Econex
Trade, Competition & Applied Economics

HEALTH REFORM NOTE 12

APRIL 2011

Modelling the Rationing of Healthcare

The previous note investigated the likelihood of switching from the public sector to the private sector in response to universal insurance, abolition of co-payments and free provider choice, as was proposed in the original National Health Insurance (NHI) documents. This note analyses the impact of factors that effectively ration public healthcare. In reaction to the lower prominence given to private providers in the new round of documents, our model no longer assumes free choice of provider. We consider how the NHI would change the demand for public healthcare services if it resulted in shorter waiting times at public clinics and hospitals, as well as increased the access to general practitioners (GPs) in the public healthcare system. The model predicts that relatively large and expensive changes in these factors would only have a moderate impact on the choice between providers

1 Introduction

No country can ever fully satisfy demand for health services. Even the most comprehensive health systems leave many wanting more, unhappy that they have to wait to see a GP, that they have to settle for the cheaper less effective generic option, or that they do not qualify for the expensive procedure that can improve their quality of life. Even in the most sophisticated systems and the most advanced economies there are waiting lists for life saving procedures and not everyone on the waiting list will receive help. No matter how big the public health budget is, unfortunately there will always be patients that have to be turned away.

Implicit in these trade-offs is a tension between the level and reach of healthcare, and governments need to decide how to balance these trade-offs. For instance, with the same human resource budget the government can appoint either many low-cost personnel, such as community health workers, or a smaller number of GPs and specialists. Given these tensions, governments must set clear priorities considering what they want to achieve and the trade-offs and costs that this would entail.

These hard decisions are part of the government's task of rationing public healthcare services. Broadly, rationing can be defined as the allocation of scarce products and services. Given that there are not enough resources to satisfy everyone's healthcare demands, what should be prioritised and how do we build a system to allocate healthcare services? The ANC's revised NHI plan does not provide much detail on how the government plans to manage the trade-off between the

This research note forms part of a series of notes dealing with issues of health reform in South Africa. In the interest of constructively contributing to the NHI debate, the Hospital Association of South Africa (HASA) has commissioned this series of research notes which can be accessed on the Econex website: www.econex.co.za.

level and reach of healthcare. The proposal does acknowledge that these hard choices are an unavoidable part of any public health plan and refer to these decisions as being at "the heart of a good plan".[1] They propose that the decisions need to be based on an informed public debate ("an explicit and inclusive discussion") and that it is essential that the cost effectiveness of various therapies and treatments be compared when compiling the list of services included under the NHI. The proposal has thus deferred these choices, outlining only general principles that should underpin and guide the decision making process.

2 Rationing Methods

An analysis of the international literature and of South African surveys suggests that the demand for public sector health services is rationed indirectly via a combination of mechanisms. These include queuing and waiting lists, gatekeeping i.e. protecting and managing access to higher levels of care such as GPs or specialists, and costs associated with accessing the services, including co-payments, travel costs and formularies on drugs and surgicals.

The need for other ways of rationing will become greater when the influence of the price mechanism is abolished under the NHI, effectively eliminating cost.

This note examines the influence of the two remaining rationing mechanisms (queuing/waiting and access to GPs) and specifically also the tensions between them. Assuming that the private sector continues to provide healthcare to those not using public facilities, the question is how large the switch may be from private to public sector services if the NHI were to be implemented. As waiting times and access to GPs may still remain issues in the public sector, it is expected that these factors and perceptions about quality may still limit switching from the private sector to the public sector.

These two rationing levers represent the trade-off between coverage and the level of care. For instance, if the government decided to focus more on broadening the scope of delivery, i.e. increasing coverage, rather than focusing on the level of care, it would be appropriate to hire many low level workers and expand the clinic network. This would reduce waiting times with little impact on the likelihood of seeing a GP. Alternatively, if the government decided to provide a higher level of care, it would make more sense to invest in relatively fewer higher level resources, such as GPs and specialists. This relatively investment would improve the likelihood of seeing a GP, but would have less of an effect on waiting times.

