Aging and public health expenditures in Spain: assessing some determinants of public hospital costs during the last decade in Spain.

Elisenda Renteria Perez – Universitat de Barcelona
Rosario Ivano Scandurra – Universitat de Barcelona

Abstract

Public health expenditure has a clear tendency of increase in Spain in recent years. Assessing its determinants is extremely important to predict future health consumption and adjust government policies to attend future demand. Population aging is among one of the most important variables that trigger health expenditures. Deeper analysis is needed to understand which is the share of health costs growth attributable to population aging, regarding other factors like technological change or budget level allocated to health expenditures. We use a hospital cost survey to analyze the age profile of public expenditures on hospitals during the last decade in Spain. Results show that during these years average hospital spending by age grew constantly for almost all age groups, but especially among the elderly. Health care for people 80 years of age or above increased 141% from 2000 to 2009, even though they represent only 13% of the total hospital expenditure.

Key words: Health Expenditure, Aging, Hospital Costs.

Introduction

Health care costs have been increasing rapidly over the last decades in most of advanced countries. The IMF (2012) estimates that health spending as a share of GDP increased from 6 to 12 percent in advanced economies. Researchers relate increasing in health spending to two main processes: demographic factors – population aging and increasing longevity due to epidemiologic change – and care response to the need of patients. By one side, extensive literature has argued that age is a determining factor to explain the increase in spending on health, as older individuals are the main users of the health care services and those who receive most expensive treatments. Therefore, the increase in the share of elderly (population aging) in the population combined with an increase in life expectancy (longevity) has a clear impact on higher health expenditures (Miller, 2001). By the other side, health services have been increasing its offer of services and people have consequently intensified its utilization.

However, some scholars claim that age is insignificant in determining health care expenditure once proximity to death is taken into account (Gray, 2005; Breyer and Felder, 2006; Himsworth and Goldacre, 2006; Zweleig et al 1999). In this case, the increase in longevity experienced in the last decades has postponed to elderly ages health care spending. Further research (Seshamani and Gray, 2004) have challenged the robustness of these findings, using a longitudinal hospital data set from England.
On the other hand, some authors (Fuchs, 1999; Jacobzone and Oxley, 2002; Di Matteo, 2005) argue that technology is the crucial variable that prompts health care costs. Technological innovations have been continuously applied to improve better health care and survival rate, being responsible for rising health expenditures in many ways (new medical techniques, treatments or new pharmaceuticals).

In Spain as previous studies show (López Casasnovas and Mosterín, 2008), there has been a steeper increase share of public policy resources consumed by elderly, which could be partially explained by the aging process. Understanding the proportion of the increase in health expenditure attributable to each of these factors is crucial to ensure health care sustainability, especially in a context of the harshest financial and economic crisis as Spain is facing nowadays. Therefore, the aim of this paper is to analyze the determinants of public hospital costs in Spain by separating the effect of age distribution, intensity of interventions and their cost. We focus our attention on public hospital costs because they represent more than 50% of overall public health expenditures, and the analysis of its determinants might give interesting insight on their effect over the total health care expenditure.

By disentangling age distribution, intensity and cost of interventions we can analyze by one side, how much of the rise in the total amount of health expenditure is attributable to the increase share of elderly and their longevity, or to other factors. Hospital utilization or the average cost of interventions are variables depending on technological change and on increasing resources devoted to public expenditures (which can open the access to more patients), that can also be analyzed with this data, allowing to observe the contribution of each factor to the growth of public hospital expenditures.

Preliminary results show that only a part of the increase in hospital expenditure in the last decade is attributable to population aging and that there is place for health policies to reduce spending and ameliorate health service.

