International benchmarking of hospital utilisation: how does the South African private sector compare?

By S Ranchod, B Childs, M Abraham and R Taylor

ABSTRACT

We benchmark the hospital-inpatient admission rates and average length of stay of the South African medical scheme population against a set of international comparators. Such a comparison is useful in developing reasonable expectations of the utilisation achievable in the private-hospital sector in South Africa, and as a means of identifying unusual characteristics of the South African environment. Such comparisons should be done on a like-for-like basis, and explicitly adjusted for differences in data definitions, patient demographics and clinical case mix. Structural differences between countries must be considered in interpreting results. We use an economic basis for determining the comparator set rather than a health-systems basis. Detailed case-mix data by country is not available so demographic and broad disease-grouping categories are used as proxies. A further limitation is that day cases are excluded. Considering two separate data sources, South Africa appears to have relatively high admission rates with low average lengths of stay. On a combined basis, the bed days used per 1 000 medical scheme beneficiaries for South Africa appears near the lower end of the spectrum, which suggests that the South African private sector is making relatively efficient use of its hospital resources.

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1.   INTRODUCTION

1.1   Given the stark disparities between the public- and private-hospital sectors in South Africa, meaningful national benchmarks are difficult to establish, increasing the relevance of global experience. Ramjee (2013) undertook a comparison of the costs of hospitalisation across the two sectors and commented on the differences in inputs, outputs, objectives and quality.

1.2   Private hospitals in South Africa are largely utilised by those covered by voluntary private healthcare-financing vehicles referred to as medical schemes. The aim of this paper is to compare the hospital-inpatient admission rates and average length of stay (ALOS) of the South African medical scheme population with a set of international comparators. International benchmarking plays an important role in establishing accountability, anchoring expectations and identifying outliers. Extensive international benchmarking of both hospital utilisation and price exists, for example, between the Organisation for Economic Co-operation and Development (OECD) countries (Koechlin et al., 2014), but such benchmarking is almost entirely absent for South Africa's private-hospital sector.

1.3   Research into the prescribed minimum benefit package that medical schemes are re- quired to cover (Söderlund & Peprah, 1998) compared private-hospital utilisation to mine hospitals and United Kingdom (UK) National Health Service hospitals on an age–sex stand- ardised basis. Mine hospitals showed lower admission rates for most categories. Medical scheme data were only available for surgical admissions and showed higher admission rates for some types of procedures than for others.

1.4   More recently, Van Eck & Besesar (2009) compared medical scheme hospital utilisation with utilisation in the United States of America (USA). Their analysis was under- taken in response to a report produced by the Council for Medical Schemes (CMS) (2008) highlighting much higher admission rates in South Africa compared to those in the USA. Van Eck & Besesar (2009) argued that the CMS paper presented a skewed and incorrect view of relative admission rates, without sufficient adjustments to improve comparability. Rather than simply update their comparison, we elect to broaden the comparator set to a wider set of countries. The recent working paper published by the OECD health division on specialist pricing practices in some OECD countries (Kumar et al., 2014) included much discussion on hospital pricing in South Africa. We think it is useful to supplement this information with an updated and broadened study on hospital utilisation.[1]

1.5   We provide some background on the South African private-hospital industry, outline the methodology used to identify comparator countries, describe the data that were obtained

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1   This research was funded by the Hospital Association of South Africa. An earlier version of the work is in the public domain (www.insight.co.za/wp-content/uploads/2015/07/HASA-Intl-utilisation- benchmarking-Final-20141123.pdf).

for this study and describe the methodology used to compare utilisation between countries on a like-for-like basis. We pay particular attention to data definitions and risk adjustment. We then present the results obtained, and discuss their relevance in the South African context.

1.6   Day cases are excluded from the analysis to keep cross-country data comparable. Day-case utilisation by country could be studied separately.

2.   BACKGROUND AND CONTEXT

2.1   South Africa has a dual healthcare system, with publicly-funded and -provided healthcare, operating in parallel to privately-funded and -provided healthcare. Approximately half of total expenditure occurs in the private sector (Blecher et al., 2011). This means that there are two distinct sectors offering hospital services that are separately financed, and that deliver care to (mostly) different subsets of patients.

2.2   Private hospitals are concentrated in the major metropolitan areas and facilities are predominantly owned by three major hospital groups (Life Healthcare, Mediclinic and Netcare). They largely provide services to medical scheme beneficiaries. As at the end of 2013 there were approximately 8.8 million beneficiaries covered by medical schemes, representing 16.25% of the population (CMS, 2014; Statistics South Africa, 2014). Medical schemes are tax-exempt, not-for-profit entities owned by their members. They provide near-indemnity health insurance cover and are regulated under social-solidarity principles.

2.3   Medical scheme beneficiaries are entitled to seek care at public hospitals. However, medical scheme beneficiaries make very little use of public hospitals; public hospitals made up only 0.37% of total medical scheme hospital spend in 2014 (CMS, 2015). Public hospitals are able to charge means-based rates, using the Uniform Patient Fee Schedule (UPFS). This provides an incentive for income earners to join medical schemes so as to avoid incurring catastrophic hospital fees.

2.4   Econex (2013) estimates that the private sector constitutes 35% of hospitals and 28% of hospital beds in South Africa. There are 3.96 beds available in the private-hospital sector per 1 000 medical scheme beneficiaries. The true level of bed availability is slightly lower than this as there are some non-medical-scheme patients who utilise private hospitals on an out-of-pocket basis, or who are covered by other insurance mechanisms (for example, hospital cash plans, medical insurance and critical illness cover).

2.5   Figure 1 compares the availability of hospital beds per 1 000 of the population in OECD countries with the number of private-sector hospital beds per 1 000 medical scheme beneficiaries in South Africa. We see that the South African private sector sits below the median (4.13) and mean (4.67). This figure reflects the actual bed counts in each country without adjustment for population risk profiles. Whilst some of the differences between

countries may be explained by demographic and disease-burden differences (which could, in part, be assessed by plotting the beds per 1 000 lives against the average age), there are other factors such as affordability, resource availability and licensing requirements that will affect the supply of beds. It is also useful to view the supply of beds in absolute terms to understand the extent of available capacity.

2.6   Figure 1 provides international context for the resourcing of the private sector but does not serve to address the issue of the relative resourcing of the public- and private-hospital sectors in South Africa (and the equity implications thereof), According to Day & Gray (2014) there are approximately 1.9 beds per 1 000 in the public sector—roughly half of private-sector capacity.

3.   COUNTRY SELECTION

3.1   There are a variety of possible approaches to determine an appropriate set of comparator countries. Broadly, the comparator set can be identified by considering the healthcare system characteristics of each country, or by considering the economic characteristics of each country, with each approach having its own challenges. In this paper we have elected to consider an economic basis for comparison because of the diversity and multi-faceted nature of healthcare systems.