3 Econometric Model and Data Inputs

Econometric models can provide estimates of how the demand for public health services is affected by these factors, i.e. waiting time and the likelihood of seeing a GP. If the wait at public clinics and hospitals is shortened and public sector patients have a higher likelihood of seeing a GP, this will raise the relative attractiveness of public health services relative to private services.

In this case probit models[2] were used to simulate the impact of changes in waiting time and the likelihood of seeing a GP on the likelihood of choosing the public sector when consulting. The current prevalence of seeing a GP during a public health visit was used as a proxy for the likelihood of seeing a GP when visiting a

1. *ANC National General Council 2010, Additional Discussion Documents. Released September 2010. Available at: http://www.anc.org.za/docs/discus/2010/aditionalo.pdf*
2. *Probit models are binary response models where the probability function takes the form of a standard normal cumulative distribution function.*

public health facility. The proportion of visitors to public health facilities who complained about waiting times was used as a proxy for the influence of waiting times on demand.[3] The models also control for a myriad of other influences on health demand, such as public and private sector prices (averages at the district level), income decile, geography (district or province), age, gender, race, education level, medical aid membership, illness, and travel time to the closest medical facility.

Figure 1: Percentage of visitors complaining about waiting time, by income decile

Source: GHS (2002 – 2008), Econex calculations

Four scenarios were investigated, two relating to waiting times and two to the likelihood of seeing a GP. In the first, waiting times in the public sector decline so that the prevalence of complaints is 10 percentage points lower than previously. In the second scenario, public sector waiting times decline to the extent that there are no longer any complaints. In the third scenario, the likelihood of seeing a GP when visiting a public health facility is equalised across districts. In the fourth, the likelihood of seeing a GP when visiting a public health facility increases to the same level as that of private facilities in that district. The model employs the same pooled version of the GHS[4] as was described and used in Health Reform Note 11.

4 Considering the Fairness of Rationing Mechanisms

It is also important to examine the distributional aspects of rationing methods. Having a lower likelihood of seeing a GP, or having to wait longer, creates a disincentive for overuse by generating a burden associated with the consumption of the service. This burden can be significant and therefore it is useful to investigate who bears this burden. To benchmark and compare the impact of these factors across the income distribution, public sector patterns are contrasted against that of the private sector.

4.1 Waiting time/queuing

Complaints about waiting times are an imperfect measure of the burden of waiting time, because they are mediated through perceptions, which means that expectations may play a large role and, in turn, are likely to be influenced by income level, age, gender and previous experiences. Figure 1 illustrates that the prevalence of complaints about waiting times at public facilities is relatively steady across the income distribution.[5] There is some evidence of

3. *Estimates were compiled separately for the top two deciles to account for potential differences in the mix of services.*
4. *GHS data from 2004-2006. Because district information was only available for these years, the model does not use information from all 8 years of the survey.*
5. *As income levels were not available in the GHS data, they were proxied by asset ownership levels. Deciles of households were created by using an asset index, where households were ranked according to their asset ownership from poorest to richest. Deciles each represent 10% of households.*

increasing complaints among the more affluent, though declining again amongst the most affluent.

This is contrary to the trend in the private sector, where the affluent appear to be less likely to complain about waiting times than the poorest households. This could perhaps be an indication of differential expectations, or that poor individuals, who are usually not covered by medical insurance, must wait longer for treatment in private health facilities. It could also be a reflection of the different types of private facilities used by different income groups, e.g. if the poor did not access private hospitals with low waiting times.

4.2 Likelihood of seeing a GP

Figure 2 illustrates that the public sector's gatekeeping policy leads to a likelihood of seeing a GP during a visit to a public health facility of less than one in three for the poorest half of households. Conversely, for the most affluent users of the system who do use public health services, it is close to 60%. This may point to inequity within the public health system, although it may in part reflect the relationship between socio-economic status and other factors such as location. In contrast, in the private system poor and rich enjoy a very high probability of seeing a GP when visiting a private health facility.

