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ORIGINAL ARTICLE

Patterns of outpatient care utilization by seniors under the National Health Insurance in Taiwan☆

Wen-Chin Hsu [a], **Yi-Ping Hsu** [b,*]

[a] *Department of Information Management, National Central University, Taoyuan City, Taiwan*
[b] *Division of Cardiology, Department of Internal Medicine, Shuang Ho Hospital, New Taipei City, Taiwan*

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Background/purpose: Taiwan has one of the fastest growing aging populations in the world, which makes the effective allocation of scarce medical resources a key issue. This paper investigates patterns in the use of outpatient services by elderly individuals in Taiwan under the National Health Insurance (NHI) program.
Methods: We assembled a random sample from the NHI Research Database in Taiwan, comprising 50% of all claims made for elderly people (65 years old) in 2010 (*n* 1,239,836 beneficiaries) including 14 variables.
Results: In 2010, individuals aged 65 years or older comprised 10.74% of the population of Taiwan, and accounted for 11.39% of all physician and outpatient visits. The rate of medical care visits was 28.54 ± 21.23 (Standard deviation) times per person per annum, with a higher rate for women, those in the 80–84 age group, low-income beneficiaries, and the inhabitants of offshore islands. The three most frequent diagnoses for elderly patients were hypertension, diabetes, and acute upper respiratory infections. The mean insured medical costs per person per annum were US Dollars 1,132, with higher expenses for men, those in the 80–84 age group, and those inhabiting urban areas.
Conclusion: This study employed nationally representative data in the detection of patterns in outpatient care utilization by elderly individuals in Taiwan. Medical care providers and policymakers should be fully aware of the complex patterns unique to older patients. The results of this study could be used as a benchmark with which to assess the impact of future medical care policy on elderly people.

☆ The copayment fee for a visit to a clinic is NT$50 (i.e., US 1.67 dollars) in 2010. If patients go directly to hospitals for outpatient care without a referral from a clinic, they pay a higher copayment.[6]
Conflicts of interest: The authors have no conflicts of interest relevant to this article.

* Corresponding author. Division of Cardiology, Department of Internal Medicine, Shuang Ho Hospital, Taipei Medical University, Number 291, Zhongzheng Road, Zhonghe District, New Taipei City, 23561, Taiwan.
E-mail address: 13140@s.tmu.edu.tw (Y.-P. Hsu).

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Introduction

The population of Taiwan is aging rapidly, with 2.4 million people aged ≥65 in 2010 (10.7% of the population),[1] and this amount is projected to increase to 7.6 million by 2050 (36.7%),[2] far exceeding the global figure of 12%.[3] As older people typically use more medical services and have more chronic illnesses than other segments of the population, growing numbers of elderly individuals would place heavy demands on medical care services. Clearly, it is crucial to develop appropriate policies and programs on health expenditure planning and long-term care for the older population, especially at a time when the number of working-age individuals (15—64 years) in Taiwan is on the decline.[2]

The current healthcare system in Taiwan, the National Health Insurance (NHI) program, is a compulsory single-payer social insurance program that provides medical insurance cover to all citizens in the country.[4] The services covered under NHI include outpatient services, hospitalization, medication, preventive services, dental care, etc., and people are free to choose any contracted medical providers, at any level, without a formal referral. In 2010, the NHI program provided medical care for 23.07 million Taiwanese (10.7% ≥65 years), with an annual healthcare expenditure of US$25.01 billion (i.e., 6.6% of Taiwan's gross domestic product), which was actually lower than for other developed countries (e.g., USA 17%, France 11.3%, UK 9.1%, Japan 9.5%[5]). In addition, NHI revenues grew at an average of 4.73% a year between 1996 and 2010, surpassing the average growth rate of costs per year (5.03%). It is reported that the aging of Taiwan's society has had a great impact, propelling the rapid growth of medical expenditure in past decades.[6]

Previous studies have examined various aspects of the NHI program in Taiwan, including medical expenditure and coping strategies,[7] NHI administration,[8] the effect of the introduction of the NHI on life expectancy,[9] differences between rural and urban areas,[10] and utilization of ambulatory care services.[11] However, only a few studies have focused specifically on the utilization of the NHI program among the older population, who constitute a large proportion of the group who need daily or more frequent help. Zimmer et al[12,13] reported an increasing prevalence of functional limitations among the older population after the launching of the NHI program in 1995. Chen et al[14] revealed that, although the NHI program greatly increased the use of medical care services, the higher utilization rate did not lower mortality or lead to better self-perceived general health status among the Taiwanese elderly people. Although both studies provide useful information concerning the impact of NHI on the health outcomes of older people, the data used in these studies were mainly based on a longitudinal survey from 1989 to 1999. To continue improving the NHI program and to make a successful healthcare policy for the increasing older population, it is crucial to understand the updated, broad pattern of the use of the NHI program by the older segment of the population. Moreover, although Taiwan's Department of Health releases statistical reports on the NHI program annually, these official statistics are mainly aggregate data from the administrative perspective (e.g., total medical expenses in 2010 for the 65 and over age group) and lack a person-based approach (e.g., medical expenses per person per year in the 60—65 age group).

To fill this knowledge gap, we seek to put together an up-to-date, comprehensive, person-based pattern of use of outpatient care services by older people under Taiwan's NHI program. The findings provide important evidence for policy-making discussion of the health of the older population, not only for Taiwan, but also for countries facing similar situations (e.g., Bulgaria, Czech Republic). Moreover, the present results can be used as a benchmark to assess the impact of future healthcare policies for the elderly.

Materials and methods

Data sources

The data for this study were collected from Taiwan's National Health Insurance Research Database (NHIRD). The NHI program was launched in 1995 to provide healthcare for all residents in Taiwan. By the end of 2010, > 99% of the residents participated in the program (i.e., 23,074,487 beneficiaries[6]). Due to its comprehensive, updated nature, and a high coverage rate, the present findings, based on the data sets, can be generalized to the entire population of Taiwan to a precise and high degree. The details regarding the NHI program and the structure of the claim data sets have been well described on the NHIRD web site (nhird.nhri.org.tw) and in previous studies.[11]

Study design

A cross-sectional, descriptive design utilizing a quantitative approach was used in this study. The study population included all residents aged 65 years and over in Taiwan in 2010. To ensure protection of privacy, the identification codes for both patients and medical facilities were changed; only 10% of the total claim data were available for study. A total of 1,239,836 people were randomly sampled from all NHI beneficiaries aged 65 and older in 2010. Study variables include the patient's age, sex, residential location, healthcare facility, primary diagnosis, specialty, and the medical expenses for each outpatient care visit (including drug fee; medical examination; treatment and medical supplies; diagnostic fee; and pharmacy dispensing service fee). This study gained favorable ethics approval from the National Health Research Institutes, Taiwan (Reference no. 101018).

Data processing and statistical analysis

To facilitate data analysis and reporting, variables were categorized into appropriate groups. The ages of beneficiaries were recoded into 5-year age groups. The primary diagnoses were categorized into 19 groups according to the International Classification of Disease, Ninth Revision, Clinical Modification (ICD-9 CM). The outpatients service visit per person per annum (pppa), and medical expense pppa were calculated. Data containing age-miscoded