
PriceMetrics

Assessment of the Methodologies and Data used in the OECD Working Paper “International Comparison of South African Private Hospital Price Levels”

Mike Holland

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PriceMetrics (Pty) Ltd
The Business Centre
William Nicol, Corner of Leslie Avenue
The Design Quarter
Fourways
Sandton
South Africa
2055
011 513 4252

Introduction and summary

1. This report is an assessment of the methodologies used in the analysis and conclusions of an OECD working paper *International Comparison of South African Private Hospital Price Levels*¹ (“the report”) authored by Luca Lorenzoni and Tomas Roubal (“the authors”) and published in February 2016. Our report was commissioned by Mediclinic Southern Africa (Pty) Ltd.
2. The purpose of the OECD report was “to conduct a comparison of price levels for private hospital services in South Africa with hospital services in the public and private sector in a selection of OECD countries.”² The period covered was 2011 to 2013.
3. According to the authors, South African “private hospital prices are expensive relative to what could reasonably be predicted given the country’s income and are likely to be expensive even for individuals with higher levels of income. However, the findings have implications far beyond the personal budgets of the fraction of the population that can afford them, as they set benchmarks for how much the public sector has to attract medical specialists to work in the public sector. This study suggests that policies to control price increases while ensuring accessibility and quality are needed. There is scope to improve the value provided to South Africans for their considerable spending on health care.”³
4. Our assessment of the authors’ methodologies and data used to reach and justify these claims is that there are a number of flaws and weaknesses in their data and analysis that preclude a valid comparison of the prices charged by hospitals and specialists in South Africa to the price calculations in their sample of OECD countries. Their policy recommendations based on their methodologies are consequently invalid.

Methodologies used in the OECD report

5. To measure the relative price level indices, the authors identified a set of common surgical procedures and other health care services (“case types”) provided by hospitals in South Africa and in European OECD countries. A case type refers to “categories of hospital services that are similar from a clinical perspective and in term of their consumption of resources”⁴ and are sufficiently representative of hospital services to allow international price comparisons.
6. The case types consisted of 7 Medical-Inpatient services; 21 Surgical-Inpatient services and 4 Day Surgery/Outpatient Surgery services, a total of 32 services. The authors obtained hospital data in South Africa from several medical aid schemes which accounted for 59,4% of total beneficiaries in the medical aid scheme sector at the end of 2013. The data included number of cases by case type, the average length of stay by case type, and average prices charged by healthcare service providers for the cases by case type.
7. For each of the 32 case types, hospital data for 20 out of the 34 OECD countries was obtained from the OECD-Eurostat Hospitals Purchasing Power Parity (PPP) survey. The countries were Austria, Czech Republic, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland and the United

¹ OECD Health Working Paper No. 85 (DELSA/HEAWD/HWP(2015)8)

² Lorenzoni, L., and Roubal, T., (2016). *International Comparison of South African Private Hospital Price Levels*. OECD Health Working Paper No. 85, OECD Paris, page 4, paragraph 2.

³ Ibid, page 4, paragraph 5.

⁴ Ibid, page 12, paragraph 21.

Kingdom. The average Gross Domestic Product (GDP) per capita in PPP terms for the sample was \$41 224 in 2013 compared to South Africa's \$12 891. The authors used a second comparison group of seven countries (Czech Republic, Estonia, Hungary, Poland, Portugal, Slovenia and Spain) with an average GDP per capita of \$27 323 in 2013 which was considered by the authors to be closer to the South Africa level.

8. The data for the OECD countries covered the number of admissions, length of stay including the coefficient of variation, exclusion criteria and price calculations.
9. Using this data the authors calculated PPPs for each of the 32 hospitals case types in South Africa and each OECD country in the sample and obtained an average price level, with the weights being the total cost for each type (price times the number of cases) expressed as a percentage of the total cost of all case types. The average for the OECD countries was calculated using geometric means and set at a value of 100. Each country's comparative price level was then expressed in relation to the mean of 100. The authors stressed that "the results should be interpreted at the relative positions of countries rather than looking at absolute numbers."⁵

Assessment of the methodologies and data in the report

10. In our assessment we used a number of sources of information published by the OECD, the WHO and the U.K. Competition Markets Authority as well as academic papers on healthcare services and policy in South Africa and OECD countries. In particular we analysed in detail an OECD report published in 2014 titled *Comparing Hospital and Health Prices and Volumes Internationally. Results of a Eurostat/OECD Project*, OECD Health Working Paper No. 75, by Koechlin, Konijn, Lorenzoni, and Schreyer ("Koechlin et al"). This report sets out and discusses in more detail the methodologies used to estimate "prices" of each case type in the sample of OECD countries and the methodologies to calculate price indices on a PPP basis. The report by Lorenzoni and Roubal is an application and extension of the methodologies in the Koechlin et al report.
11. Our conclusions are there are a number of flaws and weaknesses in the authors' methodologies and application of the data that preclude a meaningful comparison of the "prices" charged by hospitals and specialists in OECD countries to the market prices charged in South Africa by private hospitals, specialists and other health care service providers. Our primary conclusion is that the methodologies for calculating the prices in the sample OECD countries, which are not market prices but non-market prices called quasi-prices, have a number of weaknesses that prevent any meaningful comparison to market prices of the case types charged by private hospitals and doctors in South Africa. Secondly, we find comparing the health systems of European OECD countries to not only South Africa but also other middle income per capita countries also lacks validity. The reasons are the substantially different nature of the healthcare systems, the wide disparity in income levels per capita on a PPP basis and the differences in the economic, demographic and socioeconomic structure between the two sets of countries. A more appropriate and accurate analysis to establish whether prices in South African hospitals are excessive is to compare the prices in the country to prices in other developing countries with similar relative market characteristics and structure of public and private sector expenditure on health.⁶ Other weaknesses in the report are that the authors use a wrong GDP per capita figure to calculate the affordability of private hospital prices in South Africa; apply an inappropriate methodology of using macroeconomic data to analyse a microeconomic market; and provide an unconvincing cost analysis to explain "high" prices in South Africa.

⁵ Ibid, page 16, paragraph 32.

⁶ Even this kind of analysis has flaws as discussed later in the report.

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12. The result is that the conclusions and recommendation to control (i.e. regulate) prices of hospital services are invalid. Our detailed assessment is as follows.

