HEFP

HEALTH ECONOMICS & FINANCING PROGRAMME

Quality of care in contracted-out and directly provided public hospital services in South Africa: evaluation of structural aspects

Jonathan Broomberg[1] and Anne Mills[2]

HEFP working paper 02/04, LSHTM, 2004

[1] **Praxis Capital, Johannesburg, South Africa**

[2] **Professor of Health Economics and Policy, Health Economics and Financing Programme, London School of Hygiene and Tropical Medicine: anne.mills@lshtm.ac.uk**

ACKNOWLEDGMENTS

The research reported here was funded by the UK Department for International Development (DFID) through a grant to the Health Economics and Financing Programme, Health Policy Unit, London School of Hygiene and Tropical Medicine. However, the DFID can accept no responsibility for any information provided or views expressed. The authors acknowledge the generous co-operation of Lifecare Group Holdings, and the management and nursing staff at all nine of the study hospitals.

ABSTRACT

This paper evaluates structural quality of hospital care in the context of an evaluation of contracting out district hospital services in South Africa. Three contractor hospitals, run by a private company and paid by public purchasers to provide district hospital care to a rural catchment population, were matched with three adjacent public hospitals and three private hospitals serving largely insured patients. A structured instrument was used to provide a quantitative measure of structural quality, consisting of 132 individual criteria, grouped into standard categories, which were further grouped into 9 clusters representing the major functional hospital divisions. Private hospitals scored highest overall, followed by public and then contractor hospitals. While the overall differences in scores between the public and contractor groups were relatively small, there were important and consistent differences between the two groups in some key structural elements of quality of care. Contractor hospitals appeared to limit the quantity and quality of key inputs, including critical staffing and equipment and supplies, to the point of failing to meet what the evaluation defined as realistic public sector standards. On the other hand, the contractors demonstrated clearly superior provision and maintenance of hospital buildings and amenities. The study suggests scope for improved specification and monitoring of structural quality of care in the contracting process.

INTRODUCTION

In recent years, there have been concerns about the efficiency of publicly-provided hospital services in many developing countries (Mills 1997, World Bank 1993). One suggested policy response is, where possible, to contract out the provision of care to private agencies which are believed to be more efficient providers of care. However, there is very little evidence that private providers, whether under contract or privately financed, are more efficient than public providers (Bennett 1997), and any comparisons are bedevilled by the difficulties of allowing for differences in quality when comparing efficiency across hospitals. Studies which focus only on costs may show some hospitals as less costly than others, but they cannot be argued to be more efficient unless it can be demonstrated that the less costly hospitals provide services which are no worse in quality terms (Mills 1993).

South Africa has a long history of contracting-out services to the private sector. In 1995, approximately 16.5% of all hospital beds were operated under some form of explicit or implicit contract. Most of these were long-stay beds, but three contracts existed, with one private company, for the provision of acute district hospital services. Given the extensive resources in the private health sector in South Africa, the issue of whether or not to contract out services has attracted some attention. A research project was designed to address the question of whether or not it was better for the South African government to contract-out the provision of hospital services in certain areas or to provide them directly itself. Given the process of political change in South Africa at the time the study was designed, and the accepted need to make better use of private sector capacity which concentrates largely in acute care, the study focused on these three contractor acute hospitals. A comprehensive evaluation of costs, and of structural, process and outcome quality was undertaken (Broomberg 1997): this paper presents the methods and results for structural quality.

METHODS

The contractor hospitals were medium-sized, located in rural areas (which were part of former homeland areas) and provided a basic range of medical, surgical and obstetric services. In one of the hospitals (referred to below as S) only the senior management team was employed by the contractor[a], in hospital M, all staff except the medical staff were employed by the contractor, and in hospital H the contractor employed all staff. Each contractor hospital was matched with a public sector hospital using size, service mix and geographical proximity as matching criteria. In addition three other private hospitals were selected, in towns nearby to the pairs of public and contractor hospitals. While these 'pure' private hospitals served a very different market (middle and higher income households with insurance cover), it was nonetheless thought that they would give an insight into the costs and quality of private sector hospitals when not under contract to the government. It should be noted that laboratory and radiology services at these hospitals were provided by other, independent, companies; and also that clinical staff working in private hospitals are self-employed and not regarded as part of their staff. Hence these components were not included in the evaluation.