3.2   The primary basis for the comparison to be made was the gross national income (GNI) per capita of each country. GNI is one possible measure of national income and
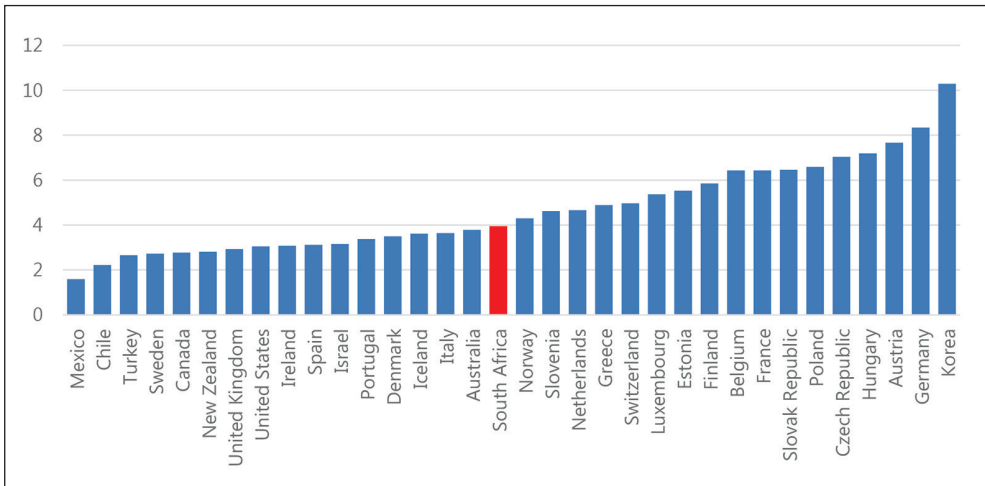

FIGURE 1. Beds per 1 000 lives (and for South Africa per 1 000 medical scheme beneficiaries)
Source: OECD Health Statistics Database (2014);[2] Econex (2013)

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2   http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT

output. A 'domestic' measure is geographical in nature, whilst a 'national' measure is based on citizenship of a country. A 'national' measure makes sense for our purposes because we are interested in the sub-population that belongs to medical schemes (i.e. we are not using a geographical boundary).

3.3   Economic measures are also differentiated as 'expenditure' or 'income' measures. An 'income' approach equates total output to total factor income (including employee compensation, interest income, rental income, royalties and profit). We have selected an income measure because there is a clear differential between the incomes of the sector of the South African population covered by medical schemes, and those that are not (Erasmus et al., 2016).

3.4   The World Bank classifies South Africa as an 'upper-middle-income' country based on a GNI per capita of $6 820.[3] However, we know that medical scheme cover is concentrated in the top two income quintiles of the South African population (McIntyre, 2010) and that South Africa has a high level of income inequality.[4] 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 sub-population using these private facilities. The corollary is also true—it would not be meaningful to compare the performance of the South African public hospital sector to countries classified as upper-middle-income or upper-income.

3.5   It is worth noting that the concept of GNI does not apply to sub-populations, and that it is therefore not possible to calculate the GNI of the medical scheme population. General Household Survey (GHS) data were used to segment the South African population into medical scheme and non-medical scheme sub-populations, and to estimate the income differential between the two sub-populations. This method is not accurate in the sense that the GHS does not reflect all sources of income. However, it does provide a useful proxy.

3.6   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.

3.7   The GNI figures used to identify comparable countries were obtained from the World Bank and are calculated for the year 2012 using the Atlas method.[5] This dataset was comprehensive but there were some countries where GNI data were unavailable. However,

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3   https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

4   http://data.worldbank.org/indicator/SI.POV.GINI?locations=ZA

5   The Atlas Method was developed by the World Bank in order to allow for comparisons that were not impacted by exchange rate volatility and consequently uses a three-year exchange rate average for conversion to a standardised currency (typically dollars). More information is available at http://econ.worldbank.org/

most of these were small island states and the only two countries of potential significance for this investigation with missing data were Argentina and North Korea. The GNI for Argentina was obtained for the year 2011 from 'tradingeconomics.com'. This was then inflated using US consumer inflation to provide a figure for 2012.

3.8   The list of countries was then trimmed down by using two simple criteria. The first was to exclude all countries with GNI of less than half of the derived South African 'private' figure of $25 416. Following this, the second criteria excluded all countries with populations of less than one million people as these were typically small island states (including some tax havens). This resulted in a list of 44 countries.

4.   DATA

4.1   The comparative nature of the research is complicated by differences in the quality and depth of available data for each country. In this section we describe the data sources, checks and adjustments. We also highlight particular issues relating to data definitions.

4.2   South African Data

4.2.1   The South African dataset was provided by participating members of the Hospital Association of South Africa (HASA) to Insight Actuaries and Consultants ('HASA data'). The data include all admissions for the period 2011 to 2013 to Life Healthcare, Mediclinic and Netcare acute-care private hospitals.

4.2.2   Data were obtained directly from the hospitals due to the highly-summarised nature of the data published by the CMS. For the purposes of this project, detailed data were required in order to adjust appropriately for differences in case-mix and demographic profile between countries.

4.2.3   Data were aggregated over the three-year period. Summary data were provided by age bands, gender and ICD 10 (3 digit) code. The key variables provided were:
— the number of day cases;
— the number of admissions (including day cases); and
— the number of bed days.

4.2.4   The age and gender profile of the South African medical scheme population was obtained from collated medical scheme statutory returns for 2011 and 2012. The total medical scheme population for 2013 was available from the CMS Annual Report 2013/14 (CMS, 2014). The 2013 age and gender distribution was assumed to be the same as for 2012.

4.3   International Data Sources

4.3.1   Data were required in a sufficiently detailed format that would enable comparison on a like-for-like basis. A thorough desktop search identified data from three potential sources. These were the OECD, the European Hospital Morbidity Database (EHMD) and from national governments. From the first two sources there were some additional

countries for which data were available in a suitable format. It was decided to include all of these countries: Hungary, Iceland, Luxembourg, Malta, Mexico, Poland and Turkey. Data were not always available for each year between 2011 and 2013. For each country, the most recent year of data within the period was used.

4.3.2 The OECD collects data on hospital utilisation for all of its 34 member nations. Figures for discharges and ALOS were available by broad diagnostic category (chapter-level ICD 10 code). However, the data were not available by age, gender and diagnostic category. All the data in this database had consistent definitions.

4.3.3 The second major source was the EHMD, a data repository of all publicly available European hospital data. The repository for each country is intended to include information on day cases, bed days and discharges (and hence ALOS) broken down into diagnostic category and by age and gender. However, not all countries in the database have data in such a detailed format, with a number of countries only providing data by broad diagnostic category or simply providing aggregate figures. Some countries also simply provide discharges or lacked data on day cases. In addition, the countries use four different diagnostic coding systems: ICD 9 (3 digit), ICD 10 (3 digit), ICD 10 (4 digit) and ISHMT (International Shortlist for Hospital Morbidity Tabulation). The latter three are compatible and we mapped the data for all these countries onto the ISHMT format. However, the countries with ICD 9 (3 digit) coding were not compatible and could not be used. This database was consequently reduced from a list of 32 to 22 countries. The definitions used for day cases, bed days and discharges were the same as those used by the OECD.

4.3.4 The final source of data obtained was from individual national governments (either via their health department or a statistics department). However, these data were not used, other than as a check on the data obtained from the other two sources. In all cases national data were either superseded by data from the other two sources or did not provide the necessary information. Language was an important consideration given that data definitions were a concern. In some cases data were not in a format that was useful for this analysis (for example, only reporting data for the top 100 diagnostic groups).

4.4 Data Cleaning

4.4.1 The data were cleaned, checked for errors and collated. The data obtained from the OECD were of a high standard and consequently, cleaning and checking resulted in very few changes and/or adjustments. The EHMD data required more adjustments to be readily usable. A crosswalk was developed in order to address differences in diagnostic coding. Age bands had to be combined to ensure comparability with the South African data.

4.4.2 In all cases, clinical coding data were based on diagnoses at discharge. Diagnoses at discharge can vary from those at the time of admission for various reasons including unconfirmed diagnoses, clinical uncertainty and the development of conditions in hospital.

