Economic Study of Referral Health Services in Lesotho: The Future of Queen Elizabeth II Hospital

Final Report

Volume I

Submitted to:

The Ministry of Health and Social Welfare
Kingdom of Lesotho

By:

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June 14, 2002
Acknowledgement

We wish to express our sincere thanks to the Ministry of Health and Social Welfare, and to the staff of the numerous health facilities we surveyed during our time in Lesotho. Your cooperation and insight were invaluable in completing this study.
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Chapter 1

Executive Summary

This Report presents the results of four months of research and investigation into the current status of the health system in Lesotho. We have studied patterns of facility usage and patient referral as well as the needs of the “apex” hospital of that system, Queen Elizabeth II (QE II). We analyze options for the renewal of this facility as well as the other needs of the health system and the likely cost of meeting these needs. We present cost estimates and recommendations for consideration by the Ministry of Health and Social Welfare (MOHSW).

1.1 Research Findings

Patient origin studies conducted at QE II, two Maseru filter clinics and Leribe and Mohales Hoek hospitals confirm that the patient load at QE II is largely drawn from Maseru and its environs. At QE II, 92% of clinic and casualty patients traveled less than an hour (mostly by taxi) to reach the facility. 66% of QE II outpatients and 75% of casualty patients traveled less than one half hour. At the filter clinics (all outpatient), many patients walked and 93% traveled less than an hour. Inpatients at QE II were only a little less local in their origin; 73% of those we were able to query traveled for less than an hour. Only 12% traveled more than two hours. Populations at Leribe and Mohales Hoek were equally local: 83% of outpatients at both facilities traveled for less than an hour.

The lesson for hospital planning is important. For the foreseeable future, the bulk of the caseload seen at any hospital in Maseru will come from the city and its immediate surroundings. Despite deficiencies in inpatient care at the District level, diversion of patients to QE II is not the primary factor determining its current utilization.

To more fully understand patterns of care, the team physician reviewed each inpatient at QE II, Leribe and Mohales Hoek. He had conducted a similar review for unrelated research a decade ago. In addition to understanding current patterns of care, this review provided insight into the changes in the Lesotho health system over the last ten years. The physician also reviewed a data base compiled from all claims paid in FY 2000/01 for referrals to Bloemfontein hospitals. This enabled us to understand the types of cases currently being sent to the Republic of South Africa (RSA) for specialist care, and determine if any of these services might be cost-effectively offered at a new “apex” hospital in Maseru.

The most common, and most expensive, reason for referral to the RSA is cancer, which accounted for 55% of the claims and 36% of the recorded expenditure. The largest single diagnosis is cancer of the cervix, a disease which can be controlled by early diagnosis and treatment. There were a number of expensive cases for trauma, spinal surgery and cardiovascular disease. However, no diagnostic group other than cancer had
more than one referral claim a week in the 1,048 claims studied. This volume is too low to support cost-effective specialist services (other than perhaps oncology) or maintain the quality of care.

A larger question raised by the referral analysis is the true cost of all referrals to South Africa. Approximately 2,400 referrals were issued in FY 2000-2001, but only 1,048 paid referral claims were identified. In the fall of 2001, the Bloemfontein hospitals claimed to have accounts receivable due from the Government of Lesotho in excess of 12 million rand, but only 4.1 million rand were paid in the previous fiscal year and recorded in our study. In addition, transport of referrals is the largest single use of the QE II vehicle fleet. The real cost of current referrals is probably at least 10 million rand per year, nearly 20% of the other costs of QE II. Fees at the Bloemfontein hospitals will likely rise again this year, and the hospitals may press harder for full and prompt payment. The current level of RSA referrals may not be sustainable.

1.2 Changes in the Health System and Urgent Needs

Assessments by the physician reviewer showed a number of changes from a decade earlier, and the direction of these changes was mostly negative. At QE II, the quality of physician care, as evidenced by patient records, has remained quite good. However, the number of nursing staff was insufficient to meet the needs of current patients, even though hospital occupancy was running below rated bed capacity at the time of our study. For reasons ranging from crowding of beds to inadequate hand washing facilities, infection control was inadequate. But the most distressing situation was the lack of equipment and facility maintenance. For example, the only ultrasound machine available outside the obstetrical service was broken and not fixed because the manufacturer refuses to send a service representative until past due bills are paid. Major items of equipment in the laundry, kitchen and X-ray departments were broken and not being fixed. Near the end of our study, the tube at the heart of the CAT scanner broke, and no money is budgeted for its replacement.

Maintenance problems are also severe at the District level. Extended outages of X-ray machines mean that a hospital cannot fulfill its role in the District health system. Of equal concern was the lack of physicians with sufficient training to fully staff all of the important District functions--outpatient care, inpatient care, clinic supervision and District management. For all these reasons, occupancy on the inpatient services surveyed was low; generally lower in the MOHSW facilities than in CHAL hospitals. Both CHAL and District hospitals had active outpatient clinics. Low occupancy stems more from the shortcomings in inpatient services than from low levels of need in the population. Hospitals across the border in the RSA now pick up an unknown portion of this need. With proper physician staffing and reliable equipment, occupancy of many of these facilities would clearly increase. A latent need for inpatient care is present at the District level and increasing with the AIDS epidemic.
1.3 Facility Assessment and Options

It will come as no surprise that our architectural analysis concluded that the existing QE II buildings cannot be salvaged to meet the needs of an apex hospital. Rebuilding on the existing site would be more expensive than new construction, would create major operational problems, and would produce a hospital that could not expand to meet future needs. On the downtown site, there is no space to spare for staff housing. Therefore, construction of a new hospital at the Botsabelo site is the preferred option. By removing an unpaved road currently bisecting the site, an attractive hospital meeting modern planning standards will fit well on the buildable land, with adequate room for expansion and staff housing. Close proximity to the mental hospital and the National Health Training site makes this location even more desirable.

Our strategies for making the patient load manageable at the new facility include the following:

- emphasizing primary care and routine outpatient services at the filter clinics and a new clinic on the existing hospital site
- staffing, funding and maintenance changes to enable District Hospitals to fully meet their role in the health care system
- immediate dispersion of any programs for the treatment of HIV and AIDS to the District level, so that the apex hospital does not draw such patients from the rest of the country.

We reviewed, but did not accept, certain options which have been proposed to divert patients from QE II. Building a second hospital in Maseru to take uncomplicated cases, thus reducing the size of the referral hospital, is not cost effective. It would require duplication of ancillary services, and any “referral only” facility would be too small to be efficient. Mixing of secondary and referral patients at large urban hospitals is an inescapable reality throughout the world.

For much the same reason, inpatient services at the filter clinics are not an efficient way to manage inpatient case load. The Ministry has never allocated recurring cost budgets for full inpatient services at the filter clinics. Patients will quickly perceive the difference between any limited inpatient service and the array of services offered at a new apex hospital.

The suggestion that Leribe and Mohales Hoek Hospitals might be upgraded to regional referral status is similarly unrealistic. These facilities are underutilized now, and do not offer the four basic services (pediatrics, obstetrics, medicine and surgery) to a standard expected of a District Hospital. Lesotho cannot afford to disperse more specialized services beyond the apex hospital at this time. To better utilize the inpatient capacity of these facilities, they need full physician staffing, adequate maintenance, and should be used to meet the palliative care needs of the increasing number of AIDS patients.
The number of patients at a new referral hospital will be driven primarily by two factors; the growth in the population of Maseru and the burden of HIV/AIDS. The referral needs of the nation are a third factor in determining total bed demand, but only 12% of QE II inpatients (less than fifty on most days) now travel more than 2 hours for care.

Because of the AIDS epidemic, population will grow much more slowly than earlier predicted. The proportion of the population over 45 (high users of hospital care) will also grow only slightly because of high mortality in the reproductive years arising from AIDS. Thus, the hospital need not be as large as some may have envisioned. However, the projection of AIDS caseload from Maseru alone suggests that these patients will comprise more than 1/3 of total bed need at the peak of the epidemic.

Our projection of bed capacity is shown below. We have used a basic guideline of .9 beds per 1,000 population served, the same as used in the CHAL analysis by MCDI. We then adjust this figure for use of the adjoining mental hospital for psychiatric cases, the increase in AIDS caseload, the number of referral patients expected from around the country, and the number of patients in the Maseru District population who could be served by existing hospitals on the fringe of the District. We also make a small allowance in the later years for the return of a few ICU and cancer referrals which would have otherwise been sent to the RSA.

Table 1.1: Projected Bed Capacity

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Requirement for Maseru District</td>
<td>472</td>
<td>538</td>
</tr>
<tr>
<td>Less Separate MH Beds</td>
<td>-40</td>
<td>-40</td>
</tr>
<tr>
<td>To Hospitals at Fringe of District</td>
<td>-156</td>
<td>-178</td>
</tr>
<tr>
<td>Referrals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National</td>
<td>+50</td>
<td>+70</td>
</tr>
<tr>
<td>Formerly sent to RSA</td>
<td>---</td>
<td>+10</td>
</tr>
<tr>
<td>Increment for Care of AIDS</td>
<td>+109</td>
<td>+253</td>
</tr>
</tbody>
</table>

Maseru Central Beds | 435 | 653 |
1.4 Funding Limitations and Needs

Building and staffing a new apex hospital is only one of the unmet needs in the Lesotho health system. Even before a new hospital can be built, funds must be focused on the following needs:

- additional physicians in the Districts
- adequate facility and equipment maintenance at the Districts and at QE II
- additional nurse and management staffing at QE II
- adjustment of the CHAL subvention
- reducing the discrepancy in professional compensation between the RSA and Lesotho
- buying drugs and supplies to treat the inevitably increasing number of AIDS infections

All of these needs exist now or are rapidly developing. In addition, running a replacement hospital will cost more than adequate operation of the existing buildings. More complex equipment, more space, and more sick patients (in the ICU, for example) will drive up operating costs.

Table 1.2: Preliminary Estimates of Expenditure Requirements for Health System Priorities

<table>
<thead>
<tr>
<th>Need</th>
<th>Recurring Cost</th>
<th>Capital Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate Staffing Needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QE II</td>
<td>6 million</td>
<td></td>
</tr>
<tr>
<td>Districts</td>
<td>2-3 million</td>
<td></td>
</tr>
<tr>
<td>Added Costs of Operating</td>
<td>8 million</td>
<td></td>
</tr>
<tr>
<td>New Facilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compensation Upgrade</td>
<td>10 million</td>
<td></td>
</tr>
<tr>
<td>CHAL Equalization</td>
<td>5 million</td>
<td></td>
</tr>
<tr>
<td>AIDS (2006 caseload)</td>
<td>14 million</td>
<td></td>
</tr>
<tr>
<td>Maintenance Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QE II alone</td>
<td>5 million +</td>
<td></td>
</tr>
<tr>
<td>New Facility Costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil Works (Construction, Design, 10% Contingency)</td>
<td>142 million</td>
<td></td>
</tr>
<tr>
<td>Equipment</td>
<td>211 million</td>
<td></td>
</tr>
<tr>
<td>Deferred Maintenance(Mohale’s Hoek and Leribe)</td>
<td>4 million</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>50 million per year</td>
<td>357 million</td>
</tr>
</tbody>
</table>
The table immediately above summarizes the estimate of funding needs developed in the body of this report. It also shows the initial estimate of construction costs for the recommended new facilities. The estimate of equipment costs is developed in Volume II, Appendix 2.

To place these needs in proportion, compare the amounts listed above with FY 1999/2000 expenditures of 45 million Maloti at QE II and 158 million Maloti for all of MOHSW.

How might these needs be financed? The report investigates several options, which are summarized in the table below.

### Table 1.3: Possible Source of Additional Resources for the Health Care System

(million maloti per year)

<table>
<thead>
<tr>
<th></th>
<th>Increased Revenue</th>
<th>Decreased Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government</strong></td>
<td>25-30?</td>
<td></td>
</tr>
<tr>
<td>(Shift additional 1% of Gov. revenue to health)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Medical Aid</strong></td>
<td>65</td>
<td></td>
</tr>
<tr>
<td><strong>User Fees</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Inflation Adjustment</td>
<td>8-10</td>
<td></td>
</tr>
<tr>
<td>· Timing</td>
<td>0.5+</td>
<td></td>
</tr>
<tr>
<td>· Self Referrals</td>
<td>0.6+</td>
<td></td>
</tr>
<tr>
<td>· Private Inpatient Service</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Private Practice Plan</strong></td>
<td>4-5</td>
<td></td>
</tr>
<tr>
<td><strong>Suspend Referrals to South Africa</strong></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>Close District Hospital Inpatient Service (per hospital)</strong></td>
<td></td>
<td>2-4</td>
</tr>
<tr>
<td><strong>Global AIDS Fund</strong></td>
<td>20-25</td>
<td></td>
</tr>
<tr>
<td><strong>Lease Kingsway Site</strong></td>
<td>???</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100 million +</td>
<td>12-14 million +</td>
</tr>
</tbody>
</table>

Our analysis shows little potential for additional revenue with “business as usual” for traditional MOHSW funding sources. User fees are only 5% of current Ministry expenditure, and improved collection has no impact on facility budgets because the money is returned to the Treasury. Adjustments in user fees have lagged well behind inflation.
In the years we reviewed, funding for health from Government tax revenues has edged downward within the range of 7% to 8% of total Governmental revenue. After adjustment for inflation, the real purchasing power of Government tax collections is constant (at best) because of the depressed state of the Lesotho economy. Only if funds were to be reallocated to health from other Ministries could MOHSW receive budgets with a real increase in purchasing power. Despite statements about the desire to increase the proportion of Government revenue going to health, this did not happen in the years studied.

Reallocation from other Ministries to MOHSW would be the most direct way to increase resources in the health care system, but it is politically difficult. This means that the Ministry must choose some of the other approaches to raising revenue listed in the above table and discussed in this report.

- **User fees.** In addition to inflation adjustments, charges can be increased to reflect convenience (afternoon and evening clinic hours) or to collect more from those who insist on self-referral to specialists. Our plans for the new hospital include private services which could generate substantial additional revenue if the facility is well run, particularly if a Medical Aid scheme is created.

- **Medical Aid.** Potentially a large revenue generator, and well established in the formal sector in neighboring South Africa. A major increase in financial and administrative capacity is necessary for such a scheme to work.

- **Private Practice Plan.** There are already at least 34 physicians in private practice in the country. If physicians working for MOHSW were allowed private practice (under controlled conditions), the increase in income would offset some of the difference in salaries between Lesotho and the RSA and help to retain key consultants.

- **Global AIDS Fund.** The increasing willingness of Western Governments to provide drugs and funds for health system operations may offset some of the additional costs imposed by AIDS.

- **Kingsway sale or lease.** This valuable piece of downtown land is effectively a resource dedicated to the health system. Sale or lease of this space to commercial interests could help finance a new hospital at Botsabelo.

Another way to fund new priorities is to cut spending on traditional activities. We have identified two possibilities for consideration. Difficult though it may be, reduction or elimination of the South African referral program may be necessary unless major new sources of revenue (such as Medical Aid) become available. Also possible, but not desirable, would be the closing of inpatient services at one or two District Hospitals.
There are places in the country where two hospitals are less than a half hour apart. Outpatient clinics would remain open at all District Hospitals, with sick patients transported by ambulance to the nearest inpatient facility. If physician staffing is inadequate in the Districts, this approach would recapture more funds than marginal cuts in bed capacity. The potential savings will only be achieved if staff positions on the inpatient service are reassigned or eliminated.

1.5 Preliminary Recommendations

There is clearly need for a new hospital in Maseru to replace QE II. Based on our projections, we recommend building a new hospital on the Botsabelo site with an initial capacity of 410 beds, plus a 10 bed ICU. This is slightly smaller than the projected bed requirement of 435 in 2006. The difference is less than one ward (30 beds), and we suggest this lower number to maintain pressure for efficient hospital management. During the planning process, the number of necessary admissions to QE II (excluding cases which should be treated at district hospitals) should be closely monitored. If opening is delayed past 2005-06, MOHSW may wish to construct one or two additional wards if demand increases. In that case, the projected recurring cost for the hospital should be revised and the staff complement and budget increased.

A description of the facility and drawings of the layout on the site are shown in Chapters 11 and 12. The facility would provide all of the existing QE II services plus an ICU. Provision is made to offer some oncology services under an affiliation agreement with a referral institution in the RSA. No other specialty services are added. TB and AIDS patients would be housed in a separate wing connected to the main hospital. The outpatient department would be supplemented by facilities for private practice by physician staff. As designed, the facility could be expanded in phases to a total of 590 beds plus the ICU. Ancillary and support services should be sized to support this expansion. An additional 80 beds could be placed in a second floor of the TB/AIDS wing, bringing the basic complement as high as 670 beds plus the ICU.

In conjunction with the construction on the new Botsabelo site, a new outpatient clinic would be built at the rear of the existing QE II site. This will meet the demonstrated need for primary care at a downtown location and divert outpatient load that would otherwise crowd the new hospital. The new clinic should be managed by the hospital, with doctors rotated to the Kingsway site so that patients do not perceive a difference in the care received at the two sites.

A commitment to proceed with the new facility must be preceded by some difficult decisions by the Government. Pressing needs must be met from the available resources. If more money is to be available, the Government must do several of the following:

- Shift funds from other Ministries
- Create a Medical Aid scheme
- Increase user fees, both selectively and for inflation
- Authorize private practice by MOHSW physicians, carefully structured to enforce obligations for public service
- Consider cuts in the number of District Hospitals and/or elimination of referrals to the RSA

The hospital should not be built unless the Ministry has implemented revenue raising decisions and has a financial plan to meet the following pressing needs:
- Increasing allowances for facility and equipment maintenance (to a level of 6% to 10% of the operating budget)
- Increasing the number (by up to 20 positions), and level of training, of physicians in the Districts
- Increasing the number of nurses at QE II (118 more are recommended)
- Improving the competitiveness of professional salaries through direct (salary adjustment) or indirect (housing, private practice) means
- Increasing the CHAL subvention, but leaving these institutions some freedom to adjust and retain user fees.

The tables above, elaborated in the text, can provide a structure for these decisions, but the consultant should not make them. Discussions should begin now so that the priority needs of current operations are addressed.

In addition to the necessary financial decisions, there are certain structural changes which must be made if a program to replace QE II is to succeed.

- A management structure for the hospital with greater authority and autonomy must be created. This may take the form of a parastatal (like LHDA) or a management contract. The apex hospital of the Lesotho health systems is far and away the most complex operation run by the Government. Such a complex organization cannot function within the existing financial control and personnel systems.

- System wide maintenance, both facility and equipment, must be given top priority with the appointment of senior managers (the positions are described in this report) with enhanced contracting authority and a “ring fenced” budget for emergency repairs and preventive maintenance.

- Authority to retain and expend user fees. The Government cannot fully subsidize all of the care which a new apex hospital can provide. If the institution is to collect more user fees from those who can afford to pay, it must have the ability to retain and expend the fees collected.

All of these changes will be complex. The Government needs to coordinate the high level decisions necessary to fund these changes and the new hospital. The Ministry should quickly appoint a users committee to serve as a “client” for architects retained to design a new hospital. And staff must be selected and appointed to follow through on all these initiatives.
Chapter 2

Introduction and Terms of Reference

The Center for International Health at Boston University School of Public Health has been tasked with determining the best option for the future of Queen Elizabeth II Hospital (QE II). We have also been asked to assess the potential for upgrading two district hospitals, Leribe and Mohale’s Hoek. Our analysis necessarily is done within the context of the entire health care system in Lesotho, from primary care to the higher level referral care at QE II, as well as referrals to the Republic of South Africa (RSA).

Our terms of reference stated that we would:

1. “Assess the health care utilization of facilities within the district of Maseru, with a detailed assessment of QE II utilization patterns based on a demand and supply-side analysis… (stating further that) this analysis should take into account the likely impact of the two proposed regional referral hospitals.”

2. “Use this information, together with other economic and demographic information and municipal plans for Maseru, to provide options for consideration by the MOHSW in deciding the future of QE II hospital, which takes full account of the future organization of referral services for Lesotho and the future organization of in-patient services in Maseru district…”

3. “The appraisal of each option should include: proposed distribution of service delivery functions, implied facility size, capital and recurrent cost estimation, and design options….”

Highlighted in the terms of reference were a number of criteria against which our proposed alternatives should be judged:

1. Appropriate redistribution of beds across referral districts.
2. Appropriate relationship between hospitals and primary care.
3. Maximization of capacity to meet appropriate throughput including teaching role.
4. Capital and recurrent cost effectiveness.
5. Effort involved.
6. Minimization of disruption (e.g. during renovation, etc).
7. Time scale.

We were also asked to appraise financing options for the new hospital, and to consider opportunities for public/private collaboration. In addition, we were to determine which services should be offered at QE II, and to scope this within the availability of the human resources and organization capacity at QE II. Implied within this was that we also
make recommendations on the staff mix requirements corresponding to the options we propose.

Finally, given the large number of studies that have been conducted at the QE II Hospital over the years, we were asked not to duplicate what had already been done or suggest a series of future studies. Rather, we were to have our work complement work that has been done in the past, and to “be the basis of final decision-making and action by the MOHSW and the GOL” on the future of the Queen Elizabeth II Hospital.
Chapter 3

Methodology

Our approach to this assignment combined economic, medical and architectural assessments. Our analysis included the following steps:

3.1 Patient surveys

In order to understand patient flows within the existing health care system, we surveyed outpatients at the QE II clinics and casualty service, at the Qoaling and Mabote filter clinics, and at Leribe and Mohales Hoek hospitals. These studies are described in Chapter 4. From these studies, we were able to distinguish local patients from those traveling some distance for care. The surveys also developed data which we used to assess patient reasons for choosing a particular facility, and the conditions for which they sought treatment.

The team physician reviewed all inpatient cases on the wards in Mohales Hoek, Leribe and QE II. This review enabled us to assess the appropriateness of the level of care. Patients were also asked about travel times to the facility. This data is a little more difficult to use because some patients were too sick to respond. However, the data does give us a basis for estimating the burden of local and referral patients at these facilities.

3.2 Referral Study

To understand the cost and nature of cases sent to the Republic of South Africa for care, we analyzed claims paid for such services from April 2000 through March 2001. This study is described in Chapter 5. From this analysis, we developed an understanding of the relative volumes for different referral services, and could estimate which, if any, might cost effectively be developed at a central hospital in Maseru.

3.3 Overall Assessment of the Health Care System in Lesotho and Identification of Priority Needs

An “apex” hospital such as QE II, the most specialized and expensive in the country, functions within a health care system. To understand the needs of the “apex” hospital, one must understand the rest of the system. Apparent problems at the “apex” hospital, such as excessive patient volume, may result from deficiencies elsewhere in the system of care. The apparent needs of the “apex” hospital may not be the greatest priority for improvement in the health care system.

The team was fortunate to have as a member Dr. William Bicknell, who undertook studies, including extensive reviews of patient care, in Lesotho in 1990 and 1992. Dr. Bicknell was able to capture a “snapshot” of current medical care, and also assessed how care has changed in the decade since his earlier studies. His findings, summarized in Chapter 6, define the priority needs for effective operation of the health care system.
system in Lesotho. Ignoring these priorities would make it difficult to operate any new “apex” hospital effectively or efficiently. Developing a strategy (and funding) to meet these needs must be part of any plan to replace QE II hospital.

3.4 Review of Existing Funding Sources

Medical need, or the need for new facilities for an “apex” hospital, cannot be determined by medical criteria alone. “Need” must be matched with available resources. Even in developed countries, there is much that medicine can do that health systems cannot afford. For this reason, we looked at the funds traditionally available to MOHSW for health services, and attempted to project what might be available in the future. The costs of any new referral facility, as well as the costs of meeting priority needs elsewhere in the system, must fit within this envelope, or the Ministry must find new sources of funding for some of its services. Chapter 7 summarizes our review of traditional funding sources. Starting from this point, the financial analysis which the Ministry must undertake can be defined as follows

\[ a. \text{Funds from traditional sources} + b. \text{New funding sources (if any)} - c. \text{Historical MOHSW operating costs} - d. \text{Additional operating expenditures} + e. \text{Savings from efficiencies or discontinuance of existing operations} \]

Because the health system cannot run at a deficit, the above equation must sum to zero.

In most developing countries, traditional sources--particularly tax revenue--show limited ability to support the additional operating expenditures of expanded health services. It is necessary to explore new funding sources and cuts in traditional operations to support new initiatives, including the expense of running a new “apex” hospital. In later chapters of this report, we attempt rough quantification of the most important elements of b and d, and briefly explore some opportunities to save money by cutting existing services. Ultimately, political decisions at the Ministerial level must balance the equation.

3.5 Architectural Review of Existing Facilities

The Project Architect visited QE II, Mohales Hoek and Leribe to conduct an architectural assessment of the facilities, including existing programs for the maintenance
of civil works. At Leribe and Mohales Hoek he estimated the cost of deferred facility maintenance. At QE II he assessed the feasibility of rebuilding the existing facility on the site, as well as building a new facility at an alternative site. The results of his analysis are contained in Chapter 8.

3.6 Facility Options

Based on all of the preceding work, including the assessment of the broader health system, the team developed and reviewed four conceptual options for an “apex” hospital facility in Maseru. These are briefly described in Chapter 9. The Terms of Reference also called for the consultant to consider possible upgrade of Leribe and Mohales Hoek to serve a “regional referral” role. Given available resources, and the conclusion that these facilities are not currently fully capable of providing expected District level inpatient care (pediatric, obstetrical, medical and surgical services), the possibility of expanding these facilities beyond the role of a fully functioning District Hospital was not further analyzed as explained in Chapter 9. However, the team has made recommendations for the actions necessary to bring these facilities to the level of fully functioning District hospitals.

3.7 Bed Supply Analysis

In Chapter 10, we examine the factors determining the need and demand for hospital beds----population growth, changes in the age structure of the population, disease burden, and proximity to alternative sources of care. From this analysis, we make preliminary calculations of the number of beds which might be included in a replacement for QE II. The bed standard used in the calculations (and used in the recent CHAL study by MCDI) should not be taken as an absolute “standard of need,” since a substantial amount of required inpatient care is provided outside Lesotho or is never delivered due to economic barriers or inadequate quality.

3.8 Program for Preferred Hospital Option

In order to undertake preliminary design and costing of a new facility, it is necessary to specify the program for that facility--number and type of services, numbers of beds and visits, ancillary and supporting services. This program, provided as a brief to the consulting architect, is initially outlined in Chapter 11. It reflects our best judgment about the level of service to be provided in a replacement for QE II. We specify some of the ways in which the design of the facility may be different from traditional “apex” hospitals in developing countries. Note particularly the specification for inpatient wards.

The program has been used by the architect to develop preliminary sketches and general construction cost estimates in the next Chapter (12). These are further detailed by documents provided in the second volume of the report for further use by MOHSW:

- "design brief" for the selected architect
- preliminary list of required equipment
- model contracts for architects, engineers, and quantity surveyor
- model advertisement to announce the design tender
While the program reflects our best judgment of what is needed, and the major design criteria for these services, we emphasize that what is needed must be compared with what is affordable, as discussed in chapters 13 and 14. It may be necessary to reduce some of the capabilities in the new hospital below those specified in this report in order to balance need and resources.

3.9 Preliminary Site Sketches, Layouts and Capital Cost Estimates

With the program in hand, the consultant architect has answered several questions:

- will a facility incorporating the program fit on the proposed site?
- how might a hospital be laid out to fit on the site and assure safe and efficient flow of patients, the public and supplies?
- how large must the facility be?
- how much will it cost to build such a facility?

Chapter 12 shows the architect’s answer to these questions, including his sketches. It also includes an estimate for the cost of rectifying deferred maintenance items at Mohales Hoek and Leribe. These could be included in a financing program for a new QE II facility. Because the team is not recommending expansion of services or beds at these two facilities, there are no drawings for Mohales Hoek and Leribe in the chapter.

3.10 Cost of Necessary Actions

In order to balance the equation shown in 3.4 above, a decision maker must have preliminary estimates of the cost of each major need in the health care system. These estimates are shown in Chapter 13. The logic behind each estimate is briefly described.

In order to understand the current costs of operating QE II, and to help in projecting the additional costs of running a new hospital, we developed a “step down” model of operating costs. This model is explained in Appendix 8 in Volume II, which also shows the spread sheets summarizing the model. Similar principles were applied to develop cost models of Leribe and Mohales Hoek.

As the program for a new QE II is refined, the “step down” model can be used to develop more accurate estimates of the total cost of running the new facility, as well as projecting unit costs for various levels of service. Additional staffing, supply and service costs can be inserted into the proper cost center in the model, and totals then developed for the “pro forma” budget for a new hospital. We have indicated in Chapter 13 our estimate of the incremental recurring costs required when a new facility opens.

3.11 Analysis of Funding Alternatives

In this Chapter (14), we complete the analysis started in Chapter 7 and continued in Chapter 13. How will the priority needs for MOHSW (including replacement of QE
II) fit within available funds? We make rough estimates of the opportunities for expanding the amount of revenue available to MOHSW and QE II. We also provide some preliminary estimates of savings which could be achieved by difficult decisions to “downsize” certain aspects of the health system in Lesotho. We offer these for consideration of the Ministry. Because decisions to expand revenue or cut services are political as well as economic, we do not recommend a single package of new funding sources and service cuts. The chapter summarizes our estimates so such decisions could be taken by the Ministry.

3.12 Recommendations

This final chapter (14) summarizes the recommendations of the consulting team. It includes:

- a program for replacement of the existing QE II hospital
- priorities for improving the overall performance of the health system in Lesotho

In addition, we list and explain certain actions which we believe should be pre-requisites to building a new QE II hospital. If these pre-requisites are not met, it will be very difficult for a complicated organization such as a new “apex” hospital to function effectively within the health system. If pre-requisites outside QE II are not met, the negative impact on the overall health status of the population may well be greater than continuing operation of the existing rundown facility at QE II.
Chapter 4

Patient Origin Studies

In order to get an idea of where patients were coming from, and reasons why they were coming to a specific facility, we performed patient origin surveys at the major facilities studied. This included outpatient origin studies at Queen Elizabeth II Hospital (QE II), Leribe District Hospital, Mohale’s Hoek Hospital, and at two of the Maseru area filter clinics, Qoaling and Mabote. Dr. Bicknell also conducted inpatient origin surveys at QE II, Leribe, and Mohale’s Hoek.

4.1 Data Collection

At QE II Hospital, we interviewed patients for one full day in each of the following outpatient departments:

- Casualty (3 days, and one Friday overnight)
- Dental
- Diabetes
- ENT
- General Medicine
- Hypertension
- MCH
- Ophthalmology
- Orthopedics
- Pediatrics
- Psychiatric
- Surgical Clinic

Each patient was interviewed as he came through registration. Where diagnosis was not obvious from the clinic in question (e.g., we recorded Hypertension as the diagnosis for all patients at QE II’s Hypertension Clinic), the patients were given a card and clinicians were asked to write the diagnosis. The cards were later collected and the diagnosis information was entered into our database. The information captured in our survey was:

- Age
- Sex
- Mode of Transport
- Time traveled
- Presenting complaint/diagnosis
- Reason for coming to this particular facility

Similar studies were conducted for two days at the outpatient clinics of Leribe and Mohale’s Hoek hospitals. For the Qoaling and Mabote Filer Clinics, patients were
interviewed on one day at each facility. Therefore, we were unable to capture every clinical area. However, at each filter clinic we covered the main Outpatient Department. In addition to this, at Qoaling we covered Adolescent Corner and the Antenatal Clinic, and in Mabote we covered Dental, Family Planning, Well Child, and TB clinic.

During the physician survey of all patients in house at QE II, data was collected on patient mode of travel and travel time. However, some patients were too sick to respond to the questions.

4.2 Questions of Methodology, Sample Size, and Travel Prior to Day of Service

Sample Size for the Study

Some questions have been raised regarding the sample size of our study. Our intent was to capture a typical day in each outpatient area, which we did. At Queen II Outpatient Departments, this amounted to one day of service in each department, sampled over a 2 week period. This yielded a total of 808 patient visits to outpatient departments. Our sample for Casualty was analyzed separately. We captured 3 days and one Friday overnight, and the number of Casualty visits sampled was 226. The inpatient survey was done over February 18 and 19, 2002, covering all inpatient wards. The total number of inpatients in the hospital over those two days (and the total ‘n’ for the sample) was 247, including 10 patients in the TB ward at the Mental Hospital. In addition to this, there were 6 infants in incubators, and 16 bassinets.

Patient origin changes very slowly, and is thus quite stable over time. However, we had concerns of both seasonality affecting the sample, and the current renovations affecting the number of people coming to the outpatient departments. Because these figures would be used for patient volume in the Step-down analysis, we wanted to confirm if the volumes we had found were typical. We therefore went back and reviewed the clinic records for each department surveyed, back to December of 2001 which was before the renovations. We also consulted with clinic staff, to find out if the numbers we had gotten in our survey and found in the records, were fair representations of reality. On the whole, our review of the records and our conversations with staff confirmed the figures we had found in our survey. In several cases, we modified our volume figures in accordance with this new information from the records and from QE II staff.

In a similar effort to confirm the accuracy of our data, Dr. Bicknell returned approximately one week after his inpatient survey, and did an evening census of all patients at QE II. On that evening, February 25, between 7pm and 9pm, the numbers were significantly higher, with 323 patients on the wards. In addition, there were 20 premature infants, and a large number of newborns. (Please refer to Chapter 6 for further discussion on inpatient occupancy at QE II.)
Travel Previous to the Day of the Outpatient Visit

In the surveys, we asked patients if they had come from home today, or if they came from far away and stayed the night before to visit a friend or relative’s house. In the Outpatient Survey at QE II, only 35 out of 808 patients (4%) answered that they had traveled the day before and then stayed over with someone. In the patient origin survey at QE II Casualty, only 1 patient out of 226 said they had done so. Because these overnight stays made up such a small proportion of the visits, we chose to focus on the time traveled on the day of service in the discussion which follows.

4.3 Results – QE II Outpatient and Casualty

Not surprisingly, the most common mode of transport to QE II was taxi, followed by about equal numbers of people coming by bus, private vehicle/ambulance, and walking. These results are shown in Figure 4.1.

Figure 4.1: Mode of Transport to QE II
OP Clinics Excluding Casualty (n=808)

![Pie chart showing mode of transport]


By far the most striking finding from the patient origin studies was the local nature of the patients that came there. In fact, as shown in Figure 4.2, 65.5% of outpatients came from within 30 minutes of the hospital. If we extend the time to one hour, then over 90% of the patients fall within this local area. This may seem surprising, as an apex hospital such as QE II draws referral patients from all over the country! However, the clinics at QE II are clearly playing a major role in the delivery of services to the citizens of Maseru.
It is fitting to ask if this pattern is unique to QE II, or to Lesotho. In fact, it is not. All hospitals, even the most advanced and internationally acclaimed, tend to draw the great majority of their patients from the local area. This is as true in Boston as it is in Maseru. To give a local example, it is instructive to compare travel time as QE II and two of the district hospitals we studied. From Figure 4.3, it is clear that basic pattern, with the majority of patients coming from nearby the hospital, holds true both in Maseru and in the districts.
Why did patients choose QE II over another facility? As shown in Figure 4.4, the most common reason given was for follow-up. The second most common reason was “Perception of Better Quality.” About an equal number of people said that they had “Always used this facility” or that it was the “Closest.” The number of people who said that they were referred by either a CHAL facility, a Government facility, or by a private doctor, was quite low.

