

Estimating Delivery Efficiency under NHI

The purpose of this series of policy briefs on National Health Insurance (NHI) and the related IMSA web-site is to put in the public domain material and evidence that will progress the technical work of developing a National Health Insurance system in South Africa. This includes tools for costing NHI and evidence on where savings could be achieved in moving to a future mandatory system with universal coverage.

IMSA NHI Policy Brief No. 6 dealt with the basics of costing and pricing healthcare from an actuarial perspective¹. Ideally, we would want to study the age-gender curves in the public sector in South Africa but despite several attempts over a nine year period it has not yet been feasible to estimate these curves. It is of course very difficult to use data from an under-resourced public service to predict cost in a future better-resourced system.

Researchers do have access to excellent private sector data and thus the technical issue becomes how to adjust the private sector age-gender curves to estimate the likely total cost in a well-resourced public system. There are some issues related to the shape of the curves² but the most critical and most difficult adjustment is the estimate of delivery efficiency.

It has been widely held³⁻⁷ that the private sector is relatively inefficient and that the predominantly fee-for-service reimbursement system is at the root of the problem. There is thus often an assumption that a future system with changed purchasing behaviour (more strategic purchasing and less passive purchasing) and changed reimbursement (more capitation^a and use of DRGs^{b, 8}) can deliver healthcare more efficiently than the private sector at present. In other words, models often make allowance for the cost of delivery to be cheaper in the public sector or NHI than the current medical scheme environment.

However hard evidence for the extent of any saving is much more mixed and the issue is not at all straightforward. This policy brief sets out some of the evidence for this critical assumption in costing and comments on some of the studies, their relevance to local conditions and newer evidence.

1. NHS in the UK compared to South African Hospitals

In early work on minimum benefits in South Africa, Söderlund & Peparah⁹ used data from the National Health Service (NHS) in the UK, blended with data from the mine hospital system in South Africa and a small amount of medical scheme data. They “combined individual data sources to yield a hybrid utilisation and cost dataset which selectively uses elements from each of the sources. The hybrid dataset was designed to represent the best possible estimates for the South African target population”.

^a Capitation is a fixed amount per person enrolled, typically per month, rather than a fee paid per patient visit. Doctors take on the risk of managing expenditure within the monthly capitation amount.

^b Diagnosis Related Groups – a payment method for hospitals which groups similar diagnostic categories into clinically meaningful diagnostic clusters that have similar resource use. It simplifies payment to hospitals and hospitals take on the risk of managing expenditure within the amounts received.

The authors found “potential for enormous variation in the elective surgery rates Admission rates for this category in the South African Medical schemes sector are almost double those of NHS hospitals, and approximately four times those of mine hospitals”.

2. NHS in the UK compared to Managed Care in the USA

It is of interest to see from later studies that the NHS is not considered as efficient as some other systems. A paper in 2003 compared the utilisation of hospital beds by those over age 65 in the NHS in England, Kaiser Permanente in California, and the Medicare programme in the United States and California¹⁰. The authors found that “Bed day use in the NHS for the 11 leading causes is three and a half times that of Kaiser’s standardised rate, almost twice that of the Medicare California’s standardised rate, and more than 50% higher than the standardised rate in Medicare in the United States. Kaiser achieves these results through a combination of low admission rates and relatively short stays.” The authors concluded that “the NHS can learn from Kaiser’s integrated approach, the focus on chronic diseases and their effective management, the emphasis placed on self care, the role of intermediate care, and the leadership provided by doctors in developing and supporting this model of care.”

It is now known that there are large differences in definition between hospital admissions in the USA and South Africa¹¹ (see section 4). The NHS- Kaiser-Medicare study also found that the differences in coding, types of facility and ways of recording information influenced the results, saying “the NHS data presented here do not distinguish between the time that patients spend in an acute hospital and the time they spend in a community hospital or similar facility. This is a limitation of the reporting of activity data in the hospital episodes statistics system and means that the NHS figures overestimate the use of acute beds in comparison with Kaiser and Medicare”. It is not simple to compare admission rates and length-of-stay across different countries or different provider systems.

3. Levels of Managed Care Efficiency in the USA

The Formula Consultative Task Team in 2003/4 considered the issue of delivery efficiency when initially developing a formula for risk equalisation between medical schemes¹². Information at that time was provided by Rob Parke and Mark Litow of Milliman USA, an actuarial and clinical consulting firm. Milliman USA made use of a concept of levels of efficiency when pricing healthcare in the USA. They used three levels of efficiency in managed care and these were interpreted for South Africa in discussions with Rob Parke in 2001:

- **Loosely-managed:** the standard level of managed care interventions in general use by SA schemes i.e. includes pre-authorisation, case management, drug-utilisation review but almost no risk-sharing with providers. This use of the tools of managed care with little risk-sharing is described by Doherty & McLeod¹³.
- **Moderately-managed:** an intermediate level of managed care that involves some risk-sharing. Examples would be per diem or per case rates on hospitalisation. In 2001 it was unlikely that many whole schemes would have reached this level. For the last seven years, many schemes at Medscheme have been on per diem rates and fixed fees for about 80% of total hospital costs.
- **Well-managed:** a full implementation of managed care with extensive risk-sharing with providers or complete risk-taking by providers as in staff model Health Maintenance Organisations. The best examples in SA (in 2001) were the mine healthcare systems like Igolide and Impala Platinum.