4.4.3 It should be noted that it is possible that the data for some countries did not include all hospitals (for example, only public or publicly-funded hospitals may be included).

4.5 Data Definitions

4.5.1   For both the OECD database and the EHMD, the same definitions were used for discharges (inpatient discharges), bed days, ALOS and day cases. Consequently, these were the definitions used for the analysis.

4.5.2   A discharge (or inpatient discharge) was defined as the release of a patient who was formally admitted into a hospital for treatment and/or care and who stayed for a minimum of one night. This included emergency cases, urgent admissions and patients originally admitted as day patients where the patients ended up with an overnight stay. In-patient discharges excluded day cases and outpatient cases. A discharge from any hospital for any reason was counted, including death, transfer to a different hospital and the discharge of healthy newborns. Any transfers within a hospital were not counted as a discharge.

4.5.3   It is important to note that, in the South African private sector, healthy new-born babies are not counted as separate discharges (as distinct from their mothers) since separate accounts are not created for them. On inspection (comparing maternity-related admissions to admissions for patients under the age of one), it appeared that there were other countries where this was the case. Consequently, for these countries the admission rate will be understated relative to comparator countries (as will bed days per 1 000).

4.5.4   South Africa appears unusual in that the gap between the two sets of admission rates is larger than most countries, but smaller than countries where newborns are clearly excluded. In South Africa, new-born babies with complications are admitted in their own right and this may account for the difference.

4.5.5   A bed day is defined as a day during which a person admitted as an inpatient is confined to a bed and in which the patient stays overnight in a hospital. The number of bed days for a patient is counted as the date of discharge minus the date of admission (for example, a patient admitted on the 25th and discharged on the 26th is counted as one day). This definition was carefully checked for all three data sources to ensure comparability.

4.5.6   ALOS is calculated by dividing the number of bed days by the number of discharges during the year.

4.5.7   Day cases are cases where the patient was either never formally admitted and allocated a bed, or where the bed days for the patient are zero i.e. the patient entered and left hospital on the same calendar day.

4.5.8   Hospital-benefit-package entitlements may not be the same in each country. For the purposes of this study it is sufficient to assume that hospital-package entitlements are comprehensive.

4.5.9   Many OECD countries are dominated by public rather than private hospitals whereas the South African data used in this study are exclusively from private hospitals.

5.   METHODOLOGY

5.1   This research is focused on measures of hospital utilisation (as distinct from total expenditure, or the pricing of hospital services). The key measures that are used are: inpatient admissions per 1 000 lives, ALOS and bed days per 1 000 lives.

5.2   According to the OECD (2013):

> The average length of stay in hospitals (ALOS) is often used as an indicator of efficiency. All other things being equal, a shorter stay will reduce the cost per discharge and shift care from inpatient to less expensive post-acute settings. However, shorter stays tend to be more service intensive and more costly per day. Too short a length of stay could also cause adverse effects on health outcomes, or reduce the comfort and recovery of the patient. If this leads to a greater readmission rate, costs per episode of illness may fall only slightly, or even rise.… Hospital discharge rates measure the number of patients who leave a hospital after receiving care. Together with the average length of stay, they are important indicators of hospital activities.

5.3   The bed-days-per-1 000 measure brings these two measures together.

5.4   Removing Outpatient Cases and Day Cases

5.4.1   All outpatients and day cases were excluded. This included all ambulatory cases, visits to emergency units (that did not result in an admission), and same-day cases. This was also done in the Van Eck & Besesar (2009) study.

5.4.2   Day cases are reported explicitly for most countries in the comparator set. South Africa's private sector sees higher-than-average day cases per 1 000 medical scheme beneficiaries (68) than the comparator countries for which day-cases data are available (60 per 1 000 lives). South Africa's figure is close to the 75th percentile for day cases per 1 000 (70). The proportion that day cases constitute of total admissions varies considerably from country to country, and South Africa's day-case rate (28%) is slightly above the median and mean for comparator countries where the data were available.

5.4.3   Differences between countries in the number of day cases per 1 000 may be due to structural differences (for example, the existence and popularity of day clinics and the availability of doctors after hours). A low day-case rate may also point to unnecessary admissions for low-acuity cases (i.e. it may be more efficient for cases to be treated as day cases as opposed to being admitted). As Van Eck & Besesar (2009) point out, countries like the USA have a well-developed infrastructure of day clinics and unattached operating theatres ('surgi-centres'). The equivalent facilities are not as widely available in South Africa. Activity in this sector has increased recently, with specialist day hospitals attracting investment.[6] In the absence of specialist facilities, ambulatory and day cases are treated in acute-care facilities on a day-case basis. The inclusion of these cases in the comparison would distort the South African admission rate upwards, and the ALOS downwards.

5.5   Scaling up the HASA Data

5.5.1   The three large hospital groups from which data were obtained represent 78.3% of beds in the private sector. In order to derive the inpatient admission rate to private hospitals in South Africa, it was assumed that the proportion of admissions seen by the three

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6   www.moneyweb.co.za/moneyweb-industrials/day-hospital-groups-seeks-buyin-from-medical-schem

large hospital groups is equal to the proportion of private-hospital licensed beds in these groups. It was also assumed that there were no significant differences in ALOS between the hospitals included in the dataset and those excluded. This does introduce some uncertainty into the results. Total figures were checked against industry-wide data published by the CMS and the Health Systems Trust.

5.5.2   There are also private-hospital patients who do not belong to medical schemes. The high cost of private-hospital care means that these patients make up a relatively small proportion of the total; however, the exact numbers are not known. Scaling did not take into account these patients and as such the private-hospital utilisation figures for South Africa in the results that follow may be a slight underestimation.

5.6   Adjusting for Demographic Profile and Burden of Disease (Case Mix)

5.6.1   WHAT IS CASE MIX?

5.6.1.1   Each individual patient treated by a hospital presents with different clinical needs depending on their diagnosis. They will consequently receive different amounts and types of services (Fetter et al., 1980). The term 'case mix' refers to the relative proportions of the types of patients treated by a hospital (Fetter et al., 1980).

5.6.1.2   If we consider the aggregate profile of patients treated by a country, some countries will treat a group of patients that require a more sophisticated and expensive set of treatments than others. These countries are considered to have a more 'severe case mix' or a 'heavier case mix'.

5.6.1.3   The term 'case mix groupers' is used to describe statistical methods that group patients into homogenous sub-sets. Diagnosis Related Groups (DRG) classification systems are used to group patients into a restricted set of clinically- and economically-homogeneous groups, according to the resources used. These groupers are used to assist the planning and management of healthcare (Heavens, 1999) and may also be used for the reimbursement of healthcare providers.

5.6.2   CHOICE OF RISK ADJUSTMENT FACTORS

5.6.2.1   The choice of risk-adjustment factors for this study was constrained by data availability. For the OECD data it was not possible to adjust by age and gender, and the only consistent clinical information available across countries was the high-level disease chapter. The countries covered in the European database have more information available to enable more precise risk adjustment. For these countries we were able to adjust for age, gender and ISHMT group. More meaningful case-mix adjustment also requires not only more comprehensive diagnosis coding but also information on surgical procedures performed.

