International Comparisons of Health Prices and Volumes: New Findings

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Health Division

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Why looking at prices and volumes is important

1. Cross-country variation in health expenditure could be the result of differences in the prices of goods and services or differences in the volume of care, or a mix of both. Disaggregating health spending into volume and price measures helps policy makers better understand the drivers of cross-country variations, and helps them decide what policy responses should be put in place to address health spending trends. Such policies may differ if, for example, a country's high health care spending is due to relatively high volume of goods and services consumed or to the relatively high price a country pays for those goods or services.

2. This note aims to shed light on the recent advances in the methodology to break down health and hospital spending into their price and volume components. It also shows that health-specific price levels play an important role in explaining differences in per capita health care volumes across countries. Hospital price levels for 2014 are for the first time available for all OECD countries (http://stats.oecd.org/Index.aspx?DataSetCode=PPP2014).

How to go about separating volumes from prices

3. Separating health care expenditure in terms of volume and price requires expenditure data, which are expressed in national currency units, to be converted using an appropriate common currency. By this conversion, differences in the monetary value of spending can be separated into the part that reflect differences in consumption of health care goods and services (i.e. volume) and the part that it is due to differences in prices (OECD/Eurostat/WHO, 2011). The choice of the currency conversion measure, however, can significantly influence the results and interpretation of economic evaluation (Gerdtham and Jönnson, 1991; Kavanos and Mossialos, 1999; Melberg 2011).

4. Whilst market exchange rates are commonly used to convert national currencies to a common unit, they are not ideal for sectors such as health care. First, market exchange rates are determined by the demand and supply for different currencies which are influenced by currency speculation, interest rates, government intervention and capital flows between countries. Second, for many goods and services that are not traded internationally – including government services such as health care, market exchange rates are unlikely to reflect the relative purchasing power of currencies in their national markets. Thus when market exchange rates are used to convert to a common currency, the results reflect not only differences in volume but also differences in price levels across countries. In other words, though shown in the same currency, volumes remain valued at national price levels (Eurostat and OECD 2012).

5. Purchasing power parities (PPPs) (see box 1), on the other hand, are conversion rates that show the ratio of the prices in national currencies of the same basket of goods and services in different countries. Thus they can be used as both currency converter and price deflators. When PPPs are used to convert expenditure to a common unit, the results are valued at a uniform price level and should reflect only differences in volumes of goods and services consumed in countries.

6. Per capita comparisons of health care expenditure presented so far in publications such as OECD Health at a Glance are based on data in national currency units converted into a common currency, using PPPs. GDP PPPs have typically been used as the most available and reliable conversion rates. These are based on a broad basket of goods and services, chosen to be representative of all economic activity. The

use of GDP PPPs means that the resulting variations in health care expenditure across countries reflect not only variations in the volume of health care goods and services, but also any variations in the prices of health care goods and services relative to GDP prices, across countries (Lorenzoni et al., 2014; Morgan et al., 2017). To properly assess differences in health volumes requires calculating robust health-specific PPPs.

Box 1 What are PPPs?

Because the prices of goods and services in different countries are expressed in national currencies, the purchasing power parity (PPP) between currencies of two countries, say A and B, is the number of units of currency of country B (or A) that has the same purchasing power as one unit of currency of country A (or B). Though the PPPs are similar to price index numbers in spatial comparisons, they assume special significance because the PPPs can be used as a conversion factor, in place of exchange rates, in converting various economic aggregates from different countries into a common currency unit (a statistical construct). In their simplest form, PPPs are price relatives that show the ratio of the prices in national currencies of the same goods and services in different countries.

Comparative price levels or price level indices (PLIs) are the ratios of PPPs to exchange rates and provide a measure of the differences in price levels between countries. Thus PLIs are highly dependent on exchange rates fluctuations.

Price collection for non-market goods and services such as health

7. When goods or services are supplied by a non-market producer such as the government, the prices charged to consumers are significantly below the price that a market producer would charge. In some cases, the price may even be zero. It would make no sense to compare such prices charged to patients or consumers across countries, as they reflect administrative decisions and not the true value of products.

8. Rather, there are two alternative possibilities for comparing prices, one based on *inputs* and one based on *outputs*.

- The input-based method, traditionally applied in PPP comparisons of non-market products, such as health services, consists of comparing the prices of inputs in the production process of non-market services. In the case of health services, an input-based method would, for example, compare the wage rate of a surgeon in different countries. In other words, the price comparison is approximated through a comparison of wages or values per unit of inputs.

- The output method consists in comparing the price per unit of output; in the case of medical services, this is typically the *price per treatment*. The comparison of prices per unit of output is – in principle – capable of reflecting productivity differences between countries. It is thus conceptually preferable to input-based approaches (EC et al., 2009, paragraph 15.122). Given that output prices for health and hospital products are not readily observable in open and competitive market transactions, "*quasi prices*" are imputed to approximate what a market price might have been, if there were a market.