While it had been hoped to do a PMB costing in one of the Well-managed settings in South Africa, this has not yet been possible and should still be a high-priority research project in South Africa.

The graph below illustrates the three levels of efficiency using data supplied by Milliman USA for their market. Note the similar shapes for the different efficiency levels in the graph.

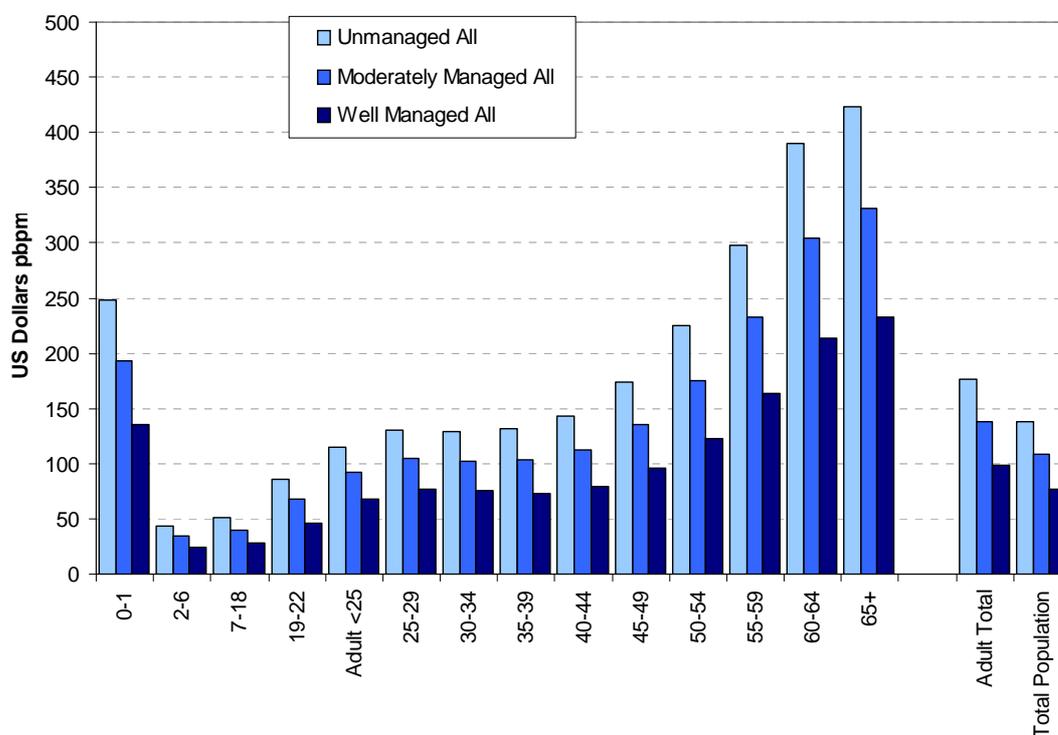


Figure 1: Effect of Efficiency on USA Hospital Costs (Inpatient + Outpatient)

Source: Milliman USA

The table below illustrates the expected effect for three measures of utilization, using data from the USA for commercial (under age 65) health plans and the very large USA national fund, Medicare, which provides healthcare to those over age 65.

Table 1: Impact of Managed Care Level on Admissions and Bed Days Needed in the USA

Source: Milliman USA ¹⁴

Population	Efficiency Level	Admissions per 1,000	Average Length-of-Stay	Bed Days per 1,000	Utilization relative to Loosely Managed
Commercial (i.e. under age 65)	Loosely Managed	77.200	3.982	307.400	100%
	Moderately Managed	62.765	3.488	218.950	71%
	Well Managed	8.330	2.700	130.500	42%
Medicare (i.e. over age 65)	Loosely Managed	292.600	6.673	1952.600	100%
	Moderately Managed	220.800	5.873	1296.650	66%
	Well Managed	149.000	4.300	640.700	33%

In the work on the Risk Equalisation Fund pricing, there have been strong arguments to suggest that this theoretical efficiency could not be expected in South Africa^{7,15}. After seven years of experience of Moderately-managed care it has been difficult to show that there is any material gain compared to Loosely-managed care. The order of magnitude of changes suggested in the USA data are definitely not what experience has shown in South Africa.

There are considerable issues delaying the full introduction of risk-sharing under managed care with little coordination between the Competition Commission, the Council for Medical Schemes, the Health Professions Council and the National Department of Health. There are also significant differences in the structures in which medicine is practiced and the relative numbers of healthcare providers between the two countries.

4. Comparison of Bed Utilisation in the USA and South Africa

The difficulties with comparing utilisation figures across different countries was examined in a recent paper comparing bed utilisation in South Africa and the USA¹¹. At face value, the Council for Medical Scheme published an admission rate for the private sector in South Africa of **301.7** days per 1,000 population, whereas USA figures are quoted as **132.2** days per 1,000, or a gap of 169.5 days per 1,000 lives.

