderly population the availability of Medicare coverage reduce OOP spending on medications (Mukherjee & Kamal, 2017).

3.1.2 Gender

Several countries reported that gender play a role in OOP health spending. Both studies in Bangladesh and Tanzania mentioned higher OOP health expenditure among female respondents. One potential explanation on why females in Bangladesh spent higher OOP expenditure on health is that males in Bangladesh are more likely employed, with their healthcare cost potentially covered by employer-based insurance (Mahumud et al., 2017).

Women of reproductive age had a significantly higher OOP expenditure in Tanzania due to high prevalence of informal payments and increased need for health service utilization among younger women and their children (E. M. Brinda et al., 2014).

Studies on OOP health expenditure among elderly in Germany shows that women and single persons paid significantly more OOP in the outpatient sector than men and married individuals. This is due to women utilize outpatient physician services more frequently than men do in term of German health care context, thus contributes to higher OOP payments (Bock et al., 2014).

OOP payments in the United States as reported by (Mukherjee & Kamal, 2017) also were found to be significantly greater for female patients than for male patients, as RA is more common in women, and that sex is significantly associated with financial problems related to paying for drugs and medical bills among RA patients.

3.1.3 Place of residence

Three of the reviewed studies suggest that OOP health expenditure was higher among people who live in urban area. In Bangladesh, OOP health expenditures were more significantly associated with urban communities, where people from rural communities tend to use instalment payments and also seeking care from traditional healer for their healthcare need (Mahumud et al., 2017). Another study in Bangladesh also suggest that rural household on
average spend 7% lesser healthcare than their urban counterpart, related to the fact that modern medical facilities and specialists are mostly available in urban areas (Molla et al., 2017).

As in China, people living in urban area are still paying more for health care than those living in rural area. Possible explanation is that considering the time and travel costs would be incurred when seeking treatment, urban residents are more convenient to access the health facilities. Other possible explanation is that rural and urban residents may have different preferences in utilizing healthcare, where urban residents may be more likely to pay for the expensive health service, while rural residents may tend to decline the expensive services and opted for a cheaper alternatives (You & Kobayashi, 2011).

Contradict to the earlier three studies, the rest of studies stated that OOP health expenditures was higher among people who live in rural area. Rural households in Sri Lanka are likely to incur OOP expenditure to access healthcare service due to higher likelihood of illness from unsafe drinking water and unhygienic toilet. Furthermore, they incur higher OOP expenditure on indirect cost (transportation etc.) to seek treatment in urban area (Kumara & Samaratunge, 2016).

Same trend is observed in nearby countries Pakistan, where household in rural Khyber Pakhtunkhwa KPK) provinces was higher predictor of OOP payments as compared to urban households in the province of Punjab. This might be due to KPK province is generally considered to be a more conservative society with lower literacy, lower level of sewerage system and larger household size than the others provinces (Muhammad Malik & Azam Syed, 2012). As for African country like Zambia, people who reside in remote and rural areas in Zambia generally live further from health facilities which increase their OOP payments through travel cost in accessing health services (Masiye & Kaonga, 2016).

While in Tajikistan, disparities of OOP payments for accessing primary health care are observed across geographic areas. Patients from the most remote district such as Varzob district is lacking in access to health care, as they paid more to obtain medicine and encountered higher transport cost. Similarly, patients from two semi-urban districts made informal payments to their family doctors in higher proportions and in higher amounts. The findings raise questions on the allocation of resources across regions in Tajikistan and issues of access and quality of the health care in certain districts (Schwarz et al., 2013).

### 3.1.4 Education level

Most of the reviewed studies agrees that OOP health expenditures were higher among those who have higher education level. Higher literacy of the head of household in Pakistan act as positive predictor of OOP payments (Muhammad Malik & Azam Syed, 2012) , as well as in China where household head with higher education qualification spent higher OOP health expenditure (You & Kobayashi, 2011).