The calculations of OECD “prices” data used in the report are not comparable to South African market prices

13. There is a major flaw in the authors’ methodologies and data that precludes any accurate comparison of private hospital prices between their sample of OECD countries and South Africa. Their study could have consisted of a comparison of prices for the chosen case types charged by private hospitals in OECD countries to the prices charged by South African private hospitals, specialists and other private sector service healthcare providers. Lorenzoni and Tomas did not adopt this methodology. Instead they calculated PPP prices for OECD countries as *non-market prices* (called *quasi-prices*) which were largely obtained from public sector hospitals in each OECD country, and compared them to the actual *market prices* charged by healthcare service providers to the medical aid schemes in South Africa. In principle, comparing a set of market prices in one country to a set of largely non-market prices in other countries is valid only if there is evidence the non-market prices would replicate accurately actual market prices in those countries. We find that the methodologies and data for estimating quasi-prices used by the authors do not meet this standard: they substantially understate the prices that would have to be charged in the markets if private hospitals are to be profitable in OECD countries and in South Africa. Given these problems, our analysis concludes that the authors’ calculations of these quasi-prices are not comparable to market prices in South Africa.

Incomparable Data: OECD “Prices” are Public and Private Sector Prices Compared to Private Sector Market Prices in South Africa

14. The authors used a combination and average of public sector “prices,” i.e. a non-market sector, and private sector prices to calculate the price levels in OECD countries: “Note that data from OECD countries include both public and private providers.”⁷ The report give no details on the weights between the public sector “prices” and private sector prices.
15. The authors justify their methodology by arguing: “The public sector in OECD countries with health insurance systems tends to have some form of price setting for specialist medical services, and this often provides benchmarks for the private sector. This mechanism has been used as a means to use private sector facilities to expand access to hospitals. Thus, given the structure of the private sector, the extent of contracting with public and private service providers, and the price setting mechanisms commonly used by governments, we would anticipate that prices in OECD countries with health insurance systems would be similar regardless of public or private hospital ownership.”
16. This is a very questionable assumption. Firstly, the OECD “prices” calculated for the case types, known as “quasi-prices,” in the Eurostat database are available only for a small-subset of treatments: the authors do not explain how the private sector would set prices for the remaining large set of treatments given there are no quasi-prices available. Secondly, as we outline below, if private sector hospitals used quasi-prices as a benchmark they would not be able to cover their costs and would go out of business. Thirdly, there is direct evidence in at least one OECD country, the U.K., to contradict the authors’ assumption. The U.K.’s Competition and Markets Authority (CMA) investigated the private healthcare market including price-setting by private hospitals.⁸ In both its provisional and final report

⁷Lorenzoni, L., and Roubal, T., (2016). *International Comparison of South African Private Hospital Price Levels*. OECD Health Working Paper No. 85, OECD Paris, page 14, paragraph 27.

⁸CMA (2014) *Private healthcare market investigation: final report*.

there is no mention of quasi-prices. Rather, in its Provisional Report⁹ the CMA stated how prices were set, which is very similar to the price-setting process in South Africa:

“Comparing insured prices is not a straightforward task. Insured prices are an outcome of bilateral negotiations between hospital operators and PMIs. During negotiations, discussions typically focus on the price of the overall bundle of a hospital operator’s services (or the associated revenue), with relatively little focus on the price of individual treatments. The prices of individual treatments are generally not set at the hospital level, but are constant across the hospital operator’s portfolio of hospitals contracted with the PMI, thus reflecting an average (national) price of the treatment. Pricing patterns can vary across hospital operators and PMIs. While a particular hospital operator may have a lower price for one treatment, this may be offset by a higher price for a different treatment. This means that comparing the price of too small a number of treatments may lead to distorted results as the hospital operator may have higher or lower prices elsewhere.”

17. The evidence in the U.K. of price-setting as a bilateral bargaining process between insurers and hospitals equates with other countries’ practices, for example the U.S.¹⁰
18. The report’s assumption that prices in the private sector are similar or linked to the public sector is also in conflict with the OECD Koechlin et al report.¹¹ For example, Koechlin et al state regarding price-setting in the private sector in Slovakia where: “Since 2003, prices in Slovakian hospitals for inpatient care have been determined by negotiation between insurers and providers. However, average prices between state-owned and non-state owned hospitals vary by between 30% - 104%, with even greater variation if certain quality criteria are included. In the outpatient sector prices are uniform (reference omitted). This systematic price heterogeneity provides some cause for concern about the ability to calculate underlying cost structures and quasi-prices.”¹²

Quasi-prices are not market prices making any comparison invalid

19. The problem for the authors is that the public sector does not charge market prices which have to cover costs but instead as a non-market sector provides services which are either free or bear no relationship to the opportunity costs of providing the service. Consequently, prices in the sector have to be created as if they did exist at levels typical of a competitive market. The report states: “When goods or services are supplied by a non-market producer, measurement is based on costs per unit of case type or *quasi-prices*. They are those (unobserved) ‘prices’ that emulate a competitive situation where prices equal average costs per product. Unit costs can be treated as *if they were prices* ... (references omitted). The term ‘quasi-prices’ is used in recognition that those values are frequently not observed in open and competitive market transactions and are imputed to approximate what a market price might have been, if there were a market.”¹³
20. The difficulty for the authors is to calculate accurately market prices in competitive markets when they do not exist. The authors could, as we mentioned above, have avoided the problem by using private sector prices in OECD countries but chose instead to create quasi-prices from the OECD-Eurostat hospitals’ PPP survey which collects data on the average quasi-prices for the selected 32 case types.¹⁴

⁹ U.K. Competition Commission, now part of the CMA, (2013) *Private healthcare market investigation, Provisional findings report*, Appendix 2, page A6(12)-2, paragraph 4.

¹⁰ There many studies on the bilateral bargaining process between insurers and hospitals in the U.S. A recent example is Ho, K., and Lee, R.S., (2013) *Insurer Competition in Health Care Markets*. NBER Working Paper 19401.

¹¹ Koechlin, F., Konijn, P., Lorenzoni, L. and Schreyer, P (2014) *Comparing Hospital and Health Prices and Volumes Internationally. Results of a Eurostat/OECD Project*, OECD Health Working Paper No. 75, page 41, paragraph 83.

¹² Ibid, page 41, paragraph 83.

