Re-examining risk in alternative reimbursement models

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ABSTRACT

This paper discusses some aspects of risk associated with alternative reimbursement models in healthcare. Stochastic risk in particular is explored under various reimbursement models. Our analysis showed that the nature of the reimbursement model has a material effect on the stochastic risk assumed to healthcare providers. However, the largest determinant of stochastic risk was found to be the volume of patients for which risk was transferred. A greater understanding of these risks is important for the further adoption of alternative reimbursement models which are an important part of suggested healthcare system reforms.

KEYWORDS

Alternative reimbursement models, risk, stochastic risk, Monte-Carlo simulation, capitation, fixed fees, diagnosis related groups, fee for service

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1. BACKGROUND

1.1 Healthcare provider reimbursement in the South African private healthcare system is predominantly fee-for-service (FFS). While FFS payment mechanisms have some advantages, such as the matching of resource use to reimbursement, responsiveness and flexibility, it also causes financial misalignment of incentives between funders and providers of care. Fees charged are aligned with output rather than outcome, with activity rather than improvement of health. There is general acknowledgement that reimbursement models need to move towards an alignment of value between funders and providers of care. The Health Market Inquiry (HMI) final recommendations concluded that '… a greater uptake of alternative reimbursement models will allow for beneficial patient outcomes …' (Competition Commission South Africa, 2019). Such models are often deemed 'Alternative' Reimbursement Models (ARMs), alternative referring to other-than-fee-for-service.

1.2 This is juxtaposed against the budget driven financing model of the public health sector which is ideal for cost containment but brings with it other problems including mismatches between need and expenditure, slow responsiveness, and other misaligned incentives such as no incentive to increase access and utilisation of services or ensure adequate measurement of quality of care.

1.3 The National Health Insurance bill suggests the reimbursement models of capitation for primary care and Diagnosis Related Group (DRG) based fixed fees for hospital services (South Africa, National Health Insurance Bill, 2019) without much detail on reimbursement models for other modalities of care or discussion of the nuances of the proposed models. The Actuarial Society of South Africa's submitted comment on the NHI bill suggested reimbursement models enshrined in the NHI bill be based on generalised principles rather than specific models so as to retain policy flexibility (Actuarial Society of South Africa, 2019).

1.4 Well-designed ARMs can better align the interests of funders and providers of care. In particular, Ransom et al. (1996) found that the number of surgical procedures that were performed during the implementation of the capitation reimbursement model decreased by 15%. Per-diem reimbursement have also been found to significantly reduce length of hospital stays and total medical costs for per-diem payment system participants (Shin et al., 2016). Continued escalation in healthcare costs in the private sector driven at least in part by increasing utilisation for healthcare services is borne fully by medical schemes in the fee for service environment. ARMs may help curb excessive increases in utilisation. Despite the advantages, progress in development and widespread adoption of ARMs has been slow. One of the challenges in designing and implementing ARMs is in contracting between funder and provider. Sometimes, there is an imbalance or asymmetry of information between the parties in the development and understanding of how ARMs work. Some data may not be accessible to a provider seeking to take risk. For example, hospitals do not have full knowledge of the billing data of healthcare professionals treating patients during admissions. Sometimes there is a lack of awareness of the risk management options available to the party taking risk in the ARM. There is sometimes a lack of awareness of the impact that changes in the model parameters can have on risk exposure. For these and other reasons there is mistrust in the industry about ARMs. This paper explores some of the misunderstandings in ARMs and in particular explores stochastic risk of various ARM structures in an effort to demystify the uncertainty and risk that can cause hesitancy for providers unaccustomed to assuming stochastic risk.

2. LITERATURE REVIEW

The literature review considers various modelling approaches to aid analysis and mitigation of financial risk associated with various ARM structures.

2.1 Capitation

2.1.1 In a capitation reimbursement structure, the healthcare provider is paid a fixed amount per patient registered per year. This reimbursement model typically requires an existing and ongoing relationship between the patient and the provider, hence this model is not usually suitable for specialists but rather primary care doctors. Under this reimbursement structure, there is an incentive to increase the number of patients registered in the practice but not to increase the supply of services to these patients (Blomqvist & Busby, 2012).

2.1.2 Cox (2011) compared the performance of capitation with the FFS reimbursement model making use of sampling. The population was comprised of all possible health insurance policyholders. The samples were portfolios of randomly selected policyholders, and the dependent variable was set as the loss ratio; the ratio of aggregated healthcare costs to aggregated premiums. By using the central limit theory and assuming that the underlying distribution of the population was approximately normal, Cox calculated the population loss ratio, the standard deviation of the loss ratio, and the probability of making profits and losses for six possible insurers ranging in size from 307 000 000 to 10 000. A further assumption was made that the experience of efficient healthcare providers under capitation agreements will mirror the results of insurers of similar size. Cox's findings suggest that under capitated agreements, capitation is inefficient when compared to fee-for-service where large insurers and providers are equally efficient. This is because efficient providers can reduce their risk by delivering less medical care than is appropriate compared to equally efficient fee-for-service providers. This also exposes providers to the additional risk of litigation costs for delayed and denied care.