![Figure 4.4: Reasons for Coming to QE II OP Departments (Excluding Casualty): n=808](image)


In order to get a good idea of patient flow in Casualty, we did more surveys there than in the other areas of QE II. We interviewed patients over 3 full days (7 am to 5 pm), and also over one Friday overnight in casualty. In terms of mode of transport to casualty, shown in Figure 4.5, the most notable difference was that fewer patients walked to casualty.
Compared to the other outpatients, more of the casualty patients came from within 30 minutes, though when we extend the time to 60 minutes, the numbers are actually the same: 91.6% of both outpatients and casualty patients come from within 1 hour of the hospital, as shown in Figure 4.6.

As shown in Figure 4.7, the reason for coming to QE II Casualty was similar to those given for outpatient, except, of course, that no patients reported coming to casualty for a follow-up appointment.


4.4 Results – QE II Inpatients

Inpatients showed a somewhat different pattern, both in terms of mode of transport and travel time. Very few inpatients walked. Also, for the inpatient survey we separated out inpatients who came by ambulance from those who came by private vehicle. Ambulances accounted for 20% of inpatient transport to the hospital. In the case of inpatients, there were also a few who came by airplane or helicopter. Mode of Transport for QE II Inpatients is shown below in Figure 4.8.
The time traveled for QE II inpatients was also distinctly different from either outpatient or casualty. As seen in Figure 4.9, the number of patients who come from under 30 minutes is only 49.8%, and if we look at those who come from under 1 hour away, this percentage is 73.3%. Although the “local nature” of the hospital still holds, inpatients are coming from further away than outpatients.
Figure 4.10: QE II Inpatients by Service Group and Time

<table>
<thead>
<tr>
<th>Service Group</th>
<th>Time Traveled</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternity</td>
<td>Up to 30 min</td>
<td>24</td>
<td>80.0%</td>
</tr>
<tr>
<td></td>
<td>31 to 60 min</td>
<td>2</td>
<td>6.7%</td>
</tr>
<tr>
<td></td>
<td>61 to 120 min</td>
<td>4</td>
<td>13.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
<td>100.0%</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>Up to 30 min</td>
<td>20</td>
<td>52.6%</td>
</tr>
<tr>
<td></td>
<td>31 to 60 min</td>
<td>9</td>
<td>23.7%</td>
</tr>
<tr>
<td></td>
<td>61 to 120 min</td>
<td>7</td>
<td>18.4%</td>
</tr>
<tr>
<td></td>
<td>121 to 180 min</td>
<td>2</td>
<td>5.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38</td>
<td>100.0%</td>
</tr>
<tr>
<td>TB and HIV/AIDS</td>
<td>Up to 30 min</td>
<td>13</td>
<td>68.4%</td>
</tr>
<tr>
<td></td>
<td>31 to 60 min</td>
<td>3</td>
<td>15.8%</td>
</tr>
<tr>
<td></td>
<td>61 to 120 min</td>
<td>2</td>
<td>10.5%</td>
</tr>
<tr>
<td></td>
<td>121 to 180 min</td>
<td>1</td>
<td>5.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19</td>
<td>100.0%</td>
</tr>
<tr>
<td>Med/Surg incl. Gyn</td>
<td>Up to 30 min</td>
<td>49</td>
<td>38.9%</td>
</tr>
<tr>
<td></td>
<td>31 to 60 min</td>
<td>36</td>
<td>28.6%</td>
</tr>
<tr>
<td></td>
<td>61 to 120 min</td>
<td>18</td>
<td>14.3%</td>
</tr>
<tr>
<td></td>
<td>121 to 180 min</td>
<td>7</td>
<td>5.6%</td>
</tr>
<tr>
<td></td>
<td>180+</td>
<td>16</td>
<td>12.7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>126</td>
<td>100.0%</td>
</tr>
</tbody>
</table>


By grouping the inpatients into 4 service groups, we can see which patients appear to be coming from further away, perhaps unnecessarily. Figure 4.10 above indicates that the “local hospital” rule holds true, to varying degrees, within the different service groupings. Maternity is the most “local” service, while the medical/surgical wards had the most patients traveling long distances.
4.5 Results- Leribe and Mohale’s Hoek

The modes of transport for outpatients at the district hospitals in Leribe and Mohale’s Hoek were quite similar, and are displayed immediately below, in Figures 4.11a and 4.11b. The reasons for coming to these hospitals were also quite similar, as shown in Figure 4.12a and 4.12b.

4.6 Filter Clinics

The final element of the outpatient surveys are the surveys conducted at 2 of the Maseru area filter clinics, Qoaling and Mabote. As one might expect, more patients walked to the filter clinics, as compared to the hospitals surveyed, as shown below in Figures 4.13a and 4.13b.

![Figure 4.13a: Mode of Transport to Qoaling Filter Clinic (n=296)](image)

![Figure 4.13b: Mode of Transport to Mabote Filter Clinic (n=241)](image)


Travel times to Qoaling and Mabote were also fairly similar, showing a very local population going for services at these facilities.

![Figure 4.14a: Travel Time to Qoaling Filter Clinic (n=296)](image)

![Figure 4.14b: Time Traveled to Mabote Filter Clinic (n=241)](image)


The question regarding reason for coming to this facility was quite revealing in the case of the filter clinics. In both cases, a substantial number of patients said that they had been referred by QE II Hospital. As shown in Figures 4.15 and 4.16, the percentage of patients giving this answer was 11.1% in the case of Qoaling, and 7.5% in the case of Mabote.
We were not expecting to see actual referrals from QE II Hospital to the filter clinics, so this finding was somewhat of a surprise to us. At the workshop held on March 4, several reasons were suggested for the referrals that showed up in Figures 4.15 and 4.16. One person suggested that some of these patients might have been inpatients at QE II, who were sent after discharge for dressing changes and other simple procedures to the filter clinics. Another workshop participant felt that these patients had not been “referred,” but rather turned away by QE II.
Though we were not expecting to have patients say that they had been “referred” by QE II, we were aware of the renovations in progress at QE II. Therefore, we incorporated an additional question into the patient origin surveys at the filter clinics, asking patients if they would have gone on that day to QE II, if it were not being renovated. There were two reasons for including this question. We heard from the staff at the filter clinics that there had been an increase in volume from early January, when the renovations started. Radio advertisements had also urged people to go their there local clinics rather than to QE II. We wanted to get an idea of how much of this increase in volume was due to the diversion of patients to the clinics. Also, we wanted to get an idea of the patients’ health seeking behavior and how it had been effected by these renovations. Here are the results from this particular question:

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qoaling</td>
<td>12.8%</td>
<td>87.2%</td>
</tr>
<tr>
<td>Mabote</td>
<td>18.7%</td>
<td>81.3%</td>
</tr>
</tbody>
</table>


4.7 Conclusions

What can we learn from the Patient Origin Surveys on the whole? There are a few key points:

1. QE II and the District Hospitals serve a predominantly local population.
2. Some patients are traveling longer distances to get to these hospitals, sometimes bypassing other potential providers.
3. On average, inpatients come from further away than outpatients.
4. The filter clinics have recently taken on a greater burden of patients, with the renovations at QE II.
Chapter 5

Referral Study

5.1 The Referral System in Lesotho

QEII Hospital sits at the top of the domestic referral chain in Lesotho. As the patient origin study confirms, its larger role is to serve as the District Hospital for the City of Maseru. Residents of Maseru and environs account for the large majority of both inpatient and outpatient care. However, QEII has the most extensive array of specialty services and diagnostic equipment in the country, and is intended to serve as the referral destination for patients who cannot be treated at District Hospitals.

As currently designed, the referral system is expected to lead from the network of primary care centers (supervised by the District Hospitals) to these hospitals, then on to QEII if the District Hospital lacks the skills and equipment necessary to render a definitive diagnosis or provide treatment. There is no firm referral requirement in the system---a patient can seek care at any level without a reference from a lower level of care. While patients may receive some referral services without paying an additional user fee, there is no penalty assessed against a patient who self-refers to an unnecessarily high level of care.

As discussed elsewhere, the intended referral system does not always operate as planned. Much primary care is provided by the outpatient clinics of the District Hospitals. The patient origin studies at Leribe and Mohales Hoek confirm that almost all patients come from within the District. However, some Basotho are clearly willing to self-refer and travel for care. At Leribe, we encountered several patients who had traveled long distances to be seen at the special clinic run by the LHDA-funded trauma team.

Onward referrals to QEII from the District Hospitals are expected to occur when the patient requires specialty services not offered at the District. However, at Leribe, Mohales Hoek and Scott Hospitals, we found that equipment usually needed for a District Hospital was not operating, or that doctors qualified in surgery, obstetrics, pediatrics and general medicine were not always available. Cases which might have been treated locally are sent on to QEII. So referrals include a number of patients who might be treated at the District Hospital level in a properly functioning system. Nevertheless, as the patient origin study shows, the number of onward referrals is limited, and seems not to exceed 10-20% of the QEII census. In fact, additional referrals might occur if staffing and diagnostic equipment at the District Hospitals were up to standard and capable of identifying additional patients who would benefit from specialized care. This may be one reason for the low level of overall hospital use in the country.

We did observe that patients will self-refer for both economic and quality reasons. The Maluti Hospital (CHAL) and the trauma unit at Leribe (MOHSW) were drawing
paying patients from some distance around. At the same time, St. Joseph’s Hospital in Roma reported that poor patients will travel to QEII because the combined cost of Government user fees and transport is less than fees at this CHAL facility.

We could not measure the extent of self-referrals across the border to the Republic of South Africa (RSA). We were told that wealthy residents of Lesotho are treated at Medi-Clinic (formerly HydroMed) in Bloemfontein. The Orange Free State (OFS) Health Department acknowledged that Lesotho citizens can obtain care in the RSA public health system. The extent of this cross border flow is unknown, although the OFS Health Department would like to quantify it.

As the apex hospital for the Kingdom Of Lesotho, QEII directs referrals to the tertiary care hospitals in Bloemfontein, RSA. The Government of Lesotho will pay for care in the RSA only if the referral is approved in advance by doctors at QEII. To measure the extent of these cross border referrals from QEII, we conducted the survey described below.

5.2 Methodology

We undertook to examine recorded referrals by diagnosis, cost, patient days and age of the patient. We combined data from paid claims vouchers with data from referral logs, then analyzed the resulting data base. This contained all of the claims which we could identify for services rendered in FY2000/2001 and paid within that fiscal year.

5.2.1 Paid Claims Ledgers

Payment ledgers held by the accounting office at QEII show the amounts paid on claims from National/Universitas and Pelenomi Hospitals in Bloemfontein. These ledgers record the QEII referral number for each paid claim. Payment and referral number were recorded in the data base for all paid claims showing a date of service within the fiscal year from April 1, 2000 to March 31, 2001. A total of 1,048 paid claims were entered in the data base. In most cases, larger claims were for inpatient care and showed a date of admission and date of discharge. The number of days of hospitalization was calculated from these dates and entered in the data base. Some large bills were probably for inpatient care, but did not show admission and discharge dates.

Cases with a date of admission in FY 2000/2001 and discharge in the following fiscal year were included in the data base. Some claims showed only an invoice date, but appeared to have a fiscal year cut off, so that the data base should include most of the payments actually made prior to April 1, 2001 for services rendered in the 2000-2001 fiscal year. The amount expended in that fiscal year in the budget category which includes referrals (along with other purchased medical services) was approximately 5,000,000 rand; our data base contains payments to these RSA hospitals of 4.14 million rand. Thus, we believe the data base captures most of the claims for referral services
actually paid in the 2000/2001 fiscal year. It does not capture claims for referral services provided in that year, but paid for in the subsequent fiscal year, or still unpaid.

In some cases, the payment ledgers show a deduction of 10% from the approved amount (amounts with a valid referral number). This apparently reflects a deduction for a VAT or sales tax payable by the vendor (the South African hospital). Because the amounts were deducted from payment totals by ledger page, and not by individual claim, we adjusted individual claims on these pages by multiplying the approved amount by 0.9, giving the amount paid per service after the deduction of the tax.

5.2.2 Referral Logs

Referral logbooks were then consulted for each referral number shown by a claim in the data base. A total of 2,470 referrals were booked in the referral ledger with dates between April 1, 2000 and March 31, 2001.

Some paid claims in the data base had referral numbers issued in the prior fiscal year. Most could be recovered, but a few referral numbers pre-dated the logs available, and thus we were unable to recover certain information on these claims. These were included in the data base with diagnosis and age unknown.

Some referrals had multiple claims. On the other hand, some claims covered services provided under more than one referral number. Only one referral number was recorded in the data base for each paid claim. The data base of 1,048 claims included 856 separate referrals.

For each claim in the data base, we entered:
- the full referral note as recorded in the log
- the clinic to which the patient was referred
- the patient’s age; children under two years of age were coded as age 1

Based on the referred clinic and referral note, a diagnostic code was assigned. The thirty two diagnostic codes are shown in Table 5.1 immediately below.

The coding system was designed to capture all care, including primary care, so several diagnosis codes had no referrals noted. If a referral note was missing, indecipherable or not recognized, the claim is categorized as #30 (unknown or unrecognized). In general, the diagnosis code captures the disease or injury causing the condition requiring referral. However, in a few cases---such as diabetic retinopathy---we have coded to reflect the procedure required (in this example, eye surgery or other ophthalmology treatment), rather than the underlying cause.
Table 5.1: Diagnostic Categories and Specific Diagnoses

1. ANC, Immunization & Complications of Pregnancy
   - Antenatal care, Ectopic Pregnancy, Incomplete, Septic and Threatened Abortion, Anemia in Pregnancy

2. Well Child
   - Growth Check, Immunizations

3. Family Planning
   - Family Planning, Birth Control, Infertility Workshop

4. Diarrhea Excluding Parasites
   - Dysentery

5. Intestinal Parasites
   - Helminths

6. All Other Gastrointestinal
   - Esophageal Structure, Liver Disease, Cirrhosis, Ascites, Ulcers, PUD Peptic Ulcer Disease, Obstructive Jaundice, Pancreatitis, Bowel Obstruction, Appendicitis, Acute Abdomen, Abdominal Pain, Gall Bladder, Hemorrhoids, Inguinal hernia, peptic ulcer, Dyspepsia, Gastritis, Gastroenteritis, Dyspepsia, Emesis

7. Skin Conditions Not Trauma
   - Erythroderma, Rash, Ulcerated Lesions, Impetigo, Exfoliative Dermatitis, Keloids, Insect Bite

8. Acute Upper Respiratory Infection
   - Otitis, Colds, Tonsillitis, Acute Pharyngitis

9. Acute Lower Respiratory Infection
   - Pneumonia, Cough

10. Dental
    - Extractions, Toothache

11. Eye
    - Conjunctivitis, Corneal Ulcers, Cataracts, Infections; treatment of diabetic retinopathy, Vernalis

12. Medical Exams & Adult Immunizations
    - Routine Physicals

13. Genitourinary/Gynecological & Sexually Transmitted Diseases
    - Gonorrhea, Urethritis, Urinary Tract Infection, Amenorrhea, Vaginal Bleeding, Urethral Stricture, Vaginal Infection, Hydrocele, PID, Vesico-Vaginal Fistula, Bartholin Cyst, Cystitis, Menorrhagia, Urethral Stricture, Benign Prostatic Hypertrophy (BPH)

14. Tuberculosis
    - PTB, Night Sweats with Cough, TB all forms

14b. Tuberculosis - not surveyed (applies only to 24 patients on the TB wards at Leribe)

15. Hypertension

16. Other Cardiovascular Disease
    - Congestive Heart Failure, Valvular Disease, Stroke, Vein Thrombosis, Carditis, Rheumatic Fever

17. Diabetes Mellitus
    - Hypoglycemia

18. Benign Tumor
    - Fibroids; papilloma of larynx; meningioma; tumors for which cancer Not specified, Bilateral Fibroadenoma

19. Malignancy
    - Tumor, Blood or Marrow, Surgical Operation or other Management, Non-Hodgkins Lymphoma, Mammography

20. Trauma, Burns and Poisoning
    - Motor Vehicle Accident, Falls, Assaults, Knife of Gunshot Wounds, Rape, Poison Ingestion, Soft Tissue Injury (STI), Post-Trauma Suture Removal of Dressing Change, Rape

Pre-employment Physicals
21. Musculoskeletal Not Trauma
   Arthritis, Mastitis, Hernia, Scoliosis, Pathological Fracture, Pain in Hip, Low Back Pain, Myalgia, Arthralgia, Synovitis, Tenosynovitis

22. Neurological and Psychiatric
   (incl. Non-cancer brain surgery)
   Psychosis, Epilepsy, Senile Psychosis, Parkinson's Disease; Hydrocephalus; VP shunt, Headache, Substance Abuse, Hypomania, Post-Herpetic Neuralgia, Somatoforms Distorder, Neurasthenia, confused, alcoholism

23. All Other Noninfections
   Pellagra, Renal Syndrome incl. dialysis, Precordial non CVS Symptoms
   Stevens Johnson Syndrome, Asthma, Lodger, Thyroid abnormalities; Splenomegaly; Peripheral vascular disease/gangrene, Varicose Veins, Chronic Obstructive Pulmonary Disease, Nehprotic Syndrome, Chest Pain if Not Cardiac

24. Other Infections
   Osteomyelitis, Infected Left Hip, Wound Infection, Sepsis (any), Abscess (any), Enteric Fever, Meningitis, Abscess (incl. cerebral), Puerperal Sepsis, Cellulitis, Septicemia, Typhoid, Tonsillitis, Chicken Pox, Measles, Mumps, Herpes Zoster of the Skin, Oral Candididiasis, Osteomyelitis, Mycosis, Lymphadenitis, Cryptococcal Meningitis, Thrombophlebitis, Thrush, Viraemia, Parotitis, Lymphonotitis, Brain Abscess, Hepatitis

25. Maternity
   a. normal delivery
   b. cesarean section/complicated delivery, threatened early labor, premature rupture of membranes, hysterotomy for removal of dead fetus
   c. premature birth
   d. post-delivery mother

26. Pediatrics
   Pediatric Case When No Other Specific Diagnosis Given, Kwashiokor, Marasmus, PEM, all other Malnutrition in Children

27. New Born

28. HIV/AIDS
   Immunosuppresion

29. Complication(s) of HIV/AIDS
   Kaposis sarcoma, Cryptococcal Meningitis Thrush

30. Unknown and unrecorded

31. Hematology
   (other than leukemia)
   Anemia, Throbocytopenia; Hemophilia

32. ENT
   Reconstructive Surgery of Mandible, Allergic Rhinitis
5.3 Distribution of Claims

The distribution of claims by diagnosis is shown in Table 5.2, then summarized in Figure 5.1. By far the largest number of claims is for cancer, 55% of the total in the database. Cardiovascular referrals and those for non-infectious diseases (such as thyroid and kidney problems) rank next, but well behind cancer. Seven point seven percent (81) of the claims were for other non-infectious diseases, while 6.68% (70) were for cardiovascular disease. No other diagnostic category accounted for more than five percent of the claims, or more than about one claim a week.
<table>
<thead>
<tr>
<th>Diagnostic Category</th>
<th>Age Group</th>
<th>&lt;1</th>
<th>2-4</th>
<th>5-14</th>
<th>15-44</th>
<th>45-60</th>
<th>60+</th>
<th>Age Unknown</th>
<th>Grand Total</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intestinal Parasites</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>0.10%</td>
</tr>
<tr>
<td>All Other Gastrointestinal</td>
<td></td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>14</td>
<td>1</td>
<td></td>
<td>1.34%</td>
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<td>4</td>
<td></td>
<td></td>
<td>7</td>
<td>0.67%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dental</td>
<td></td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>14</td>
<td>1.34%</td>
<td></td>
</tr>
<tr>
<td>Eye</td>
<td></td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>20</td>
<td>1.91%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genitourinary/Gynecological and STD's</td>
<td></td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>32</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>51</td>
<td>4.87%</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td></td>
<td>4</td>
<td>8</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td></td>
<td>1.15%</td>
</tr>
<tr>
<td>Other Cardiovascular Disease</td>
<td></td>
<td>7</td>
<td>6</td>
<td>17</td>
<td>19</td>
<td>3</td>
<td>6</td>
<td>12</td>
<td>70</td>
<td>6.68%</td>
</tr>
<tr>
<td>Benign Tumor</td>
<td></td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>11</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>25</td>
<td>2.39%</td>
</tr>
<tr>
<td>Malignancy</td>
<td></td>
<td>4</td>
<td>12</td>
<td>22</td>
<td>172</td>
<td>158</td>
<td>119</td>
<td>86</td>
<td>573</td>
<td>54.68%</td>
</tr>
<tr>
<td>Trauma, Burns, Poisoning</td>
<td></td>
<td>9</td>
<td>2</td>
<td></td>
<td>1</td>
<td>12</td>
<td></td>
<td>1</td>
<td>54</td>
<td>5.15%</td>
</tr>
<tr>
<td>Musculoskeletal Not Trauma</td>
<td></td>
<td>2</td>
<td>4</td>
<td>15</td>
<td>21</td>
<td>5</td>
<td>1</td>
<td>6</td>
<td>54</td>
<td>5.15%</td>
</tr>
<tr>
<td>Neurological and Psychiatric</td>
<td></td>
<td>9</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>8</td>
<td>26</td>
<td></td>
<td>2.48%</td>
</tr>
<tr>
<td>All Other Noninfectious</td>
<td></td>
<td>1</td>
<td>2</td>
<td>12</td>
<td>41</td>
<td>11</td>
<td>3</td>
<td>11</td>
<td>81</td>
<td>7.73%</td>
</tr>
<tr>
<td>Other Infections</td>
<td></td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td>0.38%</td>
</tr>
<tr>
<td>Maternity</td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>0.10%</td>
</tr>
<tr>
<td>Pediatrics (not otherwise specified)</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>0.19%</td>
</tr>
<tr>
<td>Complications of HIV/AIDs</td>
<td></td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td>0.38%</td>
</tr>
<tr>
<td>Unknown and Unrecorded</td>
<td></td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>25</td>
<td>41</td>
<td>3.91%</td>
</tr>
<tr>
<td>Hematology</td>
<td></td>
<td>1</td>
<td>21</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td>9</td>
<td>36</td>
<td>3.44%</td>
</tr>
<tr>
<td>Grand Total</td>
<td></td>
<td>31</td>
<td>34</td>
<td>114</td>
<td>352</td>
<td>202</td>
<td>139</td>
<td>176</td>
<td>1048</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Despite the total cost, this analysis confirms that the volume of cases sent to any specific referral service in Bloemfontein is relatively low. Only in cancer are there more than ten claims per week. Most currently referred services are well below the critical volumes needed to support a stand alone tertiary care service. The one exception may be cancer. A majority of the referred cancers are carcinoma of the breast or female reproductive tract. Cancer of the cervix is the most common single diagnosis in the claims studied.

**Distribution of Claims by Diagnosis**

![Distribution of Claims by Diagnosis](image)

Figure 5.1


5.4 Distribution of Cost

Figure 5.2 and Table 5.3 array the data by cost, not the number of claims. Cancer is still the dominant diagnosis, accounting for almost 1.5 million rand paid, or about 36% of total payments in the sample. Cardiovascular cases are next, accounting for almost 600,000 rand, a little over 14% of the sample. Cardiovascular referrals have a higher cost per claim than the cancer referrals. This may occur because the cardiovascular category includes a few large claims for inpatient care and surgical procedures. The cancer claims include a number of relatively small claims for a single outpatient consultation, perhaps cases which were too advanced for effective treatment, or follow up visits for cases that had previously received radiation therapy or chemotherapy.
Table 5.3 - Amount Paid (in Rand) by Diagnostic Category and Age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>&lt;1</th>
<th>2-4</th>
<th>5-14</th>
<th>15-44</th>
<th>45-60</th>
<th>&gt;60</th>
<th>Age Unknown</th>
<th>Grand Total</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intestinal Parasites</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9,955</td>
<td>9,955</td>
<td>0.24%</td>
</tr>
<tr>
<td>All Other Gastrointestinal</td>
<td>67,629</td>
<td>1,294</td>
<td>110,875</td>
<td>3,154</td>
<td>910</td>
<td>183,862</td>
<td>4.44%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin Conditions Not Trauma</td>
<td>846</td>
<td>110</td>
<td>910</td>
<td></td>
<td></td>
<td></td>
<td>1,400</td>
<td>0.03%</td>
<td></td>
</tr>
<tr>
<td>Dental</td>
<td>110</td>
<td>330</td>
<td>209</td>
<td>8,049</td>
<td>110</td>
<td>-</td>
<td>8,808</td>
<td>0.21%</td>
<td></td>
</tr>
<tr>
<td>Eye</td>
<td></td>
<td>110</td>
<td>9,892</td>
<td>12,187</td>
<td>5,857</td>
<td>27,500</td>
<td>55,545</td>
<td>1.34%</td>
<td></td>
</tr>
<tr>
<td>Genitourinary/Gynecological</td>
<td>1,713</td>
<td>7,048</td>
<td>189,963</td>
<td>40,359</td>
<td>939</td>
<td>9,164</td>
<td>267,558</td>
<td>6.46%</td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>12,203</td>
<td>160,327</td>
<td>172,530</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Cardiovascular Disease</td>
<td>73,051</td>
<td>120,374</td>
<td>73,670</td>
<td>4,269</td>
<td>135,199</td>
<td>85,971</td>
<td>595,260</td>
<td>14.37%</td>
<td></td>
</tr>
<tr>
<td>Benign Tumor</td>
<td>13,050</td>
<td>3,887</td>
<td>26,340</td>
<td>44,249</td>
<td>4,371</td>
<td>95</td>
<td>93,585</td>
<td>2.26%</td>
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</tr>
<tr>
<td>Malignancy</td>
<td>4,673</td>
<td>30,906</td>
<td>247,455</td>
<td>389,625</td>
<td>271,833</td>
<td>295,574</td>
<td>259,919</td>
<td>1,499,986</td>
<td>36.21%</td>
</tr>
<tr>
<td>Trauma, Burns, Poisoning</td>
<td>113,498</td>
<td>84,887</td>
<td>16,367</td>
<td>214,752</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal not Trauma</td>
<td>14,995</td>
<td>2,127</td>
<td>46,844</td>
<td>251,702</td>
<td>2,995</td>
<td>303</td>
<td>339,315</td>
<td>8.19%</td>
<td></td>
</tr>
<tr>
<td>Neurological and Psychiatric</td>
<td>41,874</td>
<td>198</td>
<td>210</td>
<td>2,698</td>
<td>99</td>
<td>24,924</td>
<td>70,003</td>
<td>1.69%</td>
<td></td>
</tr>
<tr>
<td>All Other Noninfectious</td>
<td>5,360</td>
<td>4,820</td>
<td>46,996</td>
<td>143,937</td>
<td>85,881</td>
<td>11,711</td>
<td>27,923</td>
<td>326,628</td>
<td>7.89%</td>
</tr>
<tr>
<td>Other Infectious</td>
<td>3,990</td>
<td>198</td>
<td>29,083</td>
<td></td>
<td></td>
<td></td>
<td>33,271</td>
<td>0.80%</td>
<td></td>
</tr>
<tr>
<td>Maternity</td>
<td>2,902</td>
<td></td>
<td>2,902</td>
<td></td>
<td></td>
<td></td>
<td>2,902</td>
<td>0.07%</td>
<td></td>
</tr>
<tr>
<td>Pediatrics (not otherwise specified)</td>
<td>1,062</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,161</td>
<td>0.03%</td>
<td></td>
</tr>
<tr>
<td>Complications(s) of HIV/AIDS</td>
<td>1,229</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,418</td>
<td>0.03%</td>
<td></td>
</tr>
<tr>
<td>Unknown and unrecorded</td>
<td>37,413</td>
<td>110</td>
<td>1,406</td>
<td>23,100</td>
<td>99</td>
<td>834</td>
<td>40,042</td>
<td>2.63%</td>
<td></td>
</tr>
<tr>
<td>Hematology</td>
<td>99</td>
<td>112,135</td>
<td>16,611</td>
<td>135</td>
<td>26,393</td>
<td>155,373</td>
<td>556,427</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td>260,930</td>
<td>92,250</td>
<td>698,784</td>
<td>1,542,634</td>
<td>539,907</td>
<td>451,422</td>
<td>4,142,353</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No other diagnostic category accounted for more than 8% of the costs in the database. Ranking third in cost were musculoskeletal cases. These accounted for over 8% of the cost but only 5% of the claims. We noted a small number of very expensive admissions for spinal surgery in this category.

Ranking fourth in cost was the category of non-infectious diseases, which includes kidney and thyroid problems. They accounted for just under 8% of total cost, and a little under 8% of the claims. Although there were a substantial number of referrals for nephrology consultation, we saw very little dialysis in this category, indicating that QEII has adhered to a policy excluding maintenance dialysis from consideration as a referral.

Gynecological conditions were the fifth most expensive category; accounting for 5% of the claims and 6.5% of cost. Surgical repair of fistulas was the most common condition in this category.

One other disease category is worthy of note. This is trauma-- a mere 1% of claims, but 5% of cost. We observed a small number of cases referred for a long period.
of intensive care and continuing hospitalization, cases that perhaps could have been accommodated in Maseru if there were an Intensive Care Unit at QEII.

Per claim costs show a bimodal distribution, with a substantial number of small claims (ninety to a few hundred rand) and a smaller number of large claims, probably explained by inpatient stays and surgical procedures. At the time this is written, standard charges for an outpatient consultation at the Bloemfontein referral hospitals begin at 115 rand for the simplest outpatient procedure or consultation, ranging up to 1,994 rand for the most complicated outpatient procedure by a specialist. This fee is for the physician service only—diagnostic tests and facility fees are levied in addition.

Typical inpatient fees in Bloemfontein referral hospitals at the time of writing are 688 per day on a ward and 1,554 rand per day in an ICU. Physician services and procedures or operating theatre fees are in addition to this. Compare these fees with the estimate (See Appendix 8) of fully allocated current costs at QEII--59 rand per visit at the outpatient clinic, 77 rand in casualty, and 244 per inpatient day. All of these Lesotho costs include physician services, theatre costs, diagnostic tests and drugs. Charges in the Bloemfontein referral hospitals are, at a minimum, more than twice the average QEII costs. Inpatient fees appear to be three times or more the QEII cost, although, as noted elsewhere, staffing and maintenance levels at QEII are below what is needed for the current volume of activity.

Before assuming that QEII should establish specialist services to replace those being purchased in Bloemfontein at the higher cost, it is necessary to look back at the number of referral cases. Good tertiary care requires large numbers of cases to maintain the skills of the staff. With the possible exception of reproductive tract cancers, we see no current specialty referral category which might generate a volume of cases in Maseru that would reach this “critical mass.”

5.6 Distribution of Inpatient Stay

The inpatient days recorded roughly track the distribution by age and diagnostic group seen for total expenditure. Four thousand, eight hundred and nineteen patient days were recorded. The distribution by diagnosis is shown in Table 5.4 and Figure 5.3. Compared to the total number of claims, cardiovascular disease, trauma and musculoskeletal disease show relatively high use of inpatient services. This is understandable: cardiovascular disease includes some cardiac surgeries. The few trauma cases referred were initially sent for ICU care and then had long hospital stays. A number of spine surgeries were referred, with long expected lengths of stay.

At 75% occupancy, this number of patient days would account for the use of about 18 beds in the Bloemfontein hospitals.
Table 5.4 - Patient Days by Diagnosis and Age

<table>
<thead>
<tr>
<th>Diagnostic Category</th>
<th>&lt;1</th>
<th>2-4</th>
<th>5-14</th>
<th>15-44</th>
<th>45-60</th>
<th>&gt;60</th>
<th>Age Unknown</th>
<th>Grand Total</th>
<th>% of Total</th>
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<tr>
<td>Intestinal Parasites</td>
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<td></td>
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<td></td>
<td></td>
<td>15</td>
<td>15</td>
<td>0.31%</td>
</tr>
<tr>
<td>All Other Gastrointestinal</td>
<td>55</td>
<td>2</td>
<td>139</td>
<td></td>
<td>2</td>
<td>198</td>
<td></td>
<td>4.11%</td>
<td></td>
</tr>
<tr>
<td>Skin Conditions Not Trauma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>0.02%</td>
</tr>
<tr>
<td>Dental</td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td></td>
<td>0.21%</td>
</tr>
<tr>
<td>Eye</td>
<td>2</td>
<td>8</td>
<td>21</td>
<td>278</td>
<td>61</td>
<td></td>
<td>11</td>
<td>381</td>
<td>7.91%</td>
</tr>
<tr>
<td>Genitourinary/Gynecological</td>
<td>2</td>
<td>8</td>
<td>21</td>
<td>278</td>
<td>61</td>
<td></td>
<td>11</td>
<td>381</td>
<td>7.91%</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td></td>
<td>10</td>
<td>258</td>
<td></td>
<td></td>
<td></td>
<td>268</td>
<td></td>
<td>5.56%</td>
</tr>
<tr>
<td>Other Cardiovascular Disease</td>
<td>75</td>
<td>5</td>
<td>145</td>
<td>87</td>
<td>2</td>
<td>121</td>
<td>87</td>
<td>522</td>
<td>10.83%</td>
</tr>
<tr>
<td>Benign Tumor</td>
<td>25</td>
<td>3</td>
<td>18</td>
<td>13</td>
<td></td>
<td></td>
<td>2</td>
<td>61</td>
<td>1.27%</td>
</tr>
<tr>
<td>Malignancy</td>
<td>7</td>
<td>47</td>
<td>400</td>
<td>418</td>
<td>272</td>
<td>346</td>
<td>345</td>
<td>1,835</td>
<td>38.08%</td>
</tr>
<tr>
<td>Trauma, Burns, Poisoning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Neurological and Psychiatric</td>
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<td>2</td>
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<td></td>
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<td>30</td>
<td>61</td>
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</tr>
<tr>
<td>All Other Noninfectious</td>
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<td>3</td>
<td>41</td>
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<td>69</td>
<td>12</td>
<td>38</td>
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<tr>
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<td>25</td>
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<tr>
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<td></td>
<td></td>
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</tr>
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<td>Pediatrics (not otherwise specified)</td>
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<td>Complications of HIV/AIDS</td>
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<tr>
<td>Unknown and unrecorded</td>
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<td>1</td>
<td>51</td>
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<td>Hematology</td>
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<td>186</td>
<td>32</td>
<td></td>
<td></td>
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<td>31</td>
<td>249</td>
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<tr>
<td>Grand Total</td>
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<td>66</td>
<td>885</td>
<td>1,883</td>
<td>578</td>
<td>486</td>
<td>663</td>
<td>4,819</td>
<td>100.00%</td>
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5.7 Conclusions

Analyzing the claims by age, we find that costs are concentrated in the younger age groups. While these groups are a much larger percentage of the population, the burden of chronic disease often means that patients over the age of forty five dominate the use of tertiary care services. Cancer and heart disease are more prevalent in these older age groups.