Van Eck & Besesar showed that a series of adjustments were needed to both the SA data and the USA data in order to do a fair comparison. These included:

- Adjustment to SA admission rates to remove ambulatory, emergency unit admissions and admissions to non-acute care facilities to bring the definition of facility in line with that in the USA [reduced SA figure from 301.7 to 224.4 per 1,000].
- The in-patient definition in the USA is for admission over 24-hours duration. The SA admission rates had included stays shorter than 24 hours and were thus adjusted [reduced SA figure to 136.5 per 1,000].
- A normal birth in the USA counts as two admissions whereas in SA, normal newborns are not counted separately. The USA admission figures were thus decreased to the SA definition [reduced USA figure from 132.2 to 121.6 per 1,000].
- The USA has a much older age profile than South Africa and hospital admissions have a strong pattern by age. The USA figures were adjusted to the SA private sector age profile [further reduced USA figure to 98.3 admissions per 1,000].
- The USA has a much lower maternity rate in the peak years of age 25-29. As other evidence has shown, there seems to be anti-selection in South Africa with more women joining medical schemes in order to give birth in private facilities [USA figures adjusted to SA maternity rate results in USA admissions increasing to 101.2 days per 1,000 lives].
- There are large numbers of people in the USA who are uninsured and there is a strong pattern by age. Admissions by uninsured are lower than for the insured and so the reported USA figures for the whole country are increased to allow for higher utilisation if all people were insured [USA figure increases to 114.8 days per 1,000].

This results in a comparison of adjusted SA figures of **136.5** days per 1,000 with adjusted USA figures of **114.8** days per 1,000 or a gap of 21.7 days per 1,000. The authors argue that the remaining difference may be due to the differing burden of disease in the two countries (HIV/AIDS prevalence in particular) and differences in the insurance environment. For example, in the USA many states allow insurers to decline cover for “medically uninsurable” individuals or increase premiums whereas medical schemes in South Africa operate under community-rating and open enrolment^c.

A similar exercise adjusting published length-of-stay (LOS) figures increases the observed South African LOS from 3.16 days to 5.14 days while the average USA LOS is 5.6 days.

^c Community-rating requires that everyone in an option is charged the same standard rate while open enrolment requires that open medical schemes accept anyone who applies.

5. Impact of Different Forms of Managed Care

Randy Ellis of Boston University reported on research in the USA on the effect of different forms of managed care design on cost curves by age¹⁶. Initially it seems that there are significant differences in the cost curves for under age 65s between five types of health plans. While the whole data set is 13.0 million lives, Ellis says: "Each of the lines is drawn with at least 100,000 enrollees, so the patterns are highly stable across age groups. The figure suggests that enrollees in each of the five plan types are relatively similar up until age 40, at which time there is a divergence of HMO and point-of-service (POS) with capitation plans from the rest. By age 40 there is about a 20 percent discrepancy between the HMO and POS with capitation plan from the other three plan types. Is this difference due to selection of healthier people conditional on age, to taste differences, or due to supply side moral hazard response to incentives?"

