



## **H e a l t h M a r k e t I n q u i r y**

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Promoting Healthy Competition

### SEMINAR NOTE

#### Excessive utilisation and Supplier Induced Demand

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Published 04 April 2019

## **INTRODUCTION**

1. This note provides feedback to stakeholders on the HMI's initial response to critique on Chapter 8 of the Provisional Report. This will allow stakeholders to prepare further for the Seminar on Excessive utilisation and Supplier Induced Demand ('SID Seminar').
2. The seminar will take place on the **12<sup>th</sup> of April, 2019** as outlined in the Revised Administrative Timetable published on 27 February 2019. The SID Seminar will commence at 9h00 and end at 16h30. The programme as well as stakeholder presentations have been published on the HMI website.
3. A notice about this seminar was published on 22 February 2019 see <http://www.compcom.co.za/wp-content/uploads/2014/09/Seminar-Invitation-SID-220219.pdf>. This note supplements that information.
4. The purpose of the SID seminar is to allow for the HMI to discuss and debate with stakeholders both the approach to the SID analyses, the interpretation thereof, and to engage stakeholders on the appropriateness of the remedies that have been put forward. In particular the HMI is keen to hear if stakeholders have other remedies to suggest that will result in good health outcomes and consumer benefit.
5. The information presented below expands on the HMI's views on the critique it received from stakeholders. As indicated in the HMI notice referred to above, the HMI is responding to key the issues that emerge from the comments received from stakeholders. This avoids duplication.

## **INTRODUCTORY COMMENT ON SUPPLIER INDUCED DEMAND**

6. The Panel recognises that Supplier Induced Demand (SID) is not explored in all markets and in general discussions about the economy. In most other areas of economic activity, it is very common and acceptable for suppliers of a good to attempt to boost demand for it. This takes the form of advertising and marketing investments, branding, distribution relationships and sales incentives. It is self-evident that such advertising is aimed at getting consumers to upgrade their smartphone or buy more of a product. It is ubiquitous, normal and expected in other markets. However, the HMI Panel has noted, and most if not all stakeholders agree, that healthcare markets exhibit peculiar features.
7. Unique features of health care markets was explained in Chapter 8 paragraphs 1.2 and 1.3. We noted that some of the natural constraints on demand operating in general markets do not apply in health care markets:
  - a. Most costs are borne by insurance, and thus have a very low or zero cost to the consumer at point of service – so price has a significantly muted effect on demand.

- b. For both providers and consumers there is uncertainty – regarding the diagnosis, the best therapy and the amount of that therapy needed. Since the results of an incorrect decision can be significant and irreversible, natural risk aversion would tend to drive more service demand. Litigation (or the fear of it) might worsen this.
8. Notwithstanding the uncertainty on both sides, practitioners typically have far more information than the buyers of a health service – i.e. information asymmetry.
9. In healthcare markets providers, principally doctors, have a joint role: to both advise patients on what health interventions they would benefit from, as well as to provide these interventions. Since most of a doctor's income in private practice comes from provision of services (rather than the advice), there is a natural (conscious or unconscious) tilt towards offering more services rather than less. Where competition amongst doctors is more intense (for example, there are fewer truly sick patients per doctor) we would expect the inducement of additional demand to increase.
10. Supplier induced demand on the part of hospitals is understandably more remote. They too have a natural economic incentive to fill their beds - most costs are fixed and below a given level of occupancy, hospitals will lose money. In the research to inform the HMI hospitals and hospital groups agreed that they compete for doctors who then admit patients to their facilities, rather than targeting patients directly. Attracting doctors creates an incentive for hospitals to overinvest in beds and equipment, and these beds then have to be filled in order to profit from it. Other methods used to attract doctors include payment in kind such as reduced rental on office space, subsidising start-up costs and offering shares. Hospitals also give feedback to doctors on their admission rates which may motivate doctors to admit more.. However facilities rarely have direct contact with patients, or the nature of discourse, that enables them to advocate for extra medical services. The natural economic forces shaping doctor behaviour will in and of themselves increase hospital utilisation.
11. We have articulated responses to most of the common criticisms of this chapter of the report – which are laid out over the following pages – and look forward to discussing these and others you might have at the HMI seminar.
12. The HMI has previously identified a series of questions to be addressed during the seminar. These questions, alongside additional questions raised by stakeholders will be further unpacked in this note as guidance for the seminar. For each question the underlying findings will be presented alongside the views submitted by stakeholders before outlining the HMI's proposed recommendations to address the concern.