The Bloemfontein referrals show that 37% of cost (1,543,000 rand) was incurred for patients between 15 and 44. The amount spent on patients between 5 and 24 years of age was 17% (699,000 rand). This was more than the amount spent on patients between 45 and 60 (540,000 rand) and those over 60 (451,000 rand). 261,000 rand (6% of the total) was spent on infants, and only 2% on children between two and four years of age. Patient age could not be determined for claims amounting to 13% of the cost.
The age profile underlines an important fact, particularly about the cancer referrals. Many of these referrals for cervical and other cancers are for relatively young women. This is particularly disappointing because surgical procedures substantially reduce the death rate from cervical cancer if a regular screening program identifies patients early in the course of the disease.

While the age analysis suggests that scarce referral funds are concentrated on patients with a substantial potential life span, it does not tell us anything about the survival of referred patients. Both in the MOHSW and at the Orange Free State Health Department, we heard that many patients--notably cancer patients--are referred when cancers are in an advanced stage where even the most skilled specialists can do little to prolong life. Once a referral arrives in Bloemfontein, specialists may attempt heroic efforts with little probability of success, but high costs to the Government of Lesotho. Better communication and agreement on the “staging” of cancers would improve the efficiency of the referral system.

While the above analysis provides a good picture of the distribution of referral cases by cost and diagnosis, it underestimates the full cost of referrals for two reasons:

- it does not capture all the referral services provided in the fiscal year. Many claims remained unpaid in this period because the Ministry had inadequate funds.

- the Ministry incurs substantial costs to transport referral patients to Bloemfontein and to provide subsistence for the patient or an accompanying family member.

5.7.1 Accounts Payable and Policy Change in the RSA

It is difficult to determine the full annual cost of referrals. Our data base includes only 856 of the 2,470 referrals authorizations issued in FY 2000-2001. In the fall of 2002, Pelenomi Hospital estimated that it was owed 2,000,000 rand by the Government of Lesotho. At the same time, Universitas and National Hospitals indicated accounts receivable for Lesotho referrals of 11,800,000 rand. Some of these claims may not have proper referral authorization. Others may be duplicates of previously paid claims, or reflect services provided in prior fiscal years. Nevertheless, it is clear that the amount of referral services used by Lesotho is substantially in excess of the 4.14 million rand included in our study. The budget submission for FY 2002/03 requested 14 million rand for referrals. Some of this would be used to clear the backlog of bills. However, it appears likely that the 4.14 million in paid claims from 2000-2001 is one half to one third of the current rate of utilization. Annual referrals costs, before pending price increases, are likely at least 10 million rand, and perhaps as much as 12 million or more.

The charges made by the Orange Free State Health Department for referral services will go up as the approved fee scale is revised. A revision is expected this spring, and it will likely show more than normal inflation because of the deterioration of the rand and the consequent increase in prices paid for drugs and medical equipment sold on the world market.

How long will health officials in South Africa tolerate the large debt owed by the government of Lesotho for referral services? If appropriations for referrals by the MOHSW are inadequate and payables continue to increase, health authorities in the Republic may be forced to press for payment. There is no immediate threat to cut off services, but two additional factors may change this in the future:

- As a matter of policy, South Africa is squeezing the funding of referral services to free up more money for primary care. Government subventions to referral hospitals are likely to decrease, and this will make these institutions more anxious to collect on those “chargeable” services which they render, including referral services for Lesotho citizens

- At the moment, fees collected by institutions in the health care system in the RSA are returned to the Government, and do not benefit the institutions directly. As in Lesotho, this decreases the pressure on the institution to maximize fee revenue. However, a policy change is pending which would permit institutions to retain collected fees. This, combined with a reduction in the RSA Government subvention to referral hospitals, will likely force them to become much tougher “bill collectors.” If this happens, the Government of
Lesotho may face increasing demands to pay up on past debts and stay current on payments for current referrals.

5.7.2 Transport and Subsistence

Charges at RSA institutions are not the only cost of referrals. The Ministry provides free transport to Bloemfontein for patients, returns bodies of those who die while in South African hospitals, and pays a subsistence allowance to referred patients or family members. In our analysis of QEII costs, we identified approximately 193,000 rand spent for these purposes in FY 2000/2001. While not a lot compared to the charges from the South African hospitals, this would be enough to cover the salaries of 3 or 4 staff in an ICU. This amount does NOT include the costs of purchasing vehicles, yet patient transport to Bloemfontein is probably the largest source of wear and tear on the QEII vehicle fleet. The full cost of referral transport, including depreciation of the vehicles used, would be substantially higher.

5.7.3 What Do Referrals Really Cost?

Our best estimate is that the full annual cost of referrals is now at least 10 million rand per year, probably higher, and about to go higher still with the price changes to be implemented by the Orange Free State Health Department this spring. We also conclude that the pressure for the Government of Lesotho to pay outstanding charges, and remain current in the payment of new referral charges, will likely increase. In the immediate future, QEII should take steps to reduce the referral of cases which have little prospect of improvement or continued survival. Better communication with Bloemfontein specialists may be necessary to achieve this goal. Money could be saved if both referring physicians and Bloemfontein specialists could share reliable diagnostic information. Some cases now approved might be rejected because they would not benefit from care in the RSA. This may seem a harsh result for the individual patient, but is perhaps more equitable if the monies saved are used to strengthen the health system within Lesotho.

In subsequent chapters, we identify places that the MOHSW could save money or increase revenue. We include in this category the full cost of referrals—an immediate cash saving of 4.5 to 5.0 million rand (at the level of FY2000/01 actual expenditure), and a likely potential saving of 10 to 15 million rand with current rates of referrals and expected price increases. It is not the role of the consultant to say that such a cut should be made. But it should be weighed against some of the other priority expenditure needs of the health system within Lesotho. Only ten years ago, when South Africa was still controlled by the apartheid regime, the level of referrals was far lower but the funding status of the health system within Lesotho was better. Advent of a democratic regime in South Africa has made South African facilities more available to Lesotho citizens, but this may be a benefit that Lesotho cannot afford.
5.8 Planning Implications

In general, the volume of Lesotho cases sent to any single referral service in Bloemfontein does not justify creating such a service in Maseru. This means that any replacement hospital for QEII would have the same services currently offered, although with better facilities and---if it is to function well---more adequate budget and staffing. There are two areas where the current profile of QEII should be augmented, and this will permit the accommodation of some patients now referred:

a. ICU. Although it is expensive, an ICU has become an essential part of any hospital that aspires to function at the national referral level. If the new hospital has an ICU, trauma patients need not be referred, except perhaps for life-saving neurosurgery. The sickest and most unstable patients now accommodated on the ward may be placed in the ICU, providing better care for them, and for the rest of the more stable ward patients. Good ICU care can improve the result from complicated surgeries (perhaps including fistula repair). The ICU could also receive cases of myocardial infarction that might be saved by close monitoring. See Chapter 11 for further discussion of the requisites for an ICU.

b. Cancer service. We have tentatively recommended that the plan for a new hospital accommodate a radiation therapy machine, even if current funding is inadequate to purchase and operate the machine. Before initiating a radiation therapy service, the Ministry should:

- develop a better program for screening (Pap smears) and primary treatment of cervical cancers. The prevention of cervical cancer should be a high priority. However, this is easier said than done. Sustaining a cervical cancer screening program that appropriately identifies women at an early, hopefully pre-invasive, stage of disease requires a substantial continuing investment in infrastructure. Doing good pap smears, getting them read, getting the results back to the clinic or hospital in a timely manner, finding the patient who needs follow-up, providing the follow-up care and maintaining screening as needed requires money and management. Most lower income countries have found this to be unaffordable or not manageable or both. Simpler screening techniques that link screening and definitive treatment of early disease are being tried in some countries. (University of Zimbabwe/JHPIEGO Cervical Cancer Project 1999. Visual inspection with acetic acid for cervical cancer screening: test qualities in a primary-care setting. Lancet 353: 869-873.) A recent article in the New England Journal of medicine found that male circumcision significantly reduced the occurrence of cervical cancer (Castellsague, X. 2002. Male circumcision, penile human papillomavirus infection, and cervical cancer in female partners. The New England Journal of Medicine 346: 1105-1112.) As well the
control of STDs and use of condoms may all be helpful. It is within the scope of this consultancy to urge the MOHSW to consider alternative affordable strategies for decreasing the prevalence of late stage cervical cancer. However, it is beyond the scope of our charge to develop a specific strategy that is affordable and relevant for Lesotho. This would be a good task for the planning unit to spearhead with input from clinicians, managers and cost accountants.

- Establish an affiliation agreement with the oncology service in Bloemfontein that permits this service to screen identified cancer patients at the Maseru Hospital. This may include administration of chemotherapy. When Lesotho can afford to purchase and operate a radiation therapy machine, the affiliation contract would provide for radiation dosimetry, treatment planning, and equipment maintenance. The South African institution would be responsible for training of Maseru Hospital staff. This arrangement would be far more efficient—and higher quality—than a stand alone service in Maseru.

The other lesson from this study of RSA referrals is that the MOHSW must actively manage its referrals, sending only those patients that can be treated within the available referral budget. Health officials in Bloemfontein would likely work with MOHSW to further analyze outstanding claims for referral care and identify the range of costs for different types of referrals. MOHSW could then establish a simple computer based system to track referrals and compare total estimated costs to budget. This would be similar to a budget system in which a purchase order “encumbers” funds so that an account will not be overspent when the goods are received and paid for. When the claim is received for an approved referral, the balance available in the account is adjusted up or down by the difference between the actual bill and the encumbered estimate. The paid claims go into a database constantly updating the expected cost of different referrals. At the time of the referral, estimated costs of referral care can be adjusted up or down, depending on characteristics of the individual case, after consultation between the referring and receiving physician. Once the projected cost of referrals reaches the budgeted amount for the period (month, quarter), no more referrals would be approved until the next budget cycle. A harsh result, but necessary if the Ministry is to gain control of total referral costs.
Chapter 6

Assessment of Needs in the Health System

6.1 Methodology

The needs assessment was carried out by

1) Reviewing selected recent and older relevant reports:
   - Bicknell, W.J., "Health Sector Performance Indicators", final report for the Ministry of Health, Maseru, Lesotho, May 1990 funded in part by the World Bank;
   - Puglisi, R and W.J. Bicknell, "Functional Expenditure Analysis", final report and procedure manual for the Queen Elizabeth II Hospital, Maseru, Lesotho, May 1990, updated to include Leribe and Scott hospitals in 1991 as part of the Adult Health study;
   - Medical Care Development Incorporated (MCDI), Health Study Phase II Report, 2001.

2) Surveying bed-to-bed observing patients and reviewing individual charts of
   - all QE IIs at QE II including tuberculosis (TB) patients temporarily at the mental hospital
   - all inpatients at Leribe except on the TB ward
   - all acute inpatients at Mohale's Hoek, including TB and mental observation unit patients.

The bed-to-bed surveys in 1991 and 2002 were both carried out by Dr. Bicknell and were very similar in design. More district hospitals including some CHAL hospitals were included in the 1991 survey. An extensive review of Ministry and CHAL Clinics was also done.

In 2002, the wards and clinic areas at Maluti, Roma, Mafeteng, Berea and Maseru Private (3 patients) were visited but patients were not surveyed in detail. Substantial time was spent discussing operational issues with senior staff at all hospitals except Mafeteng, where the visit was much shorter. Visits were also made to a private and MOHSW clinic in the Ramapepe area north of Leribe and to the public hospitals in Ficksburg and Zastrone in the Republic of South Africa.

Our findings and conclusions were reviewed with the team’s Basotho medical consultants and key informants in the MOHSW. All conclusions presented represent a general consensus, not merely the opinion of one person. However, it is fair to say that although there is agreement on the overall findings, reasonable people may differ with regard to some of the specifics.
6.2 Major Findings

There is serious underutilization of inpatient services in Lesotho because the services available are not adequate. Lesotho does not have excess bed capacity. Rather, there is serious underutilization of inpatient services in Lesotho because the services available are not adequate for several inter-related reasons:

- **Maintenance** - There are dangerous deficiencies in maintenance of civil works and medical equipment.

- **Physicians**
  - Shortage and high turnover of physicians, largely due to seriously inadequate compensation.
  - In the case of many district physicians, insufficient post-graduate training and in-service support in basic specialties to responsibly and safely carry out the work expected in a district hospital.

- **Nurses** - Inadequate numbers in service at QE II with system-wide compensation inadequacies.

- **Administrative Issues** - Filling funded vacant positions, ordering spares and consumable supplies, all require extensive and time-consuming approvals. Replacing people and things are very difficult. Disciplining staff is widely viewed as so difficult and so time consuming as to not be worth the effort. If disciplinary action is approved, it is so late as to have little or no impact on the worker or, by example, co-workers.

Until the maintenance, physician, nursing, compensation and administrative issues are addressed and corrected, QE II should not be replaced as maintaining and staffing a new QE II hospital will be impossible.

6.3 Looking Ahead, Not Laying Blame

As the reader continues, please keep in mind we are pointing out system deficiencies and not suggesting that any one individual, hospital or clinic is at fault or should be blamed. Rather, we give specific examples so that the magnitude of the problems can be fully appreciated.
6.4 Findings in More Detail

6.4.1 All Inpatient Areas - All Hospitals

However inadequate maintenance may be, the staff of all hospitals are to be complimented on the cleanliness of wards, patient care areas and patients in bed. This is a major, very positive achievement.

6.4.2 Primary care

Primary care continues to be good. Staffing by a qualified nurse and a nursing assistant seems to be the rule in rural clinics. Nurse clinicians are reported to be fewer due to retirement and the closure (recently reported to be reopened) of the nurse clinician training program. All hospitals have busy primary care (outpatient) clinics. Drug supply is widely reported as very satisfactory. However, Berea, Leribe and Mohale's Hoek report that because of a shortage of physicians, they are unable to make supervisory visits to their outlying health centers.

6.4.3 Inpatient Hospital Care

Quality of inpatient hospital care has declined substantially over the past decade, at QE II and in the districts. At the district level, the decline in the quality of inpatient services appears to be more serious in MOHSW than CHAL hospitals. Although there can be disagreement as to the magnitude of the decline, the severity and importance of this decline must be acknowledged and addressed. A hospital, without regard to occupancy or total number of patients cannot really be considered a hospital if essential functions either cannot be carried out or cannot be carried out safely. Specifically, maintenance has declined to the point where the system is in crisis. This affects both MOHSW and CHAL hospitals.

6.4.4 Lack of Maintenance is at a Crisis Level

Grossly inadequate maintenance of civil works and medical equipment prevents many hospitals from being seen or used as hospitals by either staff or patients. For example:

- A hospital without a functioning X-ray machine for more than a few days is not really a hospital. A hospital whose X-ray machine is frequently and unpredictably out-of-service, borders on being non-functional.

- Hospitals that do not utilize laboratory services, particularly bacteriology and antibiotic sensitivity testing, are not doing a good job. This service is nominally available at all government district hospitals but in two hospitals visited bacteriology was not being done.
• When a laundry is not operating for a year or more, as is the case at Leribe, it cripples the work of the hospital.

• At QE II the CT scan tube--long overdue for replacement (500,000 maloti) -- just failed. The ultra sound (4195 scans in 2001) for all services other than obstetrics is broken. It can be repaired within 24 to 48 hours. However, Siemens will not do the repairs until their outstanding account, reported to be 74,000 maloti, is paid. Of the two basic X-ray machines in QE II, one has been broken for over a year. We estimate that about 65% of the QE II kitchen equipment and 50% of the laundry equipment is inoperative.

• Even in the recently constructed district hospitals there are numerous signs pointing to little or no preventive maintenance and there is already a need for expenditures on deferred maintenance on civil works and major pieces of stationary equipment.

6.4.5 Physician and Nurse Staffing

Government District hospitals, for the most part are barely functioning or functioning at very low levels of inpatient use. In addition to seriously deficient maintenance, the districts suffer from an extremely serious shortage of doctors in both numbers and level of training.

Many of the district doctors are reported to have only 15 months of post-graduate training at QE II before being assigned to a district. This is not sufficient training for them to be able to safely and responsibly meet the needs of inpatients. This level of post-gradate education is satisfactory though not desirable for running clinics. As the doctors at the districts do not have the skills relevant to the job they have been asked to do, it is totally understandable that doctors may choose not to admit patients they do not feel comfortable managing. Patients are also likely to perceive that they will be better served by going elsewhere or just staying home. In the judgment of this team, 1) the shortage in absolute numbers and 2) insufficient training of physicians at the district level coupled with 3) severe maintenance deficiencies are the major reasons for low district hospital utilization. Again low utilization does NOT, in the case of Lesotho, mean excess capacity. Rather it means unmet need. And much of this need could be met if the district hospital system was functioning as it was designed to function and was functioning 10 years ago.
6.4.6 Acute General Hospital Bed Need and Supply

If we examine other regions of the world and other countries and determine what percent of their population is admitted each year (1 admission = 1 person, so 3 admissions for the same person in one year for these purposes are 3 different people), we find the following:

Europe, Japan, Australia - 16%
Canada - 9.3% - a rich country
Turkey - 6.3% - not as rich
Jamaica - 4.8% - not rich
Lesotho - 2%

Although there are differences in age structure between the various countries, these differences do not fully explain the utilization differences. Hospital utilization as low as that in Lesotho is an indication that conditions which could benefit from inpatient care are not being admitted.

If Lesotho hospitalized at 80% of the Jamaica rate, existing inpatient beds in Lesotho (about 2200) would be 75% occupied. And this does not take into account HIV/AIDS!

6.4.7 Quality of Inpatient Care

Nurses at QE II are in too short supply and are too busy to do all needed nursing care and to supervise nursing assistants who appear to be underutilized.

Infection control is a problem. There are more wound infections on the wards than our surveyor expected to find. At QE II there is extreme overcrowding of patients, including those who may well have active pulmonary TB. Our surveyor saw masks in use only on one ward (TB at the mental hospital). Hand washing was never observed and there are very few hand washing points available to staff.

In spite of spending many hours on the wards of QE II, Leribe and Mohale's Hoek, our surveyor never saw a nurse taking the vital signs of any patient. At QE II it was reported that, on cold nights, the bedding is insufficient to keep sick patients warm.

The patient medical record or charts were weak in the districts surveyed. This contrasts with good charts at QE II. Good charts are a sign of good medical care. Inadequate charting occurs when a physician is too busy, inadequately supervised or insufficiently trained. The charts at QE II tell the reader a story relating presenting
complaint to the history and physical findings that lead to an initial diagnostic impression and a plan for further diagnosis and treatment. This contrasts with many charts in the two MOHSW hospitals reviewed at the district level. Too often, these charts moved from a brief description of the complaint or a clinical impression without evidence to a plan of treatment, sometimes not mentioning a diagnosis or diagnostic impression. The patient may have been in the hospital for an extended period of time, clearly in need of hospitalization, but with no change in condition, no available history and physical and, so far as could be determined, no periodic monitoring or review of progress.

It is reported that senior medical staff from QE II rarely visit the district hospitals and, when they do, it is a day visit only. Efforts have been made in the past to bring district physicians to QE II for periods of several weeks for refresher training and upgrading. This is a very good idea, but is reported as abandoned because housing is not available in Maseru for the visiting district physicians. When physician staffing at the District Hospitals is so limited, it is difficult to release a doctor for such training.

These observations all support a conclusion that quality of care is inadequate. And when poor or declining quality is perceived by patients, it is a major reason patients and families avoid hospitalization or seek out a more distant hospital with service they perceive to be better.

In brief, there is considerable evidence that quality of care in the surveyed MOHSW hospitals is at a distinctly lower, and sometimes dangerously low, level compared to 1991.

6.4.8 Utilization and Changes from 1991 to 2002

It is important to note that the Inpatient surveys were not primarily intended to verify or determine occupancy. They were intended to assess the pattern of morbidity or illness presenting and being treated at each hospital and to determine the origin of inpatients. However, a by-product was patient occupancy on the day or days of the surveys. In the case of Mohale's Hoek and Leribe the percent occupancies found were confirmed by the staff as being representative of typical occupancy rates. QE II was revisited a week after the initial survey as the occupancy on February 18 and 19 seemed a bit low when the patients were added up. In fact, occupancy was up on the later date (February 25). Further analysis of the QE II data provides interesting insights.

QE II is a busy acute general hospital with severe staffing shortages, particularly nurses. Occupancy of services like pediatrics and obstetrics can be expected, by the nature of patient needs, to vary widely. Pediatrics on two occasions was very crowded though never at its rated capacity. This was also the case for some other acute wards that are over crowded and understaffed and contributes to a correct impression that the hospital is often bursting at the seams. Other services, such as eye, have less staffing and operate almost as a free-standing unit, making few demands on the core hospital. When such a specialty unit is not fully occupied, the empty beds are not available to other
services. And the private ward, though nominally 22 beds, has minimum staffing and on two occasions had only 3 patients (interestingly, this was also the case in 1991).

QE II, in spite of its very serious problems remains busy with occupancy rates on February 18/19 o 55% (227 patients) and 79% (323 patients) on February 25. These rates are based on 410 acute beds. All newborns including premature infants [20 prematures on February 25] as well as TB patients temporarily at the Mental Hospital are excluded from these figures. The data are summarized below:

Table 6.1: Occupancy at QE II Hospital

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<thead>
<tr>
<th>QE II Summary Data</th>
<th>18 and 19-Feb</th>
<th>25-Feb</th>
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<tbody>
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<td>Ward</td>
<td>Beds</td>
<td>Pts</td>
<td>% Occ</td>
<td>% Occ</td>
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<tr>
<td>Priv</td>
<td>22</td>
<td>3</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Fem Surg</td>
<td>28</td>
<td>26</td>
<td>93%</td>
<td>104%</td>
</tr>
<tr>
<td>Gyn</td>
<td>25</td>
<td>18</td>
<td>78%</td>
<td>68%</td>
</tr>
<tr>
<td>Male Ortho</td>
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<td>18</td>
<td>85%</td>
<td>87%</td>
</tr>
<tr>
<td>Male Surg</td>
<td>38</td>
<td>33</td>
<td>87%</td>
<td>100%</td>
</tr>
<tr>
<td>Fem Med</td>
<td>37</td>
<td>15</td>
<td>41%</td>
<td>76%</td>
</tr>
<tr>
<td>Eye</td>
<td>40</td>
<td>22</td>
<td>55%</td>
<td>45%</td>
</tr>
<tr>
<td>Maternity</td>
<td>80</td>
<td>36</td>
<td>45%</td>
<td>78%</td>
</tr>
<tr>
<td>Term Newborns</td>
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</tr>
<tr>
<td>Premature</td>
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<tr>
<td>Total Nursery</td>
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<tr>
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<tr>
<td>Male Med All</td>
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<td>56%</td>
<td>93%</td>
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<td>TB</td>
<td>40</td>
<td>10</td>
<td>25%</td>
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</tr>
<tr>
<td>Total</td>
<td>450</td>
<td>237</td>
<td>53%</td>
<td>92%</td>
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</tbody>
</table>

Source: Boston University Inpatient Survey, 2002.

Staffing needs to be adequate and beds, to the maximum extent possible, need to be multi-purpose and not service specific when demand rises. Thus, for example, clean adult general surgical cases can be accommodated with eye patients or female surgical cases with gynecology and vice versa. Adequate staffing, timely treatment and multi-
purpose beds result in fewer beds being able to serve more patients. Thus it is easy to see why at 60% to 80% occupancy, QE II appears to the casual visitor and to those charged with caring for patients as very full. Overcrowding, under-staffing and the functional exclusion of some wards from the general pool of beds (private and eye) and the need to keep some wards for exclusive use (maternity) account for this very correct impression. A well staffed and well managed hospital can serve more patients with the same total number of beds. This effectively decreases the number of beds needed. Costs per bed day are likely to increase, but total costs per admission are likely to decrease.

Looking back to the 1989 to 1991 surveys and comparing to 2002 there were some striking differences. At the time of his 1991 survey, Dr. Bicknell found it very hard to distinguish between the quality of care offered by CHAL & GOL hospitals at the district level. All inpatient services were busy and appropriate. The situation today is quite different. Historical data for the 1989 - 1991 time period is shown on the following page.
Table 6.2: Hospital Admissions for 1989 (Source: Annual Reports) and BU Surveys 1991

<table>
<thead>
<tr>
<th>HOSPITAL</th>
<th>GOV/PHAL*</th>
<th># BEDS</th>
<th>% OCCUP</th>
<th>TOTAL ADMISSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queen 2(1988)</td>
<td>G</td>
<td>430</td>
<td>82% (by BU census**)</td>
<td>20150</td>
</tr>
<tr>
<td>Leribe</td>
<td>G</td>
<td>109</td>
<td>122%(126 % by BU census**)</td>
<td>5339</td>
</tr>
<tr>
<td>Scott</td>
<td>P</td>
<td>147</td>
<td>91%(79% by our census**)</td>
<td>5465</td>
</tr>
<tr>
<td>Seboche</td>
<td>P</td>
<td>90</td>
<td>61%</td>
<td>2008</td>
</tr>
<tr>
<td>Mamohau(1990)</td>
<td>P</td>
<td>52</td>
<td>-</td>
<td>328</td>
</tr>
<tr>
<td>Mokhotlong</td>
<td>G</td>
<td>67</td>
<td>44%(67%by BU census**)</td>
<td>1973</td>
</tr>
<tr>
<td>Paray</td>
<td>P</td>
<td>100</td>
<td>50%</td>
<td>1898</td>
</tr>
<tr>
<td>Qacha's Nek</td>
<td>G</td>
<td>82</td>
<td>72%(84 by BU census**)</td>
<td>2391</td>
</tr>
<tr>
<td>Tebellong</td>
<td>P</td>
<td>38</td>
<td>93%</td>
<td>1145</td>
</tr>
<tr>
<td>Quthing</td>
<td>G</td>
<td>95</td>
<td>96%</td>
<td>3798</td>
</tr>
<tr>
<td>Mohale's Hoek</td>
<td>G</td>
<td>60</td>
<td>101%</td>
<td>3134</td>
</tr>
<tr>
<td>Mafeteng</td>
<td>G</td>
<td>125</td>
<td>96%</td>
<td>4774</td>
</tr>
<tr>
<td>Berea (TY)1988</td>
<td>G</td>
<td>72</td>
<td>102%</td>
<td>3019</td>
</tr>
<tr>
<td>Maluti</td>
<td>P</td>
<td>154</td>
<td>65%</td>
<td>4824</td>
</tr>
<tr>
<td>Butha-Buthe(?yr)</td>
<td>G</td>
<td>83</td>
<td>72%</td>
<td>3104</td>
</tr>
<tr>
<td>Roma(St.Josph)</td>
<td>P</td>
<td>129</td>
<td>40%</td>
<td>2256</td>
</tr>
<tr>
<td>Semonkong</td>
<td>P/No Report</td>
<td>30</td>
<td>low</td>
<td></td>
</tr>
<tr>
<td>Mantsonyane (St. James)</td>
<td>P</td>
<td>57</td>
<td>43%</td>
<td>1145</td>
</tr>
<tr>
<td>Mohlomi</td>
<td>G/Mental/No report</td>
<td>60-70</td>
<td>80+</td>
<td></td>
</tr>
<tr>
<td>Military Hosp</td>
<td>G/Milit/No report</td>
<td>40-50</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Leprosy Service</td>
<td>G/Leprosy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>12G/9P</td>
<td>2030</td>
<td>*Bicknell &amp; Meszoely</td>
<td>66751</td>
</tr>
</tbody>
</table>

TOTAL 19
GENERAL HOSPITALS + 1
MENTAL + 1
LEPROSY

*PHAL is now CHAL

{In 1991 Ministry and PHAL (now CHAL) hospitals surveyed bed to bed by the BU team [Queen II, (MOHSW), Scott (CHAL), Leribe (MOHSW) Qachas Nek (MOHSW) Mohotlong (CHAL)] were 24% of the country's hospitals with 41% of total beds;}

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Hospitals 10 to 12 years ago were busier with much higher average percent occupancies. From the data above, using the lowest occupancy percents for 16 hospitals reporting, we find average occupancies as shown below.

- PHAL 63%
- MOHSW 87%
- MOHSW & PHAL 77%

QE II was busy a decade or more ago and remains busy today. However the decline in MOHSW hospitals is striking and appears to be more than the decline in CHAL hospitals. The reported occupancies for all hospitals visited in February 2002 are shown below and compared to 1989-1991 data.

Comparing 1989 to 1991 data to Data collected in February of 2002 we find the following:

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Ownership</th>
<th>1989 -91</th>
<th>2002</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Joseph’s</td>
<td>CHAL</td>
<td>40%</td>
<td>&gt;50%</td>
<td>&gt;10%</td>
</tr>
<tr>
<td>Maluti</td>
<td>CHAL</td>
<td>65%</td>
<td>70%</td>
<td>5%</td>
</tr>
<tr>
<td>QE II</td>
<td>MOHSW</td>
<td>82%</td>
<td>79%</td>
<td>-3%</td>
</tr>
<tr>
<td>Mafeteng</td>
<td>MOHSW</td>
<td>96%</td>
<td>52%</td>
<td>-44%</td>
</tr>
<tr>
<td>Scott</td>
<td>CHAL</td>
<td>91%</td>
<td>42%</td>
<td>-49%</td>
</tr>
<tr>
<td>Leribe</td>
<td>MOHSW</td>
<td>122%</td>
<td>26%</td>
<td>-96%</td>
</tr>
</tbody>
</table>

QE II is, for all practical purposes, unchanged. However, when looking at all other hospitals the downward trend in utilization has clearly been most striking in MOHSW hospitals with an average occupancy decline of 36% (47% if QE II is excluded) compared to 11% for CHAL hospitals.

It is difficult to determine the actual number of beds in each hospital as criteria for counting beds appears to vary from hospital to hospital (for example, are mental observation unit beds included? TB ward beds?). A far more meaningful number is the number of staffed beds available and ready to be occupied. This number, the functional capacity, should be distinguished from the physical or built capacity. Even built capacity is an elusive number as the reported QE II physical capacity of 450 assures extreme overcrowding. The true staffed capacity of QE II is well under 400 acute beds.
Qualitatively in 2002 the inpatient care appeared to be more intense at the CHAL hospitals than at the MOHSW district hospitals. CHAL hospitals reported nurse retention as very difficult, doctor recruitment and retention very difficult and maintenance of civil works and medical equipment a problem. Nevertheless, inpatient services in each case were far more vibrant and busier than at either Mohales Hoek, Leribe or Berea. Although CHAL hospitals have slipped since 1991, they have clearly slipped less than comparable MOHSW hospitals.

We are aware that the MCDI report found lower utilization and higher per diem costs in CHAL hospitals than MOHSW District Hospitals. We are not in a position to comment on the situation at the time these occupancy rates were reported. Compared to our observations a decade ago, utilization rates have slipped in most CHAL and MOHSW district hospitals visited. During our visits, occupancies were clearly lower in the important District Hospitals at Mohales Hoek and Leribe than at Maluti. Lower occupancy at Scott may be explained by the lack of an operating X-ray machine, as well as competition from the nearby MOHSW District hospital with a lower fee structure.

One explanation of the discrepancy between our observations and those of MCDI may be that maintenance and physician staffing at Ministry District hospitals have deteriorated in the last two years. Using the resulting lower occupancy rates might produce a different result in comparative costs per bed day. We observed that the CHAL hospitals seem to have greater ability to concentrate staffing, operating fewer beds than the approved total in a way better suited to the needs of the patients present. This may result in apparently higher costs per licensed bed or per bed day, but can translate into better care and shorter lengths of stay.

6.4.9 Referrals to Bloemfontein and Other Care in South Africa

Referrals by QE II are for serious illnesses and injuries and largely appear appropriate. An unknown percentage of these referrals are patients in advanced stage of disease whose survival is not increased by referral care.

A considerable number of referrals are for cancer of the cervix. It appears these are of sufficient number and are sufficiently advanced in stage that there is need for a comprehensive cancer of the cervix program. Such a program should begin with screening, include early diagnosis and early, often curative, treatment backed up by multi-modal management of selected advanced cases. There is no reason relevant procedures, with proper training of the physicians, could not be done at the district level. Whether or not this will decrease hospitalization or overall costs is an open question. However, it will definitely help lots of women live longer.

Anecdotally, we understand there is considerable use of private practitioners for ambulatory care in some of the towns just across the border as well as use of the public
hospitals, particularly for maternity services. Bethlehem is also a destination of private, paying patients from Lesotho.

6.4.10 Data for Planning and Management

There is far less data available today at MOHSW district hospitals and at the MOHSW centrally than there was 10 years ago. This deficiency makes hospital management more difficult and seriously impedes good planning and policy making.

We found that individual medical records and patient registers are often the only reliable source of utilization data. A small amount of carefully selected data is an essential input for ongoing management, planning, program evaluation and policy analysis and formulation. This type of data is lacking. Reporting needs should be reviewed with requirements reduced to the minimum. The reason for reporting should be clear and well understood by those reporting and all data reported to higher levels should derive from data needed for operation at the hospital and health center level.

6.4.11 Filter Clinics

There is a good reason, patient convenience, for keeping the Maseru filter clinics open into the early evening. There is no reason to make an effort to keep them open as originally intended on a 24 our basis with a small number of beds. The staffing costs are too high and the services that could be afforded are too limited to avoid many admissions at QE II.

6.4.12 Leribe and Mohale's Hoek as Referral Hospitals

At present these hospitals have a minimal inpatient function. Although proximity to LHDA construction projects explains why the trauma unit is at Leribe, its resources should be transferred to QE II. The team finds neither need nor potential resources to support the development of staffing, equipment and services to elevate Leribe and Mohale's Hoek to a level approaching the QE II level. The first priority for selected district hospitals should be to function at a minimum level as discussed in Chapter 13.3. Well into the future, long after a new QE II is operational, one or two district hospitals - CHAL or MOHSW - might grow into a hospital that is intermediate between other district hospitals and the new QE II.