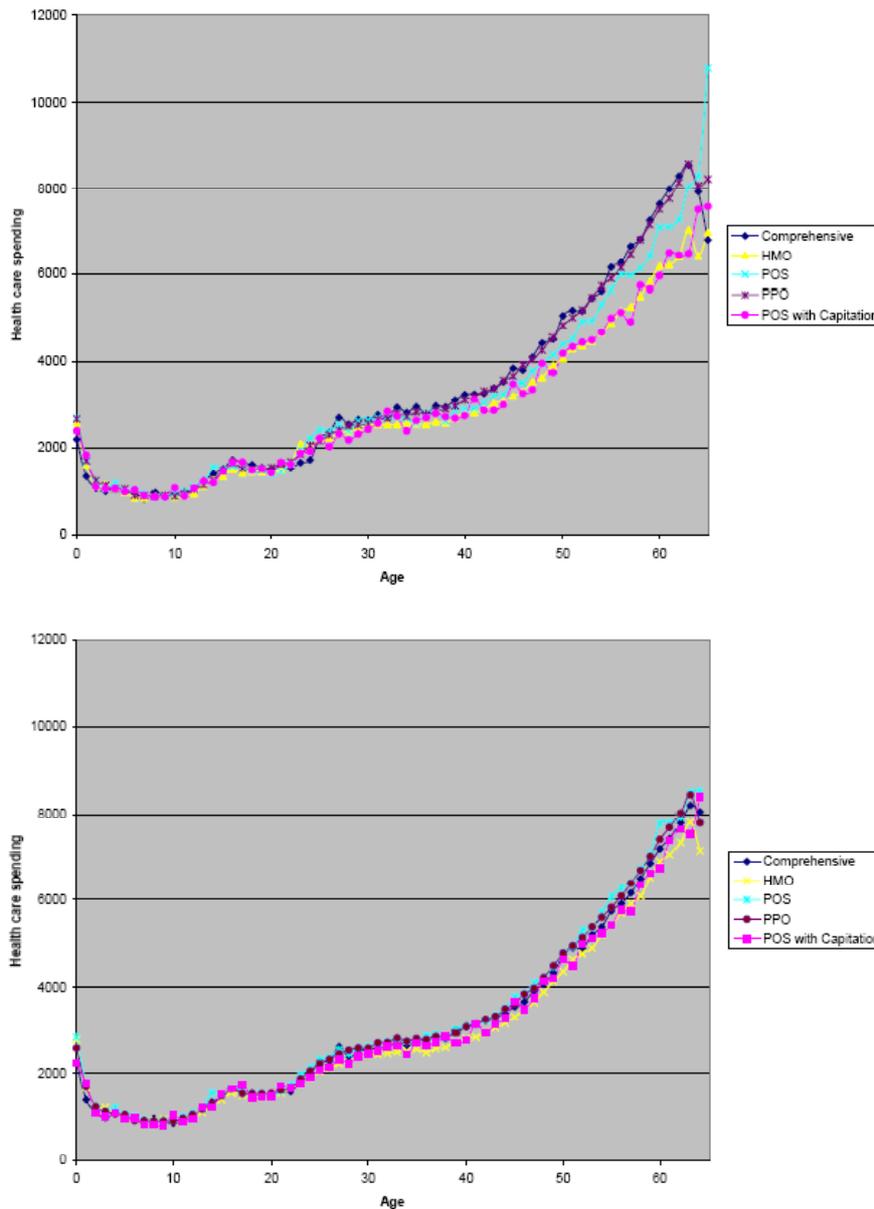


Figure 2 a and b: US privately-insured health care spending, by age and health plan type, 2004. Figure a is unadjusted and Figure b is risk-adjusted. Source: Ellis¹⁶.

Ellis says that the second graph above “provides one answer to this question. Instead of plotting actual spending by age and plan type, the figure shows the risk adjusted spending by age and plan type. Risk adjustment in this example was done using the DCG/HCC concurrent risk adjustment model. The five lines are much closer together, differing by less than 5% across plan types. There is still a difference at age 40, but it is much smaller. This modest difference once spending is risk adjusted suggests that most of the 20 percent observed difference is due to selection differences, not taste, or moral hazard. The implied cost savings from the HMO and POS with capitated from the most common plan type of preferred provider organizations (PPOs) is less than 5%, with a modest gradient upward with age.”

6. Why are Managed Care Plans Less Expensive?

Another paper that gets behind the observed differences in price between managed care plans and other plans is a 2004 paper by Polsky & Nicholson¹⁷. The paper quantifies the reasons why managed care plans appear to be less expensive, considering the roles of risk selection, utilization and reimbursement levels.

The authors say: “Today, various plan types exist; some with strict controls on enrollee use of medical services (i.e., Health Maintenance Organizations (HMOs)^d), and others with fewer restrictions such as indemnity^e plans and preferred provider organizations (PPOs)^f. The mean [annual] premium for a family policy in 2001 was US\$6,500 for an HMO, US\$7,700 for an indemnity plan, and US\$7,200 for a PPO plan. Despite the strict controls on medical service use, HMOs have been able to capture a 45 percent share of the large-employer market by charging considerably lower premiums than indemnity plans and PPOs.”

“We will consider utilization, reimbursement, and risk selection as possible explanations for the lower premiums. First, we consider the utilization effect, which would occur if lower premiums reflect the success of HMO plan managers at restricting access to medical care they believe is worth less to enrollees than it costs HMOs. Second, we consider the reimbursement effect, which would occur if the lower premiums are due to the ability of HMOs to pay physicians and hospitals less than non-HMOs by promising to channel more patients to medical care providers who agree to accept discounted payments. Third, we consider the risk selection effect, which would occur if lower premiums reflect the ability of HMOs to enrol a disproportionate share of people who have a relatively low demand for medical care.”

“Which stakeholders have been influenced the most by managed care penetration depends largely on which of these explanations tend to dominate. If HMO plans are less expensive because they are designed and managed differently, there are efficiency gains due to the more efficient use of health care resources and consumer welfare gains due to greater product selection. If HMOs are less expensive because they pay hospitals and physicians less than non-HMO plans, this transfers money from medical care providers to consumers or health insurers. And finally, if HMO plans are relatively inexpensive because HMOs attract low-risk enrollees who have low expected costs, policy makers, high-risk enrollees, and employers should be concerned because HMOs may be distorting services to create disincentives for high risk enrollees and because this differentiation could lead to market disequilibrium (quoting Cherner and Frick, 1999)”.

^d Relative to PPOs, HMOs generally have a more restricted network of physicians and hospitals, evaluate the medical necessity of medical care more rigorously (e.g., require approval before a patient can be referred to a specialist), and are more likely to provide physicians and hospitals with financial incentives to encourage judicious use of resources (e.g., by paying physicians a fixed amount per enrollee per year, regardless of how much medical care the enrollee requires).

^e Enrollees in indemnity plans are generally able to choose any physician and hospital but must pay a co-insurance rate for the medical care they receive.