¹³ Lorenzoni, L., and Roubal, T., (2016). *International Comparison of South African Private Hospital Price Levels*. OECD Health Working Paper No. 85, OECD Paris, footnote 14, pages 14-15.

¹⁴ Our earlier quotation from the Koechlin et al report on Slovakia shows that private sector price data is available.

The survey's quasi-prices "are normally extracted from administrative databases maintained for the purposes of reimbursement and health financing. The quasi-price can be a negotiated price or an administered price; where the former refers to prices that have been established through negotiations between purchasers (third party payers) and providers of hospital services; and the latter reflect the average costs of the service provided."¹⁵

21. The result is that the report compares calculated artificially constructed, non-market related "prices" in OECD countries to actual market prices determined by demand and supply factors for private hospital services in South Africa. Our analysis shows the quasi-prices calculated by the authors substantially understate the average costs of supply of hospital services for the 32 case types. Specifically, the quasi-prices calculated from the OECD survey do not account for the full costs that market prices need to cover for a private sector provider of health care services. Adjusting them to market prices will result in a substantial increase in quasi-prices in the OECD countries to make them comparable to the market prices in South Africa.

The Quasi-Prices in the OECD sample of countries do not cover the full costs of production such as the cost of capital

22. In their use of the quasi-prices the authors comment: "it is important that they cover the same types of costs across all participating countries reflecting the direct costs as well as the capital costs and overhead costs relating to the production of health services. The cost items included in the quasi-prices are listed in Annex 1."¹⁶ A review of the costs included in the calculation show that there is no cost of capital included in the quasi-prices. The only capital cost is the consumption of fixed capital, i.e. depreciation. In contrast the market prices in South Africa will include a return on capital to shareholders and other providers of capital. Without a return on capital the services provided by private hospitals would not exist. The quasi-prices calculated in OECD countries therefore need to be adjusted upward for the cost of capital to make them comparable to prices in South Africa.

Table 1: Summary of the Report's Annex 1 – Cost Items Covered by Quasi-Prices

Category	Type of Average Cost
Overhead costs	Medical infrastructure
Overhead costs	Non-medical infrastructure
Capital costs	Consumption of fixed capital excluding R & D costs
Direct costs	Compensation of employees
Direct costs	Goods and services

Source: The report, Annex 1 page 39

In addition, Prices will be higher in South Africa than OECD countries because of the country's higher cost of capital

23. The adjustments to the quasi-prices need to be made by country because the cost of capital generally varies between countries. In South Africa prices of healthcare services as well as goods and services in general will be higher than in OECD countries because the country's cost of capital is higher. Table 2 shows the market cost of equity (required rate of return to a company's shareholders) and the cost of government debt (risk-free rate) for South Africa and a sample of OECD countries in 2013. The data is based on a survey by Fernandez et al.¹⁷ of investment analysts, managers and finance and

¹⁵ Lorenzoni, L., and Roubal, T., (2016). *International Comparison of South African Private Hospital Price Levels*. OECD Health Working Paper No. 85, OECD Paris, page 15, paragraph 27.

¹⁶ The calculation is based on methodologies outlined in *A System of Health Accounts* (SHA) published by the OECD, Eurostat and WHO. The latest version is dated 2011.

¹⁷ Fernandez, P., Aguirreamalloa, J., and Linares, P. (2013) *Market Risk Premiums and Risk-Free Rate used for 51 Countries in 2013: a Survey with 6 327 Answers*. IESE Business School.

economics academics in 51 countries. The higher cost of capital in the economy, which is beyond the control of companies, is included in the prices of South Africa health care service providers in the data set used by the authors.¹⁸

Table 2: Cost of Capital in South Africa and Selected OECD Countries in 2013

Country	Required Return to Equity	Risk-Free Interest Rate
Australia	10,2%	3,3%
Czech Republic	8,1%	1,7%
France	8,1%	1,7%
Germany	7,5%	1,9%
Hungary	12,7%	4,6%
U.K.	7,9%	2,4%
U.S.A.	8,0%	2,4%
South Africa	13,2%	6,4%

Source: Fernandez et al.

Quasi-Prices used in the report do not account for informal and sometimes formal co-payments

24. The quasi-prices are understated by not including informal co-payments. In the OECD publication *Comparing Hospital and Health Prices and Volumes Internationally*¹⁹ Koechlin et al state: “In some countries the consumption of health care goods and services is often related to informal payments, so-called “envelope payments” or “under-the-table payments” (footnote omitted). Regardless of whether these payments relate to normal or additional services provided to patients, or represent a patient’s additional gratitude to the physician, these extra unrecorded payments increase the incomes of healthcare providers on one side and add to the financial burdens of the consumer on the other side.” The authors add the following comments: “In some instances, even official patient co-payments may not always be captured by administrative data collections, thereby leading to under-reporting of quasi-prices,” “It is not always clear that even such official co-payments are observed in the administrative cost data²⁰ and, “The available evidence shows that in some countries informal payments occur frequently and can be large. *This suggests that in some instances the quasi-prices reported in some health systems highly under-represent the actual costs of health care.*”²¹ (our italics added).²²

Other costs of production excluded from quasi-prices but included in market prices

25. The quasi-prices in OECD countries do not include “research and development expenditure in health” and “training and education expenditure on health personnel.”²³ Quasi-prices were reduced by 1,26%

¹⁸ The survey covers the major elements of the Capital Asset Pricing Model (CAPM) except the beta. It therefore represents the market risk in each country of holding a diversified equity portfolio. The cost of capital for individual private hospitals will vary depending on their systematic risk in relation to the market risk. Since 2013 the cost of equity has risen while it has fallen in many OECD countries. The required rate of return on equity for South Africa in the 2015 survey was 15,9% and the risk-free rate (long-term government bond) was 8,2%.

¹⁹ Koechlin, F., Konijn, P., Lorenzoni, L. and Schreyer, P (2014) *Comparing Hospital and Health Prices and Volumes Internationally. Results of a Eurostat/OECD Project*, OECD Health Working Paper No. 75. at page 22, paragraph 52,

²⁰ Ibid, page 22, paragraph 56.

²¹ Ibid, page 22, paragraph 57.