6.4.13 Maseru Private Hospital

This small, extremely underutilized private-for-profit hospital close to one of the Maseru industrial areas has been assessed by the architect on the BU team and he has determined that it is not suitable in terms of civil works for conversion to a clinic. It is not
needed as another hospital in Maseru and will be even more redundant as a larger and more fully equipped hospital in Ladybrand comes on line in 2 or 3 years. Maseru private is experiencing very low occupancies now and that can be expected to continue for a number of reasons noted below.

Small hospitals, public or private, particularly in urban areas, rarely succeed in any country. They face a number of problems. A small hospital by virtue of its size can only handle a limited number of patients. If the hospital serves a general audience, then the staff cannot develop expertise in the management of difficult cases. In addition, the breadth of equipment required for patient care in a private hospital with truly sick patients cannot be afforded by a small hospital. The costs of acquisition and maintenance are too high. Thus, both staff and equipment issues severely limit the potential of a small private hospital.

An alternative is to focus on a specialty. The problem with this is, unless the patients rarely if ever get seriously ill, the small hospital cannot handle complications as it is never possible to have enough physicians and nursing staff with the diversified expertise to handle all that will occur. The problem of safety can be largely avoided if the hospital limits itself to a safe category of cases such as certain types of cosmetic surgery or eye surgery and a high volume of paying patients choose the hospital. A specialized hospital of this type is unlikely to be a successful business venture in Lesotho.

Patients who can afford private care not only want good amenities they want good care. If they must choose between amenities and quality of care, patients will generally opt for quality over amenities.

A small hospital needs to have a consistent high occupancy of paying patients to meet its operating costs. Small hospitals, as is the case with Maseru Private, tend to run at low occupancies because patients perceive that better care at comparable prices is available elsewhere.

The constraints above will all remain even if South African medical aid schemes paid for services at Maseru private. And, the same would be true if the government launched its own medical aid program for government workers.

Unfortunately for the investors, Maseru Private has no realistic hope of attracting private patients in sufficient quantities to survive as a business. Because of its location, small size and the nature of its construction, it is not a facility that the team feels can be of any use to the Government. Some of the equipment, if available at an advantageous price, might be of use to MOHSW or CHAL hospitals. Otherwise the owners should be advised that the government has no need for the hospital. Specifically, Government is advised not to support this hospital in any way as this will divert already scarce resources from vital unmet needs with neither short or long term benefits to people of Lesotho.

The government will use its recurrent budget far more wisely if it supports the development of a vigorous private service in the new QE II hospital. The new QE II is a
hospital whose size, staffing and equipment can avoid the problems facing Maseru Private and can provide quality care to many private patients who would prefer care in Maseru rather than the Republic.

6.4.14 CHAL Subvention

Historically the government of Lesotho pays about 45 cents to get a maloti’s worth of service from a CHAL hospital with the balance coming from user-fees and, historically, contributions from religious groups. CHAL user fees are at a maximum, in fact they are reported to deter some people from seeking CHAL services. Donations from sponsoring groups have declined with no expectations they will recover and now hover between 0% and 5% of total revenue. Further, donations are typically earmarked and cannot be used to cover routine recurrent costs. Now, if the government wants to maintain the benefit of CHAL services, it will be essential to raise the CHAL subsidy to 60% to 70% of recurrent costs. This is still an excellent value for Government as citizens receive well accepted services at a cost 30% less than providing in MOHSW facilities.

6.4.15 District Hospital & AIDS

HIV/AIDS, with or without more and better drugs, will greatly increase the burden on all hospitals. District hospitals are well suited to the palliative care role and to the extent they work well, the load is reduced on QE II for AIDS and much other care. In our surveys at the district hospitals, inpatients with active AIDS were a larger percentage of the census than at QE II. This suggests such patients are appropriately being kept at the district level. As treatment for AIDS – even antiretroviral at a future date-becomes available, these services must quickly be disseminated to all district hospitals to prevent patients from traveling to Maseru in hopes of increasing their chances of survival.

6.5 Summary of Health System Needs

- Dramatically improve the maintenance of buildings and equipment. Immediate actions to remedy critical deficiencies are needed well as a long-term solution.
- More doctors, with more appropriate training in the districts.
- More nurses at QE II.
- Adjust compensation and benefits, in some cases substantially, for all professionals system-wide.
- Level the playing field between CHAL and MOHSW with comparable salaries and benefits and support for maintenance.
- Recognize and remedy structural weaknesses in the MOHSW management and organizational structure.
Chapter 7

Review of Existing Funding Sources

Overview

The capacity of a health care system is determined by a number of factors, including the supply and training of available personnel, the stock of health care facilities and equipment and the efficiency with which these resources are organized. But all of these factors are constrained by the amount of funding available to cover the recurrent costs of the health care system. In examining the future of an “apex” hospital in Maseru, we must consider the history and trend of funding for the health system in Lesotho.

Although there is a substantial volume of private office practice--34 registered physicians with a volume of perhaps 160,000 visits per year--the health system in Lesotho is largely a public system. With the large staffing subventions to the CHAL hospitals, even these independent institutions are heavily dependent on the ability of the Government to finance health care.

The Economy and Tax Revenue

The ability of a Government to fund any public service is constrained by the overall growth of the economy and the ability of the Government to collect tax revenue from the economic activity of the country. In general, the efficiency of tax collection increases with development. Poorer countries collect a smaller proportion of GNP (Gross National Product) as tax revenue. This may be appropriate, as a large portion of the households in such countries live at or below the poverty line, and cannot spare income from the basic needs of food and shelter. Tax collections are often indirect and regressive, placing a proportionately heavier burden on the poor. Few, if any, individuals pay significant income taxes.

Figure 7.1 shows trends in the Lesotho economy and total Government revenue over the last few years. Due to inflation, the amount of GNP and tax collections has increased. However, after removing the effects of inflation (see the lower lines in each pair), the size of the economy is not growing, and the “real” purchasing power of the Government’s revenue fell from 1998-99 to 2000-2001. If the Government were a single household, it would be forced to forego some items which it had formerly purchased because it no longer has sufficient cash to buy all of them at the inflated prices. With a slowly rising population, the “real” spending capacity of the Government, on a per capita basis, has fallen further. The reasons for this are well known. Cutbacks in the employment of Basotho miners in South Africa increased unemployment and seriously reduced the income of many households. Dam construction in the Highlands and the opening of clothing factories in the mid 1990’s somewhat offset the decline in expatriate earnings. The outlook for resurgence in mining, this traditional engine of the Lesotho economy, is not good and the pace of LHDA construction is slowing. In the medium
term, the most that can be hoped is that the inflation adjusted purchasing power of Government revenue remains constant.

Figure 7.1

The Economy and Government Revenue

![Graph showing GNP, GNP w/o inflation, Gov. Recurring Expenditure, and Gov. Expenditure w/o inflation over the years 1995/96 to 2000/01.]


Distribution of Government Funds and Other Revenue Sources

Ministries, interest groups and development priorities compete for the funds available to the Government. Figure 7.2 shows, for MOHSW, the result of this competition to fund recurring expenditures. In the five years analyzed, MOHSW received between 7% and 8% of total recurrent expenditure by the Government of Lesotho. This proportion fell over the period. Future fluctuations can be expected as acceptance of a particular Ministry priority may, in a single year, push up the proportion of Government expenditure going to health. However, a major change in political priorities would be necessary for MOHSW to see its share of expenditure rise above 7% to 7.5% of total Government expenditure. Officials from the Ministry of Planning indicate that the Government is considering some increase in the allocation to health, but that this would be focused on primary care to benefit the poor. Additional spending on primary care is thought to be a more cost effective investment of scarce Government funds.

The consultants cannot comment on such a shift in spending priorities, since the determinants are essentially political. Such a shift is not yet assured. If additional funds are restricted to primary care, this would not meet the needs of the “apex” hospital, and
might not be available to strengthen District Hospitals, although a strong argument can be made that District Hospitals (including QE II in its role as the main source of care residents of Maseru) are an essential part of the primary care system. For planning purposes, we must assume that the future will be like the past--that MOHSW will receive between 7% and 7.5% of total Government expenditure.

Tax revenues are not the only source of income potentially available to support MOHSW facilities. Health care is one of the few “public services” for which there is a charge in Lesotho. Figure 7.3 shows the recent history of user fees in Lesotho. From 1995/96 to 1999/2000, user fees collected rose from 5.3 million maloti to 7.7 million maloti. However, in the last year of the period, the collected fees increased by only 200,000 maloti, or less than 3%. This was less than the inflationary increase in prices in that year of 6.2%. In 1999/2000, user fees were 4.9% of total MOHSW expenditures, down from 5.7% of total expenditure four years earlier.

Figure 7.2

MOHSW Expense As a % of Government Recurrent Expenditure

User Fees

As presently administered, user fees are not an elastic source of revenue. That is, they do not grow as fast as demand, or total MOHSW expenditure. In part, this occurs because user fees are not adjusted for inflation. From 1990 to 2000, the consumer price increase rose by 172%. The cost of goods and services nearly tripled. It is our understanding that user fees have not been increased in this time. In addition, as discussed later, the institutions which collect user fees have no incentive to maximize the collection of these fees. They simply return the revenue collected to the Treasury. Better collection does not translate into an increased ability to purchase goods, hire staff or improve services.

In a stagnant economy with rising unemployment, freezing user fee rates can be an appropriate policy. Barriers to access for the poor are not increased. However, the purchasing power of the user fees will decrease, and an increase from tax funds must make up this loss. With the current rates, user fees (excluding those collected by CHAL facilities) generate less than one twentieth of the income received by the Government health care system.

Several arguments can be made against the charging of user fees in Government health facilities. When fees are small, the costs of collection are a substantial portion of the potential revenue. If fees are higher, an exemption mechanism is necessary to
maintain equity and access for the poor; but “needs based” exemption mechanisms are notoriously difficult to administer in a developing economy. The literature on user fees is equivocal; service utilization usually falls when new or higher user fees are introduced, but often recovers IF the quality of services is improved by the use of the revenue collected.

Although user fees are a small part of total expenditure in MOHSW, the total amount paid to all health providers by Lesotho households is not insignificant (See Table 7.1). A special survey of households in the Poverty Study was carried out by Sechaba Consultants in the winter of 2000. Of the 923 households surveyed, 253 (27%) reported spending money to obtain health care and/or drugs to treat one or more family members in the previous month. For these users, the mean expenditure for service and drugs at the most recent visit to a health provider was 31.5 Maloti; the median expenditure 10 Maloti. Even in the poorest quintile surveyed, 25% of households purchased health care and/or drugs in the previous month. For this poorest group, the mean cost at the last visit was 16 Maloti and the median 5 Maloti. For the wealthiest quintile, 31% of households purchased medical care in the previous month. The mean amount paid at the time of the last visit was 40 Maloti, but the median payment was still only 10 Maloti.

These purchases include user fees at Government and CHAL facilities, private providers, drug stores, and care obtained across the border in South Africa. The fact that median expenditures per visit fall between 5 and 10 Maloti suggest that much of the care sought is received at Ministry facilities where the patient pays the current user fee. On the other hand, the fact that the average amount paid is two to four times the median suggests that patients have an ability and willingness to pay more for health care, at least in some circumstances.

Table 7.1

<table>
<thead>
<tr>
<th>Household Income Quintile</th>
<th>% with Payment</th>
<th>Mean Payment at Last Visit</th>
<th>Median Payment at Last Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Poorest)</td>
<td>24.9%</td>
<td>16 Maloti</td>
<td>5 Maloti</td>
</tr>
<tr>
<td>2</td>
<td>30.3%</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>27.6%</td>
<td>37</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>23.3%</td>
<td>43</td>
<td>5</td>
</tr>
<tr>
<td>5 (Richest)</td>
<td>30.9%</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>Total Sample</td>
<td>27.4%</td>
<td>32</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: BUSPH Analysis of Data from 2000 Poverty Study, provided courtesy of Sechaba Consultants
There is no question that the poorest have more trouble purchasing care, and a smaller than average proportion of poor households purchased care in the month surveyed. Of all households that reported an illness in the previous month, one third reported that they did not seek medical assistance. Nevertheless, the Survey suggests that there is an ability (and willingness) amongst the top 60% of the population to pay an average of 35 to 45 Maloti per visit for care. While this is less than the typical fee in a private physician’s office, it is substantially more than the current user fee for clinic care at a Government facility. Citizens with regular employment might be willing to pay more than the current user fee in Government facilities for a convenient (perhaps after working hours) service of good quality that included essential drugs. The fact that CHAL facilities are still able to attract patients while charging amounts in excess of the current Government user fee also confirms the potential for a significant portion of the population to pay somewhat higher fees for services seen as good quality.

History of Cost and Revenues at QE II

Figure 7.4 looks at a five year history of spending and user fee collection at QE II. Over the period, total expenditure at QE II rose from 31.7 million maloti--35% of total recurrent expenditure by MOHSW--to 45.4 million maloti in 1999/2000 (down to 29% of the MOSHW total). Note that these values are actual expenditures, not budgeted amounts, which were substantially higher in some years. It is our understanding that the percent of budget actually expended has increased recently due to improvements in the financial management system. But over the period analyzed, QE II actually lost ground within total MOHSW expenditure. This may, in part, be a reflection of the difficulty of filling vacancies, buying supplies and issuing maintenance contracts in this complex organization.
Over the five years, QE II user fee collections grew slightly faster than total expenditure, from 1.5 million maloti in 1995/96 to 2.7 million maloti in 1999/2000, an increase of 71% when total spending grew by 43%. Still, at the end of this period, user fees only accounted for 6% of total expenditure at QE II.

It is instructive to compare current user fees with the cost of services at Queen II. The step-down cost analysis (see Appendix 8) estimated costs in 2000/2001 in the casualty service at 77 maloti per visit. Average outpatient clinic visits cost 59 maloti. At the satellite clinic of Qoaling the cost per visit was 33 maloti, and only 22 maloti at the Mabote clinic. The adult user fee of 10 maloti potentially covers 13% to 17% of the costs of a visit at QE II.

Inpatient services are another story. We estimated QE II inpatient costs at 244 maloti per patient day in 2000/2001. Expenditures for inpatient services at QE II were nearly 2/3 the total cost of running the facility. User fees at current levels cover a far smaller percentage of these costs.

One way of measuring the impact of available funding is to look at the inflation adjusted costs at QE II. In our previous study, we estimated the cost per inpatient day at 49 Maloti in 1990. At that time, outpatient costs were 20 maloti per visit in the QE II clinics and 36 maloti per visit in casualty. In the current study (of 2000/2001 costs), the
corresponding costs were 244, 59 and 77 maloti. Using the inflation index over the ten year period of 172%, the inflation adjusted prices comparable to 1990 are 90 maloti per patient day, 22 maloti per clinic visit, and 28 maloti per casualty visit. In real terms, expenditures per service unit have grown little for outpatient services (from 20 to 22 inflation adjusted maloti). Unit costs in the casualty service have fallen from 36 to 28 inflation adjusted maloti. Only on the inpatient service do real costs seem to have jumped substantially (from 49 to 90 maloti per patient day). In part, this is because our analysis is based on currently observed average occupancy of about 274 beds. If the hospital occupancy is really 100% of nominal bed capacity, there would be no significant increase in the real cost per patient day. In the decade since the first study, AIDS has developed as a costly and difficult to treat epidemic. Freedom in the Republic of South Africa means more direct competition for medical and nursing talent. The aging building should be receiving more maintenance expenditures. Technologies (such as the CAT scanner) have been added to the services at QE II. Payment for RSA referrals – here allocated to QE II Services – is 10% of hospital costs. Thus, some of the deterioration observed over the period can be explained by the inability to increase the real amount of funding available per unit of service.

Conclusion

In planning for the future, the lessons we draw from this funding analysis are three fold:

- Absent a confirmed change in political priorities, MOHSW cannot expect to receive an increase in tax revenue which will do more than offset the effects of inflation on current staff and supplies.

- With current fee levels and collection procedures, user fees add little to the ability of QE II to cover the incremental costs of urgent maintenance and staffing adjustments, let alone the added costs of running a new “apex” hospital.

- Data on household health expenditures suggests that, in certain segments of the population, there is some ability and willingness to pay additional user fees for quality services. With the proper protection for public health services and vulnerable populations, MOHSW could consider selectively revising user fees to cover some of the added costs of a new facility.
Chapter 8

Review of Existing Facilities:

8.1 Motebang District Hospital – Leribe

Leribe Hospital is potentially a 287 bed facility serving over 250 000 population in the district of Leribe. The breakdown of current as built accommodation is as follows:

<table>
<thead>
<tr>
<th>Accommodation</th>
<th>Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male surgical ward</td>
<td>20</td>
</tr>
<tr>
<td>Male medical ward</td>
<td>22</td>
</tr>
<tr>
<td>Female surgical ward</td>
<td>24</td>
</tr>
<tr>
<td>Female medical ward</td>
<td>24</td>
</tr>
<tr>
<td>Children’s ward</td>
<td>33</td>
</tr>
<tr>
<td>Maternity</td>
<td>43</td>
</tr>
<tr>
<td>TB wards</td>
<td>64</td>
</tr>
<tr>
<td>Mental observation unit</td>
<td>14</td>
</tr>
<tr>
<td>Operating theatre</td>
<td>1</td>
</tr>
<tr>
<td>Casualty minor theatre</td>
<td>1</td>
</tr>
<tr>
<td>X-ray department</td>
<td>1</td>
</tr>
</tbody>
</table>

The Gynecology ward was closed and no complicated deliveries were undertaken due to lack of staff.

Gross area: 5 775 m²

Current staff:

- Nursing officers: 22
- Doctors: 6
  - (LHDA Surgeons 2 and Consultants 4)
- Pharmacist: 1
- Laboratory technician: 1

Maintenance staff:

- Electricians: 2
- Plumbers: 2
- Carpenter: 1
- Student release (elec): 2

The hospital was completed in 1991 as part of the AfDB Rural Health Services Project for the Kingdom of Lesotho. It has a single-storey pavilion style layout with 2 parallel north/south circulation routes serving the wards, treatment and services blocks,
which are laid out on an east/west axis for greatest comfort by natural means in the prevailing climatic conditions.

The treatment facilities are in the centre behind the administration and between the circulation routes while female and childrens’ wards are to the east and male, trauma and casualty blocks to the west.

The TB wards are older blocks to the west of the casualty access, they are separate and are not integrated to the circulation routes.

Outpatients, consultation, MCH & dental clinic, public health administration and pharmacy are to the front west. Staff accommodation, comprising nine house blocks of varying sizes, is to the extreme east where nine self-catering lodges and rondawels are also provided for waiting mothers from remote areas.

The kitchen, laundry, stores, workshops, incinerator and mortuary are all suitably sited to the rear. The raised water storage tank is to the front at the highest part of the site for gravity flow.

The construction of the blocks are of locally made brickwork walls with colored aluminium-sheeted pitched roofs on timber trusses. Windows and door frames are steel and floors are finished in ceramic or pvc tiles appropriate to the facility use. Reconstructed stone walls are used in the administration block. The heating is by low pressure hot water serving radiators from a coal-fired central heating system. However, the boiler has not functioned for some time and many other smaller items require attention. Solar panels are provided on the roofs to supplement the hot water services.

The site has an even fall from the front/north to the back/south and this facilitates the gravity flow of soils and wastes to the treatment plant as well as the easy dispersal of surface water from the open storm drains. All water services including toilets were functioning very well.

The complex is maintained as well as the inadequate finance allows. There was no overall properly qualified technical person in charge of maintenance so no program of protective maintenance existed and the preparation of the maintenance budget was left to the hospital administrative officer.

Cleaners maintain standards internally but externally the upkeep of the gardens and site development is inadequate with grass uncut and drains not cleared.

Although some planning relationships are not ideal - casualty to the west end of the operating theatre block in the center leads to cross-circulation of inpatients with outpatients and a very circuitous route for post operation patients to surgical wards - the hospital is an attractive facility with a busy outpatients department.
The site is large enough for future expansion and the simple orderly layout lends itself easily to extensions for future services if required. Any such expansion should be carried out to the same design and construction materials as those existing.

8.2 Ntsekhe District Hospital – Mohales Hoek

Mohales Hoek Hospital is a 140 bed facility serving about 170,000 population in the district of Mohale’s Hoek. The breakdown of current as built accommodation is as follows:

Table 8.2: Accommodation and Staffing at Ntsekhe District Hospital (Mohale’s Hoek)

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male medical/surgical ward</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>Female medical/surgical ward</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>Children’s ward</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>Maternity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>TB wards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>Mental observation unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Operating theatre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Casualty minor theatre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>X-ray department</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Laboratory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

MCH clinic used daily supplying all services
No elective surgery - only emergencies because of the lack of a qualified surgeon.

Gross area                      |   |   |   |   |   |   | 4,740 m² |

Current staff:
Registered Nurses               |   |   |   |   |   |   | 17 |
Assistant nurses                |   |   |   |   |   |   | 21 |
Doctors                         |   |   |   |   |   |   | 4 - out of 5 posts |

Maintenance staff:
Electricians                    |   |   |   |   |   |   | 2 |
Plumbers                        |   |   |   |   |   |   | 1 |

The hospital was completed in 1991 as part of the AfDB Rural Health Services Project for the Kingdom of Lesotho. It has a single-story pavilion style layout with a north/south circulation route behind the administration, and serving maternity and clinical blocks off the east side and laid out on the desired east/west axis. The overall layout is functional and economic but the width restrictions of the site dictated the north/south axis of the ward blocks. The OPD and MCH are convenient to the site entrance as are the visitors’ 2 houses and 4 rondawels for waiting mothers.
The kitchen, laundry, stores, workshops, incinerator and mortuary are all suitably sited. The staff accommodation, comprising 7 house blocks of varying sizes, is to the extreme north. The raised water storage tank is at the highest part of the site for gravity flow.

The construction of the blocks are of locally made brickwork walls with coloured aluminium-sheeted pitched roofs on timber trusses. Windows and door frames are steel and floors are finished in ceramic or pvc tiles appropriate to the facility use. Reconstructed stone walls are used in the administration block. The buildings are heated by a coal-fired central heating system from a boiler but solar panels are provided on the roofs to supplement the hot water services.

The site falls about 6 meters evenly from east to west and this facilitates the gravity flow of soils and wastes to the town treatment plant as well as the easy dispersal of surface water from the open storm drains. The boiler and all water services including toilets were functioning very well.

The complex is maintained as well as the inadequate finance allows but there was no overall properly qualified technical person in charge of maintenance so no program of protective maintenance existed and the preparation of the maintenance budget was left to the hospital administrative officer.

Cleaners maintain standards internally but externally the upkeep of the gardens and site development is inadequate with grass uncut and drains not cleared.

The site is large enough for future expansion and the simple orderly layout lends itself easily for extensions for future services if required. Any such expansion should be carried out to the same design and construction materials as those existing.

8.3 QE II Hospital

QE II is located in the central area of Maseru, off the main busy Kingsway Road. The hospital of today has evolved since the first buildings of 1875 and the present facilities date from 1957. Various additions, extensions and improvements have been undertaken since that date, largely on the basis of short-term need and limited resources. However, the buildings have not been adequately maintained over the years so that the present facilities are in urgent need of renewal.

At present, 2.3 million Maloti are being spent on essential refurbishment of the outpatients, casualty, stores and 3 ward blocks.

The hospital has 450 beds serving a population of over 400 000 in Maseru District and the breakdown of the designed accommodation is as follows:
Table 8.3: Accommodation and Staffing at QE II Hospital

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical patients</td>
<td>41</td>
<td>37</td>
</tr>
<tr>
<td>Surgical</td>
<td>38</td>
<td>28</td>
</tr>
<tr>
<td>Children</td>
<td>76</td>
<td>80</td>
</tr>
<tr>
<td>Private patients</td>
<td>22</td>
<td>25</td>
</tr>
<tr>
<td>Ophthalmic</td>
<td>40</td>
<td>23</td>
</tr>
<tr>
<td>Gynecology</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Operating theatres</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Total staff</td>
<td>178</td>
<td>99</td>
</tr>
<tr>
<td>Administration</td>
<td>35</td>
<td>12</td>
</tr>
<tr>
<td>Physio/Orthopedic</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>Pharmaceutical</td>
<td>26</td>
<td>2</td>
</tr>
<tr>
<td>Maintenance/Repair</td>
<td>308</td>
<td></td>
</tr>
<tr>
<td>Dental</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>X-ray includes c/s</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The 1957 hospital was planned as a single-story pavilion style layout. It has a central north/south circulation route with wards and treatment areas off this route with buildings planned on the desired east/west axis for maximum comfort. However, the layout did not anticipate the expansion that was to evolve since that time and some departments now lack sufficient functional space for service delivery.

The outpatients, casualty, x-ray, pharmacy, MCH and stores are to the front, accessed directly from the busy Kingsway Road. Older buildings in the center of the site were retained for laboratory and offices. The service blocks are to the back and further wards and clinical units were added later, presumably in the only spaces available at the time.

The result of the ad hoc building works over the years is that the present hospital is no longer of a suitable design to serve the health services needs of the growing Maseru or the referral necessities of Lesotho. There is overcrowding in some departments and the lack of preventive maintenance of buildings, site works and equipment has led to an ineffective utilisation of equipment and services. The basic site zoning pattern too is now contrary to the principles of proper hospital planning - the clinical areas of x-ray, operating theatres and maternity are split and spread throughout the hospital as are the service areas.

The result is a serious cross-circulation of both inpatients and outpatients and of deliveries and services, thereby exposing patients to cross infections and spread of disease. This factor together with the multiple public access points, with no logical movement patterns, makes patient management virtually impossible and results in management inefficiencies and poor staff working conditions.
The present physical status of the hospital is also inconsistent with the urban planning and development requirements for the emerging Capital. The hospital lacks organized vehicle parking space. The design and layout are contrary to current planning and development policies and the building standards too are inconsistent with the newer surrounding developments. Already, the smaller of the 2 contiguous sites, currently serving non-hospital functions (such as the 3-story MOHSW office block) are listed for clearance to make way for the expanding shopping and office use.

The MOHSW is to be relocated on Government land in the Stadium Area. In this context, the present hospital site use is inefficient and access from the busy Kingsway Road is undesirable and unnecessary. The site coverage is too high, open space is inadequate and an orderly external circulation and parking arrangement, sufficient for patients, staff, ambulances, deliveries and services is urgently required.

Previous reports have been undertaken in the 1980s and 1990s which concluded that the present QE II site should continue as an integrated district and referral hospital.

The terms of reference for this study seek a clear recommendation on the possible separation and rationalisation of the referral and district hospital functions and the future status of the existing QE II facility.
Chapter 9

Facility Options

The team considered the following Options:

1. Renovate the existing QE II hospital.
2. Rebuild a new QE II on the existing QE II site.
3. Build a single replacement facility at the Botsabelo site.
4. Build a new QE II at the Botsabelo site and a new district hospital in downtown Maseru.
5. Build a new QE II at the Botsabelo site and a new large clinic in downtown Maseru.

The team also briefly reviewed two previous suggestions to reduce the workload on the “apex” hospital in Maseru.

1. Use of the filter clinics for low intensity inpatient cases.
2. Upgrading of Leribe and Mohales Hoek Hospitals to “regional referral” status.

9.1 Renovate the Existing Hospital

The architect’s analysis in the preceding chapter concludes that the existing facility cannot be renovated into an acceptable hospital.

9.2 Rebuild on the QE II Site

If the present QE II site is to continue to fulfill the dual referral and district functions, a major redesign of the site layout and facilities will be required. In this context, the report of Jeff Stacey and Associates (Draft 1995, Final Report 1997) would be a competent basis for such a brief. Their analysis drawings A, B, and C attached, of the Hospital, Service and Spatial Hierarchies are helpful arrangements for such an architectural solution. They recommended the building of a new hospital on the current site, while maintaining all services during the construction period. They suggested a solution of facilities up to 3-storys. All access would be from the Hill Road and the architectural form would recognize the urban planning needs in the scale and elevation of the buildings facing the Kingsway Road.

We rejected this option for several reasons. The site is too restricted in area for the desired new facility to serve the current needs adequately. There is no space to allow for a desired 30% expansion for the future needs of the emerging Maseru. This is particularly true since a high proportion of hospital staff should also be housed on the site. Building of a new hospital on the current site, while continuing to maintain the present services, is unrealistic. The phasing of such a development would be extremely
difficult and the site restrictions on a contractor would add very considerably to the overall construction time and costs. The extra costs would amount to at least an additional 20-25%.
9.3 Build a single replacement facility at the Botsabelo site.

All of the functions of the current QE II would be moved to the new site at Botsabelo. This would be a good choice. The site is spacious with ample room for all facilities and future expansion as well as the provision of staff housing. It is convenient to the National Health Training School, the newly rebuilt mental hospital, the leprosarium and the military hospital.

This solution minimizes disruption as the new hospital could be fully finished, equipped and functional before moving from the old. It would end over 100 years of a health tradition associated with the present site.

One drawback to this option is the extremely large volume of outpatient traffic created. In addition, the existing site--located on major transport routes--is more convenient to many people, and located nearer to large centers of employment.

9.4 Build a new QE II at the Botsabelo site and a new district hospital in downtown Maseru.

Two hospitals is a bad choice. This option would split resources and duplicate many services. Patients would be reluctant to use the lesser hospital with a better alternative so close. Not allowing people to go to the hospital they see as better is unrealistic. This option would undermine the effort to strengthen the CHAL and MOHSHW hospitals at the fringe of Maseru (Mafeteng, Scott, St Joseph, and Berea) that could take some of the strain off of the new “apex” hospital. Building a new downtown hospital would add both capital and recurring costs (compared to a similar number of beds in one facility) and could divert funds from more modest investments in the four existing hospitals serving patients at the fringe of the Maseru District.

9.5 Build a new QE II at the Botsabelo site and a new large clinic in downtown Maseru.

This is a very desirable option, particularly if the clinic is built to come on line just before the old QE II closes and moves to Botsabelo. The burden on the QE II hospital clinics at Botsabelo will be reduced, a convenient site for those who work or live near the downtown area will be provided. Late afternoon and evening services can be offered here for a higher price, increasing revenues and rationalizing use. If built, it is most desirable for such a clinic to be operated as a satellite of QE II, with QE II physicians staffing the clinic for follow-up and other services arranged by the various specialties at QE II. The clinic should be designed so that it is attractive to private as well as public patients, as some private patients will find their follow-up to be more convenient downtown.
This option also permits the Government to release some of the current QE II site for other development. If the existing site is used, the clinic could be placed on the back half of the site, with access from the Hill Road. The front half can be redeveloped after the new Botsabelo hospital is opened. Our preliminary inquiries with the planning authorities failed to locate an alternative site for a clinic of the required size in the downtown area, so it most likely must be located on the existing site.

9.6 Other options for diverting patients from the “apex” hospital.

The filter clinics serve an important primary care function in the residential districts where they are located. However, attempting to operate the inpatient facilities at these sites will add cost with little benefit. Staff for 24 hour inpatient operation were never budgeted, and doctors are apparently not willing to live at the site. Small inpatient facilities make sense in isolated rural areas. In cities, patients seek the full service hospitals which are available. Without casualty, a maternity service which can perform C-sections, or X-rays, labs and operating theatres, beds in the filter clinics will not meet the needs of most patients who must be hospitalized. Staffing such facilities 24 hours a day is expensive. Until the inpatient load on a new “apex” hospital reaches the limits of effective management (500-600 beds), running a second inpatient facility near central Maseru will not be cost effective. If the need for beds should ever exceed the estimates for 2026 in this report, then a second hospital of 200 or so beds might be considered.

Chapter 6 outlines the deficiencies in the operation of the District Hospital system. Leribe and Mohales Hoek cannot now perform some of the functions expected of full service District Hospitals. With limited ability to hire specialists and maintain equipment, Lesotho cannot afford to offer more than the four basic services (pediatrics, obstetrics, medicine and surgery) at any facility other than the “apex” hospital in Maseru. In addition, the caseload at Leribe and Mohales Hoek would probably be insufficient for a specialist to maintain his/her skills. Our analysis of inpatients at QE II shows that only 12% traveled two hours or more for care. Some of these will continue to come to QE II because of its specialized facilities, so an expensive (and likely unfeasible) upgrade beyond District status at Leribe and Mohales Hoek would gain little in terms of reduced patient load at the apex hospital in Maseru.
Chapter 10
Projecting Bed Capacity

10.1 Overview of Methodology

To project the beds needed to meet demand for inpatient services, the analyst must take into account:

- Projected levels of population in the service area, including important shifts in the age structure of the population.

- Actual and appropriate overall levels of admission, occupancy and length of stay.

- Adjustments for referrals in and out of the service area, including patients sent to the Republic of South Africa for tertiary care.

- Services provided by potentially “competing” providers, that is, hospital facilities which may, depending on the cost of services and transportation, be alternative care sites for some of the population in the service area. This includes the treatment of psychiatric patients in a special mental hospital.

- Changes in the burden of disease. For the purpose of this analysis, the rapidly growing burden of HIV/AIDS is the most important shift, and it will increase the demand for inpatient services. Even if antiretroviral therapy increases the life expectancy of HIV patients, the larger number of survivors means that the amount of required hospital care is not necessarily decreased. All certainly hope that health education changes behavior and reduces the burden of HIV/AIDS in the long term. However, Basotho who have already contracted HIV today will be dying and creating the burden of AIDS care in the first years of operation for any new hospital in Maseru.

- Improvements in medical technology and management. This can work both ways--to increase or decrease the demand for beds. New drugs and treatment techniques can reduce the length of hospital stay. On the other hand, new procedures may prolong patient life and offer the ability to restore physical function--but only through additional surgery or hospital care. A classic example is dialysis, a hospital based procedure which extends the life of patients who would otherwise die of renal failure, creating an escalating cumulative demand for the service as the number of survivors grows.
10.2 Population

After the 1996 Census, projections were developed for the Lesotho population out to 2026, thirty years after the Census date. The projections corrected for some undercounting of young children, then assumed a modest further increase (3 years) in life expectancy over the projection period, and a slow decrease in total fertility. These projections show the total “de jure” population of Lesotho growing from 1,968,342 in 1996 to 3,568,535 in 2026.