^f PPOs offer enrollees reduced payments at the point of care if they choose to be treated by physicians and hospitals who have agreed to accept discounted payments from the health insurer.

"Among people who had a choice of health plan type, ... Expenditures per enrollee are US\$188, or 9.3 percent, lower for HMOs relative to non-HMOs. Decomposing this -US\$188 difference into its component parts, it is estimated that US\$46 is due to different utilization of medical services due to differences in plan design and management (the utilization effect), US\$22 is due to differences in observed enrollee characteristics, US\$13 is due to differences in unobserved enrollee characteristics [both risk selection], and -US\$269 is due to relatively low HMO provider reimbursement levels."

"The large reimbursement effect combined with the small estimated utilization and selection effects indicates that HMO plan expenses are lower than non-HMO plan expenses due to superior negotiating power, rather than superior utilization management or favourable risk selection. We find no evidence of risk selection between HMOs and non-HMOs in a large national sample."

"The finding that HMO and non-HMO enrollees of similar characteristics receive the same amount of medical services differs from the results of early studies. These studies generally conclude that HMO enrollees spend fewer days in the hospital, but receive more physician visits and more preventive care than their fee-for-service counterparts (summarized by Miller and Luft, 1994), which would probably result in lower utilization for HMOs. A more recent study by Tu et al. (1999) is consistent with our findings of no utilization differences. They conclude ... that HMO enrollees receive more primary and preventive care than non-HMO enrollees, while many of the more costly services are used in equal amounts in both plan types."

"Likewise, Altman, Cutler, and Zeckhauser (2000) and Cutler, McClellan, and Newhouse (2000) find little difference in the amount of medical resources used to treat HMO and indemnity patients. The conclusion that differences in provider reimbursement rates account for most of the expenditure difference between HMOs and non-HMOs is consistent with the results of Cutler, McClellan, and Newhouse (2000) and Altman, Cutler, and Zeckhauser (2000). These studies conclude that patients with eight different medical conditions generally received the same type and amount of medical care whether they were enrolled in an HMO or indemnity plan. Massachusetts HMOs, however, paid physicians and hospitals about 40 percent less than indemnity plans conditional on the type of treatment rendered."

The authors thus conclude: "the US\$188 difference between HMO and non-HMO medical expenditures per enrollee can be explained by the relatively low provider reimbursement rates paid by HMO plans." [emphasis added]

7. Cost for Hospital Admissions in the Public Sector in South Africa

In 2001 attempts were made using South African data to get an understanding of the difference in cost between medical schemes and the public sector. The work on in-hospital benefits was attempted as part of the work on PMB pricing for 2001¹⁸. The authors wrote: "Attempts to obtain information from the public sector departments have not proved as successful as envisaged. The figure quoted several times in efforts to obtain data was that the UPFS was set up to cost 25% less than comparative private sector rates. The number of 30% is also regularly quoted. Neither has been substantiated in any meaningful way."

"The Consortium has been able to obtain two studies, which could assist in this comparison. The first relates to a single case study performed by Dr Gilbert in which she analysed anticipated costs of an appendectomy in district vs. academic facilities according to the UPFS." Data was extracted from Medscheme for comparison and it was found that "Average costs ... were ... 43.8% higher than the public sector. Initial reaction is that the private sector costs are exorbitant but if comparable analysis is done on average length-of-stay then a somewhat different picture emerges. Considering only the admissions ... for 4 days and less, the average cost per stay ... decreases to 34.08% higher than the public sector. The average cost is thus driven up by the cases with complications."

"The second [study] relates to work done by the Provincial Administration of the Western Cape Health Department by Kim Lowenherz, where a comparison was made of costs for some procedures and

diseases entities between the Public and Private sector.” “The comparison by PAWC of BHF and UPFS tariffs for the same condition provides no evidence of any pattern that can be used for the estimate of public sector delivery costs.”

The authors concluded: “A great deal of work needs to be done to definitively determine the relationship between the UPFS costs in the public sector and the costs in the private sector.” “In the absence of solid evidence,” [emphasis added] “the Consortium recommends the use of 70% of the full PMB price for delivery of both the PMB Inpatient package and the PMB Outpatient package in the public sector environment.”

More recent work at Medscheme shows that the difference in cost per admission after adjusting for risk and case mix is about 20%. However the average LOS in State is significantly longer, perhaps because there is no case management infrastructure in place and medical schemes do not manage this aggressively in the public sector. It is important to remember that that 14% of any difference between private and public hospital costs sector is due to the public sector not paying VAT. This leaves at best a **6%** difference after adjusting for risk, reason for admission and severity.

The level of urgency should also be considered in future work: while there may be potential savings on elective hospitalisations, the same may not be true of non-elective or emergency admissions.

8. Cost for Medicines in the Public Sector in South Africa

An estimate for the medicine component of PMBs in the public sector was considered as part of the PMB pricing done in 2001¹⁹. “The Department of Health developed the Essential Drugs List (EDL) for public sector implementation in 1996, with possible future extension to the private sector. Stakeholders were consulted to develop an EDL with the objectives of safety, efficacy and quality at the lowest possible cost, while providing coverage for 90-95% of the common and important conditions in the country. The development of the EDL was seen as an important part of the National Drug Policy [of that time].” ...