## RESPONSE TO CRITIQUES

13. Stakeholders have provided substantial feedback regarding the HMI's SID analysis. In order to respond where issues have been raised, the HMI has categorised the critiques under the following headings:

- a. definitions;
- b. the data and modelling approach used;
- c. geographic boundaries;
- d. inferences drawn from the results; and
- e. the appropriateness of international comparisons.

## DEFINITIONS

### *SID*

14. As a starting point, several stakeholders were of the view that the HMI did not provide a definition of supplier induced demand itself.<sup>1</sup>

15. This was in fact defined in the initial section of chapter 8 (p376). Hopefully the introductory section to this note expands on this sufficiently to make clear what we were investigating. Fundamentally SID refers to the provision of services without a commensurate improvement in health outcomes.<sup>2</sup>

### *Discretionary*

16. Criticism was levelled at the types of conditions we defined as discretionary claiming that they were not in fact discretionary. It was claimed that there are instances where hospitalisation has to be provided and doctors have little influence over this.

17. The diagnosis coding on claims was sometimes insufficient to accurately separate out discretionary hospitalisations (e.g. all psychiatric diagnoses were lumped together). However, we believe that, on average, these procedures are more likely to be discretionary than the average procedure - and as such our conclusions would still hold. Our results tended to hold whether we analysed all admissions or just discretionary ones – so this definitional issue is unlikely to affect our overall conclusions.

### *Necessary*

18. Stakeholders commented that the analysis failed to measure whether supply was necessary or unnecessary.<sup>3</sup>

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<sup>1</sup> See for example: Mediclinic "...the HMI has failed to define SID;"

<sup>2</sup> While the HMI believes it has sufficiently explained SID, a further more detailed definition may be found here: <https://www.pc.gov.au/research/supporting/supplier-induced-medical-demand/sidms.pdf>

<sup>3</sup> See for example: Mediclinic "...the HMI has failed to measure whether supply was necessary or unnecessary;"

19. It is very difficult, if not impossible to determine for every episode whether or not care in the form that it was provided was necessary or not. The only possible way in which to determine this is to track key health outcome indicators before and after treatment and measure the degree of improvement. Small or negative improvements would indicate lack of *a priori* necessity. These data are not available in South Africa nor in most other countries. Instead we have had to study the rate of treatment compared to other populations with similar levels of underlying disease incidence, to see if, on average, admission is more common than would be expected.
20. It was claimed that it is just as likely that the model results show a historic undersupply being corrected by the appropriate levels of supply being built up rather than excess utilisation caused by supply factors.
21. We do not consider this a likely explanation for a number of reasons:
- a. There is no evidence of overall underutilisation in the South African private marketplace.
  - b. Rates of hospitalisation for insured South Africans are high, even when compared to countries at a higher average income level.
  - c. Unexplained utilisation increases were found to be a significant driver of cost escalation in healthcare in the Expenditure Attribution Analysis published by the HMI in 2016. Those findings indicated that valid drivers of demand such as increased underlying illness, older age, were not increasing at the same rate as utilisation.
  - d. The HMI acknowledges that in some local areas evidence of a historic undersupply being met is likely but that this cannot be applied to the market on average.
  - e. And we have not seen any information – aggregated or otherwise suggesting unusually low rates of utilisation in prior years.