The analysts who developed these projections also anticipated that the urban and lowland areas along the border with the Republic of South Africa would continue to receive internal migrants, as they have done in the recent past. Isolated areas of the country would continue to experience outmigration. As a result, the share of the population living in the western lowlands, and particularly in the district of Maseru, would grow as a percentage of the total population. The growth of Maseru’s share in the total national population is shown below:

Table 10.1: Projected Growth of Maseru’s Share in the National Population

<table>
<thead>
<tr>
<th>Year</th>
<th>Maseru District Population as a Percentage of National</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>20.9%</td>
</tr>
<tr>
<td>2001</td>
<td>22.2%</td>
</tr>
<tr>
<td>2006</td>
<td>22.8%</td>
</tr>
<tr>
<td>2011</td>
<td>23.5%</td>
</tr>
<tr>
<td>2016</td>
<td>24.1%</td>
</tr>
<tr>
<td>2021</td>
<td>24.4%</td>
</tr>
<tr>
<td>2026</td>
<td>24.7%</td>
</tr>
</tbody>
</table>


Unfortunately, these projections of total population growth did not take into account the mortality from HIV/AIDS, which was just beginning to appear at the time of the Census. In every country in southern Africa with a severe AIDS epidemic, life expectancy is falling dramatically, often from near 60 to 40 years, and sometimes even lower. Lesotho life expectancy at birth in 1996 was 58.6 years for males and 60.2 years for females. The levels of population forecast in the original projections from the 1996 census will not be reached. (See Figure 10.1)
Figure 10.1

Population of Lesotho


As part of its effort to project population growth around the world, the US Census Bureau prepared a set of projections of total population (broken down by age and sex) for Lesotho which take into account the pattern of AIDS related mortality which has been observed elsewhere in Southern Africa. The total projected population is shown in Table 10.2, contrasted with the original estimates by the Lesotho Bureau of Statistics.
Table 10.2: Comparison of Two Populations Projections for Lesotho

<table>
<thead>
<tr>
<th>Year</th>
<th>US Census Bureau Projections for Lesotho With expected AIDS Mortality</th>
<th>Lesotho Bureau of Statistics Projections</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>2,177,062</td>
<td>2,188,869</td>
</tr>
<tr>
<td>2006</td>
<td>2,298,735</td>
<td>2,447,662</td>
</tr>
<tr>
<td>2011</td>
<td>2,342,735</td>
<td>2,735,906</td>
</tr>
<tr>
<td>2016</td>
<td>2,362,546</td>
<td>3,038,101</td>
</tr>
<tr>
<td>2021</td>
<td>2,387,261</td>
<td>3,337,696</td>
</tr>
<tr>
<td>2026</td>
<td>2,422,369</td>
<td>3,626,602</td>
</tr>
<tr>
<td>2050</td>
<td>2,849,325</td>
<td></td>
</tr>
</tbody>
</table>


By 2026, the total national population is 33% smaller as a result of this change in projection techniques. Even in 2050, the country does not reach the total population once projected for 2026.

The age structure of the population will also be very different as a result of the HIV/AIDS epidemic. Most AIDS victims will die of their disease before 45-50, the age at which rapid escalation of medical need due to chronic disease (cardiac, cancer, diabetes, etc) begins. The cohort of people in the middle years is cut drastically by the AIDS epidemic. In 2026, the population aged 40-49 will be only 41% of the number projected without AIDS mortality. As they die, these individuals will have much higher medical needs, and costs, than most people under 50. They will shift the burden of disease and hospitalization to a lower age group. The smaller number surviving beyond 49 will reduce the amount of hospital usage for the chronic diseases of aging. In 2026, the percentage of the population 50 and over will be only 11.6% of the total. This is only a small increase from the proportion of 10.9% recorded in 1996, and well below the projection of 13.6% for 2026 made by the Lesotho Bureau of Statistics. Figure 10.2 shows the change in the age distribution of the population.
Figure 10.2

Change in the Age Structure

International Database, International Programs Center
To illustrate this shift, Table 10.3 displays the age profiles for the country for both sets of population projections in 2025.

Table 10.3: Comparison of Two Projected Age Profiles for Lesotho in 2025

<table>
<thead>
<tr>
<th></th>
<th>US Census Bureau</th>
<th>Lesotho Bureau of Statistics (projected from 1996 Census)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2025</td>
<td>2025</td>
</tr>
<tr>
<td></td>
<td>Both Sexes</td>
<td>Male</td>
</tr>
<tr>
<td>Total, all ages</td>
<td>2,414,442</td>
<td>1,176,624</td>
</tr>
<tr>
<td>0-4</td>
<td>268,564</td>
<td>135,742</td>
</tr>
<tr>
<td>5-9</td>
<td>263,241</td>
<td>132,843</td>
</tr>
<tr>
<td>10-14</td>
<td>265,619</td>
<td>133,841</td>
</tr>
<tr>
<td>15-19</td>
<td>270,155</td>
<td>136,103</td>
</tr>
<tr>
<td>20-24</td>
<td>266,086</td>
<td>133,974</td>
</tr>
<tr>
<td>25-29</td>
<td>236,449</td>
<td>118,272</td>
</tr>
<tr>
<td>30-34</td>
<td>187,167</td>
<td>92,237</td>
</tr>
<tr>
<td>35-39</td>
<td>137,422</td>
<td>66,394</td>
</tr>
<tr>
<td>40-44</td>
<td>99,638</td>
<td>47,571</td>
</tr>
<tr>
<td>45-49</td>
<td>77,321</td>
<td>36,642</td>
</tr>
<tr>
<td>50-54</td>
<td>63,486</td>
<td>29,593</td>
</tr>
<tr>
<td>55-59</td>
<td>61,501</td>
<td>27,756</td>
</tr>
<tr>
<td>60-64</td>
<td>61,320</td>
<td>26,305</td>
</tr>
<tr>
<td>65-69</td>
<td>54,045</td>
<td>21,789</td>
</tr>
<tr>
<td>70-74</td>
<td>42,639</td>
<td>16,203</td>
</tr>
<tr>
<td>75-79</td>
<td>31,149</td>
<td>11,427</td>
</tr>
<tr>
<td>80+</td>
<td>28,640</td>
<td>9,932</td>
</tr>
</tbody>
</table>


The economic factors which motivate internal migration to the lowlands and urban areas will not be changed greatly by AIDS. It is possible that some AIDS victims will go home to families in rural villages who will care for them as they die. We observed a higher percentage of active AIDS patients in the district hospitals than at QE II.

On the other hand, greater availability of treatment may draw HIV victims to Maseru and its surroundings. In fact, one clear lesson from study of the population projections and the burden of HIV/AIDS is that the Ministry of Health must design any treatment strategy (nevarapine, treatment for opportunistic infections, even antiretrovirals) so that it reaches District Hospitals and major primary care facilities.
throughout the heavily populated areas of the country. If HIV/AIDS services are concentrated only at an “apex” hospital in Maseru, this will attract additional numbers of patients who might have been treated closer to home.

To reflect the expected internal migration, we have used the changing proportions of population in each District projected by the Lesotho Bureau of Statistics in the original population estimates after the 1996 Census. These percentages have been applied to the total national population projections prepared by the US Bureau of the Census. The results are shown below for Maseru District. The total population of Maseru District grows by 23.7% between 2001 and 2026, but is still only two thirds of the population that could be expected in Maseru District without the plague of HIV. The values below are used in our projection of basic bed need for the Maseru District.

Table 10.4: Projected Population of Maseru District

<table>
<thead>
<tr>
<th>Year</th>
<th>Population of Maseru District</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>438,308</td>
</tr>
<tr>
<td>2006</td>
<td>524,112</td>
</tr>
<tr>
<td>2011</td>
<td>550,526</td>
</tr>
<tr>
<td>2016</td>
<td>569,374</td>
</tr>
<tr>
<td>2021</td>
<td>582,492</td>
</tr>
<tr>
<td>2026</td>
<td>598,325</td>
</tr>
</tbody>
</table>

10.3 Hospital Admissions, Utilization and Capacity

What normative value should be used for projection of future bed requirements? The current number of beds in the country (including QE II) is about 1 per thousand population. Some facilities do not have enough staff (or funds) to operate all of the formally recognized beds. As noted in the MCDI report, occupancy as a percentage of approved bed capacity is low in many District Hospitals, and has been quite high at QE II. However, the lack of patients does not mean a lack of need (See Chapter 6). The apparent low occupancy in some facilities should not be taken, per se, as an indication that Lesotho has too many beds.

As MCDI points out, the formal data on the number of admissions and outpatient visits nationwide is not reliable. For the most recent complete year available (1998), the reports indicate approximately 36,089 admissions nationwide, or about 1.7 admissions per 100 population. This suggests that the average citizen of Lesotho will be admitted to the hospital only once in his lifetime. However, these reports only identify 12,024 hospital deliveries, while women interviewed in other studies suggest that 44% of the 60,000 to 70,000 births per year in Lesotho occur in hospital. That suggests about 29,000 in-hospital deliveries. One number or the other is wrong. We suspect that the official national statistics undercount the actual number of admissions.
The nominal planning standard cited by MCDI, and apparently used as a guideline by the Government, is 0.9 beds per 1,000. With an average length of stay of 10 days, and 85% occupancy, such a norm would permit about 2.8 admissions per 100 persons, or a total of 61,000 admissions with the current population of approximately 2.2 million. With a seven day average length of stay (possible where a large portion of admissions are for delivery or infectious disease), admission rates could rise to 4 per 100 with 85% occupancy, or about 88,000 admissions per year.

Eighty five percent occupancy would be a very desirable and highly efficient level of operation, hard to achieve on a nationwide basis and allow for seasonal and regional fluctuations in disease incidence. An admission rate of 2.8 per 100, and bed usage of 280 bed days per 1,000 population is probably below the rate at which patients should be admitted to well staffed and fully funded hospitals in developing countries.

Put briefly, a planning standard of 0.9 beds per 1,000 makes sense in the light of CURRENT utilization patterns and resource scarcity. However, it does not take into account the developing AIDS epidemic and associated cases of tuberculosis. The standard will need to be increased when there is a greater willingness to seek and ability to pay for care, or if there were to be a concerted campaign to get all babies delivered in hospital. As a starting point for our analysis, we use the 0.9 bed per 1,000 standard to make a preliminary calculation of total bed need for the population in Maseru District.

<table>
<thead>
<tr>
<th>Year</th>
<th>District Population</th>
<th>Total Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>438,308</td>
<td>435</td>
</tr>
<tr>
<td>2006</td>
<td>524,112</td>
<td>472</td>
</tr>
<tr>
<td>2011</td>
<td>550,526</td>
<td>495</td>
</tr>
<tr>
<td>2016</td>
<td>569,374</td>
<td>512</td>
</tr>
<tr>
<td>2021</td>
<td>582,492</td>
<td>524</td>
</tr>
<tr>
<td>2026</td>
<td>598,325</td>
<td>538</td>
</tr>
</tbody>
</table>

10.4.1 Referrals----to South Africa

The question of referrals for tertiary care is more difficult. As discussed in Chapters 5 and 6, most of the referrals to South Africa are medically appropriate; that is, they are referred for care not available at QE II. To “repatriate” these patients for similar care would require major additional expenditures for equipment and staff, and would generally result in specialty services which run at far lower volumes than are appropriate for good quality care. Over time, certain surgical cases might no longer be referred, particularly if the new hospital develops and maintains a good ICU. It may be possible to surgically treat cervical cancers (the most common single type of referral case), but these
would still be sent to the RSA for radiation therapy. A new facility might be built with space for a radiation therapy machine, which could later be added if budget permits and an affiliation agreement can be negotiated for South African specialists to manage the part time use of such a machine. In addition, creation of an ICU would enable QE II to retain some trauma cases now sent to the Republic.

The 4,819 days of inpatient care noted in the referral analysis would account for about 16 beds in the RSA. Allowance must be made for certain large claims which did not show dates of admission and discharge, and for unpaid claims not included in the sample. Our best guess is that all MOHSW referrals might account for 8,000 to 10,000 inpatient days per year, or 30-35 beds at 85% occupancy.

How should the Maseru bed need estimates be adjusted to reflect this use of South African Hospitals? The 0.9/1,000 bed need standard is very low, even in comparison to other southern African countries, and it does not anticipate any tertiary care. To the extent that cases are “brought back” from South Africa and treated at a Maseru Central Hospital, the beds required should be added to the complement. However, as discussed in the referral section, we do not anticipate a wholesale switch of patients back to Maseru. Terminal patients not sent to Bloemfontein with a tighter referral policy can receive palliative care at district hospitals. The proposed ICU does not count in the bed totals, so trauma patients treated in Maseru ICU will not "use up" any of the available bed complement. The ability to treat cancer patients in Maseru can be monitored and factored into a decision to add beds to the complement initially built. For these reasons, we have indicated no beds for “repatriated referrals” at the date of hospital opening, and 10 additional beds by 2026 as services develop.

Costs incurred for RSA referrals already appear to exceed amounts budgeted. It may be that MOHSW can afford no referrals to the RSA if it is to prevent further deterioration of the health system in the country. Or South Africa might refuse further referrals if claims are not paid. Additional patients might then be retained at QE II. However, many may be sent home or back to District Hospitals to die if they cannot be treated. Others will be forced to live with a correctable disability, but will not necessarily become inpatients. We have not attempted to quantify the number of additional beds required in such a “no RSA referral” scenario.

10.4.2 Referrals---to the “Apex” National Hospital

During the inpatient survey, approximately 50 patients were identified that appeared to be appropriately referred from the districts to an “apex” hospital. To arrive at this number, we looked at the patients who traveled over an hour by vehicle. We excluded maternity and TB/AIDS cases, as these should be cared for at District hospitals which are properly staffed and maintained. A few of these patients may have been sent for diagnostic procedures or surgeries which could be performed at fully functioning District hospitals; the distinctions in our survey data base are not fine enough to determine this. Offsetting this number are referrals that would benefit from the services
at QE II but are not now identified due to inadequate physician staffing and training at the District level. We therefore use the estimate of 50 beds as the capacity required for national referrals to the “apex hospital” in the near future.

Over time, we can expect the demand for referrals to grow, particularly if there is some growth in per capita incomes. Demand for referral care will clearly grow if a Medical Aid scheme makes such care affordable for more Basotho. Higher levels of education, and resulting sophistication about medical care options, will also lead to a demand for referral care. The modest population growth projected for the country, and the slight aging of the population, will also contribute to increased referral demand. We have estimated 70 beds for internal referrals by 2026. Before these beds are added, the Government can recalibrate these estimates based on available funding, the use of South African hospitals for private referrals, and any change in the need for beds to accommodate AIDS patients.

10.5.1 Other Sources of Care-----Hospitals on the Fringe of Maseru

The patient origin studies (Chapter 4) show that a substantial number of inpatients travel by vehicle for one half to one and one half hours to reach QE II. Many of these patients likely travel past, or live near to, hospitals situated on the fringe of the Maseru District or a few kilometers across the District boundary. Some of these patients can be accommodated at local District Hospitals that are properly staffed, equipped and maintained. While underutilized, hospitals such as Scott and St. Joseph’s already meet a portion of this need. But some patients living at the Maseru fringe now take a taxi (paying five rand or so each way) into Maseru. There, user fees at QE II are fixed and well known. The CHAL facilities at the fringe are forced to collect additional amounts for drugs and tests. A decision to increase the CHAL subvention and reduce the difference in fees between MOHSW and CHAL facilities would further encourage the use of hospitals at the periphery of the Maseru District. We estimate that approximately one third the population of Maseru District--those living furthest from the City center--are using, or could be encouraged by fee and staffing changes, to use these hospitals. The projected bed supply is reduced by 156 in 2006 and 178 in 2026 to reflect this.

One other factor that can relieve pressure for hospital admissions in Maseru is the policy of the Republic of South Africa which enables some citizens of Lesotho to avail themselves of public care at facilities in Ladybrand and elsewhere across the border. Before democracy in South Africa, it would have been difficult for a Lesotho citizen to receive service in a government clinic in the RSA without a work or residency permit. Now primary care services are free and patients are not asked for identification. A Basotho can say that he lives in the community and will be treated in the RSA. The patient may even be sent up the South African referral chain for required care. The Orange Free State Health Department is planning a new hospital in Ladybrand, with opening scheduled for 2005. Plans call for this facility to have a private wing as well. Unless South African policies change, it is likely that the RSA facilities along the border will continue to meet some of the need for care of Lesotho citizens. This gives us greater
comfort in saying that 1/3 of projected hospitalizations can be accommodated by hospitals other than QE II.

10.5.2 Other Sources of Care----Mental Health

There is one service already available in Maseru and housed in a recently renovated facility. This is psychiatry. In general, 5% to 10% of hospitalized patients can be expected to display psychiatric symptoms.

The MOHSW has recently established Observation Units for mental patients in district hospitals. The recent Lesotho Health study suggests integrating psychiatric inpatient care into QE II as well. Location of mental observation and treatment wards (MOTU’s) in district hospitals makes sense because there is no alternative mental health facility at these locations, and the MOTU can take advantage of the support services of the District Hospital. However, we anticipate that a new central hospital in Maseru would NOT develop a dedicated psychiatric service, and mental patients will be seen directly at Mohlomi Hospital. Any psychiatric patient arriving in the OPD at a new central hospital can easily be transferred to the mental hospital, since it is located next to the most likely site. Psychiatrists at Mohlomi can easily consult with patients hospitalized for medical reasons at the new acute hospital nearby.

Where a multipurpose medical facility has underutilized beds, it makes sense to co-locate a psychiatric inpatient unit. Where a new facility is being built, and a recently renovated mental facility is located very nearby, it is not economic to build additional beds for psychiatry in the new facility, which will have higher overhead and construction costs. The need for beds in a new central facility will be reduced by approximately 8% (one 40 bed ward) by using the Mohlomi Hospital. If the Ministry should follow the recommendation to integrate inpatient psychiatric services at a facility replacing QE II, the plan, construction and operating budgets must be expanded to cover these additional beds. We recommend against including psychiatric beds in any facility replacing the existing QE II hospital.

10.6 Changing Burden of Disease-----HIV/AIDS

There is no doubt that HIV/AIDS will add to the burden of inpatient care. Studies in Zambia, Zimbabwe and South Africa (at earlier phases of the epidemic) found rates of HIV infection varying from 30% to 60% of inpatients. In our review of inpatient care at QE II, we found that 16% (38) of the patients reviewed showed evidence of active AIDS and/or had AIDS noted as a diagnosis on the chart. There is a substantial but unknown number of additional patients who are HIV positive but have not yet developed AIDS and were being treated at QE II for other conditions. Because of the limited amount of HIV testing performed, we cannot estimate the number of such patients. It is undoubtedly similar to the percentages noted in studies conducted in other countries where the epidemic is active. Mother to child transmission of HIV is already a pressing problem.
On the pediatric service, we counted 13 patients with AIDS, often combined with tuberculosis.

Because so many Basotho are already infected with HIV, the burden is growing, and will grow further until the epidemic stabilizes or starts to recede. Even if prevention strategies become effective in the near future, the number of individuals who come down with active AIDS each year will increase through 2010.

To estimate this increment in bed need caused by the AIDS epidemic, we must estimate two factors:

- the number of patients with active AIDS. This requires extrapolation from data on current seroprevalence, transmission efficiency, the period between exposure and the development of active disease, and the survival period once active AIDS develops.

- the amount of services required by patients with active AIDS.

In our analysis, we only consider the treatment of opportunistic infections associated with HIV/AIDS, and not treatment of the underlying disease. Treatment to reduce mother to child transmission (nevarapine) may be available relatively soon, and may decrease the burden on pediatric services. It is harder to project the overall burden on the health system if antiretroviral therapy becomes available. If AIDS becomes a manageable chronic disease, patients may live longer but require more admissions during the additional years they survive.

In 1999, Lesotho reported an adult seroprevalance rate for HIV of 23.6%, higher than South Africa’s reported rate at the time of 19.9%. A report prepared for the IMF in 2001 (Hacker, M., “Providing Patient Care in Southern Africa) estimated the number of AIDS deaths in Lesotho in 1999 at 16,000, almost 1% of the population. WHO projections of the burden of active AIDS are somewhat lower, estimating 10,000 cases and 5,000 deaths in 1999. By 2005, when a new hospital in Maseru could be nearing completion, the WHO model (used by MCDI in the CHAL study) projects 17,260 active AIDS cases and 7,700 deaths nationwide. A World Bank report prepared in 2000 (Lesotho; the Development Impact of HIV/AIDS: Selected Issues and Options, October 18, 2000) estimates 10,148 AIDS deaths in Lesotho in 2001, 19,178 in 2006 and 44,062 in 2015. Thus, there is a range of estimates on the burden of AIDS from which to choose in projecting bed need. We have elected to pursue a middle road closer to the pessimistic (World Bank) projections. We assume there will be 15,000 AIDS deaths nationwide in 2006, rising to 35,000 in 2015, after which the number would be relatively stable. We also assume that a patient will live for two years after the onset of active AIDS, so the number of cases requiring care would be twice the number of annual deaths---30,000
cases in 2006 and 70,000 in 2015 nationwide. Maseru will have just less than 25% of the national population in this period, and will certainly attract patients for care. Therefore, we assume that a quarter of the national cases will seek treatment in Maseru. That means 7,500 AIDS cases in the Maseru service area in 2006 and 17,500 in 2015.

What increment in hospital demand will be created by these cases? A number of sources, including a study of AIDS cases at QE II, suggest an average hospital stay of 10 days for AIDS patients. A recently published study from Kenyatta National Hospital in Nairobi also showed typical length of stay for AIDS patients of 9.5 to 10 days.(Gilks, A. et al, “The Changing Impact of HIV/AIDS on Kenyatta National Hospital from 1998/99 through 1992 to 1997,” AIDS, Volume 14, #11). Data on the number of hospital admissions during the active (and terminal) phase of AIDS is variable, but suggests at least one admission per year for the one to two years that the patient can survive active AIDS. A World Bank study in 1997 of the expected cost of AIDS care estimated that an AIDS patient in sub-Saharan Africa will use up to 30 days of inpatient care per year during the acute phase of the disease. (Confronting AIDS: Public Priorities in a Global Epidemic, World Bank Policy Report, Oxford University Press, 1997, Ch. 4) However, the above referenced article on Kenyatta Hospital and an article by Floyd, Gilks and others (“Admission Trends in a Rural South African Hospital During the Early Years of the HIV Epidemic,” JAMA, Vo.282, No. 11, 1999) suggest that the 1997 World Bank report may overestimate AIDS related hospital use. The South African study found that adult TB admissions in one hospital in Kwa Zulu/Natal rose from 5% to 11% of total hospital admission from 1991 to 1998. An additional 4% of admissions in 1998 were explained by adults with AIDS without TB.

We therefore apply a conservative assumption of one admission per year (10 day length of stay) to the projected Maseru AIDS caseload. Using this estimate, we project 75,000 AIDS related hospital days for Maseru District in 2006 and 175,000 in 2015. At 85% occupancy, this will require 242 beds in 2006 and 564 beds in 2015. This is in addition to the burden of disease assumed in the 0.9 bed per thousand standard, and increases the total projected number of beds by this amount.

Of course, some of the AIDS patients would have required hospital care in any case due to other diseases. But this offset is relatively low, only 1.9 admissions per 100 Basotho were reported in 1998. Even allowing for underreporting of admissions, most of the burden of AIDS will be incremental to the pre-existing burden of disease in the population. The number of incremental beds required will be similar to these projections if the assumptions are correct.

Of course, not every patient will be able to afford, or will seek treatment. At the moment, many patients are sent home from QE II to die when it appears that continued treatment will have little benefit. As observed earlier, some of this need can be served by hospitals at the periphery of Maseru (Scott, Roma, TY, etc.). We estimate that 33% of Maseru District bed need for AIDS care can be met by these peripheral hospitals---but only if they are properly staffed, maintained and equipped and well managed. If, in addition, 1/3 of the AIDS sufferers who would use QE II do not seek care for economic
or cultural reasons, the incremental number of beds required due to the AIDS epidemic at a central facility in Maseru would be in the range of 109 in 2006 (242 X .67 X .67) and 253 in 2015 (564 X .676 X .67).

As a check on our estimates, we return to the international agency estimates of the current AIDS caseload in Lesotho. The World Bank projected 10,148 deaths from AIDS in 2001, or about 20,000 active AIDS cases. WHO projected 10,000 AIDS cases in 1999 and 17,260 in 2005. Linear extrapolation between the WHO estimates suggests 12,400 AIDS cases nationwide in 2001. Using the above assumptions about frequency and length of hospital stay, non-treatment and use of facilities at the Maseru fringe, the WHO projected caseload suggests an average 38 AIDS patients in QE II each day in early 2002. The World Bank projected caseload suggests 61 AIDS inpatients on an average day. We observed 38 in QE II during our survey.

In our survey of inpatients at QE II, Mohale's Hoek and Leribe of 320 patients surveyed, 68 or 21% were clinically compatible with the diagnosis of AIDS with 16% at QE II, 24% at Leribe and 37% at Mohale's Hoek. Some may feel these percentages are lower than would be found in other nearby high prevalence countries. There are several possible explanations:

1 - Data collection and reporting is almost certainly not comparable between countries.
2 - QE II is reported to avoid admitting AIDS cases for custodial care.
3 - It was also reported to the team that many families in Lesotho prefer for their loved ones to die at home rather than in a hospital setting. This will tend to lower the number and percent of AIDS cases in the hospital.
4 - Very few, if any, AIDS cases suspected on clinical grounds had confirmatory blood tests. The low frequency of HIV testing is likely to lead to fewer diagnoses of AIDS.
5 - AIDS cases were more common in Mohale's Hoek (37%) and Leribe (24%) Hospitals than in QE II outside of Maseru. This supports the notion that QE II may not be admitting cases for custodial care. Further the higher percent of probable AIDS cases at Mohale's Hoek and Leribe is consistent with their ability to care for custodial patients and is an appropriate use of their inpatient services.

10.7 Technological Change, Managerial Efficiency and Bed Supply

Technological change in health care is extremely difficult to predict. In developed countries, hospital utilization has generally decreased in recent years despite an aging population, with the remaining inpatients far more acutely ill. More procedures (even chemotherapy) are performed on an outpatient basis. Even in a less “high tech” medical care system, like that in Lesotho, technologies can change. Breakthroughs could change the pattern of treatment for the opportunistic infections afflicting AIDS patients, or the underlying autoimmune disorder, HIV. The expected increase in hospital
admissions for AIDS patients would thus be reduced. But we cannot predict these technological changes, or the point at which they will become economically feasible in Lesotho. So, we have not built a “technological change” factor into our projections. Our projections assume a continuation of existing available therapies.

In addition, we have not adjusted the bed need projections for potential managerial efficiencies, as was done with the recent analysis of CHAL District Hospitals by MCDI. Current low levels of occupancy in existing beds reflect inadequate staffing and underutilization. As pointed out in Chapter 6, there are patients who need care but are not now being hospitalized in the country. There undoubtedly are some inefficiencies in the management of inpatient care in these facilities, particularly where diagnostic equipment is broken or laboratory services delayed. It may be necessary to close some district hospitals if they cannot be adequately funded and staffed. This is an operational decision beyond the scope of our analysis, although we later estimate the savings from a closure of this type. At QE II, our review of patients and medical charts did not show much inappropriate utilization at this facility. Therefore, our analysis has used planning standards which reflect the current national bed supply in Lesotho.

10.8 Summary Bed Capacity Projections

The table below summarizes the above elements in the bed supply calculation and suggests a total of 435 beds in 2006 for any facility or facilities replacing QE II. By 2026, this total rises to 653 beds if the AIDS epidemic continues unabated.

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Requirement for District</td>
<td>472</td>
<td>538</td>
</tr>
<tr>
<td>Less Separate MH Beds</td>
<td>-40</td>
<td>-40</td>
</tr>
<tr>
<td>To Fringe</td>
<td>-156</td>
<td>-178</td>
</tr>
<tr>
<td>Referrals</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National</td>
<td>+50</td>
<td>+70</td>
</tr>
<tr>
<td>Formerly sent to RSA</td>
<td>---</td>
<td>+10</td>
</tr>
<tr>
<td>Increment for Care of AIDS</td>
<td>+109</td>
<td>+253</td>
</tr>
<tr>
<td>Total Maseru Central Beds</td>
<td>435</td>
<td>653</td>
</tr>
</tbody>
</table>
Many of the AIDS patients will also have tuberculosis, and should be accommodated in a facility which is part of any replacement hospital, but a distinct unit for purposes of staffing and infection control. Thus, a replacement facility might be built initially with 300 to 350 acute care beds, plus wards to accommodate 60 to 100 patients with TB and AIDS. Demand will clearly expand over time, and the facility should be designed to permit further expansion. This means sizing core facilities to serve an additional 200 beds, planning designated space for expansion and building structures so that an upper floor can easily be added. If the AIDS epidemic should recede earlier than expected, a portion of the TB/AIDS ward might be used as a “step down” or palliative care unit, keeping the most acute patients in the wards closest to the technical heart of the hospital (theatres, X-ray, ICU, etc.).

In our subsequent facility analysis, we recommend an initial facility with 330 regular beds (including maternity and pediatric services), 80 TB/AIDS beds, and a 10 bed ICU. This complement of 410 regular beds is slightly lower than the 435 projected above for 2006. We have kept the capacity “tight” to encourage efficiency and reduce costs. However, the demand for beds should be carefully monitored as planning proceeds. If the opening of a new hospital is delayed beyond 2005-2006, or if the demand for beds at QE II appears to grow for reasons OTHER than unnecessary referrals from the District Hospitals, then it may be appropriate to construct some of the additional capacity which is designated for the future. One or additional wards of thirty beds could be built in the initial construction, taking the capacity of the hospital to 440 or 470 beds at opening. If events of the next three years show these additional beds to be needed and a decision is made to add these ward to the initial construction, then the projected operating costs for the new hospital must be increased, and MOHSW must obtain a larger budget increment on opening of the new hospital.
Chapter 11

The New QE II - Design Considerations

11.1 Consultation with Users and Controlling Operating (Recurrent) Costs

Consultation with Users

In every area, prior to beginning the final design, the architects doing the detailed construction drawings must consult extensively with users, nurses, doctors, technicians, cleaners and orderlies. Time must be provided for a dialogue with the option for the users to think about what they have said and, based on feedback from the architect, provide further or modified information. The architects will provide schematic - not detailed - sketches of each functional area to the users for their review and comment after the initial consultation with users. A minimum process for each functional area (Ward, Specialty and general outpatient clinics, Imaging services, OR, Recovery and ICU, Kitchen, Laundry, Laboratory, Maintenance workshop(s), administrative space, etc.) is summarized below:

1 - Architects consult with users. This requires face-to-face meetings and discussion. It cannot be done by a proxy or left for a member of the hospitals staff to do and report to the architect.

2 - Architect prepares a schematic sketch showing the layout of the functional area.

3 - Users provide feedback

4 - Architect modifies the functional sketch and validates with users.

As users suggest design changes, both capital and recurrent costs have a tendency to grow. The architect should advise the users when their choices are likely to have capital cost implications that will exceed the amounts previously estimated. Experts in hospital costing should be hired as consultants to the MOHSW and continuously revise operating cost estimates as the design develops.

Determining Final Capital and Operating (Recurrent) costs

As cost escalation is likely to occur during the first 4 steps the following steps are essential:

5 - Architect estimates the construction costs of the facility and consultants estimate recurring costs at this stage prior to doing any detailed drawings.
6 - The MOHSW and Hospital administration and other relevant parties must sign off on the preliminary design and certify that the projected capital cost (with appropriate contingencies) and recurrent costs fall within the approved capital and recurrent budget envelopes.

7 - If either projected capital or recurrent costs exceed the approved budget envelope, the architect in consultation with users revises the design so that it falls within the capital and recurrent budget envelope. Consultants in hospital management and costing participate in this effort in order to identify design changes which will reduce operating costs.

8 - Final approval by the MOHSW and other government agencies, donors and lending agencies for developing the detailed construction drawings.

9 - Prior to accepting the final drawings, the MOHSW and others as appropriate assure the final actual design will fit within the capital and recurrent budget envelope.

10 - Approval to use the drawings as a basis for construction bids.

11.2 The Design Philosophy

11.2.1 Overview

The new hospital will have 330 acute beds (medical/surgical/pediatric and obstetric) and 80 TB/AIDS beds. Recovery, adult and neonatal intensive care beds and normal newborn bassinets are not included in this total. The basic layout of all wards will, wherever possible, be the same, 30 beds with two single rooms, 5 double rooms and three six-bed open bays. This allows for flexibility in use in future years. There will be ample ambulatory care space including general and specialized outpatient clinics, maternity and TB clinics, Accident and Emergency, as well as private practice offices and associated examination and treatment rooms. There will be considerable on-site staff housing.

11.2.2 Core Services

The core services of the hospital will support subsequent addition of wards up to a final acute bed capacity of 510 beds, not including beds designated for TB/AIDS. Thus the kitchen, laundry, boiler and maintenance spaces will be large enough to support a fully built out hospital many years hence. However, equipment for these and comparable spaces will be scoped for the initial capacity of the hospital. On the clinical side, a comparable example is radiotherapy. Space for a radiotherapy machine will be provided along with appropriate shielding built into the basic hospital structure as well as cabling for electric power. However, the room itself will not be equipped until the recurrent costs of operating the equipment can be fully met and there is a comprehensive cervical cancer
screening, diagnosis and treatment program operating nationally that is capable of using a radio-therapy resource. In like manner, two general purpose imaging rooms will be built but not equipped in the X-ray department to provide for the very likely growth of diagnostic imaging services and the desirability of having all imaging service in contiguous space. Similarly, the operating rooms in total number exceed current need. However, expanding operating theaters in an already built hospital is extremely difficult. Therefore, we have proposed enough theatres and related space to cover substantial growth over the next two decades. The rooms for growth (perhaps 2 or 3) should be equipped with built in equipment such as overhead surgical lights. However, they do not need to be otherwise equipped or used until there is sufficient demand.

11.2.3 Maintainability and Lifetime Costs

**Maintainability, durability, ease of maintenance and minimum life-time costs for all civil works, medical and non-medical equipment will be major considerations underlying all building and equipment decisions.** For example, all doors will be manually operated with no provision for automatic door openers even in the operating room, ICU and recovery areas. Air conditioning will be limited to those very few areas where it is essential, and even there natural ventilation will be built into the design so that such problems as "hot-box" operating rooms are avoided. Piped oxygen will be limited to the Operating, Recovery, ICU (adult and neonatal) and casualty areas. Wherever the hospital is on two or three levels, ramps must be specified in place of elevators. There will be no elevators in the new hospital (The design will take into account that at some future date exterior elevators in a few locations may be desirable.). Wherever possible manual systems will be chosen over automatic systems. Specimen delivery will be by hand using carts or baskets, routine X-rays will use conventional film rather than being digitized. We judge that even though digitizing x-rays could save the recurrent cost of film, developer and associated expenses, the maintainability of such a system is speculative at best and failure of X-ray cannot be tolerated. Wards may occasionally need oxygen and there may also be a need for resuscitation outside of the Casualty, ICU, Recovery and OR Areas. Conveniently locating crash or resuscitation carts equipped with a small, easily transported oxygen tanks are a better answer than installing and maintaining a hospital-wide piped oxygen system.

Another example is Physical and Occupational Therapy. These services absolutely require well-trained physical and occupational therapists and some very simple space and virtually no sophisticated equipment. The secret of successful physical and occupational therapy is a good therapist who can use whatever equipment is at hand, can motivate patients and tailor therapy to the widely varying needs of individual patients. Space should be allocated to this department while purchase of complicated equipment will be minimal. It should be remembered that physical therapy often begins while a patient is still in intensive care or on an acute medical or surgical ward.