2.1.3 Jones (2009) conducted a study on the actuarial basis for financial risk in practice-based commissioning and implications to managing a budget. They argued that Poisson, Negative Binomial and Extreme Value distributions are suitable models to understand financial risk in healthcare. This paper considered both primary care and hospitalisation costs under a capitation contract. In their analysis of the maximum cost per admission for each healthcare resource group, they found that admissions costing more than £30 000 only occurred for events occurring at less than 1 per 100 000. On this basis the risk was increased for population groups less than 100 000 heads. This conceptual basis was then applied to construct a computer simulation of the financial risk associated with different sized populations. Their findings suggest that under a capitated payment model the financial risk is higher than acceptable for population sizes that are smaller than 100 000 lives.

2.2 Diagnosis Related Groups

2.2.1 The DRG payment model groups clinically homogeneous hospital admissions together to determine the fixed amount paid to healthcare providers for treatments within that DRG (Jiang & Peng, 2019).

2.2.2 A study investigating the financial risk for healthcare providers under the DRG reimbursement model proposed an alternative design of a DRG system with risk-adjusted prices to prevent hospitals from selecting lucrative DRGs (Lüthi & Widmer, 2017). To measure the financial risk, they derived a stylised mathematical model to capture the risk transfer in the DRG system. This model served as the stochastic model to derive a risk-adjusted pricing mechanism based on a value-at-risk basis (VaR). The results of this research illustrated that specification of a fair compensation based on VaR-basis is not only very transparent and coherent but stimulates competition.

2.2.3 An additional study on the risk inherent in DRG payment models investigated the extent of the random financial risk involved in the Finnish bed-day and DRG-based pricing system using parametric and simulation methods (Mikkola et al., 2003). Their findings suggest that DRG-based payment schemes were found to provide significantly better protection against financial risk for municipalities, but the municipality's size was the main determinant of financial risk.

2.2.4 In 2008, Kuntz et al. developed a methodology to estimate the consequences of the DRG cost weight volatility on hospital performance. They used the hospital base rate as a quantitative measure of hospital performance and applied an extension to the metric to take the uncertainty of DRG cost weights into account. This methodology was analysed by using cost-benefit analysis and by applying it to two groups of hospitals – a homogeneous and a non-homogeneous group. Their findings illustrate that the hospital base rate spread in the more homogeneous group of hospitals is lower than in the more heterogeneous group.

2.3 Capitation vs DRGs vs per diems

2.3.1 Per diem models reimburse hospitals on a fixed fee per day regardless of the services delivered to the patient each day. Examples of decaying per diem models are more commonly observed where the rate per day decreases over time. This reflects the fact that the underlying cost of treatment decreases over time. In the absence of a decay, earlier treatment may be underfunded, and later treatment may be overfunded. This creates an incentive to extend lengths of stay.

2.3.2 Gapenski and Langland-Orban (1998) ran a Monte Carlo simulation to investigate the short-term financial risks inherent in DRG, per diem and capitation reimbursement models to hospitals. They found that:

— The DRG and per diem models had similar risks.
— The capitation model had less financial risk compared to DRG and per diem models for fixed cost structures above 70%.
— In instances where health status cannot be correctly assessed the capitation model was significantly riskier than the DRG and per diem models.
— Small populations increased the risk inherent in capitation models compared to DRG and per diem models.

2.3.3 Critics have argued that the study's results are only as good as the assumptions made when running the model. In particular, Strack (1998) disagreed with assumptions that hospital managers cannot influence utilisation or costs, that the costs per day are constant across patient stay, and that costs are independent of the reimbursement methodology.

2.4 Shared risk payment models

The Society of Actuaries (SOA) conducted a study to measure insurance risk and its impact on shared risk payment methods (Spector, Gusland & Kim, 2018). To quantify the insurance risk inherent in risk contracts they made use of deterministic and stochastic models. For their stochastic model they used Monte Carlo simulation and bootstrapping. The historical claims experience of the population was used to develop the claims probability distribution necessary for the Monte Carlo simulation. A random variable was applied to the mean and the adjustment factor to account for the risk that the claims probability distribution misrepresented the true underlying distribution. The stochastic models were run under various scenarios including differing levels of care management, the inclusion of a stop-loss product and different risk corridors. Their findings showed the impact these factors had on insurance risk and hence highlighted the necessity of actuaries to help quantify risks in provider-shared risk payment models.

3. RISK-TRANSFER vs RISK SHARING

3.1.1 To help shed some light on risk in ARMs, we consider the distinction between risk transfer and risk-sharing arrangements. Risk transfer means that the funder transfers risk over to the provider to manage. If we use a DRG-based Fixed Fee ARM as an example, the funder transfers over to the hospital group, the risk of the length of stay (LOS) or level of care (LOC) being higher than the LOS and LOC embedded in the fixed fee. The hospital group will be interested in managing LOS and managing patient outcomes to avoid complications to ensure their cost of delivering care does not exceed what is being received under the fixed fee ARM. If the hospital improves the management of their patients such that LOS or LOC are lower than that priced in the ARM, the hospital enjoys the savings achieved through this improvement. The funder will monitor LOS to ensure patients aren't being discharged too early, compromising care or resulting in readmissions. Still, they become less concerned with actively managing LOS since this risk has been transferred to the provider.