The development of the structural quality of care (SQOC) instrument involved the identification of evaluation criteria, the grouping of these criteria into appropriate categories, and the development of standards by which to judge hospital performance on each criterion. This was followed by the development of a scoring and weighting system to allow for quantitative comparisons of hospital structural quality.

In the first step of this process, a draft list of criteria, standards for each criterion, and suggested groupings was developed on the basis of information obtained in consultations with a number of experts in hospital management, clinicians and researchers[b], as well as from written documentation and the quality of care literature. The general approach adopted was to develop criteria and standards which would reflect realistic norms for the public sector, and where possible, use was

[a] This arrangement had come about because after the first 2 years of the contract, the contractor had asked the government to take back employment of all nursing and most domestic staff because it could not control staff costs or productivity

made of existing official public sector norms and standards. The draft instrument emerging from this procedure formed the basis for a consensus development process involving a series of individual and group discussions with a smaller group of experts in hospital management, clinicians and researchers. A final draft was then piloted at three of the hospitals, following which minor modifications were made.[c]

The final instrument consisted of 132 individual criteria, grouped into standard categories, which were further grouped into 9 clusters[d]. The clusters represented the major functional divisions within the hospital. The clinical personnel cluster referred to medical, nursing and paramedical staff, and was treated separately because of the importance attached to these aspects of SQOC. The maternity ward was treated separately from the other wards because of its unique equipment requirements. Most clusters were divided into the standard categories of staff, functions, supplies and equipment, and buildings. The *staff* category referred to non-clinical staff (since clinical staff were dealt with in a separate cluster) and covered issues such as staff numbers, training and qualifications. The *functions* category covered the major activities carried out within the section being reviewed. The ward clusters had neither staff nor functions categories, since their staff were covered in the clinical personnel cluster and their functions separately evaluated. *Supplies and equipment* referred to the availability, quantity and quality of supplies and/or equipment in different sections, while *buildings* covered issues such as availability of space, provision of toilets and other amenities, and the physical condition and cleanliness of buildings.

In the second step of the process, the final instrument was used as the basis for a further consensus development exercise, in this case to develop a scoring and weighting system in order to be able to aggregate scores. Since performance on different criteria could be expected to impact differently on overall quality of care, it was decided to attach unique scores to individual criteria, rather than to use a standard scoring system for all criteria. *'Good'* was given a value of 1, but the scores attached to

---

[b] Managers and clinicians connected with the study hospitals were omitted from this process because of the problem of potential bias in their contributions

[c] These involved adjustments to the definitions of standards where these were found to be impossible or impractical to measure, or to capture inadequately the specific feature being evaluated

[d] The final instrument is available from either of the authors

the *'adequate'* and *'poor'* standards were varied between 0 and 1, with a lower score representing a more negative impact on overall quality of care.[e]

Weighting of individual categories was designed to reflect the relative impact of each category within its own cluster, while the weighting of clusters was similarly aimed at reflecting the relative impact of each cluster on quality of care in the hospital as a whole. The same group of experts who participated in the design of the instrument were asked to attach their individual scores and weights. The median values of these scores and weights were taken to represent the 'consensus' values. Median values were used in preference to means in order to exclude the potential bias that might be introduced by outlier scores or weights. Sensitivity analysis was carried out to test the impact of using mean rather than median values.

In the sample hospitals, direct observation was used to complete a checklist of required information. Formal interviews, using structured interview schedules, were conducted with the medical superintendent, senior management officials and the nursing service manager at all hospitals[f] and a questionnaire distributed to all medical staff. A variety of informal interviews were held with clinical, nursing, administrative and domestic staff. All observations and interviews were conducted by the senior researcher so as to eliminate inter-observer bias.

Inconsistencies identified in the data were resolved through discussion with relevant officials. The rating of hospital performance using the SQOC instrument was carried out by the same researcher who collected the data, once again to eliminate inter-observer bias and to ensure consistency of judgements across hospitals. Scores were calculated for each category, cluster and for the hospital as a whole using Microsoft Excel Version 5. In the calculation of total scores for each category, the geometric mean of the scores of all criteria in the category was used in preference to a simple sum of the scores. This approach, which involves a multiplicative aggregation of the data, was adopted in order to capture the interactive effect of the individual criteria within each category on quality of care. Aggregation of the category and cluster scores was done by calculating the weighted sum of the

[e] A score of zero was excluded because of the use of geometric means in the analysis (see later)

scores since the implication of the impact of interactions between different categories and between clusters for quality of care is much less clear than in the case of the individual criteria within each category. Sensitivity analysis was carried out to test the effect of using mean rather than median values of the score and weight data obtained from the panel of experts, as well as to test the effect of using the weighted sum rather than the geometric mean to aggregate the scores for individual criteria within each category. The small sample sizes prevented statistical analyses of the significance of observed differences between the hospital groups.

