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Using administrative data to look at changes in the level and distribution of out-of-pocket medical expenditure: An example using Medicare data from Australia

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ABSTRACT

Objectives: Australia's universal health insurance system Medicare generates very large amounts of data on out-of-pocket expenditure (OOPE), but only highly aggregated statistics are routinely published. Our primary purpose is to develop indices from the Medicare administrative data to quantify changes in the level and distribution of OOPE on out-of-hospital medical services over time.
Methods: Data were obtained from the Australian Hypertension and Absolute Risk Study, which involved patients aged 55 years and over (n = 2653). Socio-economic and clinical information was collected and linked to Medicare records over a five-year period from March 2008. The Fisher price and quantity indices were used to evaluate year-to-year changes in OOPE. The relative concentration index was used to evaluate the distribution of OOPE across socio-economic strata.
Results: Our price index indicates that overall OOPE were not rising faster than inflation, but there was considerable variation across different types of services (e.g. OOPE on professional attendances rose by 20% over a five-year period, while all other items fell by around 14%). Concentration indices, adjusted for demographic factors and clinical need, indicate that OOPE tends to be higher among those on higher incomes.
Conclusions: A major challenge in utilizing large administrative data sets is to develop reliable and easily interpretable statistics for policy makers. Price, quantity and concentration indices represent statistics that move us beyond the average.

1. Introduction

Changes in the level and distribution of out-of-pocket expenditure (OOPE) for health care goods and services have become an increasing focus for both researchers [1–5] and policy makers [6]. According to the Australian Institute of Health and Welfare (AIHW), total health expenditure in Australia in 2013–2014 was $154.6 billion, of which $27.5 billion came from OOPE from individuals [7]. The total OOPE was more than double the $11 billion spent a decade earlier in 2001–2002 [6]. This trend is not unique to Australia; a US study found that OOPE increased by 39.4% per person from 1996 to 2005, and the growth was not evenly distributed across the population [2]. Similarly, a

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Canadian study showed that from 1997 to 2009, OOPE increased for households in all income quintiles, and the relative increase was greatest among households in lower income quintiles [1].

Previous Australian research on OOPE has had to rely on survey data that are periodically collected by statistical agencies [8,9]. Such data are often costly to collect and only provide a series of snap-shots based on self-reported information from people who live in the general community. In countries with universal health insurance schemes, there is scope for estimating OOPE much more frequently by linking individual administrative payments across the entire population. For example, information on health care utilisation and payments are routinely collected under Australia's national health insurance scheme, Medicare, which covers a wide range of medical services. The Department of Health plans to release a linked 10% sample of administrative data from Medicare (more information on the release of those data can be found at www.data.gov.au), which could be used to routinely generate population level statistics on OOPE in the future.

There is also scope to link health records with other information about individuals such as their socio-economic status. The first example of this in Australia was the probabilistic linkage of mental health services used under Medicare to the 2011 Australian census which contains information on household income [10]. However, there are presently no routinely published statistics on the distribution of OOPE across different socio-economic groups in Australia. The development of statistics to quantify inequality, such as those based on a concentration index [11], would enhance an understanding of the distributional impact of changes in OOPE.

The purpose of this study is to demonstrate how indices can be calculated from routinely collected administrative health care data to quantify changes in the level and distribution of OOPE. We illustrate how this can be done for out-of-hospital OOPE using a national representative survey (the AusHEART study) which has been linked over a five-year period to Medicare data at an individual level. In the first half of our analysis we explore how price indices, which have been widely used to track changes in prices of market based goods, can be used to track changes in out-of-hospital OOPE using a representative basket of health care services. The second half of the paper explores the use of concentration indices to measure changes in the distribution of payments across income classes over time.

2. Background

Medicare is a Federal Government-funded universal health insurance scheme which reimburses Australian citizens and some residents [12] for at least part of the cost of a range of out-of-hospital medical services provided by private practitioners on a fee for service basis. The *benefit* a patient receives from Medicare is defined by the Medicare Benefits Schedule (MBS), in which the Government sets the *scheduled fee* for different services [13]. Health consumers can claim 100% of this fee from Medicare as a rebate for general practice (GP) services and 85% of the fee for non-GP services when the services are provided out of hospital [13]. There is no limit on what providers may charge for any service, which means the fee charged can be more than the scheduled fee. OOPE arises whenever the fee charged is above the Medicare rebate. Medical practitioners can also choose to accept the Medicare benefit as full payment for a service (known in Australia as *bulk-billing* [14]). An advantage of bulk-billing from a provider perspective is that it is a way of avoiding bad debts and entails lower administrative costs [15]. Health consumers receiving bulk-billed Medicare services incur no OOPE.

Currently the only routinely published information on OOPE in Australia covers broad categories of medical services (e.g. diagnostic imaging) [16]. The statistics regularly reported for each of these broad categories are: (i) the number of services; (ii) the proportion of services that are bulk-billed (no OOPE); (iii) and the average OOPE for those services where an additional fee was charged.

Using these published statistics, the annual OOPE per person for out-of-hospital services has increased by 75% in nominal terms from $59.60 in 2003 to $104.40 in 2012 and the number of services used has increased from 10.5 to 13.5 during the same period. This rise in OOPE per person could be due to: (i) a rise in the fees charged for existing services; (ii) changes in the level and relative use of services; or (iii) the addition of new items on the MBS schedule.

As we can see from Fig. S1 in Supplementary material, between the financial years 2003–2004 and 2012–2013, there were considerable changes in the average per service OOPE for different categories of services used on the MBS. For example, the average OOPE for pathology services (MBS Item No. 65060-74999) dropped by 55%, while the OOPE for Operations (MBS Item No. 30001-50952) increased by 201%. These changes were due to variations in the rate of bulk-billing, since the bulk-billing trends were very different in different types of services, as well as the fees that were charged above the Medicare rebate. Alongside changes in the average OOPE, there were also changes in the relative quantity of different services. The quantity of operation-related services increased at a much slower rate compared with other MBS categories (see Fig. S1), while the relative OOPE per service increased at a much faster relative rate.

To better understand changes in OOPE and inform policy, there is a need to develop statistics that disentangle changes that are due to the fees charged, from those that are related to the quantity and type of services used. A potentially useful statistic is an index of OOPE which quantifies changes in patient charges over time, in the same way the consumer price index (CPI) tracks general price movements [17]. It is also possible to develop a quantity index that takes into account the relative importance of different types of medical care in terms of their contribution to OOPE [18].

3. Method

3.1. Data

The AusHEART study involved a nationally representative, cluster-stratified, cross-sectional survey in the primary health care setting carried out in 2008 [19]. The GPs who agreed to participate in the study were asked