3.1.2 Under a risk-sharing arrangement, using the same example as above, if savings were to occur, some of this would be shared with the funder. Both the funder and the provider would have a vested interest in the LOS being actively managed and monitored, from the hospital's perspective to manage costs and from the funder's perspective to actively avoid readmissions and ensure the quality of care. The extent of risk-sharing is a function of negotiation between the parties. In our experience, risk-sharing contracts are set up such that the provider also shares in losses due to higher-than-expected claims.

3.1.3 Risk-sharing contracts can occur in a fee-for-service environment, and many volume-based discount arrangements start in this way. While these are easier to implement from an administrative perspective (because the operational reimbursement structure does not need to change), the disadvantage is that incentives are still misaligned in day-to-day reimbursement transactions and the risk sharing is more abstract to providers on the ground.

4. ADDITIONAL RISKS TO CONSIDER

4.1.1 Whilst utilisation, severity and demographic risks are often considered in ARM contracting, two other risks often do not get sufficient consideration.

4.1.2 The first risk is pricing risk, the risk that utilisation levels or any other assumption used in setting fees is wrong or will not pan out as expected under real-world conditions. This is always a risk when designing a new reimbursement model with imperfectly matched data. Models designed to replace historical models of reimbursement, for example, moving to fixed fee per diem ARMs for hospital services to replace historical fee-for-service hospital billing has low pricing risk. Other ARMs designed for new ways of working such as team-based care, value-based contracts with fee modifications for outcomes, or other novel reimbursement models carry higher pricing risk as assumptions are less certain. The estimates derived are typically 'best estimates', set at expected levels and rarely contain explicit margins for pricing uncertainty.

4.1.3 The second is stochastic risk, represented by random variation in underlying claims experience. While most of the systemic variation in claims can be explained by variations in certain risk factors such as demographic profile or case mix, there remains an element of unexplained variation that can only be modelled by a random process. The size of this variation depends in part on volumes of patients, hospital admissions or other ARM specific metrics. ARMs involve taking stochastic risk that can be directly quantified through techniques such as Monte Carlo simulations.

4.1.4 Quantifying risk using stochastic modelling techniques helps to address the following questions (Spector, Gusland & Kim, 2018):

- What is the best estimate of my future performance?
- What is the range of possible outcomes?
- What is the risk of loss? What is the maximum amount at risk?
- What is the likelihood of savings?
- How can altering the ARM structure impact the range of results?

4.1.5 The graphs in the following section show examples of how we could answer all of the questions above using stochastic modelling techniques.

5. MODELLING FINANCIAL RISK

5.1.1 In order to assess the financial risk under an ARM, we need to compare what the risk-taker would have received under the ARM to the cost of delivering care to determine whether they would have made a profit or a loss (or remained cost-neutral). The cost of delivery of care is likely to vary between discipline types as well as between providers of the same discipline type. Most providers do not share this information externally for obvious reasons and this kind of information was not available to the authors. Therefore, in the absence of this information, we used FFS claims costs as a proxy for cost of delivery of care. It is widely known that FFS costs already include some margin, therefore, it is important to make an adjustment for this if appropriate. For this purpose of this illustrative exercise, no adjustment was made.

5.1.2 Two variables were allowed to vary within our modelling exercise: ARM structure and population size. Our dataset comprised of annual claims costs of almost 200 000 medical scheme lives in 2019. The admissions dataset consisted of 45 572 individual admissions. We used the 2019 benefit year so as to not distort the analysis with the impact that COVID-19 had on 2020 claims.

5.1.3 Claims were summarised per family[1] i.e. per policy. We then calculated the amount that would have been received under various ARMs for these real-world families. We performed bootstrapping to randomly sample a subset of these families and compare their aggregated FFS claims costs to the ARM fees. Traditional bootstrapping requires sampling with replacement, however, given the size of our dataset and the purpose of the sampling exercise, we believed that no additional value could be derived from sampling the same family more than once. Therefore, we performed sampling without replacement.

5.1.4 When considering the results, the specific provider context should be borne in mind. The provider landscape could be a number of individual GPs, or a corporate group of GPs, individual hospitals, or hospital group(s), or some intermediary taking Health Management Organisation (HMO) capitation risk. The patients covered by the ARM model in question may only represent a proportion of the provider's total business. The quantities of families or admissions should be interpreted with these issues in mind.

5.1.5 We ran 10 000 samples for each ARM structure and each population size considered. This allowed us to determine the probabilities associated with each of the simulated outcomes. The sections below explore the results from our modelling exercise for various ARM structures.

1 The average family size for this cohort of lives is 2.8.

5.2 Primary care capitation

5.2.1 Risk-adjustment performed was based on age, gender, chronic status, and benefit option (to allow for different levels of primary care benefits available under different options) to set the risk-adjusted capitation fees. In general, benefit differences between schemes and options will give rise to differences in stochastic risk. Stochastic variation in primary care capitation diminishes quickly as population size grows. A small population under capitation, say 1 000 patients presents wide variation in expected financial performance against a capitation fee set at the expected value. Larger populations of 7 000–10 000 patients represent a much smaller risk.