All six of the public and contractor hospitals, but none of the private hospitals, were affected by problems related to the general political environment during the period of the evaluation (1994/5). In particular, some level of industrial action amongst nurses affected all six hospitals either prior to, or during the evaluation. Since this evaluation relied upon a one-off assessment of conditions, these problems are likely to have impacted on the performance of these hospitals. These factors were therefore taken into account in the rating of the hospitals, and where appropriate, adjustments were made to the ratings in order to avoid bias emerging from the differential impact of these problems on the various study hospitals.

RESULTS

Table 1 shows the scores obtained by individual hospitals in all categories, while Table 2 shows the hospital scores for the aggregate categories. The scores represent percentages of the maximum possible score.

---

[f] The actual officials interviewed at the different hospital groups varied due to the different management structures in place

Table 1: Category and cluster scores for individual hospitals (% max. possible score)

	Contractor			Public			Private		
	M	**H**	**S**	**T**	**L**	**B**	**D**	**P**	**N**
Admin/ management									
Staff	49	82	65	49	49	89	93	49	93
Functions	71	88	71	71	59	56	95	75	71
MIS	17	17	17	100	17	17	100	100	100
Patient record system	89	99	75	78	82	95	80	72	79
Utilities/services	100	93	79	79	74	93	93	100	93
Total	61	75	60	74	54	68	92	76	86
Laboratory									
Staff	28	40	28	63	80	89	n/a	n/a	n/a
Functions	51	69	69	92	76	79	n/a	n/a	n/a
Supplies and equipment	100	100	100	80	60	100	n/a	n/a	n/a
Buildings	71	100	100	67	84	100	n/a	n/a	n/a
Total	56	70	66	78	75	88	n/a	n/a	n/a
Radiology Dept									
Staff	59	59	59	72	72	72	n/a	n/a	n/a
Functions	88	82	93	75	82	81	n/a	n/a	n/a
Supplies and equipment	100	92	92	97	79	100	n/a	n/a	n/a
Buildings	100	100	100	50	63	100	n/a	n/a	n/a
Total	87	83	86	76	75	88	n/a	n/a	n/a
Pharmacy									
Staff	87	87	94	94	100	87	94	94	94
Functions	95	100	95	89	100	52	88	79	77
Supplies and equipment	84	84	42	100	100	100	100	77	100
Buildings	100	93	79	100	68	100	93	100	93
Total	89	89	74	96	95	86	95	86	92
Clinical Staff									
Medical staff	73	61	69	80	92	68	n/a	n/a	n/a
Nursing staff	79	70	81	100	94	97	93	100	100
Ancillary services	14	14	14	100	100	100	n/a	n/a	n/a
Total	66	57	66	91	94	84	93	100	100
Operating theatres									
Staff	100	100	100	100	100	100	100	50	50
Functions	90	60	60	100	90	60	100	100	100
Supplies and equipment	99	88	84	89	89	94	100	100	96
Buildings	100	100	100	100	67	100	100	100	100
Total	98	88	87	97	88	90	100	85	84
Outpatients Dept									
Staff	100	100	50	50	100	100	n/a	0	0
Functions	87	100	87	100	100	100	n/a	71	71
Supplies and equipment	62	77	62	88	100	77	n/a	100	100
Buildings	100	100	100	100	85	100	n/a	100	100
Total	86	93	71	81	97	93	n/a	92	92
Maternity Ward									
Supplies and equipment	72	80	66	75	78	75	100	71	86
Buildings	93	100	93	93	87	100	100	100	100
Total	77	84	71	78	79	80	100	77	89
Other wards									
Supplies and equipment	59	67	47	54	60	72	59	90	72
Buildings	93	99	94	75	78	98	100	100	97
Total	66	73	57	58	64	77	68	92	77
All Wards	71	78	64	68	72	79	84	85	83
Grand Total	75	76	71	84	82	84	92	86	89