#### *Narrow disease definition*

22. A number of stakeholders said that the report relied on a flawed disease indicator (the so called "Narrow disease definition") as a risk factor for predicting likelihood of hospitalisation.<sup>4</sup>

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<sup>4</sup> See for example, Insight - Netcare: "*HMI should've used both definitions of the burden of disease in the SID analysis.*"

LHC: "*...the use of the narrow disease burden is inappropriate.*" And, Mediclinic "*...the HMI has relied on a flawed disease indicator.*"

23. The narrow disease definition included only pre-existing illness (chronic illnesses or predispositions) that would have existed before hospitalisation occurred. The so called "broad indicator" incorporates the diagnoses made during the hospital admission concerned – hence only persons who were actually admitted could receive certain diagnoses by definition. Using the broad indicator would thus bias the results because of endogeneity (or reverse causation) while we know that chronic disease status preceded hospitalisation, many diagnoses in the broad indicator followed from hospitalisation and thus, by definition, cannot be treated as underlying risks for hospitalisation.

#### *Plan-mix variable*

24. Stakeholders indicated that the analysis relied on an unexplained plan-mix variable.<sup>5</sup>

25. The plan-mix variable is explained on page 388 of the HMI's preliminary report as well as verbal explanations of its derivation were provided in interviews with respondents following publication thereof. The data available for the SID analysis did not contain other plan mix indicators used in other HMI analyses, and the size of the dataset necessitated a relatively simple categorisation.

## **THE DATA AND MODELLING APPROACH USED**

26. We note that the dataset compiled for the HMI provisional report is the most comprehensive national representation of the private sector yet compiled in South Africa, and consumed significant cost and effort to compile, standardise, and clean. Notwithstanding this, some deficiencies remained and need to be taken into account in understanding the modelling results in particular.

#### *Practitioners*

27. Stakeholders claimed that the analysis relied on inaccurate measures of practitioners.<sup>6</sup>

28. Every doctor used in the analyses had billed at least one private patient in the year concerned. Unlike other published analyses that used a number of registered practitioners which may include those who are not active, the HMI analyses included only doctors who billed.

29. Stakeholders indicated that they imagine that the doctor addresses dataset had a number of problems which have not been factored into the SID analysis. Individual doctors may have multiple numbers and some practices have one number but multiple doctors.

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<sup>5</sup> See for example, Mediclinic "...the HMI has relied on an unexplained plan-mix variable;"

<sup>6</sup> See for example Econex: "...the HMI's measure of practitioners (as one of two possible supply-side indicators that explain admissions) is also limited in that only a count of practitioners is used."

30. This was noted in the provisional report. We could not account for these deficiencies - but believe that overall the observed effects should still hold as errors such as this would cause random errors but not systematic biases. Since data were aggregated at quite a large area (municipality) we think it unlikely that large numbers of doctors practised in more than one municipality.

#### *Bed data*

31. Stakeholders, in particular the three large hospital groups, indicated that the analysis relied on incomplete and flawed bed data, which was not independently validated.<sup>7</sup>
32. The bed data used had to be inferred from incomplete data because the private hospitals association (HASA) was unwilling or unable to provide the correct comparable data to use for this purpose, despite repeated requests. The methods by which any required interpolation was made was fully explained and is deemed reasonable. If stakeholders have better bed data they should provide this.

#### *Model parameters*

33. One stakeholder commented that the SID effects disappear when municipality of residence is adjusted for (by inserting a municipality fixed-effects term).
34. Inserting a municipality fixed effects term effectively prevents the model from calculating SID effects because the municipality dummies are collinear with the supply terms – which are averaged at municipality level (doctors and hospitals) and largely constant over the period of the study. Inserting this variable invalidates the question being asked in the model.
35. Stakeholders commented that the model omits essential parameters which, when included, change the results, e.g. income.<sup>8</sup>
36. The HMI used all the information at its disposal. Suggested additional factors such as income were not available to the HMI at the level of individuals. It is likely that the scheme-plan factor captured a significant proportion of any income effect. However, if this analysis has been done by a stakeholder who holds income data at the individual level, we would be grateful if the stakeholder could make these results available.