“The 1995 Report of the Committee of Inquiry into a National Health Insurance System reported that even a partial switch to EDL medicines would reduce overall projected private health expenditure by 5% and the potential savings were estimated at some R 1.2 billion per annum. The Committee recognised the potential for resistance on the part of providers, and therefore favoured a scenario in which prescription costs would be halved, rather than the best-case scenario in which an 80% reduction could be achieved if all drug prescriptions were switched to EDL medicines. Private sector access to the list was originally given a target date of April 1997, but has not occurred.” ...

“A comprehensive study of private sector prescribing patterns compared to the Essential Drugs List protocols was performed by Professor Alan Rothberg and Dr Laubi Walters in 1994.”²⁰ “The research produces an estimate of the potential saving for medical schemes if the EDL is implemented fully. ...” The table shows that if the EDL medicines currently prescribed by GPs in the database were purchased through the State, an 18.3% saving would be achieved on the total GP medicines expenditure. An additional 15.7% would be saved if GPs switched the ‘other forms of EDL’ items to EDL items, and another 38.0% if the supplementary formulary items and some out-of formulary items could be switched to EDL medicines. Switching of all items, with the exception of an accepted 10% out-of-formulary items, would therefore achieve a saving of some 72% on total GP medicine expenditure”.

“The analysis indicates that the draft EDL covers only approximately one-fifth of items currently prescribed within a large, disciplined HMO in which the GP is promoted as the ‘gatekeeper’. the extent of such savings clearly depends on two major factors: the ability and willingness of prescribers to switch patients from non-EDL to EDL products, and the base from which the savings are calculated. Savings would also depend on the success of pricing proposals as detailed in the National Drug Policy document. (A further factor is whether) the scope of primary care is sufficient to ensure

that patients currently under GP care are not unnecessarily forced up the referral pathway to secondary-level providers and medicines.”

“Maximal savings would be achieved through switching of all except the accepted approximately 10% of out-of-formulary products to EDL medicines. According to the calculations, this could result in savings of more than 70% on GP prescriptions in a cost-controlled environment, and even greater savings in an environment in which there is currently less use of generic medicines. On the basis of the preceding discussion it would appear that the Committee of Inquiry’s estimate of a 50% reduction in private sector costs is achievable for primary health care medicines. However, this cannot be extrapolated to the total private sector medicines budget without repeating the exercise for secondary level and specialist-prescribed medicines.” “On the advice of Professor Rothberg, the Consortium recommends using an estimate of a 50% saving in the cost of the CDL package when delivered in the public sector. As policy unfolds in this area, so this estimate can be further refined.”

However in subsequent research the extent to which state tender prices are being subsidised by the prices charged in the private sector has become evident. The impact on medicine prices in the public sector of this cross-subsidy being reduced or eliminated has not been taken into account in any of the analysis above. The above estimates should thus not be used without estimating the effect on medicine prices of the loss of the cross-subsidy from the private sector and the impact of VAT. It is also critical to revisit medicine policy in South Africa and consider the estimates in the light of policy as it has evolved to 2010.

Since 1994 when the Rothberg & Walters study was done, the landscape for medicine regulation has changed substantially. It is no longer relevant to use their analysis and apply the conclusions to medical scheme data in 2010. Since 1994 there have been many changes including mandatory generic substitution, Single Exit Price (2004), a reduction in the ex-manufacturer price by 21%, introduction of a transparent pricing system, numerous attempts at regulation on dispensing fees, the banning of discounts and control over sampling, amongst other reforms. These are all things that have changed the price baseline since the initial study. It is critical that new work be done on this element before assumptions are made in any costing of future medicine prices under NHI.

9. Assumption for Delivery Efficiency in South Africa

Subsequently, three further projects were attempted at UCT in order to get a better understanding of delivery costs in other settings. The attempts at using public sector data directly have not yet yielded usable results. A promising project in a capitated primary care setting has some useful information but more work is needed in order to be able to make recommendations from the analysis. This research area is one that deserves greater attention by all healthcare financing researchers.

The core of the problem still remains: there is inadequate information to develop cost curves by age and gender for delivery of quality healthcare in the public sector. Faced with the excellent data from private sector medical schemes, what adjustment needs to be made to the private sector costs curves to estimate the public sector cost curves? The answer is, as actuaries and economists, we simply do not know.

One issue that concerns economists is that the cost “saving” in the public sector is not really an “apples vs. apples” comparison. There may potentially be great differences in the quality of care in the two sectors. The private sector nurse-bed ratio of 1.20 (28,000 beds vs. 33,600 nurses, by Medi-Clinic estimates) is exactly the same as that in the public sector (87,000 beds vs. 104,000 nurses, according to Medi-Clinic and Econex estimates), but the latter counts all the nurses in the public sector, while it should subtract those in clinics. This is just one dimension of quality difference. Yes, the public sector is likely to do things considerably cheaper, but this is not a homogenous product.