Health and hospital PPPs and calculation of price levels indices

9. Eurostat and the OECD have calculated PPPs for GDP and some 50 product groups, including health, on a regular and timely basis since the early 1980s. In recent years a number of countries have worked towards output-based measures of prices of health care goods and services (Koechlin et al., 2014; Koechlin et al., 2015). The output-based methodology has then been used by Eurostat and the OECD to produce both health and hospitals PPPs, which are now incorporated into the overall calculation of GDP

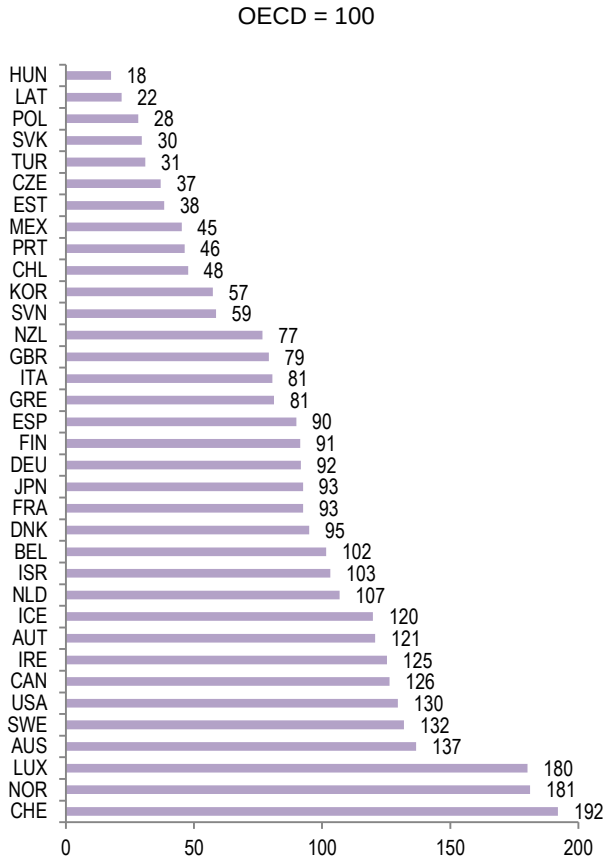
PPPs. Such PPPs can be used to calculate (health and hospital) price level indices (PLI) that can be used to compare price levels across countries. These indices are calculated as ratios of (health and hospital) PPPs to exchange rates, and indicate the number of units of a common currency needed to purchase the same volume.

10. The remaining part of this note reports hospitals and health price levels for OECD countries for 2014 [1], and shows the role of health-specific price levels in explaining variation in per capita health care volumes across countries.

Price levels for hospitals vary by a factor of 11 across OECD countries

11. Figure 1 compares the price level index for hospitals for 2014. This means that, for a basket of hospital services which costs 100 units on average in OECD countries, an equivalent basket would cost 7% more in the Netherlands and 26% more in Canada.

Figure 1. Price level indices for hospital services, 2014



Source: OECD-Eurostat Purchasing Power Parities Survey, 2016.

12. As shown in Figure 1, price level indices for hospital services vary widely across countries, a range of nearly 1-11. Hungary and Latvia have price levels that are 18% and 22% of the average OECD price level respectively, whereas in Switzerland hospital services are priced at 192% of the OECD average.

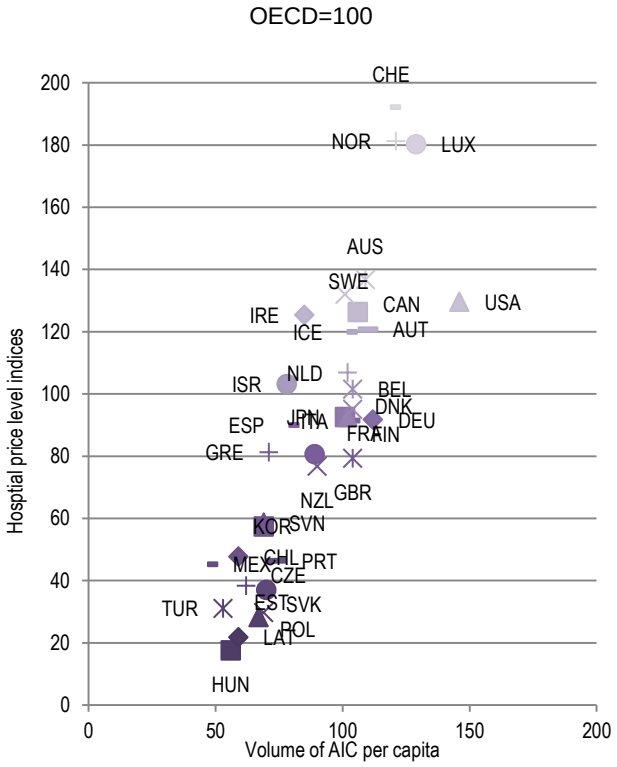
1. For the Republic of Korea, New Zealand, Turkey and the United States hospitals PPPs are estimated predominantly by using salaries of medical and non-medical staff (input method).