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<sup>7</sup> See for example: Mediclinic, “...the HMI relied on inaccurate measures of beds and practitioners;” And, Compass Lexecon – Netcare: “Importantly, the SID analyses rely on incomplete and flawed bed data, which the expert concedes he did not independently validate, and on admissions data for which he is unable to assign the correct number of beds or physicians for nearly 20% of beneficiaries.”

<sup>8</sup> See for example, Compass Lexecon: “The model omits essential parameters, which, when included, change the results.”

### *Municipalities*

37. Stakeholders, (hospital groups) noted that municipalities have vast differences in population density, income, and size such that they cannot be considered comparable for measuring hospital utilisation.
38. In the model that we employed the location where a beneficiary is admitted is not taken into account, therefore municipalities with zero beds will still show an admission rate even though those admissions occurred elsewhere.
39. These questions indicate a misunderstanding of the way the model is structured. We did not measure or use utilisation rates for any geographic area - we looked only at the propensity for an individual living in a geography to be admitted to hospital (anywhere). So the actual admission rate for hospitals in a municipality is immaterial.

### *Optimal bed-supply*

40. Stakeholders indicated that the HMI analysis assumes an optimal supply of beds per population – which is a false assumption. The stakeholder indicated that the ratio of private beds to population is close to international averages and therefore isn't exceeding this 'optimal' supply.
41. The HMI model makes no assumptions about the optimal supply of beds - we simply look at levels of demand in high and low supply geographies.

### *Adverse selection*

42. Stakeholders observed that adverse selection is inadequately controlled for in the model - hence inflating the apparent size of SID.
43. It is correct that the adjustment we have used for adverse selection is a crude one but it was taken into account. However other analyses suggest relatively little measurable effect of adverse selection overall. The cost attribution analysis undertaken by the HMI in 2016, which adjusted for member movement between plans and plan mix, showed similar rates of excess utilisation between open schemes (where we would expect more adverse selection) and restricted ones (where we would not) – approx. 1.2% net increase after adjustment in each case.

### *Replicating hospital entry analyses*

44. Some stakeholders noted that the HMI analysis does not try to replicate any of the work done by Discovery or GEMS by examining the effect of hospital entry on admissions in an area.

45. The HMI did not have data on the short-term changes in bed supply that these studies used, and hence could not replicate them. It is of interest to note that different methods come to a similar conclusion that SID is a feature of the South African health care market.

## **GEOGRAPHIC BOUNDARIES**

46. Stakeholders asserted that municipalities are an inappropriate geographic boundary to use for analysis of competitive markets.<sup>9</sup>
47. This analysis investigated overutilization / supply induced demand and was not primarily aiming to investigate competition. There is no evidence provided to support a better set of boundaries for measuring supply relevant to a given individual.
48. In the opinion of the HMI, the geographical proximate (rather than de facto “travel for services” region) is arguably a better measure for this purpose: consider two municipalities of equal size, A and B, 20km away from each where A has one doctor and B has 4 doctors. Since many people travel from town A to town B to see a doctor, we would conclude that the relevant market is the two towns combined. It is reasonable to expect that the rate of visiting the doctor is much lower in A because of the practical difficulties in getting an appointment in a town with only one doctor. If we merged the two into a single market (based on existing usage patterns), however, we would obscure this relationship between supply and demand.
49. It was commented that 40% of admissions occur outside residential municipality.
50. The data indicate that on average 32% of admissions occurred outside of home municipality, not 40%. For large cities this was much lower - 20% for the top ten municipalities by size (which constitutes 70% of the total enrolled medical scheme population).
51. Concern was expressed that 20% of beneficiaries did not have usable addresses to be geomapped and it was claimed that this 20% was not evenly distributed.<sup>10</sup>
52. It is correct that ~20% of scheme beneficiaries were not geomapped. However it is unclear how these unallocated persons can then be described as “not evenly distributed. It is reasonable to assume that this is not a systematic omission and thus does not bias the results.