5.6.2.2   Figure 2 illustrates the distribution of inpatient admissions by age and gender from the HASA data. The importance of adjusting for differences in age profile between countries can clearly be observed. The profile of admissions is distinctly different for males and females, and the significant effect of the child-bearing years can also clearly be seen. This is also reflected in the shorter ALOS for females in those years (Figure 3). The ALOS rises with age (with the exception of neonatal cases).
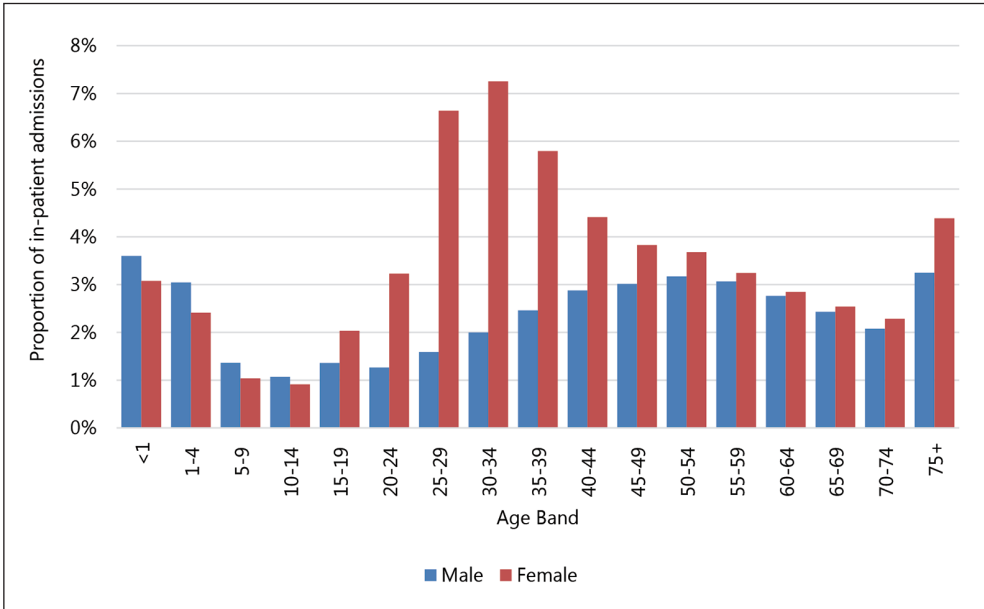
FIGURE 2. Age and gender distribution of inpatient admissions (HASA, 2011–2013)
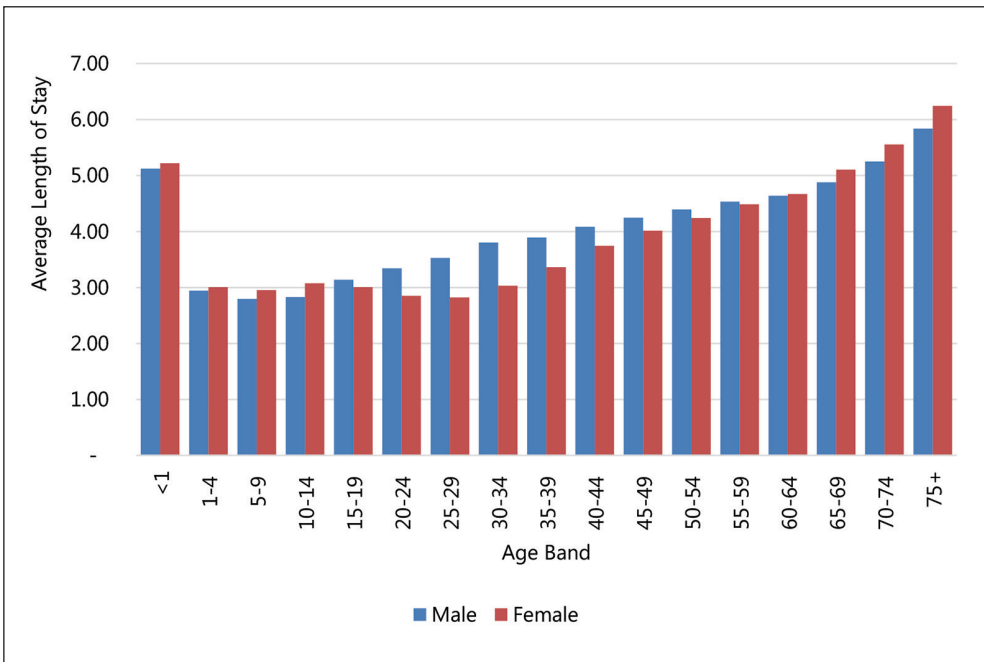

FIGURE 3. Age and gender distribution of ALOS (HASA, 2011–2013)

5.6.2.3   When we compare the age profile of the South African medical scheme population with the age profile of other countries, we notice that there are distinct differences between countries. The South African medical scheme population has a high proportion of children and a lower proportion of elderly lives. However, due to the effects of anti-selection, there is a relatively low proportion of young adults (age 20–24) as they tend to opt out of the voluntary medical scheme system.

5.6.2.4   The variations in ALOS per clinical category can be seen in Figure 4.

5.6.2.5   The distribution of admissions across these categories varies substantially between countries (Figure 5). This can be explained by differences in the age and gender profile, as well as differences in the burden of disease. Unfortunately, the disease chapters are organised anatomically and do not provide a grouping that is homogenous in terms of resource use (as would, for example, DRGs).

5.7   Maternity Cases and Newborns

5.7.1   In the Van Eck & Besesar (2009) study, an explicit adjustment was performed to allow for differences in the maternity rate between countries which arise due to differences in the underlying fertility rate, and the extent to which births take place in hospital. A higher-than-normal maternity rate is expected in the South African medical scheme environment due to high levels of anti-selection. This was not explicitly allowed for in this study, but is adjusted for to some extent in the risk adjustment (ISHMT chapter 15). Differences in the maternity rate also affect admission rates for under-1s. This is compounded by the differences in the way in which newborns are dealt with in the data. We provide a set of results where both maternity cases and newborns are removed.

5.7.2   The proportion of deliveries carried out by caesarean section in medical schemes is very high by international standards. This may affect length-of-stay comparisons for births but has not been adjusted for in this study.

6.   RESULTS

6.1   Results are presented separately for the two major data sources that were utilised: the EHMD and the OECD. This is because of the differences in the extent of risk adjustments that could be performed. Results are risk-adjusted at various levels depending on the data available within each dataset used. Admission rates are adjusted for age and gender where this information is available. ALOS is risk-adjusted for age, gender and ISHMT classification where this information is available. All comparator country data are risk-adjusted to South Africa's mix of factors.