Similarly, the level of education of household head in Zambia was positively associated with higher OOP spending due to greater demand for formal healthcare as education increases an individual ability to acquire and utilise health information. Furthermore, a possible explanation...
for the positive association between education and magnitude of OOP payments could be that better-educated individuals may have a tendency to choose better-quality, but more costly healthcare options (Masiye & Kaonga, 2016).

In Sri Lanka, literate household heads largely influence OOP spending for healthcare, where heads with secondary education are positively associated with a higher probability of seeking healthcare privately as compared to those with no education, due to relatively broader understanding of consequences of health hazards and higher tendency towards promoting good health practises among household members (Kumara & Samaratunge, 2016).

### 3.1.5 Household income

Most of the studies shows that higher income contributes to higher OOP health spending. The richest 20% of the Bangladeshi population had higher average OOP healthcare expenditures but only small proportion (4%) from their monthly household income. On the contrary, the lowest quintile of the individuals OOP spending for take higher proportion (16.27%) of their monthly household income (Mahumud et al., 2017). This indicates that burden of OOP payments was highest among the poor. Other similar study in Bangladesh also show similar result where 10% increase in household income leads to a 2% increase in OOP expenditure (Molla et al., 2017).

The finding is consistent in Sri Lanka, where household per capita income is a significant predictor of the likelihood of incurring OOP expenditure, however the financial burden from OOP was still higher among poor household as both income group prefer to access more modern and expensive private health care facilities, thus creating a gap in equity (Kumara & Samaratunge, 2016).

The importance of household economic capacity in influencing the decision to seek formal healthcare utilisation was observed in Zambia, where household with higher income tend to spend higher OOP payments for healthcare (Masiye & Kaonga, 2016). Among reasons of higher OOP spending among higher income group is that, higher income groups more preferred to seek medical attention in a private health facility, even after having initially visited a public health facility. Furthermore, amount of OOP health spending in the better-of income group tend to be higher due to higher transportation use as compared to the poor and also possible due to informal or unofficial user charges at the health centres that are rampant in most African and third worlds countries.

In Tajikistan, socioeconomic background of respondents determines the OOP payments to access primary health care. The top 20% riches group of respondents spending on average 1.3 times more on OOP health payments compared to the 40% poorest group. The richer group pay higher prices for medicine may result from an access to better quality drugs or substituting from generic medicines to a more expensive drug. Similarly, patients ranked higher economically pay their family doctors in higher proportions, which reflect that wealthier patients pay their provider better and thus receive better care (Schwarz et al., 2013).
Increasing income was also correlated with higher OOP health payments among elderly in Germany. Higher income led to higher OOP payments especially in the outpatient sector, where wealthier people could potentially utilize the non-covered individual health services (IHS) more often. These are services that go beyond legally stipulated patient care and must be completely paid by the patient, for example an eye examination without certain medical indication by an ophthalmologist or professional tooth cleaning by a dentist (Bock et al., 2014)

OOP health expenditures were also significantly higher for the high-income group than the poor and low-income groups in the United States. One possible reason is that individuals with a high income were prescribed more costly medications for example biologics and DMARDs in treating RA, which increased their OOP spending (Mukherjee & Kamal, 2017)

3.1.6 Household size

Most of the reviewed studies indicate that the more people in a household will incur a higher OOP health expenditure. In Sri Lanka, households with more than one elderly member, pre-school children or school-aged children will incur higher OOP health payment and likely burden by it (Kumara & Samaratunge, 2016). This is due to elderly people require more frequent and expensive medical services, while pre-school children might need more preventive healthcare and often experience early-age illnesses.