Space for workshops will be provided along with a recurrent budget estimate that must be assured for the maintenance of civil works and medical equipment.
11.2.4 Infection Control

The hospital design places great emphasis and priority on infection control. Spacing of beds and plentiful and convenient hand washing points for staff in all inpatient and outpatient clinical areas are examples. Spaces will be designed and materials selected that are easy to clean.

The setting of the new hospital and the layout make provision for orderly and logical growth and expansion if and as recurrent funds to operate a larger facility become available and there is a medical need for such expansion.

11.2.5 Medical Gases

Piped oxygen will be provided only for the Operating Room Suite (all rooms including induction alcoves), the Recovery Room, Intensive Care Unit and Casualty.

Nitrous Oxide will be piped only to the operating rooms. Extreme care will be taken to specify fittings and connections that make it impossible to accidentally connect nitrous oxide to oxygen lines or vice versa.

11.2.6 Stand-by Electrical Power

There will be one major stand-by electrical generator that will auto-start whenever a power failure is detected. This generator will have sufficient capacity to supply key areas, but not all of the hospital, specifically:

- Operating Room suite
- Recovery room
- Adult and neonatal intensive care
- Casualty
- Main (not outpatient) X-Ray
- Laboratory
- Refrigerators and freezers in the pharmacy store, blood bank and mortuary

In addition, in case of failure of the main back up generator, there will be a smaller stand-by generator with electrical and manual start capability that will support only the Operating Rooms, Recovery and the ICU and with the throwing of one switch will provide power to these areas. In addition all operating rooms, recovery and intensive care will have outside windows that, though insufficient for patient care, will provide enough light during the day to allow staff to see where they are going. The equipment list will also specify wall mounted continuously charging stand-by lighting for these areas including the room containing the dedicated generator. The capacity of this generator
needs to be sufficient to support no less than 60% of the full electrical load of the OR, ICU and Recovery.

11.2.7 Administrative and Medical Record Space

This is a sophisticated hospital that will require more on site managers than the current QE II. Space must be provided for them. As well, because billing and revenue collection and retention of revenue will be essential for the survival of the hospital, considerable space needs to be provided for collecting fees directly from patients, billing third parties, monitoring and managing receivables and doing all the detailed accounting essential to manage a hospital of this complexity.

The capacity to assign medical record numbers that uniquely identify one patient and can be used to retrieve the patient's medical record is essential. Storage of medical records requires substantial space and staff well in excess of that allocated in the current QE II facility. Given the current problems with retrieving old inpatient records at QE II, the practice of using patient cards for outpatient records and the introduction of substantial private ambulatory and inpatient practice, we recommend that a medical records consultant from the RSA be engaged. He will work with the hospital staff to design an appropriate medical records system that can build on the present but change as needed to accommodate the practice patterns of a more sophisticated hospital. The design should provide substantial space for central medical records and smaller subsidiary space for ambulatory records.

11.2.8 Training Space

This hospital will be used for the training of student nurses, young post-graduate physicians receiving clinical training, laboratory technicians and quite possibly other technical and professional personnel. In order to support this national training function several large conference rooms will be provided, as well as a number of smaller seminar/meeting rooms scattered throughout the inpatient and outpatient areas and in the Public Health Laboratory.

11.2.9 Staff and District Physician Housing and Amenities

The hospital will include numerous rest and changing areas for the staff. In addition there will be a centrally located cafeteria providing 3 meals a day and late evening snack service for all staff and visitors.

Housing for other staff, doctors and nurses should be available at varying levels of luxury and space somewhat related to seniority and family size. Housing can be in a mix of apartments and free-standing homes. Temporary Quarters for District Doctors for short-term training and for other professional visitors should be provided. We have
evaluated the number of units which could be built on the site, and the cost per unit and have provided an indicative estimate for a mix of housing which could be built on the available space. Prior to determining the mix of housing to be built, MOHSW should complete a review of current staff housing policies and survey the preference of various staff categories for housing allowances vs. provision of reduced cost accommodation in MOHSW housing at an equal cost to the government.

11.3 Ambulatory Care

Ambulatory care includes the following:

- Maternity clinic
- Casualty or Accident and Emergency
- The general outpatient or drop-in clinic
- Specialty clinics such as diabetes, hypertension, surgical, eye, dentistry, ENT, cardiology, etc. (nb specialty clinics with built in high cost equipment such as dental, eye and ENT will be designed for public & private use).
- The TB clinic
- Day surgery and Endoscopy (Public & Private)
- The Doctor's Office Building for private practice.

All clinics, except the general outpatient or drop-in clinic, will be designed with waiting space and staff space such that, at some future time, they have the ability to run on an appointment basis. Initially we expect that all clinics except the private practices will run on a non-appointment, “first come/first served” basis. Casualty will have a triage function to always see the most serious patients first, followed by others in order of their need for care.

The following spaces will be designated for ambulatory care:

11.3.1 Maternity

This is always a high volume clinic seeing large numbers of healthy women and a small number who are ill or require other specialized attention. Provisions are made for pregnant mothers with small children, post-partum mothers with infants (and sometimes additional small children) to wait and be seen in a timely and friendly manner. Provision is made for taking blood and urine specimens for analysis in the main laboratory as well as testing for urine protein and anemia in the clinic at the time of the visit. An obstetrical ultrasound unit will be provided and it can be used in any general-purpose exam or treatment room.
11.3.2 Casualty or Accident and Emergency

The Casualty area will have two entrances, one for patients entering on foot or in a wheelchair and the other for patients being brought by ambulance who may be on a stretcher or need a stretcher.

Walk-in patients will be first seen by a triage nurse who will determine if they should register and go to the waiting area or if they should immediately proceed to the examination and treatment area.

The examination and treatment area will have two trauma rooms well equipped to stabilize and initially manage serious injuries of all types as well as medical emergencies such as heart attack, massive GI bleeding, acute congestive heart failure, shock and extremely high fever. The trauma rooms will be located so that a stretcher may roll directly and only a short distance from an ambulance to the trauma room.

There will be an open area with space for 8 heavy-duty stretchers of the same type that are used in the recovery room and intensive care area. The nurses and doctors station will be placed so that the all urgent patients will be in view at all times.

There will be a space for two reclining chairs to be used for the treatment of asthma patients.

Adjacent to the acute care open area there will be 5 holding or observation beds where, if needed, patients can be watched for up to 12 hours prior in order to decide to admit or send home.

Pediatric and adult emergencies will be seen in the same area.

The accident and emergency room operates on a 24-hour a day, 365 day per year basis.

11.3.3 The general outpatient or drop-in clinic

This area is provided for those patients who need to see a doctor but are not so ill as to require emergency services. Patients who come to this area may:

- be seen, diagnosed, prescribed needed treatment and sent home,
- referred to a specialty clinic, or, if needed
- sent directly to the accident and emergency area.

This is a high volume area and should have generous waiting space. Patients will be seen in individual examining rooms. Treatment rooms will also be available should the examining doctor feel a minor treatment or injection is indicated. A pharmacy will be provided to dispense medication prescribed during a consultation.
11.3.4 Specialty clinics

A - Specialty clinics using multipurpose exam space:
Diabetes, Hypertension, Surgical, Cardiology. Specialty clinic space that
does not require built-in special equipment (for example, surgical clinic,
cardiology) will be designed so that different specialties can use them at
different times.

B - Specialty clinics using single purpose or dedicated space:
Eye - In consultation with the ophthalmologists, a well equipped
ophthalmologic surgical suite will be provided that will probably be
separate from the main operating room suite and proximate to the public
and private outpatient areas for ophthalmology. In addition, there will be
three, fully equipped, outpatient, ophthalmologic examining rooms.

Dental - Three dental rooms in the outpatient area will be provided along
with waiting and support space.

Ear Nose and Throat (ENT) - Two fully equipped ENT suites will be
provided.

The specialized spaces, because of the cost of the equipment, must be
designed so they are suitable for both public and private practice.

11.3.5 Tuberculosis Clinic

This space will be an integral part of the TB/AIDS wing and will have its own
parking, waiting space, exam and treatment rooms and small on-site pharmacy for storing
and dispensing frequently used drugs.

11.3.6 Day Surgery and Endoscopy - Up to 10 patients/day with waiting space and
accommodations suitable for both public and private patients.

(The endoscopy rooms will also be used for inpatients. There will not be a separate
theatre suite for day surgery patients.)

These are patients who come for smaller procedures that can be done without the
need for over-night hospitalization. This reduces the need for acute beds and effectively
increases the bed capacity of the hospital. Examples of procedures include some hernia
repairs, many biopsies, some plastic surgery procedures, the removal of external fixation,
bonionectomies, certain exams under anesthesia, uterine dilation and curettage, certain
types of endoscopic surgery such as tubal ligations and knee surgery as well as upper and lower gastrointestinal diagnostic endoscopy, diagnostic bronchoscopy and cystoscopy.

Day surgery will be performed in the general operating suite. The day surgery room will usually be the OR designated for minor procedures (Please see the section describing the Operating Rooms). Waiting and changing space for patients will be nearby but outside the OR suite with direct entrance into the OR suite after changing. After surgery the day patients to the general recovery room until they are well recovered from any anesthetic, are awake and stable. From recovery they proceed to a convalescent space outside the operating suite near the changing area where patients can be observed but not closely monitored and rest comfortably in reclining chairs for 1 to 4 hours and be provided with fluids and snacks. This convalescent area can also be used for patients who are recovering from sedation after a diagnostic outpatient endoscopy----upper or lower gastrointestinal endoscopy or a bronchoscopy.

11.3.7 Doctors Office Building

This is a unit, probably more than one floor, that is an integral part of the main hospital building. Location is very important as it makes the private practice area attractive to and convenient for physicians, facilitating both recruitment and retention of physicians. Of equal importance, the private practice area needs to be within easy walking distance of the hospital laboratory and imaging services as many private patients will require these services. Parking is needed for doctors, staff and patients. This building is intended for the private patients of physicians on the staff of the new QE II whose only private practice is at Botsabelo.

Adjacent to the main entry point there should be space for a small, but well stocked commercial pharmacy.

At the entrance to the private practice area, a few seats should be provided. However, this is not a waiting area and need only include space for signs that clearly identify the doctors in practice and the locations of their offices. It is not a reception or registration area. The final size of the private practice area will be between 4 and 6 doctor's suites. Each suite will have its own small waiting area with adjacent receptionists area. Our plans call for 6 suites with 5 doctor's offices per suite. 120 square feet is sufficient size for each doctor's office. The doctor's offices will open onto a common interior corridor off of which there will be 4 examination rooms each about 120 square feet. Each exam room will have a small writing desk and chair for the physician and two chairs for the patient and family member/friend, an examining table, storage case for supplies, hand washing basin and trash basket. If the exam table is located in such a way that the patient is visible when the door is opened, there will be a sliding privacy screen that hangs from the ceiling.

Also off of the common corridor is one treatment room of the same size as the exam rooms.
The receptionist office area with storage for files is about twice the size of an exam room.

The waiting area needs comfortable seats for 15 people and provision for a wall mounted TV.

A small office for the nurse/office manager, staff lounge, (rest, changing and snack area) and two unisex toilets with washbasins for staff and patients complete the suite.

11.4 Clinical Services

The hospital design and initial equipment will support the following specialties:

Cardiology
Dentistry
Ear, Nose and Throat (ENT)
Diagnostic Radiology
Infectious Disease including TB and HIV/AIDS
General Surgery
Internal Medicine
Obstetrics and Gynecology
Ophthalmology
Orthopedic surgery
Plastic Surgery
Urology

If the surgeons have the skill, many vesico-vaginal and recto-vaginal fistulas should be able to be repaired in Lesotho, avoiding the need for referral to Bloemfontein. Ultimately the occurrence of this type of fistula should decrease to the vanishing point with adequate pre- and peri-natal care, improved surgical skill at the districts, better management of labor and delivery and improved quality of Caesarian sections.

The general surgeons should be able to do emergency burr holes and limited emergency non-cardiac chest surgery. The operating rooms will be sufficient in size and lighting to accommodate neurosurgery, chest and vascular surgery. However, the equipment for this will not be provided and should not be provided until there is a clear need, recurrent costs can be afforded, volume is sufficient to justify the investment in developing and sustaining such a service and it is clearly cheaper to produce the service at QE II than purchase in the Republic of South Africa (RSA).

There will be no provision for renal dialysis, cerebral or cardiovascular angiography, cardiac or great vessel surgery or transplant surgery. Nor will there will be provision for diagnostic or therapeutic use of radioactive isotopes.
The above-mentioned exclusion of transplants does not exclude cornea transplants. As corneal transplants do not involve routine immunosuppressive therapy other than topical steroids, nor is tissue typing required, these procedures are well within the existing capacity of the QE II ophthalmologists. There is every reason that they should continue to be performed if and as there is clinical need.

We were asked during our meeting with the QE II medical consultants if the exclusion of dialysis would exclude even those patients requiring such treatment for pre-eclampsia. Pre-eclampsia/eclampsia requiring dialysis is uncommon. Our survey of referrals to Bloemfontein did not indicate that this was a common reason for referral. Establishing a dialysis capacity that will only occasionally be utilized has many serious downside factors:

• Maintaining the skills of nurses and physicians in the management of renal failure is difficult unless there are patients.

• The laboratory capacity for monitoring patients in renal failure must be maintained in a constantly ready state.

• There are and there will be more patients who are not eclamptic but do have End Stage Renal Disease who would benefit from dialysis.

• The interests of physicians, nurses and patients will create incredible pressure to use existing, idle capacity.

• The cost per week/per patient for dialysis consumables will be on the order of $200 to $300/patient/week.

This will be immediately unaffordable and the likely result is funds will be diverted from other programs, whether drugs in the hospital or primary care in rural clinics, in order to maintain a patient who will surely die if they are taken off dialysis.

We note that countries with 3 to 5 times the per capita income of Lesotho have great trouble maintaining even a few patients on dialysis and find the costs prohibitive.

In brief, opening the door to renal dialysis is highly likely to drain the purse of the Ministry. A far better alternative from every perspective is to send to Bloemfontein those few patients who need short-term, acute dialysis for whom the country is willing to pay. This provides quality care at a much lower cost and protects the ministry from the budgetary and program disaster of creeping dialysis.

Mental health services on a consultative basis will be provided by the nearby Mohlomi mental hospital. Inpatient and most outpatient mental health services will be provided at that hospital and not in . However, the design of the outpatient space including the private practice space is such that some outpatient mental health services
can, if the hospital so chooses, be integrated into the public and private outpatient services.

11.4.1 Imaging Services

Imaging services will include conventional X-ray for chest, bone and skull films, a minimum of two machines with image intensifier/video monitor capable of a full range of contrast studies, a built in machine in the major orthopedic operating room, an OR dedicated portable machine and two machines for portable use in the hospital. A new CT Scan will be provided that is carefully chosen to meet the lifetime cost criteria already stated. Although not a diagnostic service, a room, support rooms and waiting space for a major radio-therapy unit will be provided. When recurrent costs are affordable, machine selection should be done in close consultation with the therapeutic radiologist and radiation physicist from the RSA who will be responsible for operating the machine and doing treatment planning and dosimetry for cervical cancer and possibly other cancer patients. As imaging technologies will develop further over the lifetime of the hospital, we have allocated space for two unequipped rooms to be built as apart of the X-ray department for unspecified future imaging services.

Ultrasound for general-purpose as well as obstetric use will be provided. The Maternity service will have two ultrasound machines (one inpatient and one outpatient). The Radiology Department will have two general use machines. Additionally, echocardiography equipment for adults and children will be provided. The echo equipment will be particularly helpful in selecting patients for referral to Bloemfontein or other cardiac centers in the RSA.

11.4.2 The National Public Health Laboratory

Essential to the proper operation of the hospital is a first-rate diagnostic clinical laboratory that is well maintained, well staffed, and adequately supplied with reagents. It should have a quality assurance program that is not only internal, but utilizes external examiners and unknowns from an internationally accepted standards body.

The six basic functions of the National Laboratory include:
Bacteriology
Blood Bank
Chemistry
Histology and Tissue Pathology
Public Health
Training

11.4.2.1 Bacteriology
Aerobic and anaerobic culture facilities and the ability to do antibiotic sensitivity testing is essential.

Tuberculosis (Acid-Fast) culturing and sensitivity testing should be continued.

Appropriate provision for the safety of laboratory personnel and others should be provided, as multi-drug resistant organisms will be a common occurrence.

Viral diagnostic studies may be included but there will no capacity to culture viruses.

11.4.2.2 Blood Bank

A blood bank is included. Note: Stand-by electrical power is provided to the entire Public Health laboratory but it is particularly important for the blood bank.

Equipment for typing, cross matching and HIV/AIDS and hepatitis screening will be provided. This may be integrated with the chemistry function at the election of the laboratory director.

11.4.2.3 Chemistry

Facilities and equipment for the chemical and immunologic analysis of blood, urine, cerebrospinal and other body fluids will be provided. Autoanalysers for blood chemistries, blood counts and electrolytes will be provided.

11.4.2.4 Public Health

As the laboratory is not only the hospital laboratory, but also the national public health laboratory, its size will be far larger than a conventional hospital lab. It needs to be equipped for such unusual tests as examining the brains of dead animals suspected of rabies, as well as doing bacteriological and chemical analyses of water and foods.

11.4.2.5 Histology and Tissue Pathology

Space and equipment to support a large national cervical cancer program, specifically the reading of cervical cytology ("Pap") smears from around the country, as well as space for routine histology and pathology associated with the QE II and for surgical and other specimens sent in from the districts. Light microscopes including phase contrast microscopy will be provided along with microscopes equipped for teaching. Electron microscopy is not included.
11.4.2.6 Public Health Training

Space for in-service and pre-service training will be provided. This will require laboratory bench, lounge and training room space and some additional equipment, particularly microscopes one or two of which should have heads that allow simultaneous viewing by student and teacher.

11.4.2.7 Space for Additional Equipment

There is space in the laboratory design for additional equipment as may be needed in the future. For example, should, in the future, a need emerge to monitor the blood levels of various drugs, the equipment necessary for this can be easily added. The skill levels of the professional laboratory staff are already sufficient to operate such equipment either with self-instruction or very short-term training by an external group, most likely the supplier of the equipment.

11.4.3 Physical and Occupational Therapy

Two large rooms, staff offices, equipment storage and patient waiting space should be provided that is convenient to the ambulatory care space and allows inpatients to be easily moved from the wards to this area and back. Proximity to the brace shop is also probably desirable.

11.5 Multi-Purpose Inpatient -Wards

Thirty beds total. Two single rooms with shower, washbasin and toilet. Five double rooms each with one shower, washbasin and toilet. The washbasin in the single and double rooms should be in the room so it can be used easily by staff as well as patients. For single and double rooms these are to open directly off the interior of the rooms. Single rooms of sufficient size to roll in a day bed for a family member and still have room for a comfortable chair. Double rooms to accommodate 2 comfortable chairs, with a draw curtain between the beds. Provision for mounting a TV is made for all single and double rooms -1 TV per room. Double rooms to have a space between beds of 2.75 meters, with 1.5 meters on the remaining side. In the single and double rooms an electrical outlet and space for a small (1/2 height) refrigerator is to be provided. Each bed in these rooms to be provided with a nurses call button.

Infectious diseases that require isolation that are not active TB should be placed in either the single or double rooms that are present on every ward. This allows isolation from other patients and control of the flow of hospital personnel, visitors and materials to and from the room(s) that is being used for isolation.
The balance of the ward is 18 beds in three bays of 6 beds each. Spacing between beds is 2.75 meters. Beds adjacent to a window or inside wall shall have a clearance of 2/3 of a meter from the interior wall or window wall. A washbasin will be placed near the entrance to each bay intended primarily for use by staff who should wash their hands between each patient if they touch the patient in any way.

A small lounge for visitors is to be provided on each ward or there may be a common lounge shared by two wards.

All windows on the wards and in waiting/visitors areas are to have extremely durable shades that can be adjusted to substantially decrease sunlight but still allow ventilation on a warm day. All rooms to have windows that open sufficiently to give good ventilation on a hot day.

Each ward is to have one examination room, one treatment room, nurse’s station, drug storage and medical record storage areas. A room about the size of an examining room or up to 20% smaller is to be adjacent and connected to the nurses station for doctors to write charts and view x-rays and consult with each other. A two bay x-ray view box is in this room.

Ample storage for linens, dressings and other consumable supplies are to be provided.

Storage space on each ward is needed for special equipment. A generous room with a locking door should be provided that can be used for such items as intravenous infusion poles, Infusion pumps, respirators, orthopedic appliances that attach to the beds, walkers and similar types of equipment.

There is no piped oxygen or suction.

11.5.1 - Special needs for Maternity - 60 beds

The maternity ward needs to be proximate to the main operating room suite as all Caesarian sections will be done there. As well the ward must have space for a large room or two rooms for the more intensive care of premature infants. This room(s) should be capable of caring for up to 20 premature infants at one time. Infants below 1200 grams birth weight will not be supported. These 20 neonatal intensive care incubators are in addition to a 30 bassinet nursery for normal term infants. The neonatal intensive care spaces and the newborn nursery should be designed in close consultation with the nursing staff on the maternity floor.

The ability of newborns and particularly premature newborns to regulate and maintain their body temperature is limited. This means the ambient temperature and humidity in the nursery areas must be separate from the general maternity floor climate control and must have independent controls and the capacity to vary heat and humidity.
without regard to the situation in the larger hospital. For safety, this system must have or be connected to an independent back-up electrical supply.

Rather than immediately move to Caesarian sections for the control of mother to child HIV transmission, the MOHSW and the obstetricians at QE II should first consider short term use of anti-retrovirals. This is more effective and lower cost than routine Caesarian sections. We have not planned for routine Caesarian sections on HIV positive mothers.

11.5.2 - Special needs for Pediatrics - 60 beds (Two wards)

A family member, usually but not always the mother, stays round the clock with almost all children on this ward. A simple (not hospital) adult bed and space next to each child's bed must be provided and a family member sitting space in a rest area should be provided for each pediatric ward.

11.6 TB Wards and Clinic

As Lesotho unfortunately faces an already large and still growing burden of HIV/AIDS and about 50% of all TB patients are likely to be HIV positive, we are planning for a medium term 10 to 20 year need for additional beds to accommodate patients with either or both TB and AIDS. These patients are:

1) generally being started on anti-TB therapy and require less nursing care than patients on general medical/surgical wards. Or,
2) they are in an advanced state of illness and require mostly nursing assistant level care in bathing, toiletry and feeding.

As those patients with TB are often active and infectious on admission and the staffing requirements are different and less than acute wards and the need for this type of care will grow, we have provided for separate bed space that can grow. Up to 30 of these beds should be set aside for children. These beds will use the support services of the main hospital but will otherwise be somewhat isolated from the hospital. The TB/AIDS block will also have its own clinic space with its own entrance distant and separate from the main outpatients entrance. If, in the future, the need for TB/AIDS beds declines, these beds can be converted to general medical/surgical beds for patients at the end of their hospital stay. They might also be used for geriatric services. The design will recognize that ultimately some or all of the TB/AIDS wards may become general/medical surgical wards. Thus, they will have similar nursing stations and general purpose exam and treatment rooms like all other wards.
The TB/AIDS patients will be accommodated in a free-standing building that is separate from the main hospital and hospital wards. It should be connected by a covered walkway for transfer of patients and food trolleys. Food will be provided from the main hospital kitchen. Any needed lab services will be provided by the main hospital and patients may go to the hospital for X-rays and/or a portable x-ray may be wheeled to the TB inpatient area. Staffing levels will be substantially less intense than on the other hospital wards. Sinks should be located so that as doctors, nurses or any other staff go from patient to patient it is easy to wash hands between each patient.

Spacing between beds is to be 2.75 meters. One nursing station with space for the doctor to sit and write notes can serve two wards. Space for supplies and drugs and adequate staff and patient toilets need to be provided. Two staff rest areas for the entire facility are desirable. Easy access to the outdoors is needed for all patients. An indoor lounge and recreation area for patients is desirable.

The TB unit will also have an outpatient clinic capable of handling up to 75 patients per day, 3 doctors examining rooms, a treatment room, reception area, patient registration and drug dispensing area and provision for drug storage. Toilets for patients need to be provided. Staff can use toilets in the staff rest area. Clinic staffing will be two nurses and two nursing assistants and the clinic will run week-days only.

Provision for convenient parking is needed particularly as many of these patients are rather debilitated.

11.7 Operating, Recovery and Intensive Care Suite

In January 2002, 382 surgeries total were recorded in the operating room log books. This is reported to be a "typical month," in which case a reasonable figure for annual surgeries is 4600. The current percent of major/intermediate/minor procedures is:

Major = 40%, Intermediate= 10%, Minor = 50%

Major cases include Caesarian sections, laparotomies, open reductions, and elevations of depressed skull fractures. Intermediate cases include dilatation of urethral strictures and hernia repairs. Minor cases include uterine dilatation and curettage (D&C), manipulation under anesthesia and closed reduction, debridement, incision & drainage (I&D).

We assume that, nationwide, the primary site for more complicated surgical procedures will be QE II. There will be more cancer, thoracic non-cardiac, advanced orthopedic and urological surgery and this will increase over the years. The capacity, in terms of space outlined below, though initially not needed, will be needed over the next 10 to 15 years and certainly will be appropriate given the 50 or more year life expectancy of this hospital. Even if the hospital cannot immediately afford or recruit all of the surgeons necessary to staff this space, it is desirable to build the space in the initial
construction. Trying to later add operating rooms at some other part of the site will create serious problems of patient flow and infection control.

11.7.1 Operating Rooms

A new operating suite will contain:

Two major orthopedic rooms - one with a built in X-ray and operating table---expressly designed for major orthopedic surgery. The second orthopedic room would also be used for orthopedic arthroscopic surgery.

One portable X-ray dedicated to support the other operating rooms and to be a fall-back for orthopedics in case of breakdown of the built in machine.

Four major clean case rooms (2 adult and 2 pediatric). These are not different in space and basic layout. The instruments required will differ, and the rooms can be used for either age group if necessary.

Two dirty case rooms. Same space and equipment as for clean case rooms but reserved for dirty cases.

One minor orthopedic room. For closed reductions and application of plaster.

Two endoscopy rooms. Equipped for upper and lower GI endoscopies. Also equipped for bronchoscopies. Cystoscopies and urological and gynecological surgery requiring the use of endoscopic equipment can be carried out in one of the endoscopic rooms or any operating room.

Space for flash sterilizers will be provided so that there is one flash sterilizer for every two operating rooms. Two large steam autoclaves of the most reliable and least automatic type should be provided for sterilizing surgical packs containing instruments. It is anticipated that sterile linens will be made up and processed in the hospital main Central Sterile Supply room.

A room needs to be provided for storing extra and special surgical instruments.

An anesthesia office and store room is needed.

A lounge for nurses, doctors and anesthetists is required.

Scrub sinks strategically located at several places proximate to the operating rooms are needed.

Changing rooms including doctors and nurses changing room with a shower in each are needed. Entry to changing rooms is desirable from the general hospital with exit from the changing room directly into the operating suite.
Pre-anesthesia room with 8 spaces for gurneys (wheeled stretchers).

Each OR, the plaster room and the endoscopy rooms are to have an anesthesia machine.

All OR’s, except the plaster room and endoscopy rooms, to have an induction room contiguous to and opening directly into the OR. This in an option which allows for increasing the number of surgeries that can be performed in one room in one shift. If anesthesia prefers to induce in the theater, this option could be eliminated.

Each OR (not plaster or endoscopy) to have suction machine and cautery.

One of the design philosophies underlying the entire hospital is multi-purpose use. This means a clinic area may be used on different days for different clinics or, even if used for years for one clinic, the physical design is such that it can be used for a different clinic as need dictates. The same is true for the patient wards. Although it is highly likely general surgical patients will be mostly on one or two wards, orthopedic patients on another and gynecological patients on a third, the actual design of the wards are such that any ward (barring maternity) can be used to support any clinical service or mix of clinical services. In addition, we have strongly recommended that wards even if used primarily for one specialty can, when demand requires, accept patients from another specialty. There is no reason an empty bed on the ward usually used for eye patients could not accommodate a clean surgical case so long as the nursing requirements could be met. In like manner, operating rooms are multi-purpose. It may become traditional that one room is used for gynecology and another for urology but that is solely a matter of administrative and operating room management convenience, not a need intrinsic to the specialty. As the need arises, any room can be used for any procedure. The only exception to this is the dedicated eye theater which is so highly specialized multi-use is not feasible. Even the room with built in X-ray that will primarily be used for orthopedics can and should be used for any other clean case as the need arises. Thus, although one room may usually be used for Caesarean sections there is no need to designate and label any operating room as belonging to any one service. Such a designation would remove flexibility from operating room management, and decrease the ability of the operating room supervisor to efficiently manage workload. Multi-purpose use removes artificial barriers that reinforce professional possession of physical turf to the detriment of overall patient care and efficient hospital management.

Ophthalmologic surgery is highly specialized with equipment that demands its own operating theater. Even ear, nose and throat equipment can be readily used in a multipurpose operating room. However, this can only be done with great difficulty in the case of ophthalmology and it is far preferable to have a dedicated eye surgical operating room. We note that a dedicated eye operating room could be located within the planned 8 room operating theater. However, this would require adding a 9th room. It is more likely that the ophthalmologic surgeons will prefer their own OR conveniently located close the ward likely to be used for eye case and/or near the outpatient eye clinic. The final
location of the eye operating room should be made by the ophthalmologic surgeons and nursing staff in consultation with the architects.

Space for the storage of dirty linen and clean linen needs to be provided, as well as space for equipment and supplies for cleaning the operating rooms between cases.

11.7.2 Recovery room - 10 beds

The recovery room will contain spaces for 10 heavy-duty stretchers/mobile beds that can be used in the Recovery and Intensive care units and will also be used to transfer patients from the operating room table to the recovery room.

There will be piped oxygen in the Recovery Room, a nurse’s station and space around each stretcher for portable equipment used in post-operative care.

The recovery room can be entered directly from the operating suite and exit from the recovery room is to a main hospital corridor. Family members enter the recovery room through this door. A small waiting room for family members of patients undergoing surgery should be near the recovery room but outside the operating room suite.

11.7.3 Intensive Care Unit (ICU) - 10 Beds

This is a combined adult and child, medical and surgical, intensive care unit. The only patients excluded are neonates.

Access to the intensive care unit will be direct from the Operating Suite, with separate direct access for patients on stretchers, visitors and staff from elsewhere in the hospital.

The ICU will be so designed that all beds can be seen from the nurse’s station. Monitoring will be portable, not built-in. Every two ICU beds require five highly trained special nurses, not nursing assistants, to provide round the clock care. Thus a four-bed unit would require a dedicated staff of 10 nurses, eight beds 16 nurses, and ten beds 20 nurses. Although built to accommodate 10 patients, the initial ICU may open with as few as 4-staffed beds and 8 assigned nurses. ICU staffing also assumes round the clock availability of appropriate physicians in the hospital (the equivalent of 1 FTE physician for the ICU), round the clock access to and use of anesthesia, which may also provide respiratory therapy services, and round the clock access to laboratory and X-ray services. In addition, ward helpers and cleaners are required. The staffing intensity of a safe ICU cannot be underestimated. Sophisticated equipment, including portable monitors of essential vital functions (including oxygenation), respirators, infusion pumps and the ability to insert intra-vascular catheters and drainage tubes is required. The nurses must be able to support a number of bedside procedures from minor to fairly major and
emergent. A team of physicians and nurses should be designated to develop detailed policies and procedures for the ICU. The physician members should represent medicine, pediatrics, anesthesia and surgery. The intensive care unit should not be opened or staffed unless there is one full-time physician anesthesiologist employed by the hospital. This person oversees the nurse-anesthetists, provides them in-service training, personally handles complex or unusual anesthetic challenges and oversees the recovery room and intensive care unit.

Premature newborns will be cared for in the newborn intensive care area that is a part of the newborn nursery in Maternity. Other infants who are admitted and in need of intensive care will either be cared for in a private/single room in the pediatrics ward or in the general purpose ICU. If the infant requires a warmer/incubator, then one can be borrowed from Maternity.

11.8 - QE II Kingsway Satellite Clinic - Initially 150 visits/day with growth to 250 possible.

Dental 30 visits/day: The balance divided 25% pediatrics, 25% MCH, 50% all other adult clinics

The only space with highly specialized equipment will be the dental suite, which will have a minimum of two, fully equipped dental chairs.

There will a basic (chest, long bones) X-ray machine and processor, a portable EKG machine and an ultrasound for use in the maternity area.

In the event record keeping changes for outpatient care, provision should be made for storing and retrieving ambulatory records.

A pharmacy storage and dispensing area is required.

A specialized eye room is not included.

The overall ambience of this clinic should be such that, although it will probably see primarily public patients, many will be working. Thus, large impersonal waiting spaces and a design that suggests processing of patients rather than care of patients is to be avoided. Some private patients being seen at the new QE II site will find it more convenient to have some of their follow-up done downtown. As well some people who work will prefer to come late in the day or early evening, pay more and get a more timely and more private-like service.

The Kingsway clinic will have a general outpatients or drop-in clinic. It will be fully sufficient to designate one of several treatment rooms in the clinic to handle minor accidents, suturing and the like. Any serious cases presenting here will be sent to the A&E service at the Botsabelo site.
The design should be flexible so that the physical layout does not constrain changes in the philosophy of delivery of primary care services. Thus maternity, pre-and postnatal services may begin as a separate area. However, over time this may be integrated with the general clinic functions. This is not a recommendation that such integration should happen. Rather it is a caution to the design team to make certain space is flexible and multi-use. Except for the dental suite, exam and treatment rooms are essentially identical. Thus small sub waiting areas with a cluster of several examination rooms and one treatment room will accommodate maternity, any medical or surgical clinic, any pediatric clinic, TB, etc.

A typical cluster or sub-clinic area would contain:

- Waiting space
- 3 to 4 exam rooms
- 1 treatment room
- Space for records and reception

The cluster most suitable for TB should have access from the main clinic entrance but also separate outside access so TB patients need not mix in the waiting areas with non-TB patients. However, entry for most patients will be through a common foyer with a waiting/registration area. The patients then pass to the cluster where their particular clinic is being held. The design should not only accommodate the changing use of space over time, but also allow for the same space to be used for different clinics at different times during the day. Thus orthopedic follow-up in the morning might be in the same space as surgical clinic in the afternoon and in like manner for other clinics. In principle, the design should strive to allow for each cluster area to be used for any medical, surgical, pediatric or MCH purpose.

Appropriate toilets for staff and patients, staff rest areas and children's play areas should be included.