The major reason managed care plans appear to be lower cost, according to Polsky & Nicholson¹⁷ (see section 6) is that they are able, in the USA, to drive down reimbursement rates. The critical

difference between South Africa and the USA is the relative lack of human resources. New information on the shortages of doctors and nurses emerged in the last few years from the Development Bank of South Africa Roadmap process²¹ and from Econex²². Ownership of hospitals in the USA is typically widespread and community-based. There are also lower cost settings available for care, including day hospitals and step-down facilities. These factors have had a major impact on the ability of health plans in the USA to negotiate price in return for volumes as managed care has evolved since the mid 1970s. It is thus argued that in the South African environment the price differences for the introduction of managed care are not achievable given the relative shortage of resources.

Future work in this area should perhaps be focussed on the components of total cost, including reimbursement rates and methods, utilisation, admission rates, lengths-of-stay, levels of care and levels of severity. Ideally, there will be research on the results of demonstration projects in South Africa, looking at the improvement in the cost of delivery in a variety of settings.

In the absence of clear evidence of how to adjust the private sector data for the cost of delivery in the public sector, the McLeod-Grobler-Van der Berg model² allows for a “family” of cost curves to be developed to illustrate the sensitivity of the total cost to this critical assumption, as shown below.

Table 2: Preliminary Costing of NHI for a Range of Packages and a Range of Efficiency Levels²

Cost in Rbn (2009 terms) of Benefit Package Offered by NHI					
Efficiency assumption	Medical Scheme Prescribed Minimum Benefits (PMBs)	Basic Benefits: PMBs+ Primary Care	High Cost Benefits: PMBs+ all In-Hospital	Core Benefits: PMBs+ Primary Care+ In-Hospital	Fully Comprehensive: all healthcare benefits
Medical schemes efficiency: 100% of cost	156	251	224	319	334
Moderate improvement: 80% of cost	125	201	179	255	267
Presumed public sector cost: 70% of cost	109	176	157	223	234
Staff model efficiency: 50% of cost	78	126	112	160	167

It was estimated that fully comprehensive cover might cost as much as **R334 billion** in 2009²³. This assumes current medical scheme delivery. The same package would be **R234 billion** if there was a 30% reduction in delivery cost compared to the private sector. The authors said: “Even if one accepts the optimistic view that public sector provision could be up to 30% cheaper (though this ignores service quality) and applies that 30% reduction across the board, the funding required to fund the NHI at BBP benefit⁹ levels is a full **R176 billion**”.

The costings in the McLeod-Grobler-Van der Berg model should be regarded as preliminary costings as administration and managed care costs have not been included. The effect of HIV/AIDS in the public sector population is also not fully taken into account and there are a range of technical issues that still need to be addressed. Readers are urged to read the limitations and further work required in the full methodology report².

⁹ The Basic Benefit package consists of PMBs plus primary care only.

By **Heather McLeod, Pieter Grobler and Servaas van der Berg**

This policy brief has been extracted from a document prepared as a briefing note for National Treasury on the methodology and assumptions in the McLeod-Grobler-Van der Berg model. That model provided a preliminary estimate of NHI Costing in 2009 Rand terms.

Extracted and edited for IMSA by

Heather McLeod

25 April 2010

Resources on the IMSA Web-site

The following is available on the NHI section of the IMSA web-site: www.imsa.org.za

- The slides and tables used in this policy brief [PowerPoint slides].
- The February 2010 report by McLeod H, Grobler P, van der Berg S., entitled "Preliminary Estimate of NHI Costing in 2009 Rand Terms. McLeod-Grobler-Van der Berg Model Methodology and Assumptions. A briefing paper prepared for National Treasury." [PDF]
- The spreadsheet of the McLeod-Grobler-Van der Berg Preliminary Model [Excel spreadsheet].

As the purpose of this series is to put in the public domain material and evidence that will progress the technical work of developing a National Health Insurance system, we would be delighted if you make use of it in other research and publications. All material produced for the IMSA NHI Policy Brief series and made available on the web-site may be freely used, provided the source is acknowledged. The material is produced under a Creative Commons Attribution-Noncommercial-Share Alike licence.



<http://creativecommons.org/licenses/by-nc-sa/2.5/za/>

References

1. McLeod H. Costing and Long-term Modelling of NHI *National Health Insurance Policy Brief 6: Innovative Medicines South Africa*; 2009.
URL: http://www.innovativemedicines.co.za/national_health_insurance_library.html
2. McLeod H, Grobler P, van der Berg S. Preliminary Estimate of NHI Costing in 2009 Rand Terms. McLeod-Grobler-Van der Berg Model Methodology and Assumptions. A briefing paper prepared for National Treasury; 2010. URL:
<http://www.integratedhealingmbs.com/#/nhi-preliminary-model/4539397344>
3. Department of Health. Inquiry into the Various Social Security Aspects of the South African Health System: Policy Options for the Future; 2002.
URL: <http://www.doh.gov.za/docs/reports/2002/inquiry/index.html>
4. Harrison S, Bhana R, Ntuli A. The Role of the Private Sector within the South African Health System. In: Harrison S, Bhana R, Ntuli A, eds. *South African Health Review 2007*. Durban: Health Systems Trust; 2007.
URL: <http://www.hst.org.za/publications/711>
5. McIntyre D, Van den Heever A. Social or National Health Insurance. In: Harrison S, Bhana R, Ntuli A, eds. *South African Health Review 2007*. Durban: Health Systems Trust; 2007.
URL: <http://www.hst.org.za/publications/711>
6. McLeod H, Ramjee S. Medical Schemes. In: Harrison S, Bhana R, Ntuli A, eds. *South African Health Review 2007*. Durban: Health Systems Trust; 2007.
URL: <http://www.hst.org.za/publications/711>
7. Armstrong J, Deeble J, Dror DM, Rice N, Thiede M, Van de Ven WPMM. The International Review Panel Report to the South African Risk Equalization Fund Task Group. Pretoria; 2004.
URL: <http://www.medicalschemes.com/publications/publications.aspx?catid=23>