Figure 2: Likelihood of seeing a GP, by income decile

Source: GHS (2002 – 2008), Econex calculations

5 Likelihood of Consulting a Public Provider

Next we examine how various attempts at relaxing rationing mechanisms in the public sector are expected to affect the distribution of patients between the private and the public health systems. This analysis has practical significance for the NHI's resource planning and costing. For instance, the presumed swing towards the public health sector due to changes in these mechanisms will have a considerable impact on the overall costs of the NHI, as well as on the availability of medical personnel for the different sectors.

The documents outlining the NHI proposal mention access to private providers via the NHI, but do not make it clear when and how patients would be able to consult private GPs. If it is assumed that they would be able to go directly to private GPs, a strong preference for this option is expected. In this note, however, the focus is on more likely scenarios where patients would only have access to private GPs and specialists and other public sector doctors via their local primary healthcare provider (a clinic or network of providers).

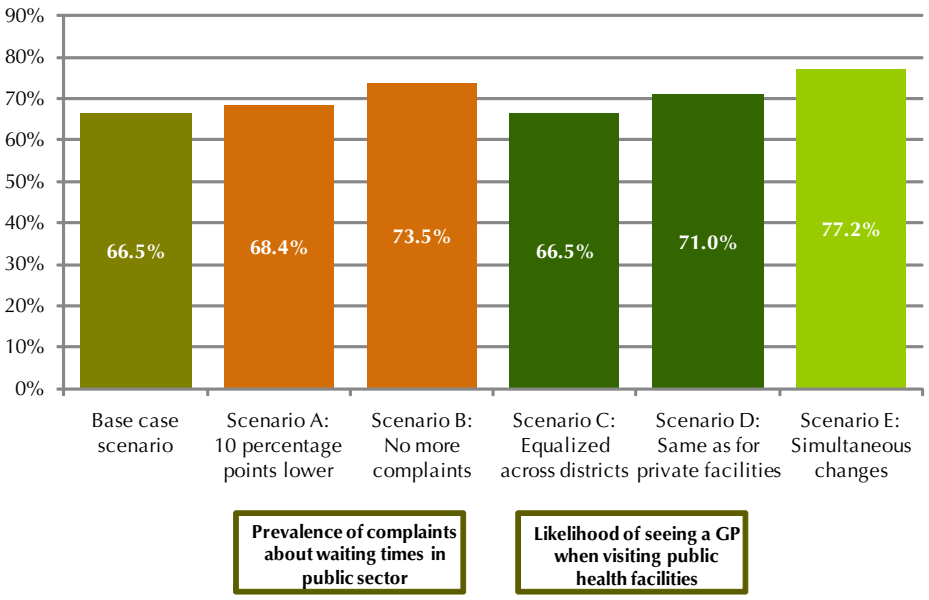
Under such a system the user will have to choose between a public provider, with some likelihood of being referred to a private provider, and going directly to a private provider. Given users' difficulty in determining the likelihood of being referred to a private provider, it is expected that their decision will mainly be based on the characteristics of

the public healthcare service, with some consideration of how access to private providers has increased the likelihood of seeing a GP.

Within this context we examine the possible impact of the two rationing mechanisms on the likelihood of consulting a public provider. Figure 3 presents the estimated results for the following scenarios:

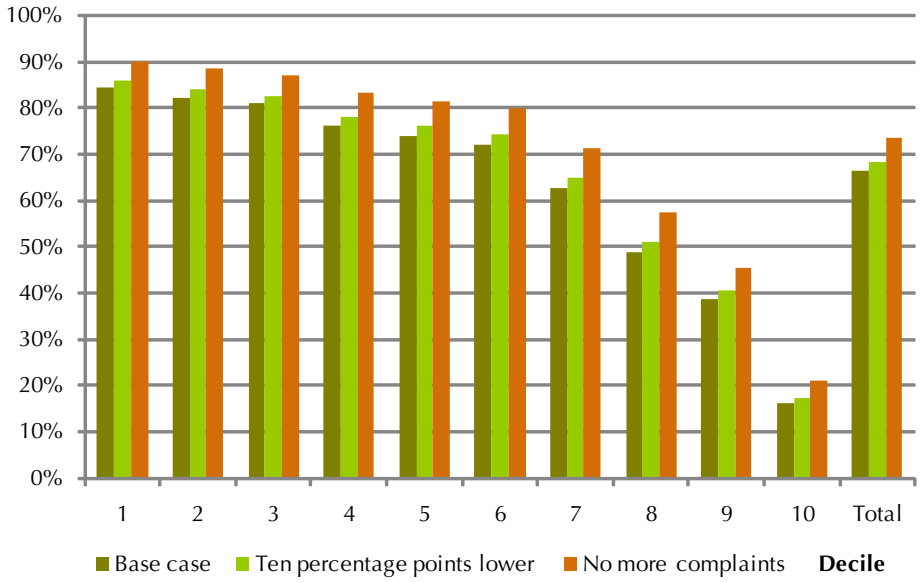
- **Scenario A**: Complaints about waiting times are reduced by 10 percentage points in public sector.
- **Scenario B**: Complaints about waiting times are eliminated in public sector.
- **Scenario C**: The likelihood of seeing a GP in public sector is equalized across districts.
- **Scenario D**: The likelihood of seeing a GP in public sector is equal to that of the private sector.
- **Scenario E**: Complaints about waiting times are eliminated and the likelihood of seeing a GP in public sector is equal to that of the private sector.

Figure 3: Likelihood of consulting a public provider



Source: Econex calculations

Figure 4: Likelihood of consulting a public provider, by income decile



Source: Econex calculations

5.1 Waiting time

According to this modelling exercise, completely eliminating all complaints about waiting times, i.e. improving the attractiveness of this factor in the public sector, would increase the likelihood of consulting a public provider from 66.5% to 73.5% across the entire population. Given the resource shortages and in light of the sluggishness of institutional change, it may be more realistic to consider a scenario where complaints are reduced by only 10 percentage points. This has a smaller effect, increasing the likelihood of a public sector consultation to 68.4%.

Figure 4 illustrates that these changes are relatively similar across the income distribution, with an increase in the likelihood of con-

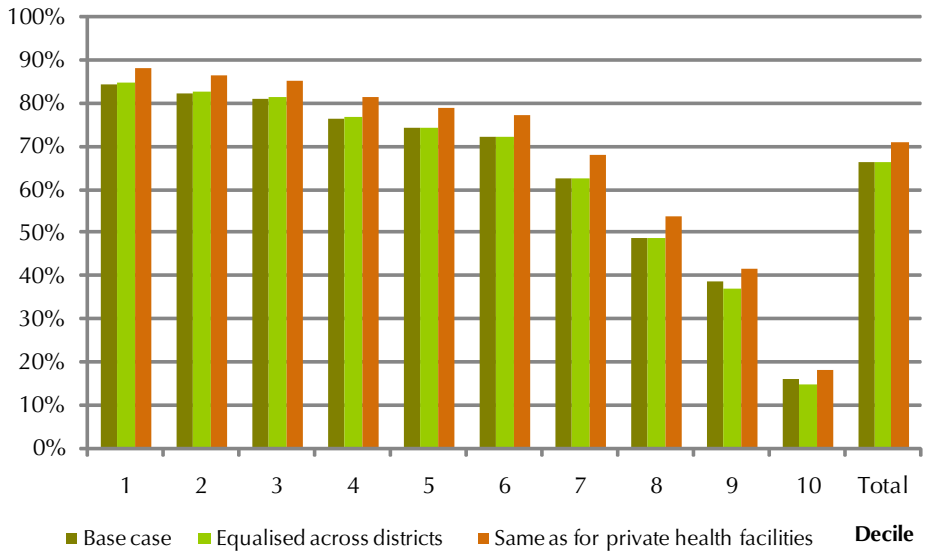
sulting a public provider of between 6 and 9 percentage points in the case where complaints are eliminated in the public sector.

