More medical resources do not imply better quality of life: A population-based study in Taiwan

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Abstract
Studies regarding medical resources input-output (I/O) efficiencies gained increasing importance in recent years. Most of published studies measure medical resources I/O efficiencies of hospitals or clinics, however, very limited number of studies investigating nation-wide medical resources I/O efficiencies. Besides, there was also very limited number of studies using population data of quality of life (QOL) as an outcome variable. The aim of this study was to investigate nation-wide medical resources I/O efficiencies of Taiwan, by using national medical service volumes statistics as input variables and population QOL as outcome variables. The population QOL data were from 2005 National Health Interview Survey (NHIS) and the national medical service volumes statistics were from 2005 National Statistics of Health Care Providers and Medical Services, which were issued by Department of Health in Taiwan. The population QOL was measured by SF-36. The data envelopment analysis (DEA) method was used to investigate the medical resources I/O efficiencies. Twenty three cities and counties of Taiwan were regarded as decision making units (DMUs). The results showed that 40% of cities and counties achieved efficiency regarding health care resources allocation. The results showed that the Tai-Nan city (an emerging high-tech city)

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and the Taiwan capital, Taipei City, were the two lowest QOL DMU. In summary, cities with high tech development and with more medical resources are not necessarily the cities with better quality of life. 

**Keywords:** data envelopment analysis, medical resources, quality of life

1. Introduction

Increasing trends of medical costs have been the global phenomenon in recent decade, and a country needs to input more medical resources in disease prevention, cure, and health promotion. Therefore, the issue regarding how to allocate medical resources more efficiently had gained increasing importance worldwide in recent years. Most of published studies showed more medical inputs would provide more medical services and would improve quality of life (QOL) for patients with specific diseases, for example: asthma[1], chronic hepatitis[2], bladder cancer[3], Alzheimer’s disease[4], tuberculosis[5]. However, studies investigating nationwide medical resources input-output (I/O) efficiencies were now still very limited. Also, Taiwan is the first Asian country to launch the National Health Insurance Program (NHIP) since 1995[6], and Taiwan is one of limited number of Asian countries to conduct a periodical population-representative National Health Interview Survey (NHIS) since 2001[7]. In Taiwan NHIS, a population-representative sample (sample size about 30,000) was recruited and the QOL was surveyed by using SF-36[8]. Therefore, Taiwan has the advantage to have a population-representative QOL database. The data envelopment analysis (DEA) method[9] was used, which had been widely used to assess the input/output efficiency of companies and hospitals[10-13]. However, very limited studies were proposed to study the efficiency between nationwide medical resources inputs and medical services and population quality of life. Therefore, this paper was aimed to investigate the I/O efficiency between nationwide medical resources inputs and medical services and population QOL in Taiwan, and the conceptual framework figure was shown in Figure 1.

2. Materials and methods

This study used two nationwide databases: 2005 National Statistics of Health Care Providers and Medical Services which were issued by the Department of Health (DOH) of Taiwan, and the 2005 National Health Interview Survey (NHIS) in Taiwan. There are 23 cities/counties