8. Deloitte Actuarial and Insurance Solutions, Ferreira M. Investigation into Procedural Coding for South Africa Board of Healthcare Funders; 2007.
9. Söderlund N, Peprah E. An Essential Hospital Package for South Africa: Selection Criteria, Costs and Affordability: Centre for Health Policy 1998.
URL: <http://web.wits.ac.za/Academic/Centres/CHP/>
10. Ham C, York N, Sutch S, Shaw R. Hospital bed utilisation in the NHS, Kaiser Permanente, and the US Medicare programme: analysis of routine data. *British Medical Journal*. 2003;327:1257-1261.
URL: <http://bmj.com/cgi/content/full/327/7426/1257>
11. Van Eck H, Besesar S. Hospital Admission Rates for the Medical Scheme Population in SA: Is there a Supplier Induced Demand Problem? Comparison with Hospital Admission Rates in the USA *Private Hospital Review 2009*: Hospital Association of South Africa; 2009. URL: http://www.hasa.co.za/media/uploads/news/file/2009-06-09/Private_Hospital_Review_2009.pdf
12. McLeod H, Matisonn S, Fourie I, Grobler P, Mynhardt S, Marx G. The Determination of the Formula for the Risk Equalisation Fund in South Africa. Pretoria: Prepared for the Risk Equalisation Fund Task Group on behalf of the Formula Consultative Task Team; 2004.
URL: <http://www.medicalschemes.com/publications/publications.aspx?catid=23>
13. Doherty J, McLeod H. Medical Schemes. In: Ijumba P, Ntuli A, Barron P, eds. *South African Health Review 2002*. Durban: Health Systems Trust; 2003.
URL: <http://www.hst.org.za/publications/527>
14. Parke R. Managing Provider Risk *Actuarial Society of South Africa Health Conference*. Cape Town; 2001.
15. Risk Equalisation Technical Advisory Panel. Methodology for the Determination of the Risk Equalisation Fund Contribution Table 2007 [Base 2005, Use 2007]. Vol Report No. 9. Pretoria: Recommendations to the Council for Medical Schemes; 2007.
URL: <http://www.medicalschemes.com/publications/publications.aspx?catid=23>
16. Ellis RP. Risk adjustment and predictive modeling: Concepts and applications. In: Lu M, Jonsson E, eds. *Paying for Health Care: New Ideas for a Changing Society*. Weinheim, Germany: Wiley-VCH; 2008:177-222.
17. Polsky D, Nicholson S. Why are Managed Care Plans Less Expensive: Risk Selection, Utilization, or Reimbursement? *The Journal of Risk and Insurance*. 2004;71:21-40.
URL: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=513686
18. Fish T, McLeod HD, Eekhout S, et al. The Costing of Existing Prescribed Minimum Benefits in South African Medical Schemes in 2001: A report prepared under contract for the Council for Medical Schemes, Pretoria.; 2002.
URL: <http://hmcleod.moonfruit.com/#/pmbpricing2001/4522784359>
19. McLeod HD, Rothberg A, Pels L, Eekhout S, Mubangizi DB, Fish T. The Costing of the Proposed Chronic Disease List Benefits in South African Medical Schemes in 2001: A report prepared under contract for the Council for Medical Schemes, Pretoria.; 2002.
URL: <http://hmcleod.moonfruit.com/#/pmbpricing2001/4522784359>
20. Rothberg AD, Walters L. Formulary and funding implications of the gap between the national Essential Drugs List and current prescribing in a large health maintenance organisation. *South African Medical Journal*. 1996;86:1084-1090.
21. Development Bank of South Africa. The National Health System: A Roadmap for Reform; 2008. URL: http://www.innovativemedicines.co.za/files/Library/NHI/national%20health%20insurance%20in%20sa/Health_Strat_DBSA_Aug2008_Brief_v2.3.pdf
22. Econex. NHI Note 4: Supply Constraints *NHI Note 4*. Stellenbosch; 2009. URL: http://www.econex.co.za/index.php?option=com_docman&task=cat_view&gid=904&Itemid=60
23. Van der Berg S, McLeod H. Promises. Promises. Why the National Health Insurance plan needs hard numbers *Health-e News*; 2009.
URL: <http://www.health-e.org.za/news/article.php?uid=20032492>