5.2.2 An individual GP in South Africa manages in the range of 3 000 and 5 000 patients;[2] some practices may be larger. This suggests that an individual GP would be exposed to some stochastic variation if their patients were funded according to a capitation model. Currently in South Africa, GPs treat patients from the range of medical scheme benefit options on the market as well as private patients. It is unlikely all patients in a practice would be on a capitation model and so GPs will have a mixed model of reimbursement. Some GP practices are corporatised and operate in groups which have more patients collectively. This may allow for more risk-taking via capitation.

5.2.3 Allocations in the modelling approach are randomised. Systemic risk due to, say, demographic differences in allocated patients should be mitigated via an appropriate risk adjustment structure. In practice, patients would be allocated to a GP practice within geographic areas which may have an effect on the underlying variation in claims behaviour.

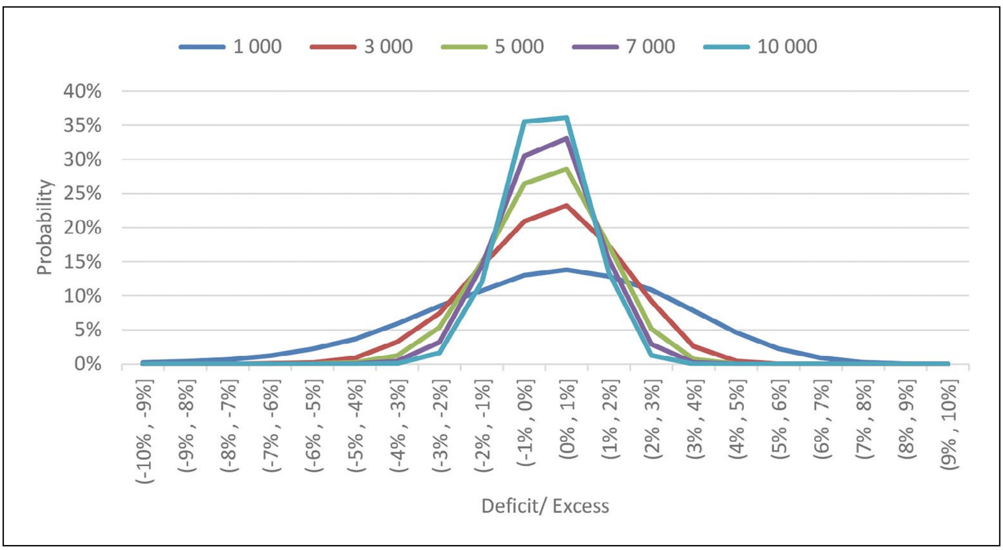

FIGURE 1 Risk-adjusted capitation fees for primary care services

2 Obtained from telephonic discussions with several GPs in practice and Independent Practitioner Association managers.

This could be considered for a future refinement in the work to test the effect that geography has on stochastic risk.

TABLE 1 Risk-adjusted capitation fees for primary care services

Population size	1 000	3 000	5 000	7 000	10 000
Standard deviation	2.9%	1.7%	1.3%	1.1%	0.9%
Probability of a deficit >= 5%	4.6%	0.3%	0.0%	0.0%	0.0%

5.2.4 A typical GP then, looking after between 3 000 and 5 000 patients could take capitation-based payment with little stochastic risk, less than a 0.3% chance of a deficit of more than 5% arising. Of course, it may not be possible to arrange capitation fees for all of a doctor's patients given fragmentation on the funder side of the market.

5.3 DRG-based fees

5.3.1 In South African parlance, we would term Fixed Fees for hospital admissions to include the hospital facility, medicines used in hospital and medical consumables used by the hospital, whereas Global Fees would include all of the aforementioned hospital fees as well as fees for healthcare professionals including doctors, radiology, pathology, and auxiliary service providers. As expected, there is a strong positive correlation between the hospital fees and hospital-related costs with a correlation coefficient of around 89%.

5.3.2 Using the same population sizes in the capitation example above, a 25% admission rate was used to determine the number of admissions used for the simulations in this section. Twenty-five percent is broadly in line with typical admission rate per annum in

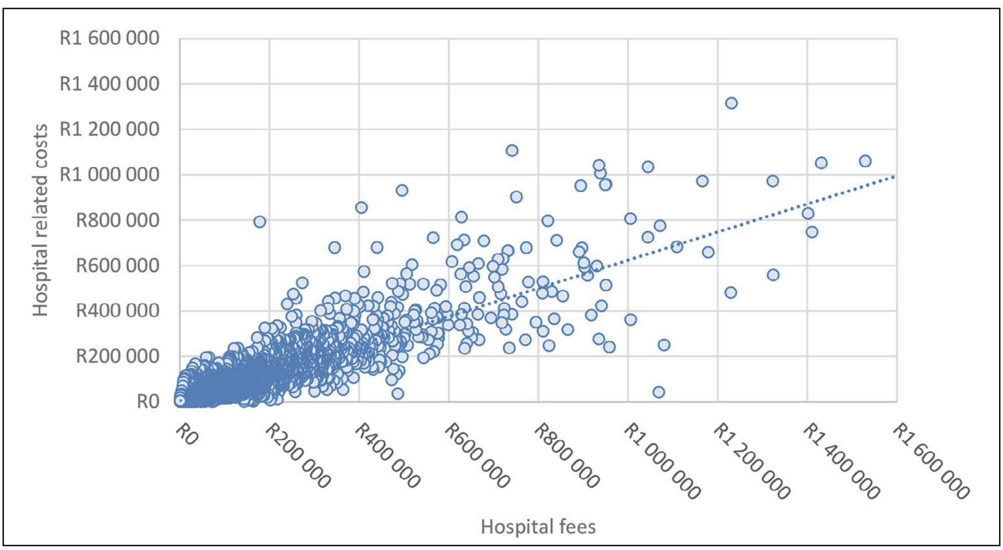

FIGURE 2 Hospital-related costs in relation to hospital fees (25 000 sampled admissions)