Whereas in Pakistan, households with elderly members have greater influence on OOP payments as compared to households with children. This might be explained by the lack of non-communicable disease financial coverage in the country for the elderly (Muhammad Malik & Azam Syed, 2012). Similar findings were observed in Bangladesh, where household with more than one under-five and above 60 years old will incur more OOP health payments. It is well-known that elderly population suffers more from chronic illnesses and requires more healthcare which results in a higher healthcare expenditure (Molla et al., 2017)

3.1.7 Presence of chronic illness or comorbidities

Presence of chronic disease were also associated with higher OOP health spending in most of the reviewed studies in developing countries such as Bangladesh, Sri Lanka, Tanzania and China. In Bangladesh, presence of chronic disease will double household health expenditure, consistent with other findings in other middle- and low-income countries. This is due to Bangladesh system of chronic care management is only limited to patient treatment, with no functional preventive and health promotion measures (Molla et al., 2017). Same result observed in Sri Lanka, where the likelihood of incurring higher OOP payments and the burden are higher when households consist of more members with chronic illnesses (Kumara & Samaratunge, 2016).

That is also the case in a more developed country like Germany, where the elderly with a higher illness level leads to a higher OOP payment due to higher demand for health care services (Bock et al., 2014). In the United States, as the number of comorbid conditions increased, the OOP expenditure for prescription drugs increased significantly. More than 85% of patients with RA had ≥1 comorbid condition, whereas a little more than 33% had ≥3 comorbid conditions. Most
of the patients had high blood pressure, high cholesterol, and other cardiac ailments (Mukherjee & Kamal, 2017). This resulted in cost-related medication non-adherence causing poor health outcome, despite of high health care spending in the country.

3.1.8 Other determinants.

Studies in Bangladesh by (Mahumud et al., 2017) indicate that marital status have some effect on the OOP health spending. Being married was associated with higher OOP expenditure on healthcare in Bangladesh.

In more developed countries such as United States, undertaking of health insurance is compulsory for one to access health services. The OOP expenditures for uninsured individuals were significantly greater than for patients with private or public insurance. This finding was comparable to previous study findings which reported that the absence of health insurance causes a severe financial burden on patients with RA. Many patients with RA have functional limitations and disabilities, which can limit their earning potential. Higher OOP expenditures, coupled with limited earning or unemployment and a lack of insurance, impose a tremendous financial burden on these patients (Mukherjee & Kamal, 2017)

Higher OOP payments also occurred for health goods and services that are completely or partially withdrawn by the existing Social Health Insurance (SHI) in Germany. Most OOP in Germany were paid as co-payment or in full for medical supplies such as for glasses and expensive medical supplies like electric wheelchair, followed by dental prostheses and pharmaceuticals, particularly the non-prescription drugs (Bock et al., 2014)

Distance to health facility also plays a role in determining OOP health expenditures, where the longer distance to health facilities contributes to higher OOP expenditure in Pakistan, Sri Lanka and Zambia. Rural household in Sri Lanka faced relatively a higher burden from OOP spending as they need to travel to get access to secondary or tertiary health facilities that are mostly located in an urban area. This incur more higher OOP payment directly from getting the treatment itself and also indirectly from the travel time, transportation and lodging costs (Kumara & Samaratunge, 2016).

4.0 Conclusion and recommendation

Main determinants of OOP health expenditure identified by this review were age, gender, place of living, education and income level, household size and presence of comorbidities. Other minor determinants identified were marital status, insurance status, payments for medical supplies and pharmaceuticals and distance to health facilities. OOP healthcare spending is a worrying issue throughout the world be it in a developing or developed world. The presence of significant levels of OOP expenditures and its determinants shows that the populations in the affected countries is sufficiently affluent to afford healthcare, however OOP payments are not an equitable financing mechanism, as such expenses could become catastrophic. This review
can help policy-makers in identifying the determinants of OOP, focusing on the mechanisms driving them, and from there initiatives to formulate policy options for building stronger and sustainable health financing system. It is necessary to establish intervention mechanisms to improve equity in access to health services and payment for health care, protect vulnerable population against financial risk, and reduce the incidence of catastrophic healthcare spending. In an effort toward providing complete universal health coverage as recommended by the WHO, every nation should consider formulating the best health financing mechanism through standardized and improved health services packages, ensuring financial protection against health-related risks and equity in the health system.

Declarati

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Author’s contribution

Author 1 : Information gathering, analysis and preparation of draft manuscript.
Author 2 : Initiation of idea, editing and final review of manuscript

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