Broadly, three clusters of OECD countries can be identified: seven mainly Central and Eastern European countries with PLI below 40, 18 countries with PLI between 40-110 and ten countries with PLI over 110, including Switzerland, Norway, Luxembourg and the United States.

Hospital price levels tend to correlate with household welfare

13. Figure 2 shows the price levels for hospitals plotted against the index of real per capita actual individual consumption (AIC)[2], which constitutes a measure of average household material welfare. In line with expectations, there is a strong correlation: higher levels of AIC correspond to higher price levels for hospitals as richer countries have generally higher price levels than poorer ones. The correlation is, however, not perfect: as an example, the hospital price level in Switzerland is twice the level observed in Germany, for comparable consumption levels.

Figure 2. Comparison of price levels for hospital services and per capita actual individual consumption, 2014



Source: OECD-Eurostat Purchasing Power Parities Survey, 2016.

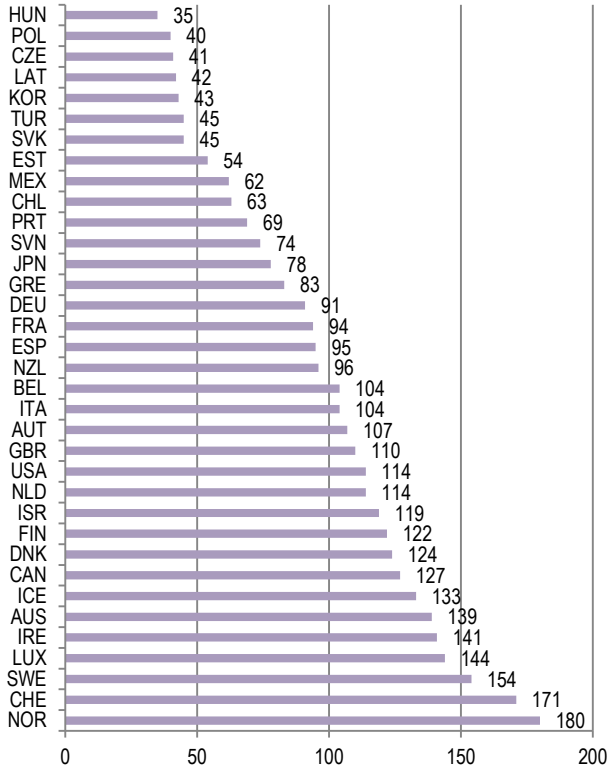
Overall health price levels show less variation than hospital specific price levels

14. To obtain PPPs for total health care, PPPs for hospital services need to be combined with PPPs for other health care goods and services. Because hospitals are an important part of health care services - on average, OECD countries spend approximately 30% of health care expenditure on hospital services – overall health prices are highly dependent and correlated to the hospitals results presented above. That said,

2 AIC corresponds to household consumption adjusted for social transfers in kind, that is health, education or housing services provided by government.

the spread of health PLIs is less pronounced than that of hospital PLIs also because health includes also products, such as pharmaceuticals and therapeutic appliances, which are tradable[3] (Figure 3).

Figure 3. Price level indices for health, 2014, OECD=100



Source: OECD-Eurostat Purchasing Power Parities Survey, 2016.

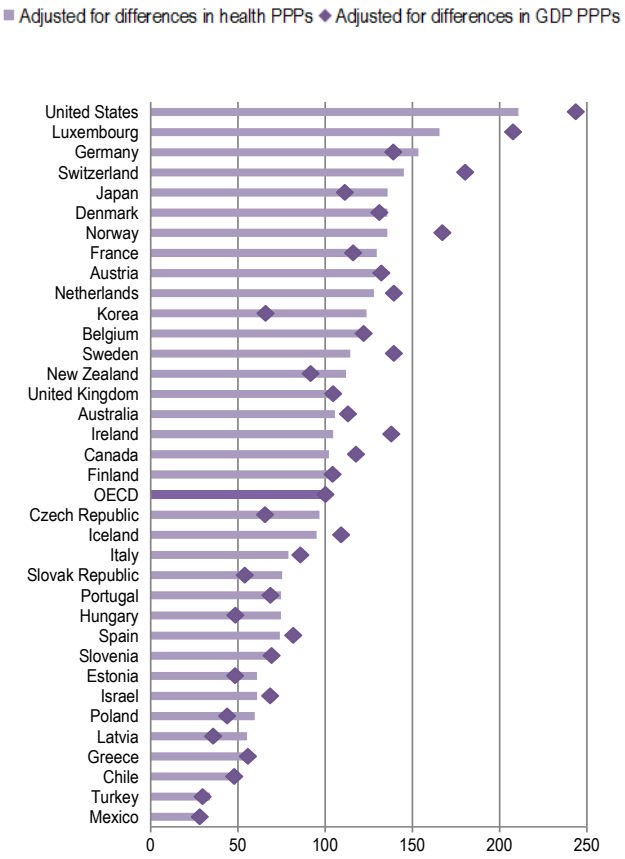
Less variation in per capita health care volumes across countries