the South African medical schemes and is used here as a rule of thumb. We sampled these admissions from a broader admissions dataset. Each record in the admissions dataset represents an individual admission with costs incurred between the admission and discharge dates.

Table 2 Number of admissions for simulations

Population size	Admission rate	Number of admissions
1 000	25%	250
3 000		750
5 000		1 250
7 000		1 750
10 000		2 500

5.3.3 While 250 admissions is very small, this could happen in the context of a scheme seeking a risk transfer on one option only or a subset of the population e.g. cardiac patients only, although this would affect the admission rate assumption. The variation of results is significantly higher for 250 admissions indicating that the provider is taking on significant stochastic risk.

Table 3 DRG-based fixed fees for hospital facility costs

Admissions	250	750	1 250	1 750	2 500
Standard deviation	8.9%	5.3%	4.2%	3.5%	2.9%
Probability of a deficit >= 5%	24.0%	15.3%	11.3%	7.5%	4.3%
Probability of a deficit >= 10%	10.6%	2.9%	1.0%	0.3%	0.0%

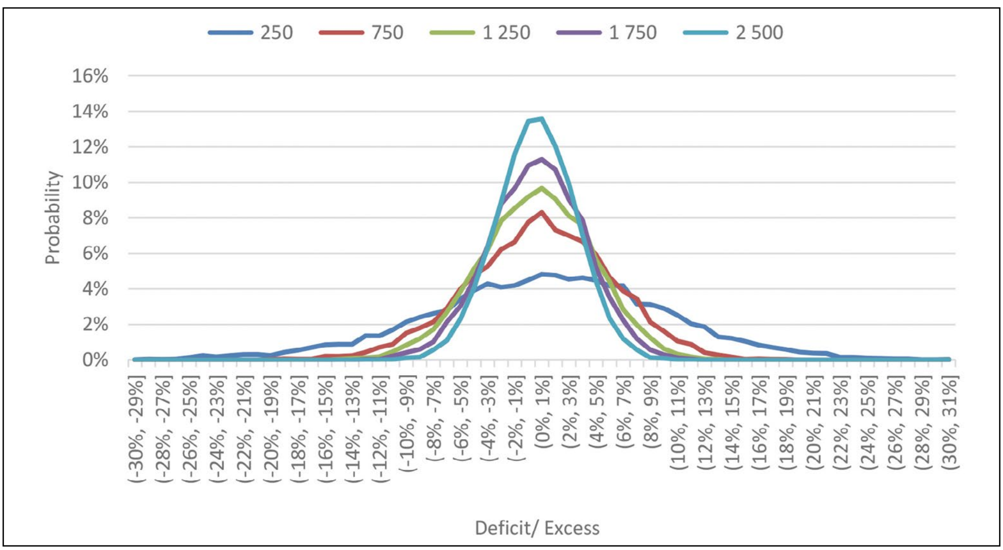

Figure 3 DRG-based fixed fees for hospital facility costs

5.3.4 For small population sizes of 1 000, and hence a small number of admissions, the risk of deficit being above 5% or 10% is large and would likely require the inclusion of a risk margin. This diminishes quickly for a deficit in excess of 10% to below 1% above 1 250 admissions but stays significant for a deficit in excess of 5% even for larger population sizes.

Table 4 DRG-based global fees for all in-hospital costs

Admissions	250	750	1 250	1 750	2 500
Standard deviation	8.4%	5.0%	3.9%	3.3%	2.7%
Probability of a deficit >= 5%	23.7%	13.9%	9.9%	6.2%	3.4%
Probability of a deficit >= 10%	10.0%	2.4%	0.7%	0.2%	0.0%