Notes: n/a - not applicable

Table 2: Aggregated category scores for individual hospitals (% max. possible score)

	Contractor			Public			Private		
	M	**H**	**S**	**T**	**L**	**B**	**D**	**P**	**N**
Staff	79	78	78	89	96	92	94	81	88
Supplies and equipment	82	83	67	83	82	89	87	89	90
Buildings	96	99	95	85	72	100	98	100	98
Functions/Services	72	76	70	87	73	67	93	85	84

An initial observation from these data is that all of the study hospitals performed relatively well, as suggested by the generally high mean grand total and cluster scores. There are a few markedly low scores, especially amongst contractors in staffing categories, and in all contractor hospitals and in 2 public hospitals for management information (MIS). Figure 1 demonstrates that the contractors obtained a lower grand total score than the public hospitals, a pattern which is repeated for all clusters aside from x-ray and administration. The figure also shows that the private hospitals obtained the highest grand total score of all three groups, as well as the highest cluster scores in all cases aside from operating theatres and pharmacy.

Figure 1: Mean cluster and grand total scores by hospital group

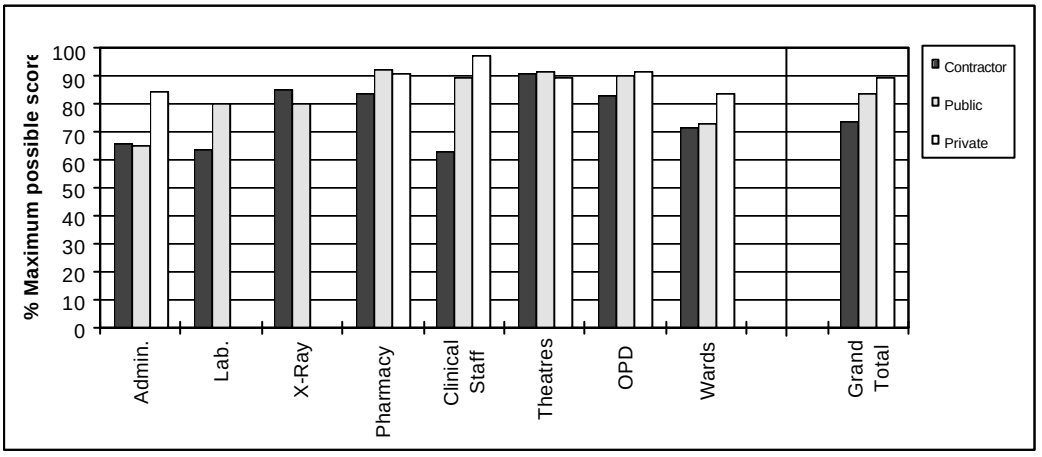


Table 3 shows the mean scores obtained by each hospital group for the individual categories within each cluster.

Table 3: Mean category and cluster scores by hospital group

	Contractor	Public	Private
Admin./Management			
Staff	66	62	78
Functions	77	62	80
MIS	17	44	100
Patient record system	88	85	77
Utilities/services	91	82	95
Total	66	65	85
Laboratory			
Staff	32	78	n/a
Functions	63	82	n/a
Supplies and equipment	100	80	n/a
Buildings	90	84	n/a
Total	64	81	n/a
Radiology Dept.			
Staff	59	72	n/a
Functions	88	79	n/a
Supplies and equipment	95	92	n/a
Buildings	100	71	n/a
Total	85	80	n/a
Pharmacy			
Staff	89	93	94
Functions	96	80	81
Supplies and equipment	70	100	92
Buildings	91	89	95
Total	84	92	91
Clinical Staff			
Medical staff	68	80	n/a
Nursing staff	77	97	98
Ancillary services	14	100	n/a
Total	63	90	98
Operating theatres			
Staff	100	100	67
Functions	70	83	100
Supplies and equipment	90	90	99
Buildings	100	89	100
Total	91	92	90
Outpatients Dept.			
Staff	83	83	n/a
Functions	91	100	71
Supplies and equipment	67	88	100
Buildings	100	95	100
Total	83	91	92
Maternity Ward			
Supplies and equipment	73	76	86
Buildings	95	93	100
Total	77	79	89
Other wards			
Supplies and equipment	58	62	74
Buildings	95	84	99
Total	65	66	79
All Wards	71	73	84
Grand Total	74	83	89