5.2 Likelihood of seeing a GP

According to the model, in the scenario where the likelihood of seeing a GP during a visit to the public sector is increased to be on par with the private sector, the preference for public providers would rise from 66.5% to 71.0%. If access to GPs were only equalized across districts (i.e. large differences in the distribution of GPs between districts were eliminated), it appears that there would be no discernible impact on the aggregate preference for public rather than private providers, although it would have varying effects in different districts.[6]

Figure 5 illustrates the impact of this variable by income decile. If the likelihood of seeing a GP in the public sector is equalised across districts there is almost no discernable impact, except for a slight decrease for the affluent, probably because the overall likelihood of seeing a GP has decreased slightly in their districts. If the likelihood of seeing a GP at public facilities is increased to the same level as the private sector, the predicted probabilities of visiting a public provider increase slightly by between 2 and 5 percentage points.

Figure 5: Likelihood of consulting a public provider, by income decile



Source: Econex calculations

These estimated changes are relatively small, especially given the resources and efforts that would be required to make such changes a reality. It may be that there is an asymmetry in terms of the ease of switching between the systems and that there may be additional impediments and preferences that restrict movement from the private to the public sector. Alternatively it may be that the proxies used in the modelling exercise are not capturing these influences adequately.

However, it is clear that there are still strong preferences for the private sector which even these quality improvements cannot completely overcome – at least not insofar as the preferences

About ECONEX

ECONEX is an economics consultancy that offers in-depth economic analysis covering competition economics, international trade, strategic analysis and regulatory work. The company was co-founded by Dr. Nicola Theron and Prof. Rachel Jafta during 2005. Both these economists have a wealth of consulting experience in the fields of competition and trade economics. They also teach courses in competition economics and international trade at Stellenbosch University. Director, Cobus Venter, who joined the company during 2008, is also a Senior Economist at the Bureau for Economic Research (BER) in Stellenbosch. For more information on our services, as well as the economists and academic associates working at and with Econex, visit our website at www.econex.co.za.

6. *These results should be interpreted with caution, as the coefficients are imprecisely estimated and there are wide error bands around these estimates of the average impact of the likelihood of seeing a GP.*

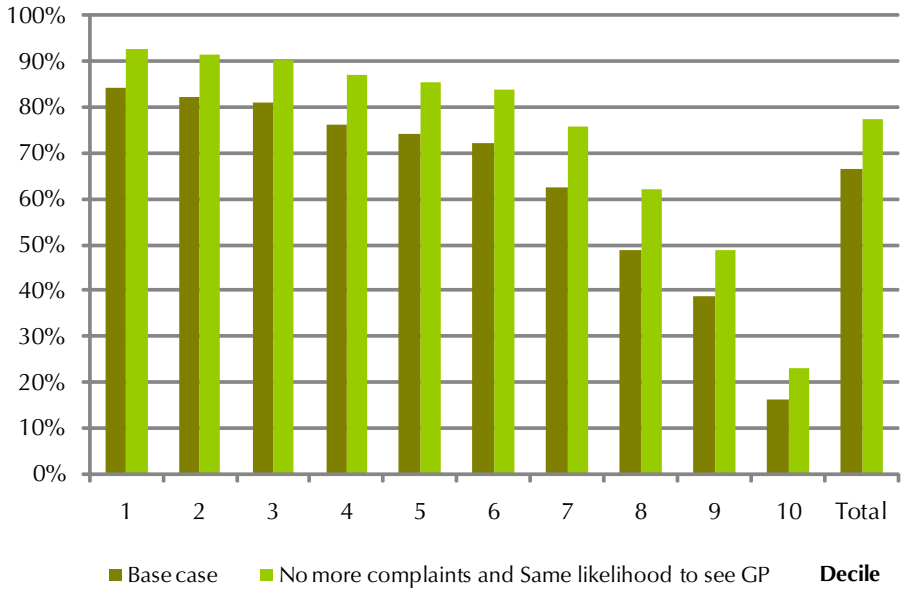
affect behaviour in the surveys that the modelling is based on.

