Impact of SARS on healthcare utilization by disease categories: Implications for delivery of healthcare services

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Abstract

Objective: To assess the impact of the SARS epidemics in Taiwan on ambulatory care and inpatient utilization by disease categories and accreditation levels of hospital.

Methods: The National Health Insurance claims data of Taipei were analyzed. We calculated the changes in utilization between June 2002 and June 2003 to estimate the impact that SARS had on utilization.

Results: The top three disease categories with the most significant drop in utilization were gastroenteritis (−53%), acute bronchitis (−45%), and tonsillitis (−40%) in ambulatory care and acute bronchitis (−82%), gastroenteritis (−72%), and pneumonia (−64%) in inpatient care. On the other hand, the disease categories with the smallest reduction were allergic reactions (−4%), skin infections (−6%), and anxiety (−10%) in ambulatory care and respiratory failure (+40%), delivery (−2%), and fractures of lower limbs (−5%) in inpatient care.

Conclusions: Disease categories could be classified into three groups according to the extent of change in utilization during the SARS outbreaks. Diseases with a prominent reduction were respiratory diseases, minor problems, and elective procedures. Diseases with a moderate reduction were mainly chronic diseases. Diseases with a limited reduction were acute conditions, difficult mental disorders, or procedures that could not be postponed. The utilization of some diseases shifted significantly from medical centers to district hospitals or clinics.

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Keywords: Patient acceptance of health care; Health services/utilization; Severe acute respiratory syndrome (SARS); Claims data; Diagnostic categories; Taiwan

1. Introduction

One important factor that affects whether a patients seeks medical advice is that the relative benefits outweight the costs [1,2]. During the severe acute respiratory syndrome (SARS) epidemic (from February to July 2003), one of the costs of going to the doctor (especially doctors in hospitals) was the risk of being infected or stigmatized with SARS. Studies have revealed that a large decrease in healthcare utilization occurred during the SARS epidemics [3–8]. Nonetheless, little is known about whether this reduction in

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utilization was the same of different across different disease categories.

For some diseases, patients perceived that the benefits of going to the doctor outweighed the costs and therefore the utilization did not reduce significantly during the SARS epidemics. On the other hand, for some diseases with significant reduction in utilization, patients might have perceived that the costs of going to the doctor outweighted the benefits. The SARS epidemics provided us with an opportunity to examine patients' perceptions of "necessary" utilization, according to certain disease categories. The aim of this study was to assess if there were variations in outpatient and inpatient utilization by disease categories and levels of hospital accreditation during the SARS epidemic, using National Health Insurance (NHI) claims data.

2. Methods

2.1. Data

The analysis of claims data was confined to Taipei only. Taipei is the capital of Taiwan with a population of 2.6 million people. It was the most seriously affected region during the SARS epidemics in Taiwan. All claims directed to the Taipei branch of Bureau of NHI between June 2002 and 2003 regarding ambulatory care and inpatients were included in this study. To protect the privacy of individual patients, only the aggregate figures were provided by the Bureau of NHI. Variables in the tabulated aggregate figures included service type (outpatient versus inpatient), month of utilization, diagnosis, and accreditation level (academic medical centers, regional hospitals, district hospitals and clinics).

2.2. Grouping of disease categories

Three diagnoses were listed in ambulatory care claims and five diagnoses were listed in inpatient claims. ICD-9-CM (International Classification of Diseases, Ninth Revision, Clinical Modification) codes were used for both ambulatory care and inpatient claims [9]. To group the visits by disease categories, Clinical Classification Software (CCS) was used. The CCS grouping scheme, which was composed of 260

mutually exclusive disease categories, was developed by the Agency for Healthcare Research and Quality (AHRQ) for the Healthcare Cost and Utilization Project (HCUP). CCS categories are revised regularly in response to ICD-9-CM annual changes, and the entire CCS can be downloaded for free from the Internet [10]. CCS has proven to be a good classification scheme for casemix adjustment [11] and for utilization studies [12]. One special feature of the CCS grouping scheme is that diseases with a similar etiology across organ system chapters are combined [13].

For inpatient claims, licenced nosologists coded the main diagnoses and sub-diagnoses from each hospital. We used the main diagnoses to attribute each inpatient utilization into one of the CCS categories. Identifying the main diagnoses in NHI ambulatory care claims is not required in Taiwan because it is too difficult to identify a single diagnosis for each visit, especially with elderly individuals who suffer from multiple comorbidities. Therefore, we took into account all three diagnoses listed in ambulatory care claims.

2.3. Analysis

There are 260 disease categories in the CCS grouping scheme. We confined our analysis to the 25 disease categories that are utilized the most. This correlated to more than 90,000 ambulatory care visits per month and more than 600 inpatient admissions per month. We used the number of utilizations in 2002 as a reference to calculate the percentage of change between 2002 and 2003 by disease categories, and therefore the impact of the SARS epidemic.

3. Results

3.1. Changes in ambulatory care utilization according to disease categories

Five disease categories were noted to change the most significantly across the study period (from −35% to −53%). Three of the categories were respiratory diseases (i.e., acute bronchitis, tonsillitis, and upper respiratory infections) and the other two were digestive diseases (i.e., gastroenteritis and other gastrointestinal disorders). The pattern was very similar at different accreditation levels. Nonetheless, the reduction was