Given the substantial variation in scores at hospital level and the overlap of some score ranges between hospital groups, comparisons clearly need to be made cautiously, though the following points are supported also by examination of the hospital-level data in Table 1. Table 3 indicates that within the administration cluster, the contractor group obtained higher scores than the public group in all categories aside from MIS. The lower contractor score in the laboratory cluster is attributable to the significantly lower scores in the staff and functions categories, which override the effects of the relatively higher contractor scores in the supplies/equipment and buildings categories. In the radiology cluster, on the other hand, the higher mean contractor score is explained by the higher scores obtained in all categories aside from staff, where the contractor score is substantially lower than the public hospital score. In the pharmacy cluster, the lower contractor score is due to lower scores on the staff and supplies/equipment categories, which outweigh the higher contractor scores in both the functions and buildings clusters. The significantly lower contractor score in the clinical staff cluster is attributable to lower scores on all individual categories within this cluster, although the margin is particularly noticeable in the case of paramedical staff.[g]

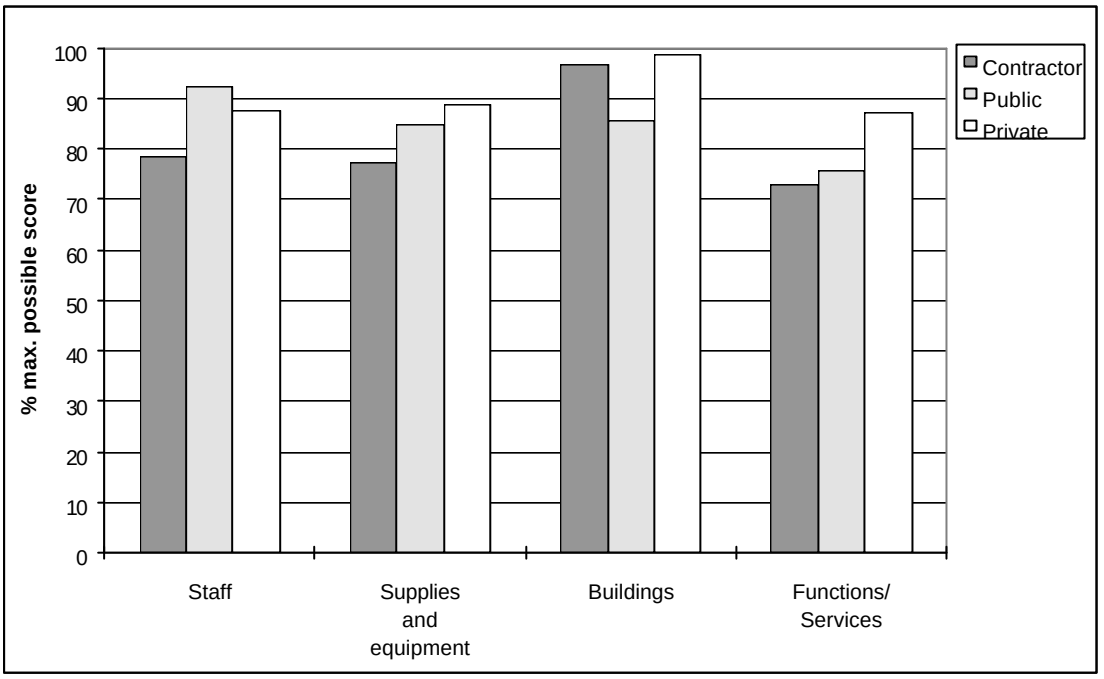
The contractor and public groups show very similar scores in the operating theatre cluster, with the marginally lower contractor score attributable to a lower score in the functions category overriding the better contractor score in the buildings category. In the OPD cluster, the lower contractor score is explained by the lower scores on the functions and supplies/equipment categories. The maternity ward and general ward clusters demonstrate similar patterns to those observed above, with the lower contractor score being attributable to the lower scores in the supplies/equipment category outweighing the effect of the higher scores in the buildings category.