²² Ibid, page 22, paragraph 55. Koechlin et al state: Given their nature, it is often difficult to obtain accurate data on the size of informal payments. A 2010 survey of health care consumers in the targeted countries reveals that in Lithuania, Romania and Hungary almost half of hospitalised patients made informal payments. In Bulgaria around 50% paid only formal charges ... (reference omitted). In Hungary, the amount of informal payments adds a significant expense for patients as it equals 13.7% of the average monthly salary ... (reference omitted). In Bulgaria, the size of informal payments was estimated to be equal to 3.6% of public expenditure on health and 47.1% of all out-of-pocket payments ...” (reference omitted).

²³ Ibid, page 14, paragraph 32.

for research and development and 1,18% for training and education expenditure. For the data to be comparable to the private sector the quasi-prices should include these costs.

Hospital deficits are not included in quasi-prices leading to under-valuation of quasi-prices

26. If revenues are less than their costs hospitals incur deficits which means that quasi-prices are set at too low a level. Koechlin et al acknowledge this is a significant problem in some OECD countries: “The presence of financial deficits indicate that the revenue received by hospitals do not cover their total costs. This, in turn, may be a sign that the prices received by hospitals through the DRG-based payment system are too low.²⁴ Deficits have been a relatively common feature in a number of health care systems, including some CEE countries. The presence of deficits may indicate that quasi-prices are intentionally set by payers at a lower level than full cost of production. If this is the case, then there is a possibility of under-valuation of quasi-prices.”²⁵
27. Although Koechlin et al state that the health deficits are being reduced some countries are still incurring large deficits. For example, the latest quarterly report²⁶ of National Health Service providers (hospitals and clinics) in the U.K. showed an operating deficit (Earnings Before Interest Tax Depreciation and Amortisation or EBITDA) of £2,26 billion (R49,4 billion)²⁷ for the period March to December 2015. The forecast for the 2015/16 year is £2,37 billion (R51,8 billion), a figure which is *before* charges for the consumption of capital (depreciation) and interest. It is highly unlikely that the quasi-prices from the U.K. based on the report’s methodology will cover the costs of production for the case types included in the country’s contribution to the OECD price indices.

Arbitrary and questionable rates of fixed capital consumption in quasi-prices

28. In their calculation of quasi-prices for the Eurostat survey some countries did not include consumption of fixed capital (CFC) from their cost calculation. Koechlin et al state: “To account for those differences, 4.8% was added to prices for consumption of fixed capital for the following countries: Bulgaria, Croatia, Denmark, Germany, Hungary, Ireland, Latvia, Lithuania, Norway and Switzerland. Countries were identified on the basis of the results of the 2013 hospital PPP metadata questionnaire. The add-on figure was estimated on the basis of National accounts data from the German Statistical Office.”²⁸ The approach is an arbitrary one and the use of an average rate of 4,8% for the depreciation (equivalent to an economic life of average assets of over 20 years) of fixed assets seems implausibly low, particularly for hospital plant and equipment. The application of German data to other countries is also open to question.

²⁴ Ibid, page 23, paragraph 58.

²⁵ Ibid, page 23, paragraph 59. The authors state many countries have substantially reduced the size of their health care deficits as well as the number of countries in which deficits exist. While the presence of deficits may require careful interpretation and monitoring in future PPP results, there are signs that this issue is being resolved. The authors do not provide any quantitative evidence for their conclusion. The deficits can be substantial. Koechlin et al quote the example of Hungary: “The Hungarian Insurance Fund operates at a deficit and has experienced consistent gaps between expenditure and revenue since the implementation of DRGs. This figure has been as high as 23.8% of total health expenditure (or 1.7% of GDP), although for 2010 the overspending has reduced to 4.8% of health expenditure (0.3% of GDP)” (paragraph 58)

²⁶ NHS Trust Development Authority, (25 February 2016). *Quarterly report on the performance of the NHS provider sector; 9 months ended 31 December 2015*.

²⁷ On the 25 March 2016 the rand/sterling exchange rate was R21,84 to one pound sterling. Source: <http://gbp.fxexchangerate.com/zar/>

²⁸ Koechlin, F., Konijn, P., Lorenzoni, L. and Schreyer, P (2014) *Comparing Hospital and Health Prices and Volumes Internationally. Results of a Eurostat/OECD Project*, OECD Health Working Paper No. 75, page 14, paragraph 31.

Heterogeneity in product reduces validity of results and questionable research practices by the authors

29. One of the problems in obtaining accurate results was the likelihood of product heterogeneity by country. If there is significant heterogeneity in the characteristics of each country's products quasi-price comparisons between countries and average quasi-prices are less reliable. The survey showed a wide dispersion of price level indices that may have been caused by this problem. Koechlin et al comment:²⁹ "The fact that a large part of variation is accounted for by cross-country differences provides some indication that these come as a result of systematic differences between countries in the way that hospital services are provided (in particular different practices concerning the length of a hospital stay), rather than factors that are associated with individual case types. Koechlin et al add:³⁰ "In a bid to increase homogeneity even further, countries were asked to restrict their sample of hospitalisations to standard profiles of care and a length of stay no greater than 1.5 standard deviations away from the case type mean. Even with these restrictions, it is possible that cross-country heterogeneity in any specific case type remains. One potential source of unobserved heterogeneity may be complexity of cases which, in turn, could result in higher average resource use and costs." We find it concerning that to reduce heterogeneity the researchers' methodology is to remove the heterogeneous data from the survey.

Possible biases in the survey responses

30. The report used an average of OECD levels of the 30 countries in the survey. The response rate to the survey which was used by the report's authors was mixed with some countries providing a high response to the survey and others a very low response. Low responses were received from France (5% of hospitals), Finland (17%), Ireland (23%) and Switzerland (38%). Averaging countries quasi-prices based on such major differences may lead to unreliable averages of the quasi-prices.

Different accounting systems, and measurement problems for quasi-prices reduce the reliability of the price indices

31. In general, Koechlin et al conclude, "Countries share many common features in the collection of data used for measuring the costs of hospital products that form the basis of the quasi-prices, but there are also some important differences that need to be accounted for. It is clear that the cost accounting systems used by the countries will not be harmonized (reference omitted), but the results should be comparable.³¹ However, Koechlin et al add: "Some of the results reported in this paper require further interpretation and analysis as there is the possibility of systematic under- or over-valuation of quasi-prices for some of the lower income, primarily CEE, countries."³² A further problem of reliability of the data is identified in the report as Lorenzoni and Tomas Roubal point out: "Price levels depend on exchange rates and may be subject to large variations in line with exchange rates swings and should therefore be interpreted with caution."³³ The depreciation of the rand exchange rate is a good example. On 31 March 2011 the dollar/rand exchange rate was R6,77³⁴ to one dollar; on 31 March 2013 the dollar/rand exchange rate was R9,24 to one dollar.³⁵

²⁹ Ibid, page 20, paragraph 46.