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<sup>9</sup> See for example, Netcare: *“An additional significant concern relates to the use of local bureaucratically defined municipalities as the geographical unit of observation instead of appropriate economically defined geographic markets”* And Mediclinic: *“...the HMI relied on municipalities rather than geographic competition markets;”*

<sup>10</sup> See for example, Netcare: *“Furthermore, the fact that 20% of beneficiaries’ locations could not be determined biases the results.”*

## INFERENCES DRAWN FROM THE RESULTS

53. Some stakeholders noted that the analyses have not established causality.<sup>11</sup>
54. That is correct. A statistical model based on observational data is very unlikely to prove causality - it would need to be taken into account together with other factors (such as high absolute levels of utilisation, as well as individual submissions to the HMI). In such circumstances decisions need to be made based on the totality of relevant information.
55. One of the hospital groups commented that the results for discretionary services were notably weaker than the overall model, despite the HMI's theory that they should be more significant. They noted that some services had negative results and indicate that these findings undermine the SID theory.<sup>12</sup>
56. This point refers to the results for hospital beds in the specialty-specific model. Given that the beds data for the specialty models was inaccurate (that is beds by speciality rather than for the total number of beds was poorly described in the data) it is more reasonable to conclude that no inference can be drawn from this model. As explained in the text where the HMI itself draws attention to this point we note that the specialty models are most useful for analysing doctor behaviour, and the overall models for hospital behaviour, since the bed numbers used probably only have meaning at the whole hospital level. If the data were more accurate (clear description of which beds are allocated to surgical/medical/obstetric/etc. care) it is reasonable to assume that the model would demonstrate a better fit. This leads the HMI to recommend improved and more detailed reporting to a supply side regulator.
57. One hospital group opined that the implications of the model are not material for hospitals.<sup>13</sup> They note that for roughly every 10,000 people, 10% more beds would be associated with just 1 additional admission, or 900 extra admissions nationally.
58. There are three responses to this point:
- a. The stakeholder implies that a 10% increase in supply of beds is a reasonable degree of variation to expect. In reality we see much bigger variation in bed supply between

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<sup>11</sup> See for example, Netcare: *"The regression model employed by the HMI is not designed to, cannot, and does not, determine a causal relationship between the addition of beds and increased admissions..."* and

Mediclinic: *...the HMI has not established causality or directionality."*

<sup>12</sup> See for example, Netcare: *"Finally, the results for the separate models conducted on "discretionary" services were notably weaker than (and indeed inconsistent with) those for the overall model, despite the fact that according to the HMI's theory, they should have been more significant."*

<sup>13</sup> See for example, Netcare: *"Even if one accepts the model and results as valid, the real-world relationship determined by the HMI's expert's model is so small, that it cannot possibly be a motivating factor for hospitals or demonstrate a meaningful relationship."*

geographies, and would hence expect significant numbers of "surplus admissions" in oversupplied geographies. Just looking at the ten largest municipalities in SA, we see a more than threefold difference in the supply of private hospital beds, implying that the most oversupplied top ten market has a 300% (rather than a 10%) increase in supply relative to the least, and a commensurate increase in utilisation

- b. The effect size estimates differ between the analyses and the stakeholder picked one which suits their purpose. However one could similarly chose another finding - the result for ICU bed supply. This indicates that a 10% increase in ICU beds would give rise to an additional 5600 ICU admissions per annum nationally (with no additional increase in illness severity, patient age, etc.) equating to an extra cost of over R200m. As for hospital beds overall, there is a more than 3 fold variation in the supply of ICU beds between the top ten municipalities - so we would expect a significant excess utilisation in the highly supplied ones.
- c. Where random data errors are common - as is suggested regarding the data we have used - this biases effect sizes downwards. This is a well-known data driven problem when extracting coefficients from models such as this. It would thus be expected that as data quality improves, other factors being equal, the apparent size (and hence meaningfulness) of the relationship between supply and utilisation will increase.