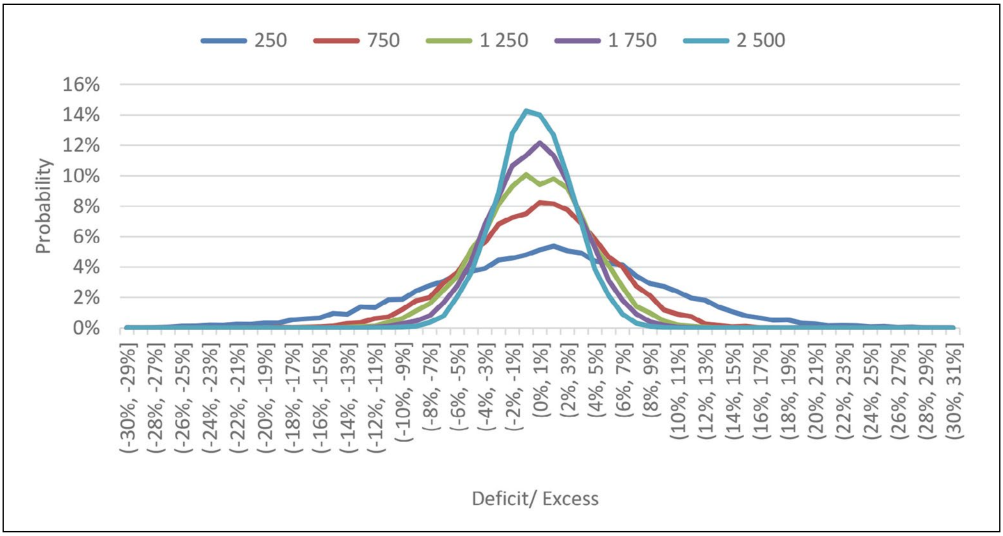

Figure 4 DRG-based global fees for all in-hospital costs

5.3.5 The risk profile of global fees is slightly lower than fixed fees, as the imperfect correlation coefficient means a reduction in variance. Risk of a deficit above 10% are negligible for populations over 5 000 lives.

Table 5 Fixed fees vs global fees for two sample sizes

Admissions	**250**		**2 500**	
ARM	Fixed fee	Global fee	Fixed fee	Global fee
standard deviation	8.9%	8.4%	5.3%	5.0%
Probability of a deficit >= 5%	24.0%	23.7%	15.3%	13.9%
Probability of a deficit >= 10%	10.6%	10.0%	2.9%	2.4%

5.3.6 Comparing global and fixed fees for numbers of expected admissions, one can see that number of admissions is a far greater contributor to risk than whether or not in

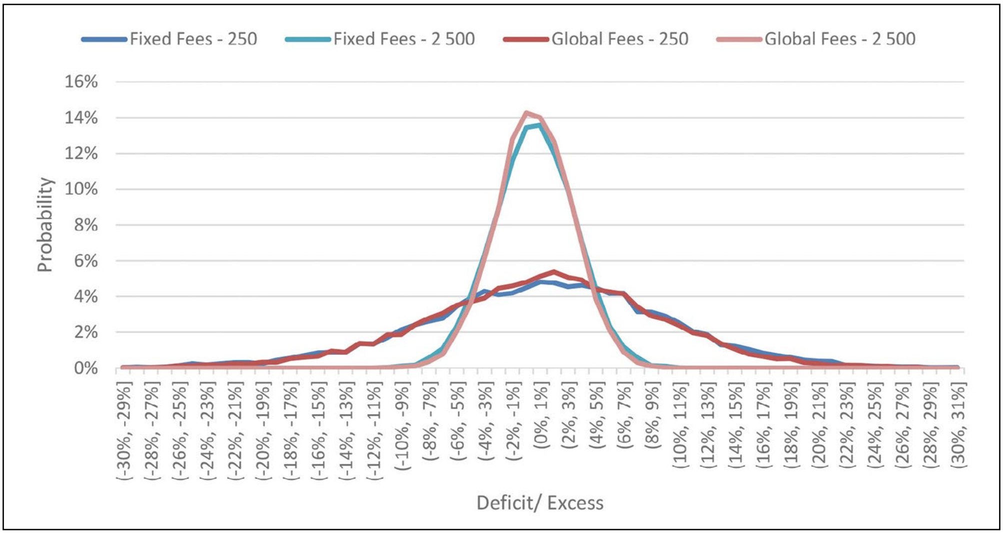

Figure 5 Fixed fees vs global fees for two sample sizes

hospital-related costs are included in the ARM. Therefore, while inclusion of related costs would increase the total pool of money under risk in the global fee ARM (by about 65%), the stochastic risk under the expanded contract is lower.

5.4 Full capitation

5.4.1 Although not widely in use in South Africa, it is possible for a medical scheme to pass on all of the underlying claims risk to a provider risk-taker in a full-capitation model. The provider risk-taker may be a GP practice, or a group of GP practices, or an umbrella of providers operating within a corporate or similar structure. There are various nuances to the prevailing provider contracting models in South Africa, including narrow interpretations of health professional guidelines, that can make it challenging to design progressive multi-disciplinary team-based ARMs. Such considerations are important for the design and implementation of ARM models but are not part of the scope of this paper and analysis.

Table 6 Risk-adjusted capitation fee for ALL services

Population size	1 000	3 000	5 000	7 000	10 000
Standard deviation	6.6%	3.8%	2.9%	2.4%	2.0%
Probability of a deficit >= 5%	21.8%	9.6%	4.4%	2.3%	0.8%
Probability of a deficit >= 10%	7.5%	0.7%	0.1%	0.0%	0.0%

5.4.2 For small population sizes, the stochastic risk is significant with the chance of a deficit of more than 5% arising remaining notable for population sizes of below 3 000 families.