³⁰ Ibid, page 16, paragraph 40.

³¹ Ibid, page 14, paragraph 29.

³² Ibid, page 21, paragraph 47.

³³ Ibid, Lorenzoni, L., and Roubal, T., (2016). *International Comparison of South African Private Hospital Price Levels*. OECD Health Working Paper No. 85, OECD Paris, page 16, paragraph 35

³⁴ Source: <http://www.exchange-rates.org/Rate/USD/ZAR/3-31-2011>

³⁵ Source: http://www.exchangerates.org.uk/USD-ZAR-31_03_2013-exchange-rate-history.html

The wide range of quasi-prices in OECD countries reduces the reliability of the average price level indices used in the comparison to South Africa

32. The results of the calculations of quasi-price level indices from the international comparison in the OECD showed that the indices for hospital services vary widely across countries. Koechlin et al comment: “Bulgaria and Romania have price levels that are 17% of the average EU price level, whereas in Switzerland hospital services are priced at 246% of the EU average, a range of nearly 1 to 15. Broadly, three clusters of countries can be identified: fourteen mainly Central and Eastern Europe (CEE) countries and Western-Balkan countries with PLIs below 50, sixteen countries with PLIs between 50 and 150 and seven countries with PLIs above 150.”³⁶
33. Using a simple average with such a very substantial variance in the indices makes the number unlikely to be representative when comparing to another set of data like the South African data. Lorenzoni, and Roubal acknowledge the problem and use a subset of lower GDP per capita PPP countries to compare to South Africa but the sample is very small: seven countries comprising the Czech Republic, Estonia, Hungary, Poland, Portugal, Slovenia and Spain. Five of these countries are former socialist countries where there was no private sector healthcare and which currently have a small private health care sector, albeit growing significantly. It is difficult to see the relevance of comparing countries with socialist-style health care systems to South Africa’s private healthcare system. The size and structure of these Eastern European countries’ economies are also very different to South Africa (and also to the remaining countries in the sample, Portugal and Spain), making comparisons of their health care systems to South Africa even more difficult to justify.

The quasi-prices were not adjusted for quality differences in case type treatments

34. Prices in separate markets are not strictly comparable unless they are quality-adjusted. Neither the Eurostat survey nor the authors have undertaken this task. Koechlin et al state: “The comparison of product types across countries assumes that these services are delivered with the same level of quality. This is a strong assumption but it should be noted that it is also implicit in other PPP comparisons. Also, the methodology at hand has been designed to minimise biases through quality differences by only comparing hospital products with the same or very similar characteristics. In this way, stratification keeps quality constant if the products included in a particular stratum are relatively homogeneous.”³⁷
35. This statement is weakened by the acknowledgment, as shown above, that product heterogeneity is a problem in the survey’s results. Koechlin et al add that: “Nevertheless, further work may be required to control for potential quality differences” and “This would entail regular monitoring of hospital products, particularly when different technologies become available. Over the longer term, methodological advancement could occur by augmenting the analysis with an explicit quality adjustment based - as an example - on post-treatment survival, life expectancy and waiting times and patient-reported outcome measures”³⁸ (references omitted). Since the quasi-prices are derived from data in both the public and private health sectors while the South African prices are for the private sector only it is reasonable to assume that the quasi-prices do not reflect the same quality. One of the reasons people pay for private healthcare is the expectation that the quality of care will be higher.

³⁶ Koechlin, F., Konijn, P., Lorenzoni, L. and Schreyer, P (2014) *Comparing Hospital and Health Prices and Volumes Internationally. Results of a Eurostat/OECD Project*, OECD Health Working Paper No. 75, page 15, paragraph 38.

³⁷ Ibid, page 23, paragraph 60.

³⁸ Ibid, page 23, paragraph 61.

The authors acknowledge the reliability of the current Eurostat survey results for quasi-prices need further refinement and accuracy

36. Overall, given the problems with the survey's results, one of Koechlin et al's conclusions is: "Some of the results reported in this paper require further interpretation and analysis as there is the possibility of systematic under- or over-valuation of quasi-prices for some of the lower income, primarily CEE, countries." In the comparison with South Africa five of these countries are CEE (Central and Eastern Europe) countries.

A serious weakness in the report's methodology: not accounting for waiting times for diagnosis and treatment

37. Another serious weakness of the report is that it does not take into account the issue of waiting times for treatments. There is a cost of waiting for a treatment which needs to be added to the price of the treatment or deducted from the estimated value of the treatment. One of the problems with public healthcare both in OECD countries and South Africa is when a health care service is free to the patient or at a price well below the cost of production there will be excess demand compared to the supply of the service. When prices cannot ration demand other means of rationing occur such as higher waiting times for diagnosis and treatment.
38. Excessive waiting times for public sector healthcare services are a problem in many but not all OECD countries. In the OECD document *Health at a Glance*³⁹ the authors state: "Long waiting times for health services is an important policy issue in many OECD countries. Long waiting times for elective (non-emergency) surgery, such as cataract surgery, hip and knee replacement, generates dissatisfaction for patients because the expected benefits of treatments are postponed, and the pain and disability remain."
39. A recent paper by Siciliani et al⁴⁰ provides evidence of long waiting times in some OECD countries public sector hospitals for common surgical procedures including several of the case types used in the report. For example, the median "time from specialist addition to list to treatment" in 2012 for a hip replacement was 82 days in the U.K., 87 days in Canada, 113 days in Finland, 116 days in Australia and 161 days in Spain. This is a wide difference between countries which is emphasised by the short 40 days waiting time in the Netherlands. In contrast the "time from list to treatment" in Slovenia is 341 days.
40. Health policy decision-makers in the public health sector in OECD countries face a trade-off in between long waiting times for diagnosis and treatment and the costs of additional resources which will reduce waiting times but lead to an increase in quasi-prices. One way of comparing is to adjust the quasi-prices for the estimated additional cost in patient pain, disability and suffering compared to the time waited for a private sector treatment. For the purpose of the report and given the high waiting period in many OECD countries, an adjustment by the authors would most likely lead to a substantial increase in quasi prices to make them comparable to private sector prices in OECD countries and South Africa. While we have no statistical evidence to support the argument it is common cause that a primary reason for using private health care services is to avoid the waiting times in the public healthcare sector.