This comparison of mean contractor and public scores for individual categories has demonstrated some consistent patterns. Most noticeable among these is that the contractor group shows higher scores in the buildings category in all 7 clusters where this category is analysed, and lower scores in the staff category in 4 of the 7 relevant clusters (the exceptions being in the administration, operating theatre and OPD clusters). Performance in the other common categories, functions/services and supplies/equipment, is more even although the public hospital group demonstrates superior scores

[g] This category is not heavily weighted within the cluster, explaining its relatively small impact on the cluster total

more often than does the contractor group. These patterns are clearly demonstrated in Figure 2, which shows mean values of the aggregated scores for each of these common categories.[h] The contractors have a lower mean grand total score for the aggregated staff category, and a higher score for the aggregated buildings category, than do the public hospitals. In the remaining two aggregated categories, the contractor group shows lower scores than the public group, although the margins are somewhat smaller than those observed in the aggregate staff and buildings categories.

Figure 2: Analysis of aggregated categories by hospital group



[h] These scores are calculated by taking the weighted sum of the scores obtained from the relevant categories in all clusters. Weights used were the same as those used in the general analysis

Table 3 and Figure 2 also show some consistent patterns in the performance of the private hospitals, and demonstrate that this group obtained the highest mean scores of all three groups in the supplies/equipment, buildings and functions/services categories, but lower scores than the public hospitals in the staff categories.

As stated above, the calculation of the various aggregated scores relied on the use of the median values of criteria scores and category and cluster weights obtained from a group of experts. The analysis reported above was repeated using the mean rather than the median values of the criteria scores and category and cluster weights. The use of mean data did not materially affect any of the observations (Broomberg 1997). While the grand total score, and individual cluster and category scores, were all modified slightly, the direction of the margins between the groups was not affected in any case, and the extent of these margins was either left unchanged, or modified only slightly. Where the margins did change, the average change involved a shift of less than 2 percentage points. In the case of the private-public margins, the use of mean data had the effect of reversing the direction of the observed margin only in the case of operating theatres. In all other categories, there were either minor increases or decreases in the extent of the margin, or no changes at all.

Similar conclusions were drawn from the analysis of the aggregated categories using mean data. The direction of the observed public-contractor margins remained constant across all four aggregate categories, and the extent of the margin remained constant in two of these (staff and supplies/equipment) and increased by 1 percentage point in the remaining two categories. Similarly, analysis of the private-public margins showed no change in the direction of these margins in any of the aggregate categories, and only slight changes in the extent of the margins.

Use of weighted sums in place of the geometric mean in the calculation of category total scores also did not materially affect any of the conclusions (Broomberg 1997b). In the case of the comparisons between the contractor and public hospitals, the previously observed margin changed direction only in the case of the other wards cluster (where the contractor score shifted from 1 percentage point below that of the public hospitals to an equal score).

DISCUSSION AND CONCLUSION

This evaluation used a structured instrument to provide a quantitative measure of structural quality in order to address the question of the relative structural quality of public, contractor and private hospitals. The critical methodological problem encountered in this process was the influence of subjective judgement at each stage of the evaluation process. Although efforts were made to address this problem through the use of a wide range of published information, through consensus development with numerous experts, and through the use of a single researcher to collect and interpret the data, these could not completely eliminate the influence of subjectivity. Its impact was perhaps strongest, and this component of the study consequently weakest, in the implicit judgements on the importance of the various elements of the structure of care relative to each other, as well as on the causal relationships between these elements and the ultimate quality of patient care. These problems are somewhat aggravated by the use of quantitative scales, which may imply the existence of ordinal relationships both between the various elements measured, and in their impact on quality of care, when it is clear that such relationships do not exist. Despite these potential interpretation problems, it was nevertheless felt that quantitative measures would more easily allow for concise interpretation of the data, as well as for comparability between individual hospitals and hospital groups. It is however crucial that the data be interpreted cautiously, and that ordinal relationships are not imputed where they do not exist.

These latter problems also relate to the more general problem of the uncertain relationship between structural aspects of care and overall quality of patient care. While it is clear that several of the elements evaluated impact directly on the nature of patients' experiences in hospital, and that other elements are vital to ongoing hospital functioning, it is not clear which of these elements are necessary and/or sufficient for good quality of care, nor how they relate individually and collectively to the ultimate measure of quality of care - the outcome of care for the patient.