6.2   The results in this report are focused on how South Africa compares at an aggregate level to a set of other countries. The factors driving the utilisation of each individual country are complex, and require substantial understanding of each of the health systems. Factors influencing utilisation will include both those relating to the supply of medical practitioners and hospital beds and those relating to the demand for medical care. According to the OECD
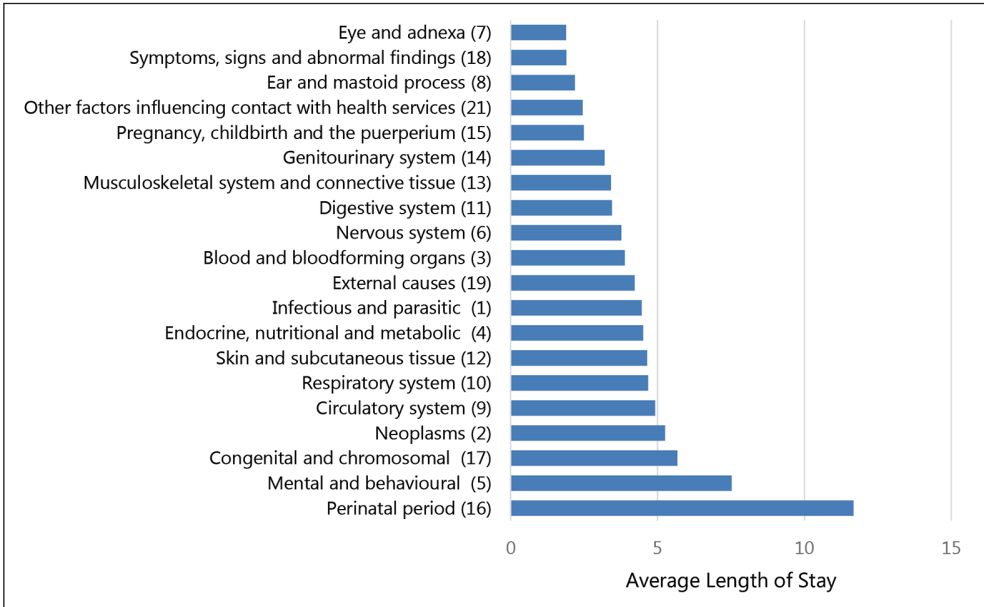
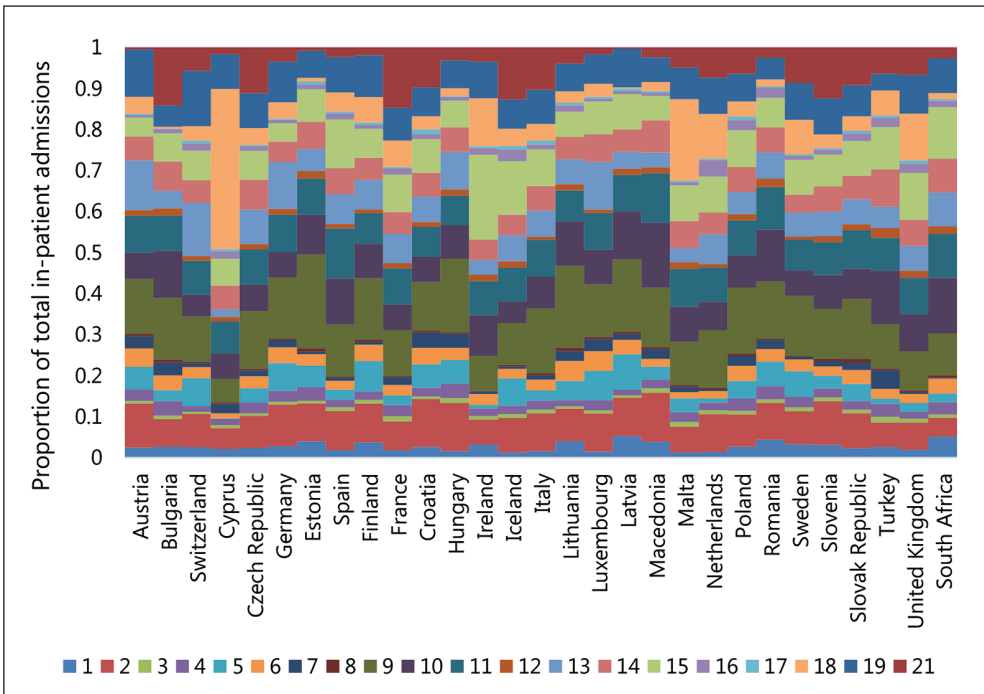FIGURE 4. ALOS per disease chapter (HASA, 2011–2013)

FIGURE 5. Variation in the proportion of admissions for disease chapters 1 to 21 across countries

(2013): "Hospital activities are affected by a number of factors, including the demand for hospital services, the capacity of hospitals to treat patients, the ability of the primary care sector to prevent avoidable hospital admissions, and the availability of post-acute care settings to provide rehabilitative and long-term care services."

6.3 Comparison to Countries in the European Hospital Morbidity Database

6.3.1 Of the two data sources, the EHMD is the richer source and presents scope to adjust for age, gender and case mix. We present the results of the comparison of South Africa with the countries in this dataset first.

6.3.2 In Figure 6, countries are sorted by the raw unadjusted ALOS. Two adjustments done: the first is just based on the high-level disease chapters. This is in line with the adjustments that were possible for the OECD countries. The second adjustment was more granular and took into account age, gender and the more detailed diagnosis codes. Raw ALOS figures range from 5.6 to 11.1, whereas ALOS adjusted for age, gender and ISHMT ranges from 4.9 to 8. Risk adjustment narrows the range observed, or emphasised differently, risk-profile differences explain some of the variation in hospital utilisation seen between countries.

6.3.3 The differences in ALOS between countries are overstated if we do not adjust fully for age, gender and case mix. In addition, the ALOS in South Africa is lower than all other comparator countries, even once the data for comparator countries has been
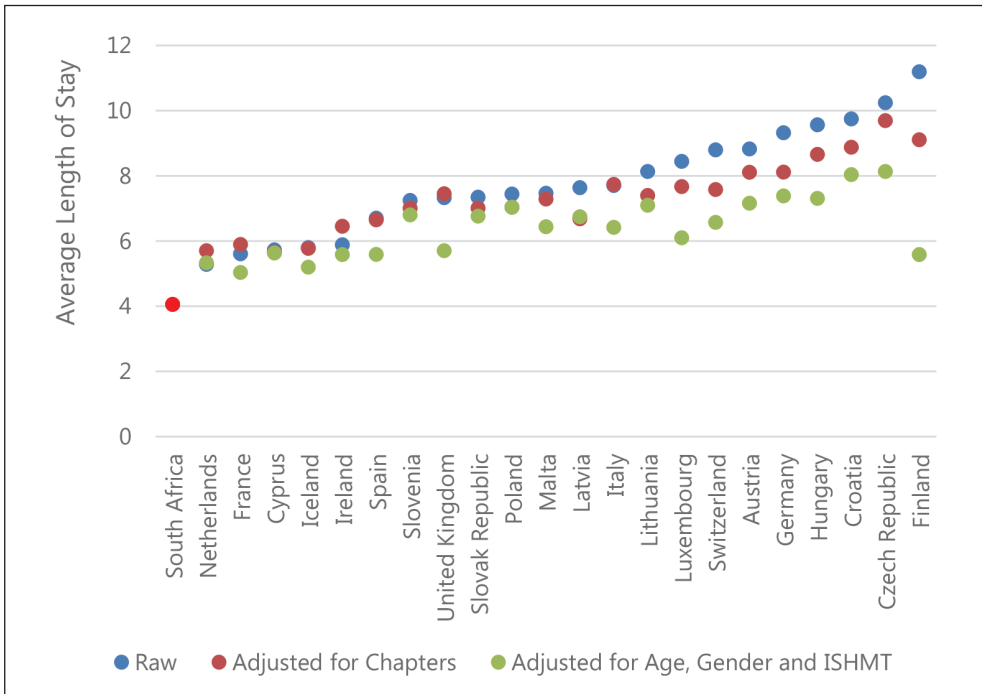

FIGURE 6. Impact of risk adjustments on ALOS figures (EHMD)

risk-adjusted. The result of the risk adjustment is particularly extreme for Finland where the population has a very different age profile to South Africa. Finland spends 2.1% of GDP on long-term care which is likely to skew ALOS figures.

6.3.4　　In Figure 7, countries are sorted by the raw, unadjusted admission rate per 1 000. The risk adjustment was based on age and gender (i.e. the admission rates per age and gender category were reweighted based on the structure of the South African population). Admission rates range between 78.7 and 273.4 per 1 000, whereas risk-adjusted admission rates range between 49.8 and 228 per 1 000.