³⁹ *OECD Health at a Glance 2015*, page 128.

⁴⁰ Siciliani, L., Moran, V., and Borowitz, M., (2014). Measuring and comparing health care waiting times in OECD countries, *Health Policy*, 118, 292-303.

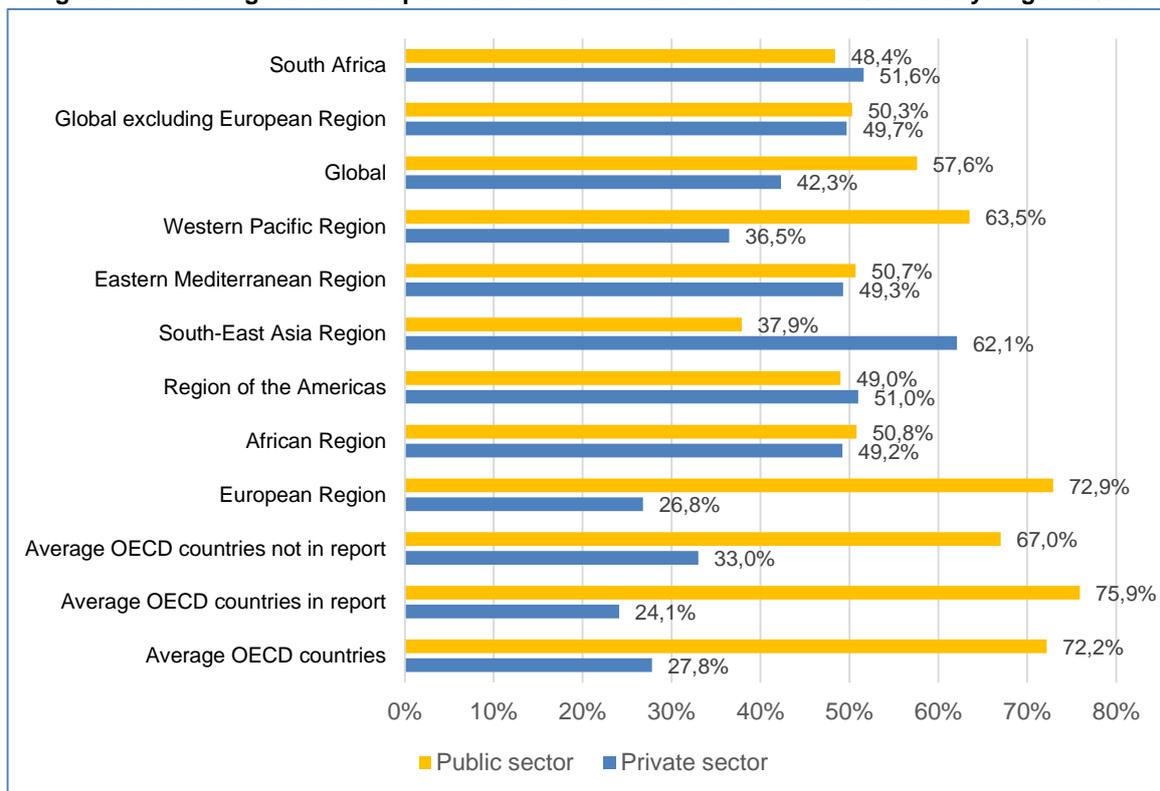
Conclusion on the validity of comparing quasi-prices to market prices

41. The above assessment shows that the quasi-prices used by the authors in the report are highly unlikely to be comparable to the data used for market prices in South Africa. The authors' policy conclusions that prices are high relative to incomes on a PPP per capita basis compared to OECD countries and should be controlled (i.e. regulated) are invalid based on their data and analysis in the report.

Validity and benefits of comparing healthcare prices in OECD European countries with South Africa

42. The previous analysis concludes that the quasi-prices and price level indices created by the OECD/Eurostat/WHO survey are not comparable to prices in the South African private hospital market. Given the wide differences between South Africa and the Western and European economies in OECD in terms of national income levels, and major differences in economic, demographic and socioeconomic structure it is not obvious that comparing the private and public healthcare systems of South Africa with those countries offers significant benefits for health policy makers in this country. In fact, it is interesting to note that the OECD European countries differ markedly with the rest of the world in terms of the broad characteristics of their healthcare systems. Compared to global averages and developing countries statistics the European countries are outliers in the structure of expenditure on health. Figure 1 summarises the differences in the healthcare expenditure by the public and private sectors in 2012.

Figure 1: Percentage of Total Expenditure on Health: Public and Private Sectors by Region 2012



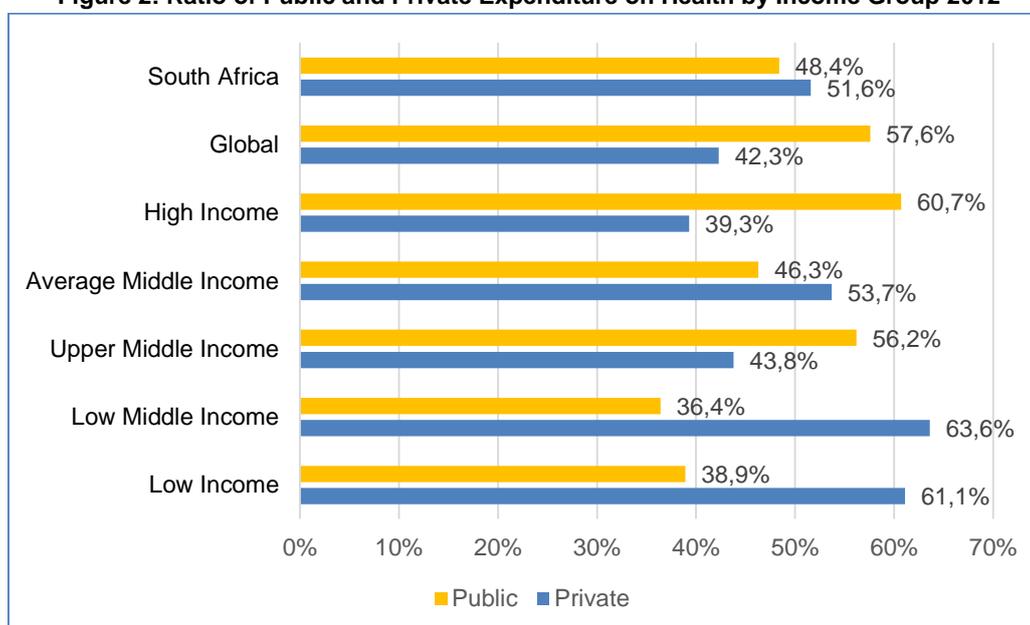
Source: WHO Health Statistics 2015

43. The chart shows that European countries have a much larger public sector than all other regions in the world: 75,9% of total expenditure on health of OECD countries in the report and 72,9% for all OECD countries, compared to 50,3% in the rest of the world and 57,6% globally. OECD Europe is different to the rest of the world because of the emergence of welfare states in Western Europe since

the Second World War while the former socialist countries of Eastern Europe until the 1990s had no private health sector and one which is now still relatively under-developed.