While both the contractor and public groups on average performed relatively well in the evaluation of SQOC, some consistent trends and differences between the groups did emerge. In general, the contractor group performed worse than the public group, obtaining a lower total score, as well as lower scores in all but two of the functional clusters analysed, suggesting that from a structural

perspective, quality of care at the contractor hospitals could be considered inferior to that observed in the public hospitals. However, several factors suggest the need for some caution in the interpretation of this general result. Firstly, the absolute differences between the two groups were relatively small in both the total score, as well as in all but two of the functional clusters. In addition, the mean values disguise fairly wide variation between individual hospitals in some cases, as well as overlapping ranges of results between the two groups.

Further analysis of the performance of the two groups does however indicate some consistent and important differences which bear on judgements about SQOC. The functional cluster which contributed most to the observed difference between the groups was that of clinical staff, which assessed the numbers, training and qualifications of medical, nursing and paramedical or ancillary staff. The observed difference between the two groups was substantial (an absolute difference of 27 percentage points in the mean scores), and was attributable to substantial differences in all three staffing categories, although the largest difference was in the paramedical staff category, followed by nursing and medical staff. Examination of the data reveals several factors behind these patterns. In the case of medical staff, the contractors were inferior to the public hospitals in the supply of specific specialist skills, and in the general experience of the medical staff. In the case of nursing staff, the major contributor to the observed difference was the much smaller total supply of nurses in the contractor hospitals, which was sufficient to override the impact of the more highly qualified mix of nurses in these hospitals relative to the public hospitals. In the paramedical staff category, the observed difference was due to inferiority of the contractors in supplying the full range of skills.

Similar patterns were also observed in the aggregated analysis of the categories within each of the functional clusters. In the aggregated analysis of non-clinical staff, for example, the contractors demonstrated substantially and consistently poorer performance, again due to a combination of lower numbers and skills of staff. In the aggregated services/functions and equipment/supplies categories, the contractors again performed somewhat more poorly than the public hospitals. The differences were attributable to general inferiority on the part of the contractors in the performance of specific functions or services, and to poorer performance in terms of the availability, quantity, and quality of various supplies and equipment regarded as essential for adequate quality of care. The opposite pattern was observed in the case of the aggregated buildings category, however. Here, the

contractor hospitals were consistently and substantially superior to the public hospitals, a pattern attributable to a combination of better provision of space, ablution and other facilities, and more importantly, to superior physical condition and cleanliness of all of the hospital buildings which were evaluated.

In understanding the reasons for these differences between contractor and public hospitals, it is relevant to note that the contractors were paid on a per diem basis, with outpatients paid as a proportion of an inpatient day. Hence the lower were capital and running costs, the greater would be the margin between income and expenditure as long as demand for hospital care was not reduced. The incentive to attract patients, which might be achieved through clean, tidy and well maintained buildings and grounds, together with the superior general management and personnel management capacities and systems of contractor hospitals (Broomberg 1997a), might help to explain the superior scores for buildings.

In the context of poorer contractor performance on staff, it is important to recall that in contractor hospital S, all staff except senior managers were employed by the public sector and in contractor hospital M, the medical staff were publicly employed. Despite these differing arrangements, overall staff scores for the individual contractor hospitals were very similar. In hospitals M and H, the contractor had an incentive to keep staff costs down in order to maximise the difference between income and expenditure, but this was not the case at hospital S where all staff except managers were employed by the public sector. Yet staffing scores at hospital S were not significantly better. Possible explanations might be either low priority given to posting staff to this hospital, or greater difficulty in encouraging staff to accept posts there.

A possibility which should not be neglected is that at least some part of the difference in staffing levels represented excess staffing levels in public hospitals rather than inadequate levels in contractor hospitals. Standards were specified, as explained earlier, in terms of what were regarded as realistic public sector standards. Nonetheless, from the perspective of economic efficiency and resource scarcity, they may have been on the generous side. That this might possibly be the case is suggested by the fact that the mean score for staffing in private hospitals was less than that for public hospitals, although in many aspects the private hospitals represented the 'gold standard' in terms of structural

quality. Staffing patterns often represent one of the key differences between public and private ownership, with private managers possessing greater freedom to judge staff quantities and skills mixes than their public sector counterparts (Pannarunothai and Mills 1997). Hence contractor hospital staffing patterns may suggest the possibilities of using staff more efficiently in the public hospitals.

