Inpatient care expenditure of the elderly with chronic diseases who use public health insurance: Disparity in their last year of life

Worawan Chandoevwit[a,*], Phasith Phatchana[b]

[a] Faculty of Economics, Khon Kaen University, 123 Mitraphab Rd., Muang, Khon Kaen, 40002, Thailand
[b] Thailand Development Research Institute, 565 Ramkhamhaeng Rd. Soi 39, Bangkok, 10310, Thailand

ABSTRACT

The Thai elderly are eligible for the Civil Servant Medical Benefit Scheme (CS) or Universal Coverage Scheme (UCS) depending on their pre-retirement or their children work status. This study aimed to investigate the disparity in inpatient care expenditures in the last year of life among Thai elderly individuals who used the two public health insurance schemes. Using death registration and inpatient administrative data from 2007 to 2011, our subpopulation group included the elderly with four chronic disease groups: diabetes mellitus, hypertension and cardiovascular disease, heart disease, and cancer. Among 1,242,150 elderly decedents, about 40% of them had at least one of the four chronic disease conditions and were hospitalized in their last year of life. The results showed that the means of inpatient care expenditures in the last year of life paid by CS and UCS per decedent were 99,672 Thai Baht and 52,472 Thai Baht, respectively. On average, UCS used higher healthcare resources by diagnosis-related group relative weight measure per decedent compared with CS. In all cases, the rates of payment for inpatient treatment per diagnosis-related group adjusted relative weight were higher for CS than UCS. This study found that the disparities in inpatient care expenditures in the last year of life stemmed mainly from the difference in payment rates. To mitigate this disparity, unified payment rates for various types of treatment that reflect costs of hospital care across insurance schemes were recommended.

1. Introduction

Chronic diseases are the main contributors to disease burden among the elderly (Bromfield and Muntner, 2013; Prince et al., 2014). The aging population has brought about the epidemic of chronic diseases globally, including Thailand. In 2015, the proportion of aging population of 60 years and above was 15% (United Nations, 2015). Chronic diseases, including cardiovascular diseases, cancer, diabetes mellitus, and heart disease are the major causes of disease of the Thai elderly. According to International Health Policy Program (2015), these diseases accounted for about half of the elderly's disability-adjusted life year (DALY). The epidemic of chronic diseases is expected to become more serious when the proportion of Thailand's aging population reaches 20% in 2020.

The growing number of elderly individuals with chronic diseases inflates healthcare expenditure, inasmuch as healthcare resource use intensifies with age and number of chronic conditions (Denton and Spencer, 2010). Households with elderly members and those with members with chronic diseases increase the demand on healthcare system and one's medical expenditure. If these households lack the

financial protection against health risks, high medical expenditure may push them into poverty (Bhojani et al., 2012; Mwangi et al., 2015). Fortunately, all Thai households are protected universally against health impoverishment.

Thailand provides its citizens with three schemes of public health insurance, namely, Civil Servant Medical Benefit Scheme (CS), Social Security Scheme (SS), and Universal Coverage Scheme (UCS). CS covers civil servants, including the retired ones, and their dependent children and parents, whereas SS is for private employees in the nonagricultural sector. Those who are not covered by the first two schemes are eligible for UCS. UCS members are generally of lower socio-economic status compared with CS and SS members (Anutrakulchai et al., 2016; Osornprasop and Sondergaard, 2016). In 2013, approximately 75% of the Thai population were covered by UCS (National Health Security Office, 2013).

Although the elderly populations are eligible for either CS or UCS depending on their pre-retirement or their children work status, most of them (80%) are under the later. Both CS and UCS provide a comprehensive benefit package covering outpatient and inpatient treatment and medication under the national essential drug lists. The major

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differences between the two schemes are the benefit package, payment mechanisms for outpatient care, and payment rates for inpatient care (Anutrakulchai et al., 2016; Hanvoravongchai, 2013). The payment mechanism to service providers is an important issue for the multiple health insurance schemes, as it could result to unequal treatment and health outcomes across socio-economic groups (Anutrakulchai et al., 2016; Dilokthornsakul et al., 2016).

In our current study, we are interested in the disparity in public healthcare expenditure at the end of life of the elderly with chronic diseases. As aging population and a burgeoning chronic disease epidemic increase the demand for healthcare utilization, public spending on CS and UCS schemes are expected to grow accordingly. However, according to Osornprasop and Sondergaard (2016), the utilization of inpatient care service by UCS patients dropped after the age of 82, but that by CS patients continued to rise. This could result in the disparity in public spending on health at the end of life between the two schemes.

Previous studies on healthcare expenditure at the end-of-life have gained attention in many countries (Brockmann, 2002; Cunningham et al., 2011; Kelley et al., 2011; Levinsky et al., 2001; Lubitz and Riley, 1993; Menec et al., 2007; Rolden et al., 2014; Shugarman et al., 2004; Taylor et al., 2007). Their findings have indicated that healthcare utilization and expenditure grew faster among the elderly than the younger population (Gregersen, 2014; Organisation for Economic Co-operation and Development, 2013); the healthcare expenditure of deceased elderly individuals was much higher than that of survivors (Lubitz and Riley, 1993); and the end-of-life healthcare expenditure increases with proximity to death (Felder et al., 2000; Geue et al., 2014; Moorin and Holman, 2008; Seshamani and Gray, 2004; Tanuseputro et al., 2015).