44. The chart also shows that South Africa's average income per capita level and structure of health care expenditure has little in common with European countries but much in common with other developing countries. For example, South Africa's private expenditure as a percentage of total expenditure on health is very close to the average in African countries.
45. Figure 2 shows the similarities of South Africa's structure of health expenditure to developing countries classified by income. South Africa is classified as an Upper Middle Income country. The chart shows the country's private expenditure on health as a percentage of total expenditure on health is higher than the average for Upper Middle Income average but below the average for Low Middle Income countries. Given the wide disparities of income in South Africa it may be more appropriate to take Middle Income countries as a whole. In this case the country's private expenditure as a percentage of total expenditure on health is very similar to the average of Middle Income countries.

Figure 2: Ratio of Public and Private Expenditure on Health by Income Group 2012



Source: WHO Health Statistics 2015

46. The chart suggests that to establish whether the prices of private sector hospitals and specialists are too high, a comparison with countries that have comparable income levels per capita and a similar relative size and structure of the private sector could be a useful indicator to policy-makers in South Africa.
47. In this context the report's statement that South Africa is "unique" because "South Africa spends a higher share of its total health expenditure on private voluntary health insurance compared with any OECD country – including the United States" is correct but misleading. Although South Africa has the highest proportion of private prepaid plans as a percentage of private expenditure on health in the world, this reflects a different economic organisation of the private health insurance market compared to many developing countries. South Africa has a large and sophisticated private insurance sector: its high expenditure paid to healthcare service providers is largely offset by very low out-of-pocket expenditure by consumers to healthcare service providers. Out-of-pocket expenditure as a percentage of private expenditure on health in 2012 was 13,8% in South Africa compared to 77,1% in Spain, 76,1%

in Switzerland and 56,4% in the U.K.⁴¹ Overall, as the charts above indicate, South Africa is typical of many middle income countries in its relative share of private sector expenditure as a percentage of total expenditure on health.

48. It is also interesting to note the relative structure of health expenditure by sector in South Africa to other BRICS countries. Table 3 shows that South Africa's proportion of total health expenditure spent in the private sector is very similar to Brazil and the Russian Federation, but significantly above China and significantly below India. Overall it is close to the average of the BRICS countries.

Table 3: Ratio of Public and Private Expenditure on Health by BRICS Countries 2012

Country/WHO Region/Group	Private expenditure on health as % of total expenditure on health	Public expenditure on health as % of total expenditure on health
Brazil	52,5%	47,5%
Russian Federation	48,9%	51,1%
India	69,5%	30,5%
China	44,0%	56,0%
South Africa	51,6%	48,4%
Average	53,3%	46,7%

Source: WHO Health Statistics 2015

The authors used a wrong GDP per capita figure to calculate the affordability of private hospital prices in South Africa

49. The authors conclusion that price levels are excessive in terms of affordability because they are high relative to per capita incomes in South Africa compared to OECD countries is misleading because they use an inappropriate measure of GDP PPP per capita in South Africa.
50. The authors state:⁴² "South Africa has the lowest GDP per capita in the sample of countries used for this comparison; however, price levels for private hospitals are comparable to the average observed across OECD countries. Comparative price levels for the South African private sector are as high as the price levels in hospitals in OECD countries with considerably higher incomes. For the 20 OECD countries in this study, the average Gross Domestic Product per capita is US\$ 41 224 in 2013. The corresponding figure for South Africa is US\$ 12 891. Private hospital prices in South Africa, however, are on par with prices in countries with much higher GDP levels including the UK, Germany, and France. While hospitals prices are comparable, the economy-wide price level – that is the prices for goods and services - in South Africa is half that observed in OECD countries in 2013. This implies the private hospital services are expensive relative to countries at similar levels of income and likely to be expensive even for individuals with higher levels of income."
51. The South African GDP PPP per capita is not an appropriate measure to measure the affordability of private hospital prices because it does not represent the incomes of those who use private hospitals in the country. Comparing South Africa's GDP per capita to other countries, particularly European OECD countries, is misleading. The reasons include South Africa's extremely high levels of unemployment, one of the highest in the world, very substantial income inequality which depending on the measure, is the highest in the world⁴³ and different demographics with a much high proportion of children in the total population compared to OECD countries. The incomes of the South African working population are therefore much higher than would be estimated from the GNP per capita figure

⁴¹ World Health Statistics 2015, table 7, page 133.

⁴² Lorenzoni, L., and Roubal, T., (2016). *International Comparison of South African Private Hospital Price Levels*. OECD Health Working Paper No. 85, OECD Paris, page 36, paragraph 67.

⁴³ Source: World Bank. <http://data.worldbank.org/indicator/SI.POV.GINI>

compared to other countries. Moreover, given the high levels of inequality there is a sizeable minority in the country who earn salaries similar or close to European levels and these correspond to those who are customers of private healthcare services.