59. A stakeholder commented on the overall (all specialties combined) model; they note that the low model fit would generally indicate that the model is not designed to measure what it intends.

60. The HMI rather argues that low overall explanatory power could also be due to the fact that admission to hospital from any cause in a given year is genuinely difficult to predict with available variables (i.e. the events are largely random). Low levels of model fit do not prove incorrect results, they simply reflect that the occurrence of serious health events remains uncertain.

## **THE APPROPRIATENESS OF INTERNATIONAL COMPARISONS**

61. Some stakeholders claimed that countries used in the comparison of rates of admission and intervention are inappropriate because they are wealthier.

62. Health care utilisation and spending increase with increasing national wealth and given this one would thus expect that SA would have lower admission rates. If the logic of the stakeholder is held, the comment suggests that SA is even more abnormal than would otherwise be thought. They further argue that poverty leads to higher incidence of disease and this is a reasonable point. However the diseases compared in the HMI analyses are not particularly associated with poverty - cataracts, hip and knee osteo-arthritis, tonsillitis.

63. It is argued that countries used in the comparison of rates of admission intervention are inappropriate because they use different health care financing methods.
64. This is in fact our point - that the financing method is a cause of excess utilisation in SA, and this suggests that a change from fee for service is required to reduce perverse incentives and lower wasteful excess utilisation.
65. Stakeholders wanted to understand why the full suite of OECD surgical procedures was not used in the comparison with South Africa. There are two reasons:
- a. Our intent was to compare discretionary procedures. Emergency procedures - where there is no choice about whether or not to admit patients - would not be expected to show supplier-induced demand.
  - b. We could not match all OECD procedures to the procedure categories applied to the claims data we used - which used fairly coarse diagnostic/procedural categories
66. It was noted that, because of the high rates of HIV and trauma in South Africa, ICU comparisons are invalid.
67. Trauma constituted 7.5% of all ICU and High care days, and 1.5% of ICU admissions were HIV positive. Even if all of these were removed from the SA private sector numbers (unrealistic as it assumes these never occur in other countries) we would still have the highest rates of ICU admission in the world.

## **CONCLUSION**

68. In this document the HMI has tried to address the key points raised about the SID analyses. This is not a comprehensive list of all points made. For example we note that the critique offered on cataract rates was put forward; the HMI did present those results and also noted in the provisional report that this level of care may be appropriate.
69. We have not listed all the responses that corroborated or agreed with our conclusion that SID is a feature of the private health care market in South Africa. The HMI notes that many stakeholders consider SID to be a problem.
70. The HMI wants to reiterate the interventions that it has proposed to assist in curbing SID:
- a. The introduction of a single comparable base scheme option with a risk adjustment mechanism to drive competition between schemes so as to force more vigorous supply side negotiations

- b. Measurement of and transparent reporting of health outcomes to allow for value purchasing and to improve scheme member ability to choose providers and interventions
- c. A health technology assessment function to curb inappropriate purchase and utilisation of health care technology or prevent third party payment when non-recommended technology is used
- d. Provision of guidance on best treatment options
- e. Methods to control prices through a Supply Side Regulator
- f. Changes in the HPCSA ethical rules to promote innovation in models of care to allow for group practices and alternative care models so that fee-for service ceases to be the dominant payment mechanism
- g. Changes to training curriculum for health practitioners

71. One of the purposes of the SID seminar is to engage stakeholders on whether these recommendations will have the result of reducing excessive utilisation and SID in South Africa's healthcare market. Another purpose is to provide an opportunity for stakeholders to offer and debate any additional recommendations on these issues. The HMI hopes to profit from a robust exchange of views between stakeholders during the seminar.