If the Kingsway satellite clinic is NOT built, the ambulatory care space in the new QE II hospital will have to be enlarged sufficiently to meet the additional demand.
Chapter 12

Preferred Option: Layout and Preliminary Cost Estimates

We recommend construction of an inpatient facility with extensive outpatient facilities at the Botsabelo site, with an outpatient facility at the existing site to meet local need and divert patients from the Botsabelo complex. The program for these facilities is discussed in Chapter 11. We discuss here the basic architectural design parameters and develop a preliminary estimate of construction costs.

12.1 New Hospital Site, Botsabelo

The proposed site at Botsabelo is a large elevated area of over 150,000 square meters about 5 kilometers from Central Maseru. It is situated between and convenient to the leprosy hospital (400 meters) and the psychiatric hospital (300 meters). The current physical development plan shows the overall Referral Hospital Site split by a proposed north/south access road to the Lepereng and passing a proposed Rehabilitation Centre opposite existing housing. The larger part of the site, about 125,000 square meters, is to the east of this roadway while that to the west is about 42,000 square meters and the north boundary of the latter adjoins the existing National Health Training Centre.

The site is well served with access roads on 3-sides and falls evenly from the north access road to the lower southern section with contours running east/west across the site which would help the hospital layout.

The mission spent some time examining the land and established that the lower southern area, towards the pig farm which is to be abandoned, had a high water table and poor draining capacity that make it unsuitable for building use. Accordingly, in subsequent discussions, the Acting Director of Planning and Development at the Maseru City Council accepted the suggestion that the proposed access road which splits the site be repositioned. He suggested that the lower unsuitable building land could be used for tree planting and open space.

Drawings 1 and 2 show the site before and after the change in access roads. With the removal of the bisecting road, the site would in our opinion be very suitable for the proposed New Referral Hospital.

Visually the new site is very attractive and the shape, contours, orientation and access make it very suitable for a new hospital that would comply with the best design principles for the latitude of Maseru. The contours look a little steep so the final layout will require a degree of cut and fill. Accordingly, the mission recommends that the MOHSW arrange a grid and contour survey with trial holes to establish the contours, drainage capacity and bearing strength of the subsoil for foundations and development. An aerial photo of the site is attached as Figure 12.0.
12.2 Layout of New Hospital

Our diagram for the proposed hospital is shown in Drawings 3A and 3B. Drawing 3A illustrates the accommodation layout for the initial hospital. This diagram allows for a future 60% expansion and drawing 3B shows the ultimate development which could be achieved in stages over the years. The key to these drawings is shown below.

1. Main Entrance
2. Accident and Emergency Entrance
3. Outpatients Department Entrance
4. Paediatrics on ground floor
5. Maternity Department on first floor
6. X-ray on ground floor
7. Operating Theatres, Recovery and ICU on first floor
8. Ward Blocks
9. Administration Block
10. Public Health Laboratory
11. Kitchen
12. Laundry
13. Central Supply Stores
14. Boiler, Tank and Fuel
15. Tuberculosis Wing
16. Ambulance Center
17. Post Mortem and Mortuary
18. Staff Accommodation Area
19. Workshops and Maintenance
20. Road Accesses and Circulation
21. Private Practice Accommodation
22. Planting to lower site
12.3 Phasing of Development

In its initial phase, the hospital would have the following capacity:

- 7x30 bed adult medical/surgical wards = 210 beds
- Plus Paediatric (60 beds) and Maternity (60 beds) = 120 beds
- Separate block for TB outpatients and wards = 80 beds

**Total capacity (excluding ICU and newborns) = 410 beds**

Subsequent construction could expand the facility to a maximum capacity of 670 beds:

- 13x30 adult medical/surgical wards = 390 beds
- Plus Paediatric (60 beds) and Maternity (60 beds) = 120 beds
- Expanded TB/AIDS wards = 160 beds

**Total capacity (excluding ICE and newborns) = 670 beds**

The TB ward blocks should be designed to take a second floor for an additional 80 beds; alternatively, these upper floor wards could be linked to the main hospital by an extension of the main hospital corridor or “street” if preferred.

Phase One is achieved as follows:

- The 2-central blocks west of “street” are 2-stories and the other 2-blocks west of “street” and the ward to N/E are single story.
- The private practice wing, over the entrance is 2-stories

Final Extended Hospital is achieved as follows:

- The 2-central blocks west of the “street” become 3-stories, the other 2-blocks west of “street” and the ward to N/E become 2-stories
- and the Administration Block receives a second floor for a 30 bed ward.

The initial structural design should allow for such easy future extension. The general construction should be simple, rugged and easy to maintain. Ramps, not elevators, should be provided to give vertical access. Depending on the bearing capacity of the soil and the structural engineers’ recommendations, we visualize the structure could be of simple load-bearing walls, pitched roofing with concrete ceilings which become future upper floors where required.

Finishes to be selected for function and maintainability; ceramic floors with coved skirtings to wet areas and pvc tiling otherwise where suitable.
12.4 Outpatient Facility On Portion of Existing Site

We recommend construction of an outpatient facility at the rear half of the existing QE site. Having first established with the Planning Authority at the Maseru City Council that a suitable alternative site was not available, we prepared the attached Drawing 4 for the facility and staff accommodation at the present Kingsway site. The key to Drawing 4 is shown below:

1. OPD entered from Hill Road
2. 3-story Apartment block for staff
3. Tree planting and landscaping
4. Vehicle entrances
5. Pedestrian entrances
P. Parking for vehicles

The outpatient facility could be built at the rear of the site as shown. To do so prior to opening the new hospital will require moving the male surgical, TB and pediatric units to the private block, or making other temporary arrangements during the construction period. Another alternative is to fast track the construction of the new Kingsway clinic with site preparation and construction beginning as or slightly before the new hospital at Botsabelo opens. In this scenario the filter clinics could temporarily absorb the load of outpatients until Kingsway was complete. Accommodation may be required temporarily for the orthopedic workshop but it would appear that the mortuary could remain until the Botsabelo facility opens.

Yet another option would be to find land in the downtown area that provides similar ease of access and build the new clinic not on Kingsway but elsewhere nearby. This option would eliminate the temporary loss of capacity inherent in either option above. Finding and assessing such alternative sites was outside the scope of the teams assignment but could easily be done by the planning unit of the MOHSW.

If a clinic like that proposed here is not built on a downtown site, the size of the OPD at Botsabelo must be increased to accommodate the extra volume of cases. Patients who work in the downtown area, or those for whom public transport downtown is less expensive than transport to the Botsabelo site, will prefer to receive care downtown so long as the quality is the same--something that can be assured by rotating physician staff from the hospital through the downtown clinic. Total costs for meeting the needs of Maseru will not be greatly increased by building the downtown clinic--extra square footage would be needed at the Botsabelo site, and the professional staff deployed downtown would be needed to serve the larger volume at Botsabelo. Only a few support positions are “dedicated” to the downtown facility and would be eliminated by consolidating at a single site. There is little specialized equipment downtown--nothing more complex than a general X-ray machine or a dental chair.

We recommended the downtown clinic after listening to staff concerns about the amount of activity at a new hospital. While splitting high technology, inpatient and 24
hours services (A&E) to two sites would significantly raise total operating costs (and potentially reduce quality); the creation of a downtown “satellite” to handle routine cases will reduce the traffic to Botsabelo substantially.

On completion of the new hospital and OPD, the present QE2 hospital can be vacated and the apartment blocks for staff may then be built. We show 3-story units, being the highest level one should build without providing lifts, and this would accommodate 27 x 2-bedroom apartments in accordance with drawing 4. We suggest retaining 100 meters for the full width of the site to allow for future development. The front half on to the Kingsway road could be sold or leased.

12.5 Estimated Costs of Civil Works

12.5.1 Botsabelo Facility

Contractors are registered in Lesotho by experience and financial status as follows:

- grade A for work - 1.0 million Maloti upwards
- grade B for work - 350,000 to 1.2 million
- grade C for work - 75,000 to 350,000
- grade D for work - up to 75,000

Building Contract Articles are based on the British Forms. Procurement is based on National Competitive Bidding (NCB) in accordance with Multi-National Agency Guidelines. There are enough contractors in Lesotho to ensure NCB. The cost of civil works depends on the construction specified and on the standard of finish and services to be provided. As an example, a 2.3 million Maloti contract is currently being implemented at QE II to revitalise the Outpatient, Casualty, Medical Stores and Wards 4/5/6 buildings. The work specified includes:

a) the removal of existing finishes
b) replacement with new
c) roofs, ceiling, brandering, insulation, floor finishes, wall tile splashbacks, doors, ironmongery, skirtings, sanitary fittings, plumbing, internal drainage, painting, decoration and external gutters and rain water disposal.
d) This amounts to circa 40% of total new works and the floor area of revitalisation is about 1840 square meters.

The cost of new construction then for simple health buildings similar in standard to those at Leribe works out currently at about 2000 Maloti per square meter calculated as follows:
2.3 million spent on 1840 m² for 40% of new construction works out at a
approximate 2000 Maloti per square meter, to which must be added the cost of site
development works, roads, parking, fences, gates, outbuildings and landscaping.
The approximate total rate would work out to about 2500 maloti per square meter.

Based on another tender recently received for new building, about the same size
but where the standard of finish and services is far superior and includes air-conditioning
throughout, the rate per square meter works out at 4500 Maloti. These tenders give an
indication of the span of cost rates depending on the standard of construction and
technical services specified.

Based on the above unit cost estimates, we estimate an indicative cost of the new
referral hospital as described, to replace the present QE II with a comparable building
standard for outpatients, 2-story blocks for inpatients, a somewhat higher standard for the
clinical areas and air-conditioning to the surgical areas, all in accordance with good
hospital planning and the principles applicable to the climatic conditions in Maseru, in
the region of 73 million Maloti made up as follows:

Table 12.1: Construction Cost of New Referral Hospital

<table>
<thead>
<tr>
<th>Area</th>
<th>Unit Cost</th>
<th>Construction Cost (maloti)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating, Intensive Care,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central Sterile, Postmortem and X-ray areas</td>
<td>1450 m² @ 4500 M/m² = 6 550 000</td>
<td></td>
</tr>
<tr>
<td>Obs, Paeds, Pathology</td>
<td>2400</td>
<td>@ 4000 = 9 600 000</td>
</tr>
<tr>
<td>Kit, Laun, CSs, W’shops, Boiler</td>
<td>2000</td>
<td>@ 3500 = 7 000 000</td>
</tr>
<tr>
<td>Balance, allowing for future</td>
<td>16850</td>
<td>@ 3000 = 50 550 000</td>
</tr>
<tr>
<td>Totals</td>
<td>22700 m²</td>
<td>73 700 000</td>
</tr>
<tr>
<td>Roads and Car Parking</td>
<td>4000</td>
<td>@ 200 = 800 000</td>
</tr>
<tr>
<td>Site development works:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cut/fill, planting, fencing, gates, security etc</td>
<td>= 14 500 000</td>
<td></td>
</tr>
<tr>
<td>Total cost in Maloti</td>
<td></td>
<td>89 000 000</td>
</tr>
</tbody>
</table>

Hospital 330 beds and 80 TB = 410 bed total.

Construction cost per bed is just over 217,000 Maloti per bed.

Gross area per bed is 55 square meters.

All costs are Base Costs at February 2002 and No Contingencies are added.
With a 20% allowance for design and engineering services, and a 10% contingency allowance, total cost WITHOUT AN INFLATION ALLOWANCE would be 117,500,000 maloti.

Annual Maintenance Budget : 0.5% x 89 000 000 ------- 445 000 Maloti

The present QE II hospital is 14 773 m² with a nominal capacity of 450 beds.

The differences between the hospitals are due to higher amounts and standards of accommodation and design - greater clinical accommodation, increased bed spacing, etc.

12.5.2 Outpatient Facility at Kingsway Site

Table 12.2: Construction Cost of Kingsway Satellite Clinic

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPD building</td>
<td>2,500 m² @ 3500 Maloti/ m² = 8 750 000</td>
</tr>
<tr>
<td>Demolition and clearing rear reduced site</td>
<td>allow 250 000</td>
</tr>
<tr>
<td>Site Development Works</td>
<td>@ 20% = 1 800 000</td>
</tr>
<tr>
<td>Total</td>
<td>10 800 000</td>
</tr>
</tbody>
</table>

All costs are Base Costs at February 2002. No allowance for inflation is added.

With a 20% allowance for design and engineering services, and a 10% contingency allowance, total cost WITHOUT AN INFLATION ALLOWANCE would be 14,250,000 Maloti.

12.5.3 Total Cost Estimates

At this stage of very preliminary conceptual design, we estimate the total cost of construction at 99,800,000 maloti at the prices prevailing in February 2002. Fees for architects, engineers and technical services can be expected to increase this amount by 20% to 119,760,000 maloti. With a ten percent contingency allowance, this brings the capital cost for new construction to 131,750,000 maloti WITHOUT ANY ALLOWANCE FOR INFLATION. With both the economy and the construction schedule uncertain, the consultants cannot estimate the additional amount required to offset inflation.
12.6 Equipment & Furnishings; Botsabelo Hospital and Kingsway Clinic

The Equipment lists, one for the New Referral Hospital Botsabelo, and one for the Kingsway Clinic, are provided in an Excel spreadsheet, attached as Appendix 2. We include a floppy disk with the equipment lists in Excel. Each disk will contain 2 electronic copies of each list, with identical contents. We strongly suggest that anyone who will be working with the equipment list copy it to their computer’s hard drive and leave the original unchanged on the floppy disk which should be stored in a safe place.

The core equipment list, containing Fixed Equipment (Group 1), Major Movable Equipment (Group 2), and Minor Movable Equipment (Group 3), was initially generated by Gene Burton & Associates (1893 General George Patton Drive, Franklin, TN 37067, Phone: 615-376-3100, Fax: 615-376-3114 and email: info@gbainc.com) based on the architectural space program. It was then reviewed and revised by the BU team, and for the Draft Final Report, we added estimates for computer, furniture, and biomedical and surgical workshops.

For this Final Report, we have added more detailed estimates for biomedical test equipment, computers, furniture, kitchen utensils and crockery, as well as an estimate for maintenance equipment. The biggest single change is an increase to $4.875 million for Surgical Equipment and Instruments. The cost estimate for this equipment (Group 4) was provide by Millennium Surgical Corporation, 326 West Lancaster Ave. Suite 100, Ardmore, PA 19003 to cover the following surgical specialties:

- General surgery
- Orthopaedics
- Ear, nose and throat
- Ophthalmology
- Obstetrics
- Gynecology
- Limited thoracic non-cardiac surgery
- Urology
- Limited plastic surgery
- Limited emergency neurosurgery

Surgical instruments, related non-consumable supplies and equipment such as operating microscopes and endoscopes will total up to $4.875 million. This figure provides a realistic, possibly generous, estimate, that will allow for all new instruments and equipment for the operating rooms in the new hospital. The specific selection of instruments and equipment for each specialty should be done by the surgeons in each field taking cognizance of maintainability, life time costs and the availability of spares and replacements from the Republic of South Africa. The choice of equipment may well impose additional electric power requirements not covered in the basic design specifications for the hospital. The design team should consult closely with the surgical specialists choosing equipment to make certain that the physical infrastructure will be
adequate to support the equipment. It is possible the $4,875,000 estimate is high and with careful purchasing from proven suppliers in the Republic or elsewhere a lower purchase cost may be possible. While some existing equipment might be moved to the new hospital to reduce this amount, we have included the full cost of all instruments which would be used in an American surgical facility of this size.

We obtained a detailed list of equipment for the Biomedical Workshop (Group 5), from the American Medical Resources Foundation (AMRF). See section 12.6.3 for a description of the training in use of medical equipment which AMRF provides. We have included the list of basic test equipment drawn up by AMRF which should cover most medical equipment testing requirements. Additional test equipment or deletions from this list could be recommended depending upon evolving needs. The unit costs quoted for the items in Group 5 include a 10% correction for inflation, as the prices originally quoted were from 2000/2001.

The need for Computers and Related Equipment (Group 6), was estimated based on projected use in each area of the two facilities. Computers were included on each ward, in the operating room, and in outpatient areas, as well as in each office. Provision was made for multiple computers in the pharmacy, laboratory, radiology, and central supply, as well as the reference library. Printers were also allocated, so that each computer would either have its own printer, or share it with a nearby computer on the network. The list also includes 2 LCD projectors for facility-wide use, and a provision for several small and large capacity copying machines. Unit costs for all computers and related equipment were based on recent purchases made by Boston University, and provision was made in the cost estimates for networking of the computers.

In order to quantify the need for furniture throughout the hospital (Group 7), we went room by room through the schedule of accommodation for both facilities, as laid out in Appendix 1, the Briefing Documents for the Architect and Design Team. For each area, we considered the activities to take place there, and the necessary furniture. This included basic chairs for many areas, with padded chairs in areas where an individual would be sitting for most of the day, and desks and tables as appropriate for patient interviews or administrative work. Though special high-density shelving is included under Group 1 (Fixed Equipment) in areas such as the main X-ray store in Radiology, we also included less costly, open shelves in many areas such as a doctor’s office or administrative office, where a moderate number of records might be stored. Cabinets were included where the storage of supplies called for them. Provision was made for simple, sturdy benches in most patient waiting areas, and office chairs in the waiting area of the private doctor’s office building. Finally, a number of conference tables were included in the conference and meeting areas.

Given the important of maintenance in the new facilities, we have included a provision of $50,000 (or 500,000 maloti) for Yard and Maintenance Equipment (Group 8). We list this under the equipment list of the New Referral Hospital Botsabelo, though some of the same equipment is expected to be used at the Kingsway Satellite Clinic site.
In consultation with the department of dietetics at Boston University Medical Center, we have estimated $30,000 for the initial price of a set of Kitchen Utensils and Crockery (Group 9), for a hospital of the proposed size.

The Equipment list in hard copy should be a part of all bidding documents.

The list can be sorted by area, by type of equipment, by price or by any variable or up to three combination of variables in the list. Users will want to both add and delete items and put in their own specifications, quantities and prices.

12.6.1 Equipment Cost Estimate Summaries*

(* Boilers, Laundry, kitchen equipment and the like are not included in this list but are included in the construction cost estimates. All prices are in US Dollars and do not include shipping costs or any taxes or duties.)

| Table 12.3: Equipment Cost Estimate for New Referral Hospital Botsabelo |
|--------------------|------------------|--------|
| GROUP 1            | FIXED EQUIPMENT  | $2,089,793 | 10.1%  |
| GROUP 2            | MAJOR MOVABLE EQUIP | $5,847,745 | 28.3%  |
| GROUP 3            | MINOR MOVABLE    | $6,977,749 | 33.8%  |
| GROUP 4            | SURGICAL EQUIPMENT AND INSTRUMENTS | $4,875,000 | 23.6%  |
| GROUP 5            | BIOMEDICAL WORKSHOP | $100,000   | 0.5%   |
| GROUP 6            | COMPUTERS & RELATED | $411,000   | 2.0%   |
| GROUP 7            | FURNITURE        | $272,091   | 1.3%   |
| GROUP 8            | YARD AND MAINTENANCE EQUIPMENT | $50,000   | 0.2%   |
| GROUP 9            | KITCHEN UNTENSILS AND CROCKERY | $30,000   | 0.1%   |
| TOTAL              |                  | $20,653,378 | 100.0% |

| Table 12.4: Equipment Cost Estimate for Kingsway Satellite Clinic |
|--------------------|------------------|--------|
| GROUP 1            | FIXED EQUIPMENT  | $87,940  | 17.8%  |
| GROUP 2            | MAJOR MOVABLE EQUIP | $246,432 | 49.9%  |
| GROUP 3            | MINOR MOVABLE    | $111,952 | 22.7%  |
| GROUP 4            | SURGICAL EQUIPMENT AND INSTRUMENTS | $5,000   | 1.0%   |
| GROUP 5            | BIOMEDICAL WORKSHOP | Not Applicable |
| GROUP 6            | COMPUTERS & RELATED | $17,800  | 3.6%   |
| GROUP 7            | FURNITURE        | $25,071   | 5.1%   |
| GROUP 8            | YARD & MAINTENANCE EQUIPMENT | Not Applicable |
| GROUP 9            | KITCHEN UNTENSILS AND CROCKERY | Not Applicable |
| TOTAL              |                  | $494,195  | 100.0% |
Table 12.5: Combined Equipment Cost Estimate
for New Referral Hospital Botsabelo and Kingsway Satellite Clinic

<table>
<thead>
<tr>
<th>GROUP</th>
<th>DESCRIPTION</th>
<th>COST ESTIMATE</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP 1</td>
<td>FIXED EQUIPMENT</td>
<td>$2,177,733</td>
<td>10.3%</td>
</tr>
<tr>
<td>GROUP 2</td>
<td>MAJOR MOVABLE EQUIP</td>
<td>$6,094,177</td>
<td>28.8%</td>
</tr>
<tr>
<td>GROUP 3</td>
<td>MINOR MOVABLE</td>
<td>$7,089,701</td>
<td>33.5%</td>
</tr>
<tr>
<td>GROUP 4</td>
<td>SURGICAL EQUIPMENT AND INSTRUMENTS</td>
<td>$4,880,000</td>
<td>23.1%</td>
</tr>
<tr>
<td>GROUP 5</td>
<td>BIOMEDICAL WORKSHOP</td>
<td>$100,000</td>
<td>0.5%</td>
</tr>
<tr>
<td>GROUP 6</td>
<td>COMPUTERS &amp; RELATED</td>
<td>$428,800</td>
<td>2.0%</td>
</tr>
<tr>
<td>GROUP 7</td>
<td>FURNITURE</td>
<td>$297,162</td>
<td>1.4%</td>
</tr>
<tr>
<td>GROUP 8</td>
<td>YARD &amp; MAINTENANCE EQUIPMENT</td>
<td>$50,000</td>
<td>0.2%</td>
</tr>
<tr>
<td>GROUP 9</td>
<td>KITCHEN UTENSILS AND CROCKERY</td>
<td>$30,000</td>
<td>0.1%</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>$21,147,573</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

The prices shown are F.O.B. (Free On Board) from the US supplier; MOHSW will want to procure equipment on a "C.I.F" (customs, insurance, and freight) basis so that customs, insurance and freight to Maseru are included in the bid price. For currency conversion, we use the rate of 10 rand/maloti to the dollar which prevailed on June 1, 2002. This suggests a total equipment cost of 211 million maloti. The actual amount required will depend on the ability of the contractor and MOHSW to negotiate discounts and to refine specifications to in order to obtain durable but less expensive models for some equipment. Because much of the required equipment is not manufactured in South Africa, the final cost will be highly dependent on the exchange rate at the time of procurement.

The special and additional electric power requirements for the operating rooms in addition to a reliable standby power supply cannot at this time be specified. As final decisions are made on operating room equipment, the design team must take into account any requirements for unusual voltage supply (such as 408 volts) and other requirements such as voltage stabilization.

12.6.2 Moving to a Final Equipment List

As the architectural program changes in the detailed design process, so too must the equipment list. The equipment we have selected is fully sufficient for purposes of estimating a budget for donor financing. However, it is only a starting point with regard to a final list of equipment that will actually be purchased.

The A & E firm selected for final design of the hospital should have a rich and detailed knowledge of hospitals and medical equipment in South and Southern Africa. The equipment we have specified is appropriate to the proposed QE II hospital but reflects the American market and American norms. Thus the costs in almost all cases will
be on the high side. We prefer this so as to be certain budget estimates for capital costs are fully adequate. However, the final list developed by the design firm in close consultation with users should reflect norms appropriate to the Southern African region and Lesotho in particular. Maintainability and lifetime cost considerations should be paramount as the final list is developed in the next stage of the design process.

The Equipment list is intended to 1) provide a valid estimate of costs and 2) serve as a starting point for developing the final equipment list.

Final equipment lists must be 1) directly and very closely cross-checked and related to the final architectural design and engineering specifications, 2) carefully reviewed by users and 3) chosen for durability, maintainability and affordable lifetime costs.

Review by users is a multi-step process and is time consuming for all parties. However, if omitted or shortened, the wrong equipment will be purchased. As space layouts are developed in consultation with specific user groups, equipment lists should be reviewed, revised and made absolutely congruent with the final architectural design.

User groups are rarely just the end user. For example the surgeon may want a specific brand or type of equipment, however the maintenance engineer knows this is very difficult to repair and frequently breaks down even though it is a superior instrument when it is in good working order. The nurses who set-up, clean and support the equipment may have well-considered opinions that differ from the surgeon. The purchasing agent who must live within a budget has yet another perspective. Acceding to the demands of any one party is usually an error. A joint decision should be made. This is time consuming and also requires persons with different professional backgrounds to work together even though they rarely see or talk to each other. Investing in this process has a large long term payoff in terms of affordability, professional satisfaction, patient satisfaction and overall quality of care. It is a back and forth process that must be characterized by give and take.

A very similar process is required for the balance of the architectural design process as the new hospital and the Kingsway Clinic moves from concept to detailed and final design. Where exactly should the nursing station be placed in relation to the doctor's office and treatment room? What is in a treatment room? What is the preferred relationship of the various types of rooms on a ward? Where in the operating room suite should the scrub sinks be placed? How much space is required for anaesthesia and orthopaedic equipment storage? What is the best type of cart for moving supplies from central stores to the wards? Users are the experts. The person who loads and unloads the cart and pushes the cart from place to place is the only person who is really expert in the use of the cart. What will look inconsequential to most of us who have never pushed and loaded a cart will often be of great day to day importance. And, if this is ignored, when the operating supplies don't get to the wards on time, workers are disgruntled, costs rise and quality of care suffers.
12.6.3 Training in use and Maintenance of Medical Equipment

Equipping a bio-medical workshop is only the first step toward achieving the sustainable capacity to maintain complex equipment. Technicians need to be trained and paid a salary that will keep them on the job and less likely to accept offers from the private sector. The potential for the new QE II workshop to serve as a national resource exists. This would entail more staff and more equipment. We have provided a small contingency in the expected budget to allow for this. It might be reasonable to increase by a further $20,000 bringing the total planning budget for the bio-medical workshop up to $120,000.

However, the training of maintenance technicians is critical. The non-profit group from which we obtained the biomedical test equipment list and quotes for this equipment is called the American Medical Resources Foundation or AMRF (http://www.amrf.com/). AMRF provides on-site training that, in the case of Lesotho, would use the equipment in the workshop and would train on the actual equipment the technicians will be maintaining in the new QE II as well as in other hospitals. A training program of this type should be seriously considered as an integral part of the hospital development process and budget.

AMRF provides training to users and maintainers of medical equipment in country. These services are provided in the following forms:

AMRF will assist hospitals in setting up a clinical engineering/biomedical department, or improving the performance of existing departments by sending one or more professional Clinical/Biomedical engineers to the requesting institution. These engineers will work with the departments of the hospitals usually for a period of 1 - 2 weeks. Often a series of visits are required to cover all the training needs. The cost is airfare, local travel and subsistence and a small honorarium for volunteer engineers. Usually volunteers can be sent by AMRF. If special skills are required or time off cannot be arranged there may be a charge for the salaries of these personnel.

12.6.4 A Note on Beds

Hospital beds have a very wide price range. As with all equipment, these should be looked at carefully in the Southern African market. Almost certainly you will be able to purchase many items of good quality at prices lower than American prices. The choice should be made on the basis of lifetime costs. Thus, it is often worth paying more to acquire a piece of equipment or furniture if it will last longer and be easier and lower cost to maintain.

In the US market, bed prices range from $3,000 to over $15,000. These beds typically have electrical or hydraulic and electrical units that allow push button operation. Beds for $3,000 are typically remanufactured (used and fully reconditioned with a multi-
year guarantee). Beds are not only costly to acquire, they can be costly to maintain. We strongly suggest that MOHSW:

1) look at durable beds that are mechanical not electrical or hydraulic,
2) validate the maintainability, comfort and ease of use of the model proposed for purchase,
3) purchase beds that are available from South African suppliers (who also provide service).

The range of beds and bed-like accommodations required are:

1- Full size Patient Beds (adults and older children)
2 - Cribs for infants and toddlers
3 - Bassinets for normal newborns
4 - Warmers/incubators for premature newborns
5 - Wheeled Stretcher-Beds for the ICU and Recovery Room
6 - Patient transport stretchers (Gurneys)
7 - Simple beds for mothers or other relative in paediatrics**

(**We recommend this as the team observed that almost every child had a relative in attendance around the clock, most often the mother. A rugged simple bed is all that is required.)

12.7 Staff Housing:

We are not recommending any specific complement of staff housing. The choice of the number and type of units will be up to the Ministry and should be made after a review of existing policy and staff preferences. At current prices, the current construction costs (per unit) are as follows:

3-bed married unit for senior staff --------- 78 m2 x 2500 M --- 195 000 Maloti

2-bed married unit for middle cadre ----- 57 m2 x 2500 M --- 142 500 per unit
(usually built in semi-detached units)

1-bed unit for single nurses ------------------------------- 71 500 per unit
Bed & living rooms sharing services between 2 units-usually built in units of 4

1-bed single unit for visitors --------------- ---------------------- 36 000 per unit
usually built in blocks of 6 x 1 bedroom sharing kitchen and shower/wc.
The site drawings show the space allocated for staff housing. The area shown would comfortably provide up to:

- 30 3-bedroom houses  
  and  
- 72 middle-cadre married  
- 2-bedroom units (in three 3-story apartment blocks)  
  or  
- Some mix of the two types.

Total construction costs can be determined by multiplying the above unit costs times the selected number of units. As an indicative budget, we have indicated the cost of placing 15 senior cadre units and 36 middle cadre units on the available space at the Botsabelo site. The resulting indicative housing cost is 8,000,000 maloti.

With a 20% allowance for design and engineering services, and a 10% contingency allowance, total cost WITHOUT AN INFLATION ALLOWANCE would be 10,560,000 maloti.

Whatever configuration is finally chosen for staff housing, units must be provided for temporary accommodation of District staff during training at the hospital.

12.8 Summary of All Estimated Costs:

All costs in Maloti are at February 2002 prices with currency conversion from the US$ at the rate of 10 maloti to the dollar prevailing on June 1. They do not include any allowance for inflation. No provision is made for taxes or duties as we expect a public project will be exempt.

Table 12.6: Summary of All Estimated Costs

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>COST ESTIMATE</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Construction of New Referral Hospital</td>
<td>117,500,000</td>
<td>33.2%</td>
</tr>
<tr>
<td>Staff Housing (Indicative)</td>
<td>10,560,000</td>
<td>3.0%</td>
</tr>
<tr>
<td>Equipment at New Referral Hospital</td>
<td>206,534,000</td>
<td>58.4%</td>
</tr>
<tr>
<td>Subtotal for New Referral Hospital</td>
<td>334,594,000</td>
<td>94.6%</td>
</tr>
<tr>
<td>Construction Kingsway Clinic</td>
<td>14,250,000</td>
<td>4.0%</td>
</tr>
<tr>
<td>Equipment Kingsway Clinic</td>
<td>4,942,000</td>
<td>1.4%</td>
</tr>
<tr>
<td>Subtotal for Kingsway Clinic</td>
<td>19,192,000</td>
<td>5.4%</td>
</tr>
<tr>
<td>Grand Total</td>
<td>353,786,000</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Chapter 13

Costs of Necessary Actions

In this chapter, we present preliminary estimates of the costs to meet identified needs in the health care system of Lesotho. This includes immediate needs at QE II and the Districts, plus additional needs that will develop when a replacement hospital opens. Wherever possible, these values are estimated using actual costs incurred in FY 2000/2001, including the step down cost analysis done of QE II, Leribe and Mohales Hoek for that year.

13.1 Immediate Staffing Needs

13.1.1 QE II

Nurses

All persons consulted emphasized that QE II is very understaffed. Dr. Bicknell's observations confirmed understaffing at the nursing officer level. Nursing assistants seemed to be underutilized, possibly because the nurses have little time to train and supervise them. It is also possible compensation issues contribute to low motivation.

The total number of nurses currently employed is 149. We took the various hospital functions and assuming the same shift structure, assigned a sufficient, perhaps only barely sufficient, number of nurses to each function or functional area as listed in Table 13.1. We then corrected for vacations, holiday, sick-time and, where 24 hour coverage was needed, corrected for that. However, all functions did not need full night, weekend and holiday coverage. For example, the operating rooms were assumed to have 4 nurses and nurse anesthetists on duty after hours, far less than the daytime staffing. Casualty received the same staffing every day, around the clock. Clinics other than casualty were staffed only for the day shift. Maternity had a larger staff than any other ward. Eye and private were assigned the lowest staffing, with all other wards in between. TB inpatient services, temporarily at the mental hospital, are treated separately and are staffed higher than eye or private but less than the other 9 wards at QE II.

In many years of looking at hours of professional work and days of leave, sick leave, holiday and vacations, the team has consistently found that the norms for days and hours at work in the US are little different than those found in developing countries. With a work week of approximately forty hours, and time lost to holidays, sick leave and vacations, it takes about 5 employees to staff one position 24 hours a day, 365 days a year. For this reason, we used the following multipliers to correct for staffing positions on a single shift and around the clock. We assumed the evening shift is 12 hours, or 1.5 times the normal shift. Table 13.1 shows the development of these estimates.

Single shift year round staffing: multiplier = 1.7
Round the clock staffing: multiplier = 5

Nurses currently employed = 149, Nurse needed = 267 for a deficit of 118 nurses.

NOTE: These are not nursing assistants.

We assume a mid-range nurse salary of 50,000 maloti/year and the increment in salary funds required is 5,900,000 maloti.

To run the current QE II hospital adequately, staff are urgently needed to:

- Plan for the new hospital,
- Manage the design and equipment purchase process,
- Handle the staff work and negotiations needed to develop maintenance contracts and clinical services affiliations with the RSA
- Develop the detailed plans needed for parastatal entity or management contracts
- Contract to run the entire QE II hospital.