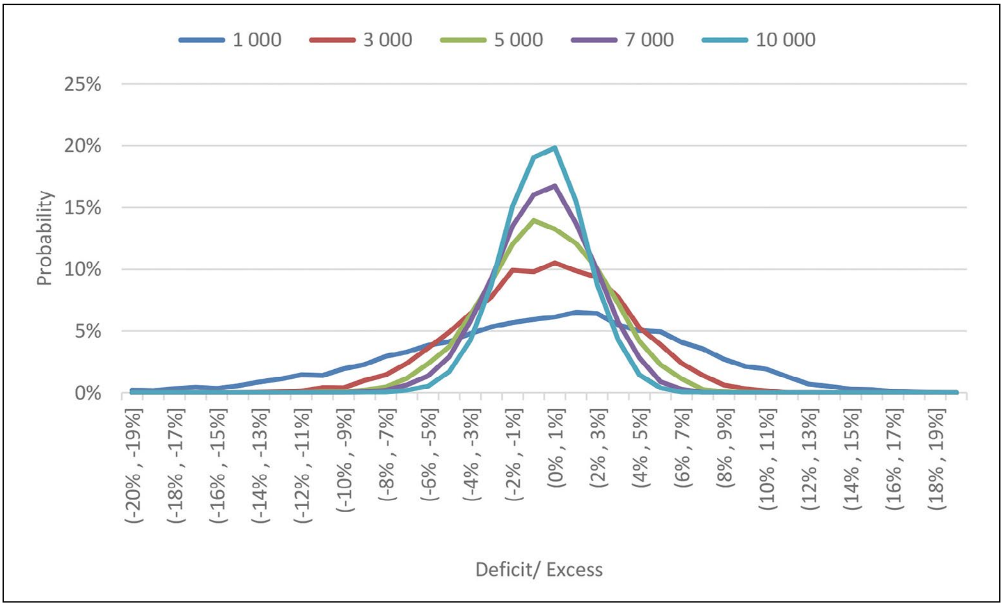

FIGURE 6 Risk-adjusted capitation fee for ALL services

5.5 Hybrid models

5.5.1 We also considered a variety of hybrid ARM structures for a fixed population size of 5 000 families to test the effect on stochastic risk under different combinations of ARM.

TABLE 7 Example hybrid ARM structures with model results

	Out-of-hospital		In-hospital		Standard deviation	Probability of deficit >= 5%	Probability of deficit >= 10%
	Primary care	Secondary care	Hospital bill	Hospital related costs			
ARM 1	Risk-adjusted capitation fee				2.86%	4.4%	0.1%
ARM 2	Risk-adjusted capitation fee		DRG-based fixed fees	FFS	2.00%	0.9%	0.0%
ARM 3	Risk-adjusted capitation fee		Per diems	FFS	2.03%	0.8%	0.0%
ARM 4	Risk-adjusted capitation fee	FFS	DRG-based global fee		1.78%	0.4%	0.0%
ARM 5	Risk-adjusted capitation fee	FFS	DRG-based fixed fees	FFS	1.57%	0.2%	0.0%
ARM 6	Risk-adjusted capitation fee	FFS	Per diems	FFS	1.65%	0.3%	0.0%

5.5.2 Note that the probability of deficit as is shown in Table 2 above reflects the aggregate result for the risk-taking provider(s). In practice, risk-taking in such a hybrid

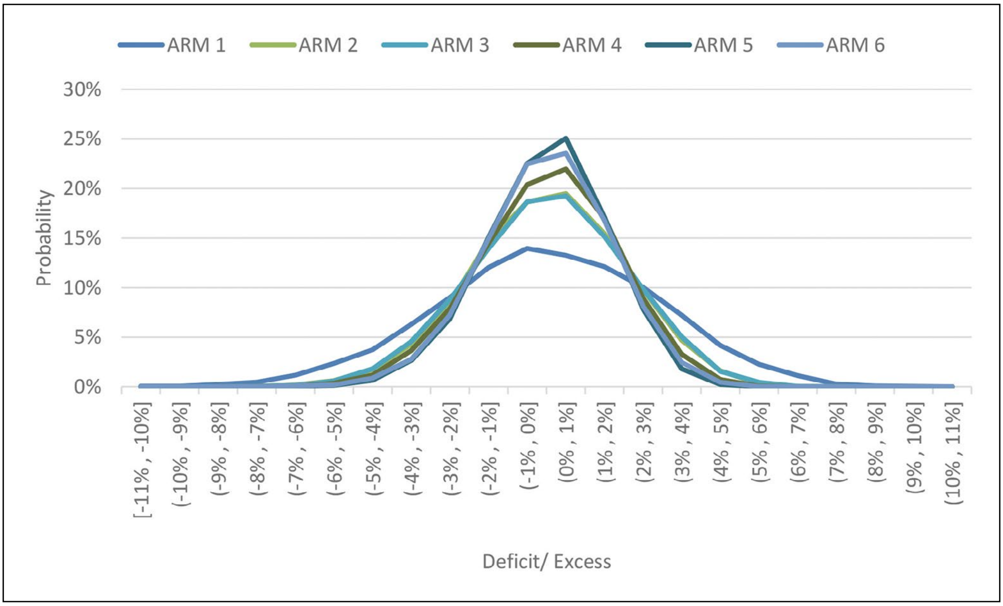

FIGURE 7 Hybrid ARM structures for population size of 5 000 families

model may be shared among participating providers unevenly depending on the specific contractual design. In such cases each risk-raking provider should consider their particular insurance risk taken on. The view reflected in Table 2 above should be interpreted as a 'consortium' result.