6.3.5　　The impact of the adjustment is greatest for countries with an elderly population (for example, Finland, Germany and Austria). The inpatient admission rate per 1 000 for South Africa (175.76) is higher than the average (149.08) for comparator countries on a risk-adjusted basis, and closer to the 70th percentile (177.37).

6.3.6　　A relatively high admission rate would be expected in a market with private health insurance and private delivery, as compared to a publicly-funded or publicly-delivered system where rationing is likely to be tighter. All of the comparator countries have a large public-sector coverage or a high percentage of healthcare expenditure in the public sector. Amongst the comparator countries, the average extent of public sector coverage is 77%, and the average percentage of healthcare expenditure in the public sector is 72%.

6.3.7　　Rationing mechanisms such as waiting lists for elective procedures, strict gate-keeper and referral pathway rules, and exclusions from benefit packages serve to reduce the admission rate. When people buy private health insurance, they buy increased access and freedom of choice, and therefore it would be expected that admission rates may be higher than national systems.
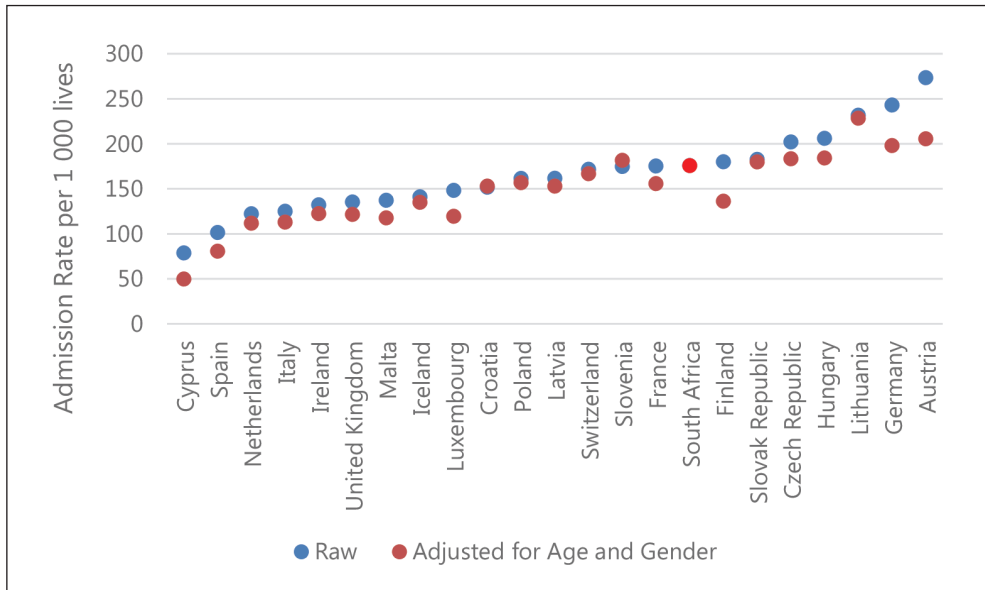

FIGURE 7. Impact of risk adjustments on inpatient admission rate per 1 000 (EHMD)

6.3.8   The South African medical scheme market is voluntary (as opposed to compulsory). For those employed, there is a strong incentive to join the scheme market to avoid out-of-pocket payments for hospital services. Medical scheme membership is often made compulsory by the employer as a condition of employment. There is evidence of adverse selection against schemes (Ramjee et al., 2014); a feature of the environment that would impact adversely on admission rates. The South African private sector also lacks supply-side rationing mechanisms—medical schemes have been criticised for not adequately engaging in active purchasing (McLeod & Ramjee, 2007).

6.3.9   It is useful to consider admission rate and ALOS together. The figures are considered on a risk-adjusted basis below (Figure 8). On a risk-adjusted basis South Africa remains above average in terms of admission rate and the lowest in terms of ALOS. Admission rates and ALOS figures can be combined to derive a bed-days-per-1 000 figure which indicates the overall utilisation level of hospital services across comparator countries (Figure 9).

6.3.10   South Africa ranks eighth out of 23 countries in terms of total bed days per 1 000 on a risk-adjusted basis. If we repeat this analysis but exclude maternity cases and newborns this shifts to a rank of ninth out of 23 countries. The biggest decreases in bed days per 1 000 are for those countries where newborns are counted as separate admissions and those where the maternity rate is high.

6.4   Comparison to OECD Countries

6.4.1   The OECD dataset does not have utilisation data by age and gender, or detailed clinical coding. For these countries the only risk adjustment done was to the ALOS
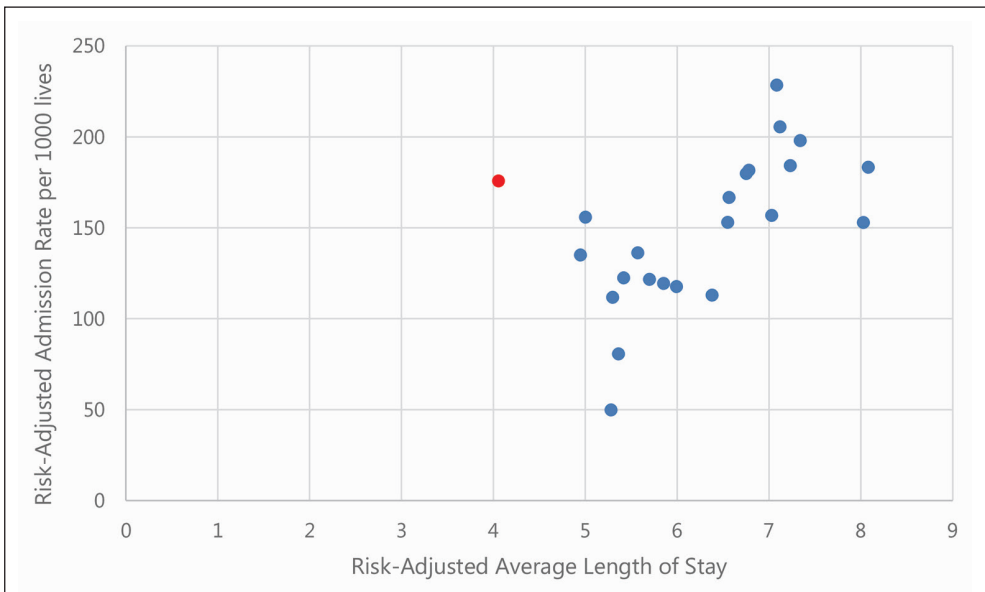

FIGURE 8. Relationship between risk-adjusted ALOS and risk-adjusted admission rate per 1 000 (EHMD)

based on the high-level disease chapters. No adjustment is possible for the admission rate; as demographic profile information is required for such an adjustment. Nevertheless, adjusting for the known clinical chapter differences causes some notable changes to observed country statistics (Figure 10).

6.4.2   On this larger comparator set, South Africa ranks ninth out of 42 countries at 713 bed days per 1 000 (Figure 11). Mexico shows the lowest figure in the comparator set at 234 per 1 000, and Korea is the highest at 2 486 per 1 000.

6.4.3   The OECD dataset also contains information on the hospital beds available in each comparator country. Plotting this against the bed days used per 1 000 a very clear pattern emerges (Figure 12). Bed days used correlates very highly with available beds per 1 000 (80%). South Africa is aligned with this correlated pattern, with comparatively low available beds and bed days used. Note that we have not adjusted the available beds downward to reflect the use of these beds in South Africa for same-day admissions, as discussed above.