The equity of public expenditure on healthcare in the last year of life has been put forward. Previous studies have found that lower socio-economic groups were associated with lower healthcare expenditure at the end of life (Cunningham et al., 2011; Felder et al., 2000; Hanratty et al., 2007). To our knowledge, no other study has examined the disparity in healthcare expenditure in the last year of life across socio-economic groups or across insurance schemes in Thailand.

This study aims to investigate the disparity in healthcare expenditures in the last year of life among Thai elderly individuals who are under the two public health insurance schemes, namely, CS and UCS. However, we focus on inpatient care expenditure paid by public health insurance schemes. Inpatient care expenditure was about 30% and 50% of CS and UCS total health expenditures, respectively (International Health Policy Program, 2011). As CS and UCS use similar payment method for inpatient care, the comparison between the two schemes can be made consistently.

This study covers a five-year period, from 2007 to 2011. Our subpopulation group includes the elderly with four chronic disease groups: diabetes mellitus, hypertension and cardiovascular disease, heart disease, and cancer.

1.1. CS and UCS schemes

Both financed by general tax revenues, CS and UCS are administered by the Comptroller General's Department and the National Health Security Office (NHSO), respectively. CS uses fee-for-service payment method for outpatient care and applies Thai diagnosis-related groups (DRGs) payment system for inpatient care. Thai DRG grouper tool is developed based on the United States Medicare DRG (World Health Organization. Regional Office for the Western Pacific, 2015). The details of Thai DRG coding practice can be found in Pongpirul et al. (2011).

The DRG relative weight is calculated to reflect the unit of resource used for a specific DRG. The DRG relative weight is adjusted for the length of stay in hospital. The adjusted DRG RW is used for calculating inpatient payment. The payment per patient-day declines as the patient stays longer in hospital. Hereafter, we refer RW and adjusted RW to

DRG relative weight and DRG adjusted relative weight, respectively. The amount paid for inpatient care is the product of adjusted RW and the rate of payment per adjusted RW. CS applies over 20 rates of payment. The CS and the UCS use the same version of Thai DRG.

Meanwhile, UCS uses capitation payment method for outpatient care and Thai DRGs under global budget for inpatient care. Both UCS and CS schemes do not pay for doctor fee, long-term care and home healthcare. Although UCS uses a similar method of calculating RW and adjusted RW, it employs a unique rate of payment to all hospital levels in each NHSO jurisdiction. There are 13 NHSO jurisdictions, and, thus, the maximum number of NHSO rate of payment is 13. In practice, the variations of the rate of payment between NHSO jurisdictions are small because the global budget limits them.

Patients who use public health insurance must visit public hospitals where doctors and other staff members are paid by fixed salary inclusive in the government budget. UCS beneficiaries must register at a community hospital or one close to their home. They will be referred to a higher-level hospital, that is, a general (secondary hospital), a medical school, or a regional hospital (tertiary hospital) if the illness is beyond the ability of the first admitted hospital. For CS beneficiaries, they can visit any public hospitals that matches their preferences.

The community, general and regional hospitals belong to the Ministry of Public Health. However, in Bangkok areas, hospitals belong to Bangkok Metropolitan Administration (BMA). Public health insurance also covers medical treatment in other specialty and tertiary hospitals belonging to BMA and other government organizations, such as the Ministries of Defence and Education.

2. Methods and data

Data are from two administrative sources, the death registration and inpatient administrative data. The death registration database was from the Bureau of Registration and Administration. Inpatient administrative data were obtained from claim data, which the hospitals submitted to the Central Office for Healthcare Information (CHI) and the NHSO. The CHI administers CS claim data, whereas the NHSO is responsible for the overall UCS administration.

The study population was Thai elderly aged 60 and older who died from 2007 to 2011 and had a history of chronic diseases in their claim files. To capture this population, we linked the death registration with each episode of inpatient admission using encrypted Personal Identification Number as identifiers. In their last year of life, patients could be admitted to one or more hospitals. We obtained the following information from linked database: gender, date of birth, date of death, hospital and province of the last admission, primary and secondary diagnoses of the last admission, the last discharge type, and length of stay, the RW and adjusted RW from each admission. For CS data file, payments to the hospitals in each admission were available. The rates of payment per adjusted RW for CS varied according to hospital levels.

Unlike CS, UCS payments to hospital were not recorded. The global budgets were allocated to 13 regional NHSO offices to make payment to hospitals in their areas. These regional offices did not record the amount paid to each admission. The NHSO provided us the rates of payment, which varied by year and NHSO's office. UCS payment for each episode of inpatient treatment was calculated from the base rates or rates of payment multiplied by adjusted RW.

Our study captured deceased persons with chronic diseases identified in primary and secondary diagnoses in any of the inpatient episode. Those diagnoses were coded according to the Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems (World Health Organization, 2004). The ICD-10 code for diabetes were E10-E14, E160, and E162; for hypertension and cardiovascular disease, I10-I15 and I60-I69; for ischemic heart disease, I20-I25; and for cancer, C00-C09 and D00-D09. As a patient could have multiple inpatient records, we used primary diagnosis in the last admission to group the data by disease. A deceased person could be