**Methodology**

We analyze the impact of aging on health expenditures using hospital costs. One of the reasons of this choice is that Spanish National Health System (*Sistema Nacional de Salud*) only allows an accurate estimation by age for hospital expenditures. Moreover, hospital costs represent more than 50% of total public health expenditures, being the most important variable in total expenditures. The information used here is collected in the CMBD (* Conjunto Mínimo Básico de Datos al alta hospitalaria*), a register that includes all discharges performed inside Public General Hospitals in Spain. The CMBD also takes into account those specialized hospitals that collaborate with general or regional hospitals, but it doesn’t include psychiatric or long-term care hospitals. It offers detailed information on hospital costs for each hospitalization using the Diagnostic Related Groups (DRG). The DRGs are a patient classification scheme that relates hospitalization episodes to the costs incurred by the hospital. The DRGs were created by Fetter and Thomson from Yale University during the 70s as a mechanism to control hospital health services quality (Mayes, 2007). Using them, each hospital episode can be associated to a cost and to a type of patient.
Therefore, DRGs are associated to a specific cost and the Ministry of Health informs about the number of cases of each DRG by age and sex. With this information age profiles of total and average hospitalization costs are elaborated. Once this is obtained, the total expenditure by age group can be divided among all individuals of the population group estimating average hospital costs by age for the total population.

**Preliminary Results**

Figure 1 shows the age profile of hospital expenditure per capita for 2000 to 2009, in 2000 prices and Figure 2 the aggregate profile by age for the same years. In Figure 1 it can be observed the usual profile of health expenditures following a similar pattern as mortality rates is reproduced here for each year, being the children under 1 year old and the elderly, the age groups that experiment higher costs. There is a general increase of hospital expenditure in all age groups during all these years, however, the rise of average costs is stronger for those individuals being 70 years old and above, and it soars in recent years. Figure 2 gives a different picture, as in the total health expenditures it is the age groups between 60 and 79 that seems to show a greater increase in total costs, compared to the rest of population. The increase in Figure 2 is a combination of demographic and level effects, while Figure 1 only shows the changes in the average cost of each individual of each age group.

**Figure 1**: Age profile of hospital consumption per capita in 2000 prices. Spain, 2000-2009.

Source: CMBD and authors estimations
Table 1 shows the results of the decomposition of hospital expenditure by age group for 2000 and 2009, and some measures of the participation of each age group in the increase of health expenditures between these two reference years. The elderly use more expensive hospital services as more than a half of hospital expenditures are concentrated in people aged 65 and over, while they only represent around 15% of population. People that are less than 39 years old represent 27% in 2000 and 24% in 2009 of the total hospital expenditure, showing a clear decrease of their share in total public hospital expenditures as population ages. A clearer picture is given by looking at the percentage increase between the reference years. The age group with a higher increase in hospital expenditure is for people 80 years and over, being 141%, representing almost 26% of the overall increase. However, the baby boom generation (40-64 years old) represents a special concern, as their hospital costs also increase substantially (almost 77%), and their participation in the total expenditures growth is even higher than those of the elderly (31.4%). If baby-boomers trend is maintained, the sustainability of the entire system will be challenged.

Table 1: Hospital expenditure between 2000 and 2009 by age group, Spain.

<table>
<thead>
<tr>
<th>Age</th>
<th>% Total Expenditure 2000</th>
<th>% Total Expenditure 2009</th>
<th>% Increased 2000-2009</th>
<th>% of Total Increase 2000-2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>5.06</td>
<td>4.61</td>
<td>53.38</td>
<td>3.96</td>
</tr>
<tr>
<td>5-19</td>
<td>4.86</td>
<td>3.52</td>
<td>21.95</td>
<td>1.56</td>
</tr>
<tr>
<td>20-39</td>
<td>17.81</td>
<td>14.67</td>
<td>38.59</td>
<td>10.07</td>
</tr>
<tr>
<td>40-64</td>
<td>27.86</td>
<td>29.29</td>
<td>76.84</td>
<td>31.38</td>
</tr>
<tr>
<td>65-79</td>
<td>38.37</td>
<td>39.24</td>
<td>57.96</td>
<td>27.08</td>
</tr>
<tr>
<td>80+</td>
<td>12.54</td>
<td>12.92</td>
<td>141.19</td>
<td>25.95</td>
</tr>
</tbody>
</table>

Source: INE and authors estimations
Bibliography