52. It is therefore inappropriate to use GDP per capita as a measure of incomes for the comparison. Instead the incomes of the subset of the population that use private hospitals should be measured to assess affordability. As Ranchod et al state;⁴⁴ “The World Bank classifies South Africa as an “upper-middle-income” country based on a GNI⁴⁵ per capita of \$6,820. Income inequality in South Africa means that the population can be segmented into an upper-income group and a lower-middle income group. Furthermore, we know that medical scheme cover is concentrated in the top two income quintiles of the South African population (McIntyre, 2010⁴⁶). Given that this research aims to compare the utilisation of private hospitals only, it makes sense to compare this sector with countries with similar economic profiles to the subpopulation using these private facilities. From this segmentation method, a GNI figure of \$25 416 was estimated for the medical-scheme sub-population. This is comparable to an upper-income country using the World Bank’s definitions. By contrast the non-medical-scheme sub-population was estimated to have a GNI of \$3 446.”
53. The GNI figure for those using medical schemes as a ratio of average GNI is 3,7 times. Applying this ratio to the country’s GDP PPP per capita gives an income level of \$47 700 for the medical-scheme sub-population which is higher than the average GDP PPP per capita of \$41 224 in the comparison group of 20 OECD countries and \$27 323 in the comparison group of 7 countries. On this calculation the authors’ claim that “private hospital services are expensive relative to countries at similar levels of income” is unfounded. The figures discussed in paragraphs 52 and 53 are summarised in Table 4 below

Table 4: Comparisons of GNI and GDP: South Africa and Selected OECD Countries

Indicator	Value
GNI per capita (1): SA population	US\$ 6 820
GNI per capita (2): SA medical scheme sub-population	US\$ 25 416
Ratio of GNI per capita (2) to GNI per capita (1)	3.7
GDP PPP per capita SA	US\$ 12 891
Ratio of 3.7 applied to GDP PPP per capita	US\$ 47 700
Average GDP per capita for 20 selected OECD countries	US\$ 41 224

Inappropriate methodology: using macroeconomic data to analyse a microeconomic market

54. Furthermore, the focus on the subset of the South African population that uses private health care services highlights a problem with the authors’ overall approach in their report. Lorenzoni and Roubal are using macroeconomic data such as GDP per capita to analyse a microeconomic market or industry. A more appropriate method in assessing whether private hospital prices are excessive is to conduct a demand and supply analysis of the private hospital market based on those determinants specific to the industry. International comparisons are not necessarily of substantial value for this analysis. In addition, demand for a product is measured by economists as those customers who not only wish to use but can afford to purchase private hospital services, not the general population of a

⁴⁴ Ranchod, S., Childs, B., Abraham, M., and Taylor, R. (2015). *International benchmarking of hospital utilisation. How does the South African private sector compare?* Conference paper presented to the Actuarial Society of South Africa’s 2015 Convention.

⁴⁵ Gross National Income, a similar aggregate measure of national income to GDP (Gross Domestic Product).

⁴⁶ McIntyre, D (2010). *Private sector involvement in funding and providing health services in South Africa: Implications for equity and access to health care.* EQUINET Discussion Paper (Vol. 84): Regional Network for Equity in Health in East and Southern Africa (EQUINET).

country as Lorenzoni and Roubal suggest. In addition, demand and supply conditions in a market are also affected by a market's institutional framework, particularly government legislation and regulation affecting the market and the economy. Since the institutional framework of any industry is likely to vary widely between countries it is a further argument against the approach followed by Lorenzoni and Tomas. The authors generally ignore differences in the institutional framework of a country's healthcare and socioeconomic system in their comparative analysis.

Unconvincing cost analysis in the report

55. The authors attempt to study prices without providing a convincing analysis of the differences in the cost structure of private hospitals in South Africa and the OECD countries in the study. The report uses "claims by groups of disciplines" as a proxy for costs. The authors state "Disciplines used for this study included "family practitioners and specialists", "radiology", "hospital", "pathology" and "other". Future work may carve out "pharmaceuticals" from the hospital component as pharmacy costs make up a significant part of hospital costs."⁴⁷ The use of these "disciplines" is unlikely to be an accurate estimate of the total costs of production for private hospitals since it provides no insight into major elements of costs such as salaries of nurses and other professional staff and infrastructure costs such as wards, theatres and medical equipment. The appropriate approach is to analyse hospital costs directly.
56. Because prices are closely related to average costs of production, the authors' recommendation that prices should be controlled without a detailed analysis of the cost structure of private hospitals is a major weakness of the report. Prices may be affected by the market power of hospitals but also by economic rents from unionised labour and suppliers of inputs such as medical equipment and by inefficient regulations and legislation restricting hospitals ability to improve efficiencies. Without this kind of analysis it is difficult to identify the sources of high prices. Rather than controlling prices a more effective remedy may be to introduce more effective competition in hospital market output and input markets.
57. One factor overlooked by the authors is that hospitals need to compete for resources such as nurses who can find employment in overseas markets. In addition, South African doctors also have alternative opportunities internationally. South African doctors and nurses have the advantage of speaking English and having good quality qualifications. They have alternative attractive employment opportunities working in English-speaking countries such as the U.K., U.S.A., Canada, and Australia. While there are family and cultural ties to the country, salaries of medical professionals carry a premium to keep them in South Africa. The costs of paying these salaries, particularly given their widely recognised scarcity relative to their equivalents in many OECD countries, means that in South Africa private hospitals and medical aid schemes, which reimburse medical specialists, have higher costs than the country's GDP per capita figures would suggest. While the "law of one price" works imperfectly in this case it is an argument against the authors' contention that prices should reflect per capita incomes in a country. In South Africa's case this argument is substantially weakened. The same argument is relevant for the supply of medical equipment where for many technological products the market is international and dollar or euro-based. South African private hospitals are a small market in global terms and are likely to be price takers in the market. Consequently, they are likely to pay the same dollar price as hospitals in developed country markets, raising their costs for medical equipment to levels similar to those facing hospitals in OECD countries.

⁴⁷ Lorenzoni, L., and Roubal, T., (2016). *International Comparison of South African Private Hospital Price Levels*. OECD Health Working Paper No. 85, OECD Paris, page 14, paragraph 26.

Conclusion

58. Our assessment is that the methodologies and data used by the authors in the report are flawed and render invalid their claims that in South Africa “private hospital prices are expensive relative to what could reasonably be predicted given the country’s income and are likely to be expensive even for individuals with higher levels of income.” There are a number of reasons for this conclusion which we have outlined above but the primary weakness of the authors’ report is that they use a data set of non-market prices to compare to actual market prices of private hospitals in South Africa. The methodologies to calculate these non-market or quasi-prices are unreliable and under-estimate their true values, preventing any meaningful comparison to the market prices in South Africa. The authors policy recommendations to control (regulate) prices are invalid and could harm the welfare of patients wishing to use private healthcare services in the country by restricting the supply of private hospital services.