15. Dividing per capita health care expenditure by the respective PPPs gives a measure of real (i.e. price level adjusted) expenditure or volume of health care goods and services consumed. Figure 4 shows the change in the per capita volume index of health care if health-specific PPPs rather than GDP PPPs are used. The spread of per capita health volumes is less pronounced if health-specific PPPs are used (the ratio of the highest-volume to the lowest-volume country is 7.8 instead of 8.7). This is because price level indices for health tend to vary more across countries than price level indices for GDP.

16. When accounting for such differences, the gap between the United States and other countries is substantially smaller – 32 percentage points - than in comparisons adjusted for differences in general price levels. On the contrary, the health per capita volume index for the Republic of Korea is 57 percentage points higher if health-specific deflators are used as the health price level is much lower as compared to economy-wide price level.

3 The prices of tradable products are determined by the law of one price because if a country prices its tradable products too high they will not be sold. Prices for non-tradable products are determined by local circumstances, in particular productivity, which is generally higher in high-income countries. Price level differences between countries are therefore greater for non-tradable than they are for tradable products (Eurostat and OECD 2012).

Figure 4. Health expenditure per capita as a proportion of OECD average (=100), 2015



Source: OECD-Eurostat Purchasing Power Parities Survey, 2016.

The use of health and hospital-specific price levels is recommended

17. To reveal to what extent spending across countries is the result of price and volume effect, the use of health and hospital PPPs is preferable. As an example, the relatively high health prices helped explain the overall high level of health spending in Norway (Morgan et al. 2017). Private hospital prices were estimated to be expensive relative to what could reasonably be predicted given South Africa's income (Lorenzoni and Roubal, 2016). Wider use of health- and hospital-specific price levels would help better informing policy debate, analysis and reform.

REFERENCES

EC, IMF, OECD, UN and World Bank (2009), *System of National Accounts 2008*, European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations and World Bank, New York, Dec. 2009.

Eurostat (2001), *Handbook on Price and Volume Measures in National Accounts*, Luxembourg.

Eurostat and OECD (2012), *Eurostat-OECD Methodological Manual on Purchasing Power Parities (2012th ed.)*, European Union, Luxembourg.

Gerdtham, U. and B. Jonnson (1991), "Conversion Factor Instability in International Comparisons of Health Care Expenditure", *Journal of Health Economics*, Vol. 10, pp. 227–234.

Kavanos, P. and E. Mossialos (1999), "International Comparisons of Health Care Expenditures: What We Know and What We Do Not Know", *Journal of Health Services Research and Policy*, Vol. 4(2), pp. 122–125.

Koechlin, F., P. Konijn, L. Lorenzoni and P. Schreyer (2015), "Comparing Hospital and Health Prices and Volumes across Countries: A New Approach", *Social Indicators Research*, http://dx.doi.org/10.1007/s11205-015-1196-y.

Koechlin, F., P. Konijn, L. Lorenzoni and P. Schreyer (2014), "Comparing Hospital and Health Prices and Volumes Internationally: Results of a Eurostat/OECD Project", *OECD Health Working Papers*, No. 75, OECD Publishing, Paris.

Lorenzoni, L., A. Belloni and F. Sassi (2014), "Health-care Expenditure and Health Policy in the USA versus Other High-spending OECD Countries", *The Lancet*, Vol. 384 (9937), pp. 83-92.

Lorenzoni, L. and T. Roubal (2016), "International Comparison of South African Private Hospital Price Levels", *OECD Health Working Papers*, No. 85, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jrrxrzn24wl-en.

Melberg, H. (2011), "Some Problems with International Comparisons of Health Spending – and a suggestion how to quantify the size of the problem", Working Paper 2011:4, University of Oslo & HERO, Department of Health Management and Health Economics.

Morgan, D., M. Gmeinder and J. Wilkens (2017), "An OECD Analysis of Health Spending in Norway", *OECD Health Working Papers*, No. 91, OECD Publishing, Paris, http://dx.doi.org/10.1787/63302bbf-en.

OECD/Eurostat/WHO (2011), *A System of Health Accounts*, OECD Publishing, Paris.