7.   CONCLUSION

7.1   Undertaking an international comparison of hospital utilisation is potentially useful as a means of establishing expectations for South Africa and identifying characteristics of the environment that are particularly unusual. However, it is clear that it is important to undertake such comparisons carefully. It is particularly important that comparisons are on a like-for-like basis, and do not ignore differences in data definitions, patient demographics and clinical case mix.
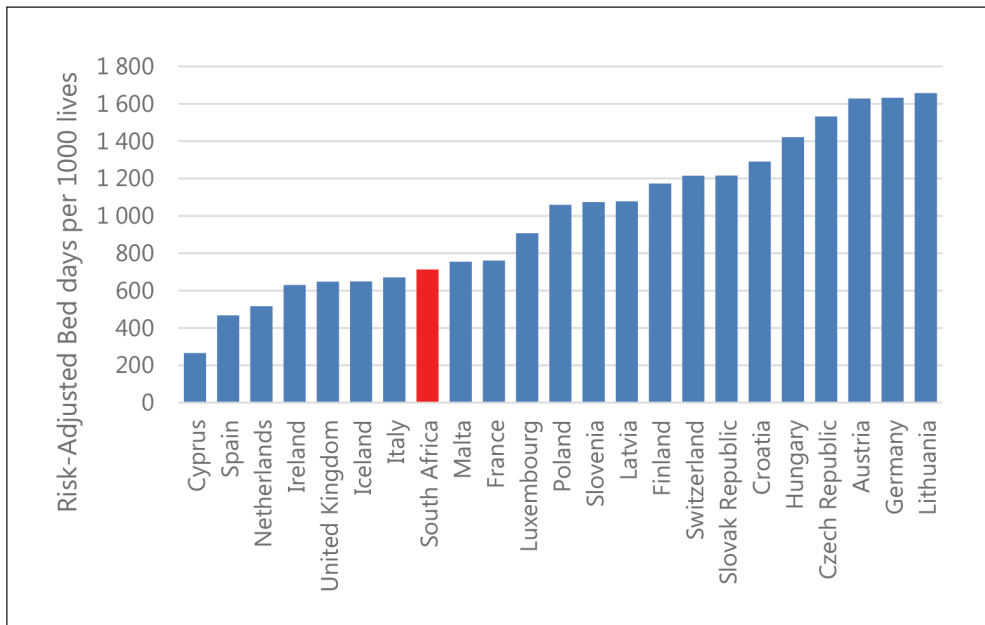

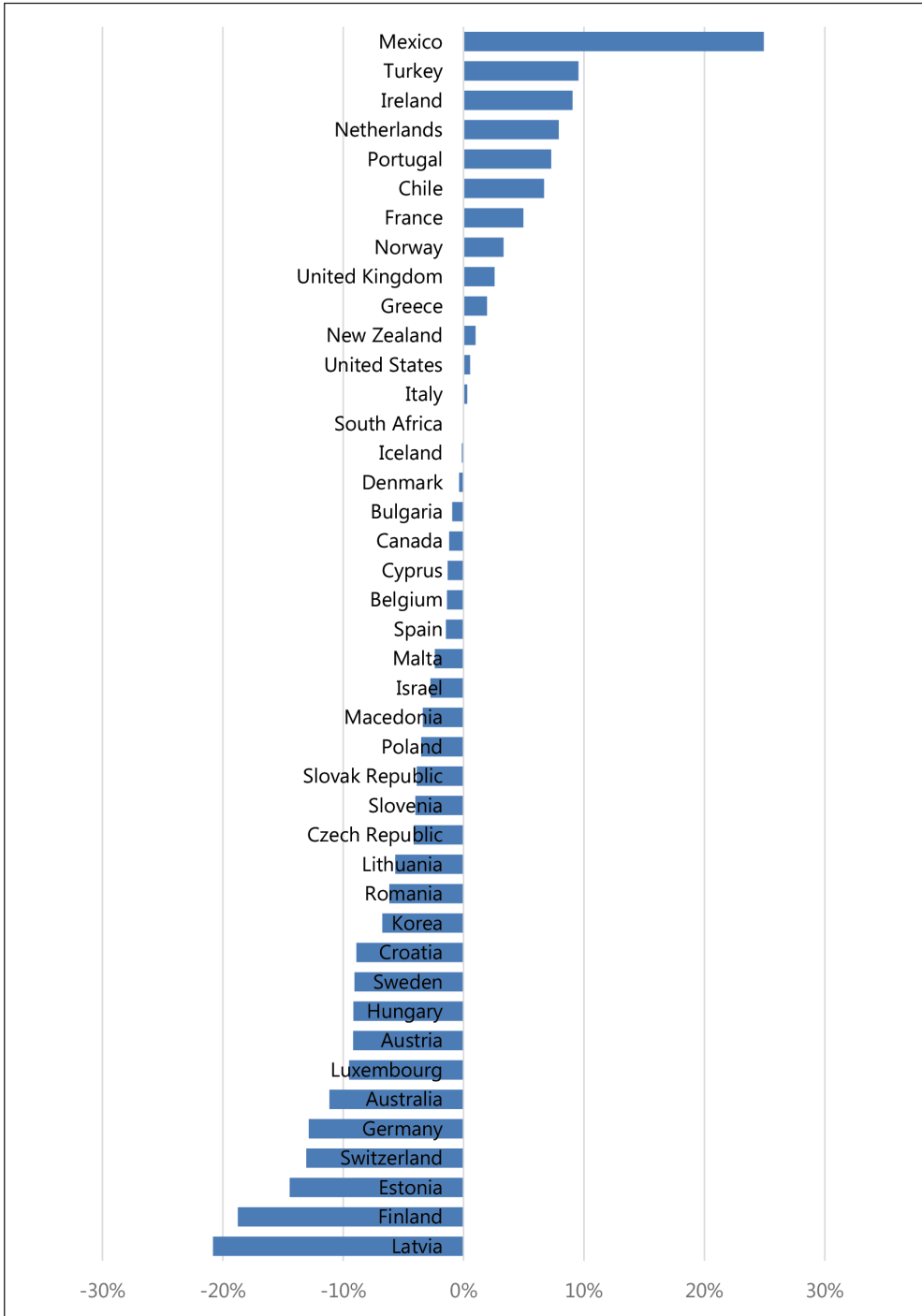FIGURE 9. Risk-adjusted bed days per 1 000 (EHMD)