5.3 Simultaneous changes

The above modelling was based on the premise that government would have to deal with scarcity by trading off low cost staff (e.g. community health workers) against high cost staff (GPs and specialists). Increasing the number of low cost staff would reduce waiting times as a means of rationing, but then gatekeeping (another form of rationing) would have to continue to limit access to GPs. This trade-off illustrates the essence of rationing.

As an additional exercise, the model is used to investigate how behaviour may change if both of these changes could be achieved simultaneously in the public sector, i.e. if the public sector could appoint enough staff to eliminate waiting times as an issue while also ensuring the same level of access to GPs and specialists within the public sector as in the private sector. In this case the model predicts that as many of 77.2% of patients would visit the public sector, compared to the base case situation of 66.5%. The impact thus remains less than expected, at just over 10 percentage points. Figure 6 illustrates these changes across income deciles. The predicted changes are largest in the middle of the distribution (around 12 percentage points), and smallest among the richest decile (7 percentage points). The reason for these relatively small changes may be that the behaviour reflected in the GHS is strongly influenced by a perception of the quality of public healthcare, which extends far beyond only long waiting times. Changing this perception would require major changes in the way in which the public sector operates, in order to have a large impact on preferences for the private sector. It may also be that, because many of these perceptions have become so deeply entrenched in certain spheres of society, these

Figure 6: Likelihood of consulting a public provider, by income decile



Source: Econex calculations

ECONEX Services

Econex has extensive experience in competition economics, international trade and regulatory analysis. Strategic analysis was recently added as practice area. We have an established reputation for providing expert economic advice for high profile mergers and complaints that appear before the competition authorities. Some of the more recent highlights include the complaint against British American Tobacco, the merger between MTN and iTalk, the complaint against Senwes and the acquisition of KayaFM by Primedia. Apart from competition work we have also been involved in trade matters which included analyses of the effects of tariffs, export taxes and anti-dumping tariffs.

As a result of our work in competition analysis we also have invaluable experience in some of the sectors of the South African economy where regulation continues to play a role, e.g. the telecommunications, health and energy sectors. We use economic knowledge of these sectors to analyse specific problems for some of the larger telecommunications, health and energy companies.

may be hard to change even if the circumstances that created these perceptions were to change.

6 Conclusion

Given resource constraints and an increase in healthcare demand, government's rationing decision entails a trade-off between appointing additional low-cost staff, which would reduce waiting times but increase the need for gatekeeping, and appointing more high cost staff such as GPs, which would reduce the need for gatekeeping at least somewhat but would not reduce waiting times.

The model predicts that if there is not free choice of provider under the proposed NHI, none of these factors would have a very large impact on the move from private to public providers. Shorter queues and more GPs do increase the relative demand for public healthcare, but by far less than one would have anticipated, especially considering the effort and resources that would be required to make this happen. Even if both of these rationing mechanisms could be eliminated, there would only be a moderate switch in visits from the private to the public sector.

This implies that the behaviour reflected in people's current choices, as captured in the GHS data, exhibits a very strong and persistent private sector preference, despite cost differentials, and extending beyond only waiting times and the likelihood of seeing a GP. However, it is important to highlight that their full effect cannot be modelled with the available data, since the number of visits that each patient makes to health facilities was not captured in the survey data that the modelling is based on, as discussed in the previous research note.

The analysis shows that if the public sector is really to become an attractive option for those who are ill this would require not only a dramatic increase in resources and improvements in how the public sector functions, but also time to convince people that the public sector can adequately compete with the private sector. This means that the NHI, if based wholly or mainly in the public sector, would probably not draw people out of private health services to the extent expected – at least not in the short to medium term. The implication is also that this would not make scarce medical staff from the private sector available for public health services under a NHI.

More Information

ECONEX regularly publishes Research Notes on various relevant issues in South African competition, trade and applied economics. For access to previous editions of Research Notes, or other research reports and published articles, go to: www.econex.co.za
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