5.5.3 ARM 1, full capitation, has the highest stochastic risk because variation in hospital costs are not adequately mitigated through a typical population-based capitation model. Other models all include some measure of FFS which would fall outside of the ARM. Hybrid models incorporating some more specific risk adjustment for hospital costs have narrower variation and hence lower risk.

6. OTHER FACTORS TO CONSIDER

Aside from modelling techniques, there are a few key elements to consider when constructing an ARM contract, as this will affect the answers to the questions above. The list below is by no means exhaustive.

6.1 Contract specifics

Our modelling above assumes a like-for-like transfer of risk between funder and provider for without carve-outs, trimming, stop loss arrangements or similar contract specific nuances. These sorts of adjustments are unavoidable in ARM contract design. In some cases, this is due to differences in risk appetite between the parties, or incomplete geographic coverage, or benefit design specifics in which the provider may have no risk management expertise. Too much carved out or removed from ARM might diminish the effectiveness of the ARM, where too little allowance for risk mitigation without an explicit risk margin may expose the provider to more risk than they are willing to take. Whatever the reason, parties need to negotiate such contract terms fairly, considering the other party's perspective, if the ARM contract is to be fair and sustainable.

6.2 Expected value

6.2.1 The expected value or target is the benchmark against which performance is measured. It is important to understand how this is set and what methods are used. This may be a simple projection of current experience with some risk adjustment or based on a more complex machine learning model. Different methods are appropriate for different ARMs.

6.2.2 A tricky conversation between funders and providers is the question of whether a risk premium should be included. Providers usually do not have reserves or a balance sheet to support extensive risk-taking, so some of the reserve-building margin held by funders could be transferred to the provider in the form of a risk premium.

6.3 Risk adjustment

6.3.1 It is important to understand what factors are being used for risk adjustment (such as age, gender, co-morbidities, etc.) and whether more factors could better explain the risk. Tools such as DRGs, episode groupers and population groupers could be used to perform risk adjustment.

6.3.2 Additionally, parties to the ARM should consider if there is any scope to manipulate risk adjustment factors. There may be a trade-off between the accuracy and reliability of the factors used.

6.4 Outliers

The methodology of identifying outliers should be clearly defined and carve-outs should be limited to an acceptable level to avoid an ARM that covers an insufficient number of claims.

6.5 Risk corridors

Risk corridors affect risk-sharing contracts by providing a band around the benchmark within which there is no transfer of funds between the funder and risk-taker. This protects the risk-taker from some level of loss (depending on how wide the risk corridor is). In our experience, this is a two-sided arrangement meaning that the funder will expect to share in savings achieved.

6.6 Savings

If there are savings expected due to care management interventions, quantifying this with limited experience under new interventions may be challenging. Contracting based on savings expectations may be a delicate undertaking and may sit in another layer of the ARM contract.

6.7 Risk-sharing formula

The new contract must specify all the relevant parameters, methods and models in a technical specification. This could be an appendix to the ARM contract. Small changes in these parameters may significantly impact the risk-taker's risk exposure and having these discussions retrospectively may be problematic.

6.8 HPCSA rules

The Health Professions Council of South Africa has dampened reimbursement innovation in South Africa because of strict interpretation of its rules for any payments in advance and any fee sharing between professionals from different disciplines. In recent years however some providers have challenged these rules and some ARMs involving multi-disciplinary teams and advance capitation-based payments have been permitted. Compliance with regulations is however important for ARMs to grow and be sustained.

6.9 Marketability

Some ARM models require patients to access care at a network of providers, or in some cases require patients to be allocated to specific providers such as in the case of capitation. These can have an effect on marketability to prospective members due to the perceived reduction in freedom of choice. This is usually traded off against a reduction in contributions.

7. CONCLUSION

7.1 Ongoing cost pressure in the South African private healthcare sector is one reason for renewed interest in alternative reimbursement models. Successful ARMs require mutual agreement between healthcare funder and provider, which in turn requires informed decision-making facilitated through the quantification of risks. This helps parties better understand risks, which in turn supports good risk management and mitigation. Our analysis shows that, subject to an appropriate minimum volume of patients or admissions, as well as considerations for appropriate risk premium, it is acceptable for healthcare providers to take on stochastic risk. While the models shown above are simplifications of reality, they nonetheless provide guidance on the nature and magnitude of the risks under such ARM contracts. Each contract between funders and providers has its own nuances, benefit design considerations, risk appetites and risk mitigation mechanisms to consider.

7.2 Entering the right ARM design for the right contract structure helps ensure that each party holds appropriate risk and can better align the interests of the parties. Wider adoption of ARMs is an important area of improvement for the South African healthcare system.

7.3 Additionally, regular performance measurement is required as this is key for tracking performance against expected outcomes. Data sharing between funders and providers is thus a key component of sustainable ARM models. ARMs provide a means to improve the health system by aligning risk and incentives between parties but on their own they are not a silver bullet. They need careful context specific design, and monitoring and adjustment to ensure improvement is ongoing.

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