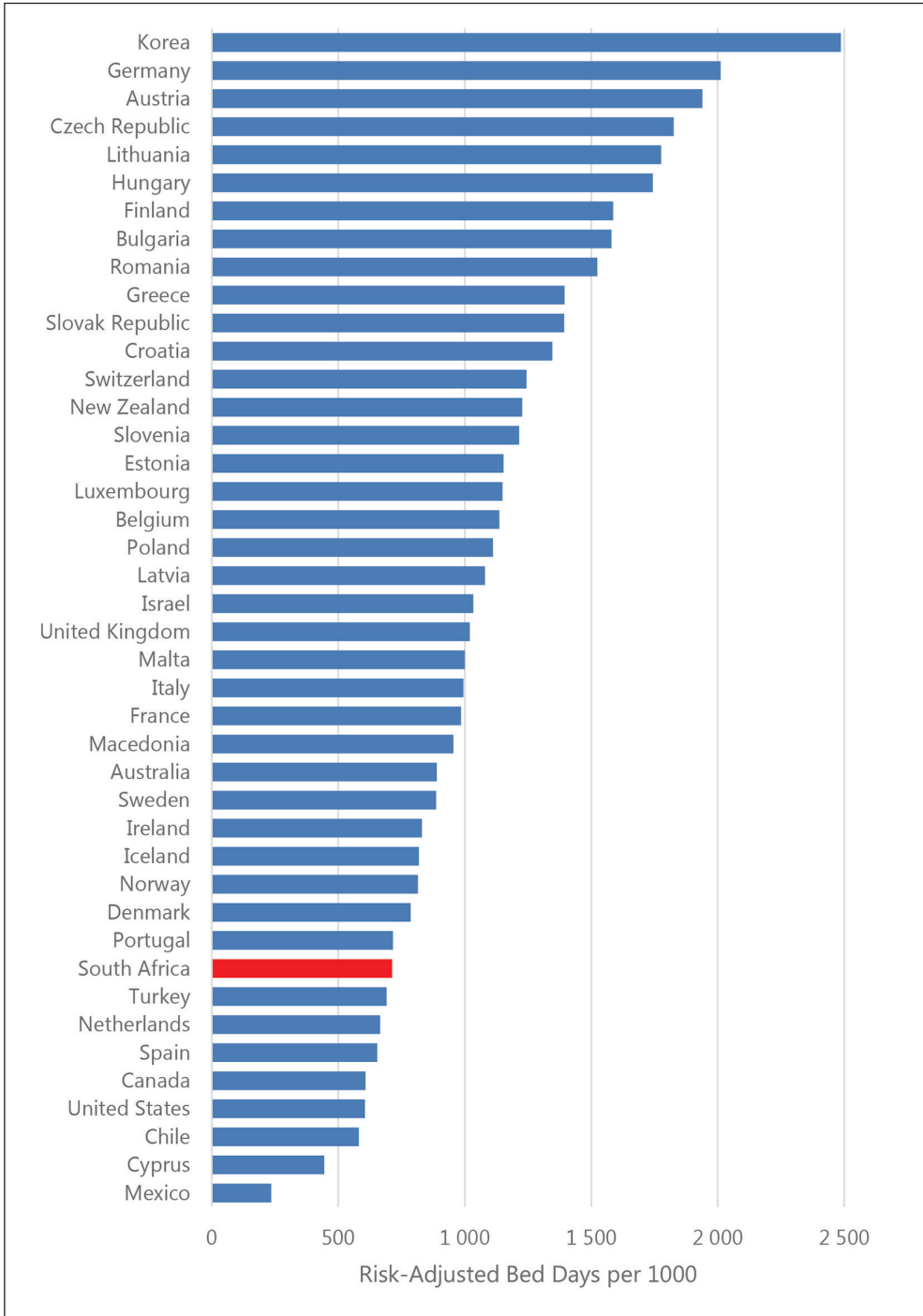FIGURE 10. Percentage change in ALOS due to risk adjustment (OECD)

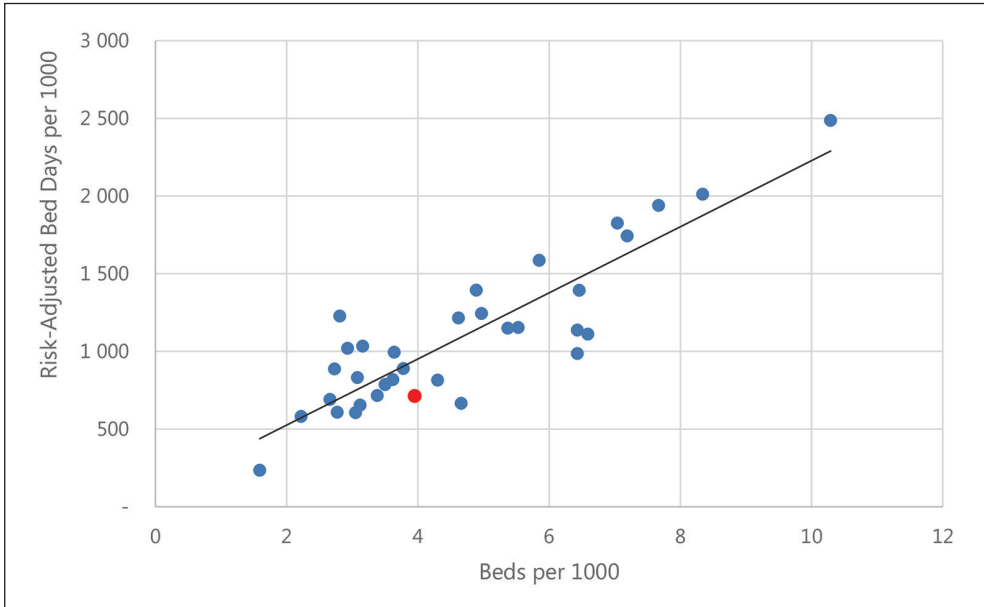FIGURE 11. Risk-adjusted bed days per 1 000 (OECD)

FIGURE 12. Relationship between bed days per 1 000 and beds per 1 000

7.2   It is also important to select a relevant comparator set. We have used an economic basis for comparison as opposed to a health-systems basis. Given that the private sector in South Africa typically serves higher-income individuals, we have used the income differentials between covered and uncovered lives as a proxy for GNI. Comparator countries were chosen that are in a similar GNI-per-capita bracket as the South African private sector. This does not address the issues of inequity between the public and private sectors, and does not engage with whether the private sector should be serving a different population.

7.3   It is worth noting the impact of risk adjustment on the results obtained. Risk adjustment narrows the range observed, or emphasised differently, risk-profile differences explain some of the variation in hospital utilisation seen between countries.

7.4   For these comparator countries we can compare the utilisation of hospital services by looking at overnight admission rates per 1 000 and ALOS (and the combined bed days per 1 000). Results are risk-adjusted to make them more directly comparable. Considering two separate data sources, South Africa appears to have mid- to high-range admission rates with low ALOS. On a combined basis, the bed days used per 1 000 for South Africa appears near the lower end of the spectrum which would indicate the South African private sector is making fairly efficient use of its hospital resources.

7.5   The high admission rates can be understood in the context of privately-funded and -provided care, with the concomitant rationing mechanisms. However, further analysis is

required to understand the relatively low ALOS. One possibility is that medical schemes manage length of stay more actively than they do admission rates.

7.6   Reimbursement structures for hospital services are mixed, with the majority still being fee-for-service with notable progress in alternative reimbursement models such as per diems and fixed fees. Diagnosis Related Groups (DRGs) are widely used for analysis purposes but are yet to become the dominant form of reimbursement of hospital services.

7.7   Other dimensions, such as level-of-care and waiting times are also of interest and should be considered in further research.

7.8   Further investigation will be useful to describe the drivers of the utilisation figures observed in South Africa as well as in the comparator countries. One such investigation would be to determine the utilisation figures by ISHMT chapter in order to observe which groups of diagnoses are experiencing relatively high inpatient admissions, average lengths of stay, and bed days per 1 000. There is, however, the issue that only EHMD had sufficiently detailed data for this, which limits the set of countries against which South Africa can be compared. In addition, the interpretation of such investigations is complicated as a detailed understanding is required of how each individual health system is structured, in order to provide possible explanations for the results observed.

7.9   In interpreting the results, it is necessary to consider structural differences between countries, for example, the extent to which care is rationed and prioritised, the split between types of facilities, the availability and access to facilities and the way in which care is financed. For example, some countries may have a large number of nursing homes, long-term care facilities and step-down facilities which may impact ALOS. Differences in the nature of hospital reimbursement between countries may also affect comparative utilisation rates.

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