It should be noted that whereas the contractor hospitals represented a 100% sample, this was obviously not the case with respect to the public and private hospitals. There is no reason to believe that the public hospitals studied were atypical, but there were quite substantial differences between them in their scores. Without extending the study to a wider sample of public hospitals, it is impossible to say how representative were these three hospitals. A similar caution applies to the three private hospitals, though the structure of the private hospital industry, plus the dominant pattern of insurance funding for patients, may encourage greater uniformity in structural quality of care than in the case of public hospitals dependent on local provincial management which varies greatly in its capacities.

In summary, in terms of the overall focus of the study, while the overall differences in scores between the public and contractor groups were relatively small and should be interpreted cautiously, there were important and consistent differences between the two groups in some key structural elements of quality of care. More specifically, the contractor hospitals appeared to limit the quantity and quality of key inputs to the hospital production process, including critical staffing and equipment and supplies, to the point of failing to meet what the evaluation defined as realistic public sector standards. On the other hand, the contractors demonstrated clearly superior provision and maintenance of hospital buildings and amenities, suggesting closer attention to these aspects of SQOC than was observed in the public hospitals, where these aspects were generally found to be very poor.

Other components of the overall evaluation addressed other aspects of quality, including nursing quality and clinical outcomes. Nursing quality at ward level was generally superior in contractor hospitals than in public hospitals despite the differences in staffing levels (Broomberg and Mills 2004a), whereas nursing management presented a more even picture with each group having

particular strengths and weaknesses, and noticeable differences in nursing management style. Private hospitals had the highest nursing quality according to the standards of the assessment. In the case of clinical outcomes, there were few sustained and significant differences between public and contractor hospitals (Broomberg and Mills 2004b).

A key deficiency in the relationship between the contractor hospitals and their respective public purchasers was any significant attempt to monitor quality, and this may help to explain why certain features of structural quality, notably staffing levels, were inferior in contractor hospitals. Performance under contractual relationships is crucially dependent not just on the design of the contract but also on the ongoing relationship between the purchaser and the provider. It was clear in this evaluation that both contract design and monitoring required greater attention from the purchaser. Of all aspects of quality, structural quality is the easiest to specify and monitor, and hence can readily be addressed within contracts as long as the ability of contractors to adopt the most efficient mix of inputs is not unduly constrained.

REFERENCES

Bennett S (1997). Private health care and public policy objectives. In: Colclough C (ed) *Marketizing Education and Health in Developing Countries: Miracle or Mirage?* Clarendon Press, Oxford, 93-123.

Broomberg J, Masobe P, Mills A (1997a). To purchase or to provide? The relative efficiency of contracting out versus the direct public provision of hospital services in South Africa. In: Bennett S, McPake B, Mills A (eds) *Private health providers in developing countries: serving the public interest?* London, Zed Press, 213-236.

Broomberg J (1997b). Managing the health care market in developing countries: a case study of selective contracting for hospital services in South Africa. Thesis submitted to the University of London in fulfilment of the requirement for the degree of Doctor of Philosophy in the Faculty of Science.

Broomberg, and Mills A (2004a). Evaluating the quality of nursing care in the context of a comparison of South African hospitals. London, Health Economics and Financing Programme, London School of Hygiene and Tropical Medicine.
http://www.lshtm.ac.uk/hpu/hefp/index_new.html

Broomberg J and Mills A (2004b). Comparing public, contractor and private hospitals: evaluation of outcomes of care. London, Health Economics and Financing Programme, London School of Hygiene and Tropical Medicine.
http://www.lshtm.ac.uk/hpu/hefp/index_new.html

Mills A (1997). Improving the efficiency of public sector health services in developing countries: Bureaucratic versus market approaches. In: Colclough C (ed) *Marketizing Education and Health in Developing Countries: Miracle or Mirage?* Clarendon Press, Oxford. 245-274.

Mills A (1993). The cost of the district hospital: a case-study in Malawi. *Bulletin of the WHO,* **71**(3/4):329-339.

Pannarunothai S and Mills A (1997). Characteristics of public and private health care providers in a Thai urban setting. In: Bennett S, McPake B, Mills A (eds) *Private health providers in developing countries: serving the public interest?* London, Zed Press, 54-70.

World Bank (1993). *World Development Report 1993.* Oxford, Oxford University Press.