This work requires a significant increase in senior hospital management as well as analysts with knowledge of medicine and health care. These talents are needed now and are NOT functions that can be delegated to consultants. Unless this level of management is on board full-time at QE II, most consultant input will be wasted. We have allowed for eight new positions. The overall management correction is 540,000 maloti.
### Table 13.1: Projection of Need for Additional Nurses

#### Nurses All Level above N. Asst:

<table>
<thead>
<tr>
<th>Assumptions for Need</th>
<th>Multiplier</th>
<th>Units</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prin. Nursing Officer</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Matrons days</td>
<td>3</td>
<td>1.7</td>
<td>5</td>
</tr>
<tr>
<td>Matrons nights</td>
<td>2</td>
<td>1.7</td>
<td>3</td>
</tr>
<tr>
<td>OR N &amp; N Gas Days</td>
<td>14</td>
<td>1.7</td>
<td>24</td>
</tr>
<tr>
<td>OR coverage</td>
<td>4</td>
<td>1.7</td>
<td>7</td>
</tr>
<tr>
<td>A&amp;E RTC</td>
<td>4</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Clinics days including TB</td>
<td>25</td>
<td>1.7</td>
<td>43</td>
</tr>
<tr>
<td>Maternity ward 7 del RTC</td>
<td>8</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>Eye RTC</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Private RTC</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>9 other wards days</td>
<td>4</td>
<td>1.7</td>
<td>9</td>
</tr>
<tr>
<td>9 other wards nights</td>
<td>3</td>
<td>1.7</td>
<td>9</td>
</tr>
<tr>
<td>TB days</td>
<td>3</td>
<td>1.7</td>
<td>5</td>
</tr>
<tr>
<td>TB nights</td>
<td>1</td>
<td>1.7</td>
<td>2</td>
</tr>
</tbody>
</table>

**TOTAL NEED FOR NURSES**: 267

**Current Nurse Staff**: 149

**Nurse Deficit**: 118

**Increase Number of Nurses by**: 79%

**Nurse deficit**: 118

**Median nurse salary**: 50,000

**Nurses Increment Needed**: 5,900,000

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13.1.2 Districts

The district hospitals serve a vital function which will only endure and grow as Lesotho continues to develop. The district hospitals, whether CHAL or MOHSW, have three core functions:

1. **Provision of basic inpatient services**—Obstetrics, including elective and emergency Caesarian sections, gynecology, limited elective and emergency, general surgery, pediatrics and general adult medicine.

2. **Provision of primary care service** in the hospital outpatient clinic.
3 - Supervision and support of primary care services provided by affiliated outlying, free-standing clinics.

(Note: Some CHAL hospitals have a fourth very valuable function - the education and practical training of nurses.)

All district hospitals seem to be busy and doing well with function two - Provision of primary care service in the hospital outpatient clinic.

Ministry hospitals are having great difficulty carrying out function three - Supervision and support of primary care services provided by affiliated outlying, free-standing clinics, as they report not having sufficient physicians to visit the clinics. No supervision by physicians and more senior and experienced nurses means the quality of service will degrade, patients will perceive this, utilization will fall and what is now a vital and good cornerstone of the health system will slowly erode.

However, it is function one - Inpatient Services - where the most serious problems lie and they appear to be more serious in MOHSW district hospitals than in CHAL hospitals.

The most fundamental, most urgent and extremely serious source of this problem is physician supply: The problem has several components:

• Too few physicians overall
• Too few Basotho physicians
• Excessive physician turnover
• Insufficient post-graduate training in basic specialties for physicians to responsibly and safely carry out the work they are asked to do.

These are system faults not the fault of any one person or group of individuals. Though not completely satisfactory, it appears that nursing is a less critical problem at the district level than at QE II.

District hospitals may be classified into larger, smaller and extremely isolated. On this visit only the larger hospitals were visited. In the past Dr. Bicknell has visited a good sampling of all district hospitals in the country.

There may be one or to very remote districts where it is very desirable to have emergency Caesarian sections available in order to avoid a 4 to 6 hour trip to the nearest facilities with this service. The minimum staff in such a situation, in addition to nurses who can scrub and circulate in the operating room but spend most of their time on general ward and clinic duty, is a nurse anesthetist and a physician trained to the diploma level in obstetrics and gynecology. Such a site might well have only an outpatient clinic and a maternity inpatient service with little or no hospitalization of any other patients. However, the physician not only needs proper training, he or she also needs enough volume to maintain surgical proficiency. This is certainly no less than 1 or 2 cases per
month. Whether a physician with the required skills will be available and willing to work alone in such a remote area is a very open question.

At other district hospitals, smaller and larger, the objective should be to cover the 4 basic specialties in one of two ways:

Smaller District Hospitals: Minimum of two physicians with 3 of the 4 major disciplines covered at the diploma level with one of those always being obstetrics and gynecology. If one of the physicians is also given duties as a District Medical Officer, then either a third physician is needed or a non-physician district administrator should be employed. (Note: it is the team’s understanding that physicians may acquire diploma level training in several specialty areas. Thus, it is quite feasible to plan for covering four specialties with 2 physicians.)

Larger District Hospitals: Minimum of four physicians with all 4 of the major disciplines covered. If one physician is functioning as the District Medical Officer, the minimum requirement moves to five, or a non-physician district administrator should be employed. Emphasis is given to minimum. As hospitals become better staffed and utilization increases, more physicians will be needed.

Everyone has a right to and need for supervision. This includes physicians. Physicians should not be left alone once assigned to the Districts. Supervisory visits of several days duration by QE II specialists should be made periodically to each district hospital. One 3-day visit per year, per basic specialty, is a reasonable goal. As well, district physicians should receive a minimum of 6 weeks of in-service training every two years at QE II. This could be in blocks of two or three weeks each, or in a single six week block.

Thus the basic minimum staffing recommendations are:

Extremely remote rural settings: 1 physician with diploma level training in obstetrics and gynecology and one nurse anesthetist. No other changes in staffing.

Smaller District Hospitals: A minimum of 2 physicians covering three of the 4 basic disciplines with at least one in obstetrics and gynecology. If a physician serves as a District Medical Officer, then 3 are required or a non-physician district administrator should be employed. No other changes in staffing.

Larger District Hospitals: A minimum of 4 physicians covering all 4 basic disciplines. If a physician serves as a District Medical Officer, then 5 are required or a non-physician district administrator should be employed. No other changes in staffing.

There are currently 44 physicians assigned to the Districts. On this basis, 54 would be needed just to provide the minimum level of physician coverage. Additional physicians (or an allowance for non-physician managers) must be allowed to cover the District Manager functions so these doctors have time to devote to medical practice. We
have allowed another eight physician positions to cover this need. Eighteen additional physicians at the level of a senior registrar would cost 2.6 million maloti per year.

13.2 Operation of New Facilities

The incremental costs of operating the new hospital and the Kingsway clinic were estimated using the step-down costing model of the existing facility (see Appendix 8). Only one significant service is being added--an ICU. Staffing 10 beds in the new ICU would require 25 additional skilled nurses. An affiliation contract for on-site oncology services would be the other potential service enhancement. The initial bed size (410, not including bassinets and ICU beds) is similar to the operating bed complement of the existing hospital. The hospital design has more area per bed and the flexible design will permit the facility to provide good care to more patients at any one time. Staffing growth beyond the nursing adjustment discussed above will be limited, but must reflect the additional services (ICU) and higher level of activity expected. Recurring costs for the new facility will increase above the revised staffing levels suggested above for a variety of reasons:

- the ICU must be fully staffed
- new and properly functioning equipment will run more tests, with associated supply costs
- utility and cleaning costs will rise with the additional area and added complexity of hospital systems
- building maintenance costs must rise even though the facility is new (see discussion below)
- improved medical records will require additional clerical services
- revenue enhancements (user fees, Medical Aid, private services) will require strengthening of the accounting department

There are few “productivity improvements” available in the building of a new hospital. Experience in the health care field shows that capital investment rarely produces a significant saving in labor costs, as it does in the manufacturing industry. The amount of nurse and physician time per patient will not be reduced. If the hospital takes sicker patients, it could need more nursing hours per patient, but this is partially accounted for in the addition of the ICU and its staff. The one area in which productivity improvements are possible is in basic cleaning, security and housekeeping. Our initial review of the existing QE II budget showed a relatively large number of low paid positions. With the few exceptions shown below, we have not increased the number of these positions. The size of the hospital---the square footage of floor space to sweep, the number of washbasins and toilets to clean---will increase substantially. Therefore, it will be necessary to obtain additional productivity from the existing cadre of unskilled workers. This will require improved supervision and incentives.

In order to calculate the incremental annual running cost of the new hospital and clinics, we took the unit costs of each additional item, and multiplied by the number of units required. To staff a position 24 hours a day, 7 days a week, 365 days per year
requires approximately 5 employees because one employee working 40 hours per week (with normal holidays and sick leave) works approximately 1,760 hours out of the 8,760 hours in a year. We have used this 5:1 ratio of FTE’s to positions in our calculations. For one shift operation 365 days per year, 1.7 employees are required, for 2 shift operations 3.3 FTE’s. To staff a position for eight hours on weekdays only requires about 1.2 FTE’s. We have used these ratios in all our calculations. However, if house officers can be required to work more than 40 hours per week, the indicated number of physicians could be reduced.

The total incremental operating cost of running the hospital each year will be about 8,134,000 maloti. The estimates made to determine this increase are explained below. For purposes of consistency, all base costs and salaries are from 2000-2001, the same year as the step-down cost analysis. Because a few new physician and nurse positions are included in this total, a small additional amount would have to be added if MOHSW adjusts professional compensation as discussed in Section 13.3.

Intensive Care Unit

In the Intensive Care Unit (ICU), one dedicated, round the clock doctor will be needed, with an additional senior one of the day shift. Thus, we need 1 consultant (with a salary of 129,444 maloti) and 4 senior houseman, each with a salary of 80,376 maloti (80,376 x 4 = 321,405 maloti). In addition, these physicians receive a call allowance of 24,000 for the consultant and 11,400 for each of the 4 senior housemen (11,400 x 4 = 45,600 maloti).

Because the patients are very sick, an ICU nurse can serve no more than two beds at one time. The ICU will need 5 full time equivalent (FTE) nurses for every 2 beds. Thus, with 10 ICU beds, we would need 25 nurses. If these nurses are to be paid at the rate for nursing sisters (42,252 maloti) then the incremental salary cost is 42,252 x 25 = 1,056,300 maloti. Similarly, we need 2 nurse assistants 24 hours per day, which requires 10 FTE nursing assistants who earn 19,824 maloti, so 19,824 x 10 = 198,240 maloti.

Consumables and drugs will also contribute to the incremental cost of the ICU. To estimate the costs of consumables and drugs in the ICU, it was estimated from experience that the cost of drugs and consumables per inpatient day in the ICU would be 5 times that in the Medical and Surgical Wards. From the step-down analysis, the annual cost of consumables and drugs in the Medical and Surgical Wards was 2,190,529 maloti. This was divided by 50,370 patient days, to get 43.5 maloti per patient day. Since there will be 10 beds in the ICU, we take 43.5 maloti x 5 x 10 beds x 365 days x .70 (for 70% occupancy), to get 555,569 maloti for drugs and consumables.

This makes the total incremental recurring cost of the ICU 2,331,000 maloti per year.
Radiology

In the radiology department, there will be a need for 13.5 FTE senior radiographers. This represents one machine manned 24 hours/day (5 employees) plus 5 machines manned 8 hours/day seven days/week (8.5 employees). As there are now 3, this means an increment of 10.5 senior radiographers earning 43,536 maloti, or 10 x 43,536 = 457,128 maloti. A total of 5 radiographic assistant FTE’s will be required, and since there are now 2 FTE’s, the incremental increase is 3 FTE’s. Each of these will earn 11,760 maloti, for a an incremental cost of 3 x 11,760 = 35,280 maloti.

Consumables in the radiology department, including x-ray film and x-ray forms, are now 529,160 maloti. With the additional machines operating reliably the number of X-rays will likely double, so the incremental cost is 529,160 maloti.

Total incremental recurring cost associated with full operation of the recommended X-ray equipment (over and above the recommended additional allowance for equipment maintenance) is 1,022,000 maloti per year.

Theatre

In the theatre, supplies and consumables now account for 913,064 maloti. We estimate that this will increase 50%, due to the greater availability of the theatre and greater complexity of procedures performed, for an incremental cost of 456,532 maloti.

General (hospital-wide) incremental costs

We estimate that the new hospital will use 50% more water then the present one, particularly as greater hand washing and better cleaning is encouraged. Current water use costs 485,289 maloti, so the incremental increase will be 242,645 maloti. Electricity is 2,692,593 maloti, and this is predicted to double in the new hospital with additional equipment, lights and utilities in regular operation, for an incremental cost of 2,692,593 maloti. Similarly, the phone and communication use of 272,163 will double, giving an incremental cost of 272,163 maloti. The need for cleaning supplies will increase in proportion to the increase in floor area of the hospital. The current hospital is 14,773 square meters, and the new hospital is planned at 22,700 square meters. 22,700/14,773= 1.54. The 54% increment in area is multiplied by the current cost of cleaning supplies of 360,500 maloti, to yield 194,670 maloti in incremental cost. The total increment in recurring cost attributable to the additional space and utilities usage is 3,402,000 maloti.

Laboratory

The step-down analysis calculated laboratory costs using 60% of the cost of the national lab, plus costs from the hospital that were allocated to laboratory. In terms of
manpower cost, this amounted to 1,183,208 rand. With more reliable equipment and a higher volume of tests ordered, this is projected to increase by 20%, yielding an incremental cost of 236,642 maloti. Consumables, which now cost 691,031 rand, will increase 50%, for an incremental cost of 345,516 maloti. Total incremental cost of laboratory operations would be 582,000 maloti.

Casualty

The new hospital will need a total of 6.7 senior houseman FTE’s assigned to casualty. (This is equivalent to having 2 senior housemen on duty from 7am to 11pm, and one on duty overnight.) Currently 3 FTE’s are assigned to casualty, so this is an increase of 3.7 FTE’s. We multiply this by 80,376 rand for salary to yield an increase of 297,391 maloti. These senior houseman are paid call allowances of 11,400 rand each, yielding an increase of 3.7 x 11,400 = 42,180 maloti for an increment of 340,000 maloti.

Downtown Clinic

The Kingsway Clinic will reduce the volume of outpatient visits at the Botsabelo facility, so there should be no increase in the number of nurses and doctors required beyond those necessary for the full caseload at a single site. This professional staff can be rotated or assigned to the Kingsway Clinic by the responsible departments at the Hospital. Only some additional support positions will be required, and the incremental yearly operating cost of the clinic would be only 266,000 maloti.

If the clinic is open 12 hours per day, 5 days per week, then for any one category of staff, 1.8 FTE’s will be needed. Thus the clinic will require 1.8 people in medical records. The current salary for an Assistant Medical Record Officer is 13,596 rand, so 1.8 x 13,596 = 24,473 maloti in incremental cost. Similarly the position of clerk will require 1.8 FTE for clerical assistants, so 111,388 rand x 1.8 = 20,498 maloti. The salary of 1.8 senior radiographers is 1.8 x 43,536 = 78,365 maloti. We estimate the salary of a phlebotomist to be about that of a pharmacy technician 38,028, and 1.8 x 38,028 = 68,450 maloti.

The new clinics will need 3 FTE cleaners. As the salary for a hospital assistant is 7,788, we multiply this by 3, yielding 23,364 maloti in additional cost. 1 FTE receptionist will cost 7,788 maloti. In addition, because of the high burden of TB in the country there may well be a need for a Nursing Sister for TB at the downtown clinic. This would represent an additional cost of 42,252 maloti.

13.3 Compensation Upgrade

Wherever we traveled in Lesotho, we heard complaints that trained Basotho doctors and nurses--and now long time contract physicians--are leaving because pay is
inadequate in comparison to opportunities elsewhere. The biggest nearby competitor for
Lesotho professional staff is the Republic of South Africa. Table 13.2 presents a
comparison of typical compensation for comparable professional positions that include
most of the professional staff in Lesotho. The values for South Africa include Medical
Aid contributions, bonuses and housing allowance. Pension allowances are not included
for either country. Lesotho does not have a contributory pension scheme, so it would be
difficult to make a comparison of this benefit. The Lesotho physician compensation
schedule includes on call allowances for doctors. It does not include hardship
allowances, but these are relatively minor. Lesotho has no Medical Aid scheme for its
civil servants. No value is included for the value of housing that is provided to some
professionals in Lesotho. For doctors, the South African figures include a fixed
allowance in lieu of overtime equal to 40% of the basic salary.

For Lesotho, we have taken the average of actual current compensation for all
employees in a job category. For South Africa, we have taken a midpoint in the pay
range for the compensation grade assigned to the job title. Depending on the job
category, the apparent differential in annual compensation ranges from 126 % (Senior
Houseman) to 57 % (Pharmacist) of current compensation in Lesotho.
### Table 13.2: Comparison of Annual Professional Compensation (rand)

<table>
<thead>
<tr>
<th>Job Category</th>
<th>Lesotho</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Lesotho)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Consultant/</td>
<td>154,507</td>
<td>279,096</td>
</tr>
<tr>
<td>Specialist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior Registrar</td>
<td>147,444</td>
<td>279,096</td>
</tr>
<tr>
<td>Registrar I/II</td>
<td>101,184</td>
<td>214,391</td>
</tr>
<tr>
<td>Senior Houseman</td>
<td>92,064</td>
<td>208,105</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>65,832</td>
<td>103,385</td>
</tr>
<tr>
<td>Senior Nursing Officer</td>
<td>65,592</td>
<td>103,385</td>
</tr>
<tr>
<td>Nursing Officer</td>
<td>60,300</td>
<td>103,385</td>
</tr>
<tr>
<td>Nursing Sister</td>
<td>43,800</td>
<td>87,261</td>
</tr>
</tbody>
</table>

Source: Data from Health Department, Orange Free State, March 2002 and Step-down Model of QE II Hospital, Appendix 8.

We excluded from the analysis professionals in senior management positions, as well as certain technicians at the lower end of the professional pay scale where it was difficult to match South African and Lesotho job titles. This left a total of 684 positions for analysis, including almost all nurses and physicians. Total annual compensation for this group is now 43.76 million maloti. The aggregate differential between Lesotho and South African compensation levels for the positions in these cadres is 39.18 million maloti.

Lesotho cannot afford to close this entire gap, and it is not necessary to do so. Living costs are likely higher in South Africa. Many professionals in Lesotho have local family ties that keep them from emigrating in search of work. There may be some elements of compensation in Lesotho we have missed. However, Lesotho must be prepared to reduce the discrepancy to avoid losing additional trained Basotho health professionals, and some of the more experienced expatriate doctors. To obtain an idea of the cost of reducing this gap, we calculated the cost of increased compensation if the Government of Lesotho were to close 25%, 40% or 50% of the apparent compensation gap for the 684 positions. The aggregate annual costs of such an adjustment for professional positions at QE II and the Districts are as follows:
Table 13.3: Aggregate Annual Cost of Closing the Gap

<table>
<thead>
<tr>
<th></th>
<th>QE II</th>
<th>Districts</th>
<th>MOHSW Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>25% of differential</td>
<td>5.113</td>
<td>4.682</td>
<td>9.795</td>
</tr>
<tr>
<td>40% of differential</td>
<td>8.181</td>
<td>7.492</td>
<td>15.673</td>
</tr>
<tr>
<td>50% of differential</td>
<td>10.226</td>
<td>9.345</td>
<td>19.591</td>
</tr>
</tbody>
</table>

(all values in millions of maloti)

An additional amount would have to be added to top up the compensation of any additional professionals hired as discussed in 13.1 and 13.2.

Closing only 25% of the gap would cost the Government of Lesotho 9.8 million rand per year. This might be sufficient to hold nurses with family ties and other constraints on mobility. For Basotho physicians, the adjustment may not be enough. However, this could be viewed as a starting point for professional compensation reform. The money need not all come from an increase in basic salaries paid by MOHSW. It could also come in terms of special allowances, employer provided housing, or the opportunity to officially conduct a private practice outside of regular working hours.

13.4 CHAL Equalization

Other consultants have examined in great detail the issues in the relationship between the Government and the Christian Health Association of Lesotho (CHAL). The relationship is one of mutual dependency. The CHAL facilities could not survive without a subvention from the Government. But, if the Government attempted to replace the CHAL facilities with its own, it could not afford to spend as much as the CHAL facilities currently spend. Higher levels of user fees and some sponsor funding enable the CHAL facilities to provide services that the Government could not fund with tax revenues at the same level that it funds its own facilities (90% to 95%).

In addition, the CHAL facilities (see analysis in Chapter 6) show some of the benefits of autonomous management, with facility managers having greater authority and ability to motivate personnel and spend funds received. Although CHAL facilities struggle for lack of capital investment, their operations, at the time of this study, seemed to be more effective than many Government-run District hospitals.

We do take issue with the statement in the MCDI report that the higher level of personnel costs in CHAL facilities simply means that these facilities are inefficient (compared to Government facilities). In many cases, the higher costs are incurred because the CHAL facilities are better meeting the basic goals for a District hospital, with
active surgery services and a more intense case load than seen in Ministry facilities. If funds are insufficient, an argument can be made for closing some hospitals in order to fund remaining District Hospitals adequately. CHAL and Ministry facilities should be treated equally in such analysis, and credit must be given to the CHAL ability to tap revenue sources which Government facilities cannot. Occupancy levels should be analyzed in terms of beds actually staffed, patient and service mix, and average length of stay. In general, the savings from closing a few beds in each facility may be minimal, and it may be better to look at closure of entire facilities (MOHSW or CHAL), particularly where road transportation to alternative sites is adequate.

Nonetheless, it is clear that CHAL facilities are struggling, and that this adversely affects the health system:

- the decline in charitable contributions by sponsors makes it difficult for CHAL facilities to invest in new plant and equipment.
- Government subventions for staff at CHAL facilities are actually below the level of compensation for similar staff working in the Ministry (funds are not provided beyond the first step in a grade). The Ministry can recruit experienced staff away from CHAL by offering more money for the same position.
- CHAL facilities must buy their own drugs and supplies, and pass these costs on to patients. The higher level of user fees forces poorer patients to shift to government facilities where user fees are lower and more predictable. In our interview at St. Joseph’s in Roma, management acknowledged that some patients who formerly sought treatment there now go to QE II. The cost of the basic QE II outpatient fee, plus transport from Roma to Maseru and back, is less than the likely cost of care for the same condition at St. Joseph’s. Because QE II provides all necessary drugs and tests after payment of the basic consultation fee, the cost to the patient is capped at QE II, but unpredictable at the CHAL facility.

The MCDI analysis of four CHAL hospitals shows that Government subventions accounted for 44.5% (St. Joseph’s) to 60.6% (Scott) of total revenue. It is beyond the scope of this report to specify the exact method by which the Government contribution to CHAL hospitals should be expanded. MCDI offers several alternatives. While a reduction in the gap between MOHSW user fees and CHAL user fees is necessary, it is likely not appropriate to eliminate this differential entirely. As noted elsewhere, tax funds cannot support all of the needs of the existing health system, let alone subsidizing CHAL facilities at the same level as MOHSW facilities. Sponsors of CHAL facilities may not be able to provide the amount of funds that the Government would like them to provide, but sponsor funds and CHAL-determined user fees do bring more money into the health system. Independent operation of the CHAL facilities is still desirable, and they should have some ability to depart from the Government fee schedule, particularly when offering a service not available from a Government facility.
Rather than trying to quantify the costs of a particular policy for CHAL “equalization,” we estimated the cost if Government funding of CHAL (at current CHAL budget levels) rises by 15 percentage points. Given the distribution of funding sources observed in the MCDI study, we set the goal of such a revision in the funding formula to raise the share of Government funds in CHAL budgets from 52.5% of revenue (mid point of the four financial statements analyzed by MCDI) to 67.5% of revenue. Current Government subventions to CHAL in the MCDI analysis were 17.2 million rand. Meeting this “15%” target would require an additional 4.9 million. Allowing for two years inflation since the year used in the MCDI study would raise the required amount to 5.4 million.

The exact terms of any increase in the CHAL subvention will be determined by negotiation. Our analysis suggests that the following principles should be applied:

- the additional funds should enable CHAL to compete with Government salaries and retain experienced staff.
- the CHAL intuitions should retain substantial managerial autonomy consistent with meeting reasonable quality standards.
- the CHAL facilities should have the ability to charge user fees in excess of Government user fees, but the differential between the fees for the same services at CHAL and Government facilities should be reduced.

Reaching these goals in an equitable manner will require 5 million or more maloti in addition to the current CHAL subvention. If any CHAL facilities are closed, the amount of the subvention saved by such closure can be deducted from this amount.

13.5 AIDS

AIDS and its associated illnesses is rapidly becoming the largest single burden on the health care system. In Chapter 10, we projected the number of beds which may be required to provide inpatient care for AIDS patients. But inpatient care is only part of the picture. The opportunistic infections afflicting AIDS patients require a variety of drugs for treatment. In 1997, a World Bank policy report estimated the cost of drugs and supplies, per patient year with active AIDS, at US$18.96 for relief of pain and symptoms, plus a further US$32.76 for treatment of all but the most costly opportunistic infections. Treating the more expensive opportunistic infections would raise the cost by an additional $140 per patient year. Translated into rand at 10 maloti to the dollar, the cost for palliative care and the less expensive opportunistic infections totals about 500 maloti per patient year. (Confronting AIDS; Public Priorities in a Global Epidemic, A World Bank Policy Research Report, Oxford University Press, 1997, Ch.4). Using the same number of AIDS cases projected in Chapter 10, the drugs and supplies for AIDS patients could cost 14 million rand (plus an inflation adjustment) by 2006.
This estimate does not reflect recent developments in the cost of drugs for AIDS. Fluconazole for treatment of fungal infections is now being offered free by the manufacturer under certain conditions. The price of antiretrovirals is coming down, but such drugs were not included in the above estimates. Even if antiretroviral drugs should become available free, the medical care and laboratory tests associated with their use would be a large additional expense. Nevarapine to prevent mother to child transmission seems to be the exception—some studies have even suggested giving it to all mothers without an HIV test when infection rates are high. The manufacturer now claims to make nevarapine available for free in AIDS-afflicted countries like Lesotho.

If antiretrovirals become available, and if they are effective, they will not necessarily reduce the costs projected here. If patients live longer, they will require treatment for a longer period of time. They may survive additional opportunistic infections.

Any antiretroviral program which is introduced in Lesotho must be quickly disseminated to the District level. If such advanced care is given only at the “apex” hospital in Maseru, some patients will surely migrate to the capital for treatment, overloading that hospital. Yet a well staffed District hospital should be able to meet the needs for palliative care and treatment of opportunistic infections—so long as staff are trained. Staff at such facilities could even administer simple antiretroviral regimes.

In FY 1998-99, the total drug bill for MOHSW was about 25 million, rising to 27 million rand in FY 1999/2000. The additional 14 million maloti burden of purchasing drugs for the treatment of AIDS (not including retrovirals) could increase the need for drugs by 50% by 2006.
Deterioration Curve
(Max. Theoretical Deterioration -70%)

-5.00
-17.96
-34.07
-48.61
-59.02

- Building Age (in Years)
13.6 Maintenance of Buildings

The many demands on the limited resources available for new facilities have inevitably led, in many countries, to a diminution of building maintenance. Accordingly, there is frequently an almost total absence of a preventive maintenance culture, resulting in a growing deterioration of the building stock. This has inevitably led to major expenditures on the rehabilitation of existing facilities and is very wasteful of resources. As an example, a 2.3 million maloti contract is currently being undertaken on essential works to the OPD and some wards at the QE II Hospital simply to make up for the lack of maintenance over past years.

Buildings too are often seen in terms of capital cost only, whereas the actual life-span of a building depends on its upkeep and maintenance. If a building is not maintained, the life-span is perhaps 25/30 years, but if well maintained that may be extended to 60/75 years. The Deterioration Curve (Figure 13.1) shows the maximum theoretical deterioration of buildings at minus 70%. The remaining 30% represents the substructure, walling and site works which are unlikely to deteriorate. When this graph is applied to the life cycle, the total actual building costs are as follows:

For an unmaintained building over two generations (60 yrs);
The total cost is made up of the Initial construction cost, say 10 million + one 70% replacement, that is: 10 million + 70% 10 million = 17 million.

The cost of that building properly maintained for the same period;
Initial construction cost, 10 million + 0.5% per annum = 13 million.

This represents a powerful economic argument for the proper preventive maintenance of the building stock and illustrates that it does not make sense to build new facilities without making proper provision for their maintenance.

It appears that there has been little upkeep of buildings or preventive maintenance in the Kingdom of Lesotho for the past decade or more, other than emergency repairs. Accordingly, we suggest the first step required is to appointment a senior experienced architect/engineer/building specialist as Facilities Manager at a Central Maintenance Center. This proposal is elaborated in Chapter 15.

For the Facilities Manager to be fully effective, he should be allocated a dedicated or “ring-fenced” Maintenance Budget. His work will necessitate visiting all the Health facilities within the Kingdom of Lesotho regularly in order to co-ordinate an up-to-date record and program for continuous preventive maintenance and repair of all health buildings and services. He should also develop a Deterioration Curve applicable specifically to Lesotho.

The Mission recommends that the maintenance Facilities Manager examine the most effective and economic means of maintaining all health facilities. He should
address both Emergency and Preventive Maintenance; the former includes the breakages and repairs arising from storms, accidents and usage and the latter refers to the regular planned upkeep of facilities including repainting on a 5-year cycle.

He should review a variety of possibilities including a maintenance approach to preserve investments in facilities in the most cost effective manner. He should;

- provide guidelines on using contractors versus in-house staff for preventive maintenance
- develop guidelines for preparation of budget submissions,
- develop performance criteria for evaluating maintenance needs,
- allocate funds for implementation
- advise design teams on the selection of minimum-maintenance materials as well as construction specifications.

13.7 Maintenance at QE II

We understand that the RSA public sector budgets up to 10% of hospital recurrent costs for maintaining equipment and civil works, including the replacement of small items of equipment. In the West, where the wage bill for doctors, nurses and patient care staff is much higher, hospitals routinely budget 6% of total operating cost for maintenance. These figures include routine and preventive maintenance of buildings (at 0.5% of construction costs), with the remainder for equipment maintenance. Given the large amount of deferred medical equipment maintenance that must be done and continued for the next five years until the new hospital is built and operating, an allocation of 10% of the current recurrent budget at QE II is likely needed. This figure is in addition to the expenditure for the emergency civil works repairs that are currently underway. At present about 600,000 maloti/year are expended for maintenance. When this number is subtracted from 10% of the recurrent budget the increment of additional funds needed now for maintenance is 5,600,000 maloti.

If the recommended new facilities are built, the amount needed from the beginning for maintenance of the buildings should be about 700,00 per year (140 million X 0.5). The remainder of the proposed 6 million maintenance budget would go into equipment maintenance, including the replacement of minor equipment (surgical instruments, ECG machines, furniture, etc.) In the very first year of operation, this full amount of 6 million maloti may not be needed. All of the equipment will be new and most will be on warranty. However, by years two and three, maintenance costs will rise rapidly as equipment comes off warranty and broken items need to be replaced. In the first year, some of the budgeted maintenance allowance might be used to cover the cost of purchasing the expanded initial inventory of expendable supplies needed in the more complex facility. However, it is extremely important that budget planning from the very first year or operation anticipate the need to fully fund building maintenance (at 0.5% of construction cost) and to cover the cost of maintenance and equipment replacement, with a total allocation equal to approximately 10% of operating cost.
13.8 New Facility Costs

The previous chapter estimated a cost of 108 million maloti solely for construction of the proposed facilities at both sites, including an allowance of 8 million for staff housing. Design costs and a 10% contingency raise this total to 142 million, without any allowance for inflation from February 2002 costs. Fully equipping the new hospital and Kingsway Clinic will cost 211 million maloti at prices currently prevailing for items of equipment used in the United States (conversion rate, 10 rand to the dollar). The detailed equipment list is included in Volume II as Appendix 2, but is only indicative and should be amended as plans for the facility develop. It should be possible to somewhat reduce the estimated total equipment cost with negotiated or competitive discounts or some redefinition of the criteria for some items.

13.9 Deferred Maintenance at Leribe and Mohales Hoek

Although we are not recommending any expansion of these two facilities, or any upgrading of services beyond that of a District Hospital, our survey did reveal the need for significant civil works because of a lack of maintenance since construction.

Because there has been no preventive maintenance, the buildings have moved down the deterioration curve shown in Figure 13.1. Before applying the formula for deterioration to calculate building maintenance costs, it is first necessary to establish the cost in maloti of constructing the hospital today. Applying this to each hospital in turn:
Table 13.4: Cost of Deferred Maintenance at Leribe and Mohale’s Hoek

<table>
<thead>
<tr>
<th>Location</th>
<th>Area (m²)</th>
<th>Clinical Area</th>
<th>Balance</th>
<th>Site Development</th>
<th>Total Cost After 8 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leribe</td>
<td>5775</td>
<td>775 @ 3500</td>
<td>5000 @ 2500</td>
<td></td>
<td>17.0 million</td>
</tr>
<tr>
<td>Mohales Hoek</td>
<td>4740</td>
<td>520 @ 3500</td>
<td>4220 @ 2500</td>
<td></td>
<td>13.5 million</td>
</tr>
</tbody>
</table>

Applying the formula for rehabilitation: -14% deterioration X 17.0 = 2.4 million

Annual maintenance budget: 0.5% x 17 million = 85 000 Maloti

Annual maintenance budget: 0.5% x 13.5 million = 67,500 maloti.
13.10 Summary

The table immediately below summarizes the above estimates for ADDITIONAL funding needs in the health care system. We have rounded the numbers so we do not imply a precision which is not justified by our estimating techniques. Operating cost estimates are based on costs in 2000-2001, and would need to be inflated to account for inflation in the years prior to implementation. Using official Lesotho data for 2000 and data from South Africa for 2001, it appears that inflation over this two year period is a little over 9%. Construction and equipment costs are based on prices in early 2002.

Table 13.5: Summary of Estimated Additional Funding Needs in the Health Care System

<table>
<thead>
<tr>
<th>Need</th>
<th>Recurring Cost</th>
<th>Capital Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate Staffing Needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QE II</td>
<td>6 million</td>
<td></td>
</tr>
<tr>
<td>Districts</td>
<td>2-3 million</td>
<td></td>
</tr>
<tr>
<td>Added Costs of Operating</td>
<td>8 million</td>
<td></td>
</tr>
<tr>
<td>New Facilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compensation Upgrade</td>
<td>10 million</td>
<td></td>
</tr>
<tr>
<td>CHAL Equalization</td>
<td>5 million</td>
<td></td>
</tr>
<tr>
<td>AIDS (2006 caseload)</td>
<td>14 million</td>
<td></td>
</tr>
<tr>
<td>Maintenance Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QE II</td>
<td>5 million +</td>
<td></td>
</tr>
<tr>
<td>New Facility Costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil Works *</td>
<td></td>
<td>142 million</td>
</tr>
<tr>
<td>Equipment (1US$ = 10 maloti)</td>
<td></td>
<td>211 million</td>
</tr>
<tr>
<td>Deferred Maintenance</td>
<td></td>
<td>4 million</td>
</tr>
<tr>
<td>(Mohales Hoek and Leribe)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>50 million/year</td>
<td>357 million</td>
</tr>
</tbody>
</table>

* Includes Botsabelo Hospital and indicative amount of 8 million for staff housing, Kingsway clinic; Construction and design with 10% contingency. No inflation allowance.
Chapter 14

Analysis of Funding Alternatives

The previous chapter outlined the priority items to make the health system more effective in Lesotho, and developed very basic estimates of the cost of each. In this section, we look at the alternatives available to the Government to fund some of these priorities. As argued in Chapter 7, it appears that existing tax revenue and user fees will be sufficient, at best, to cover inflationary increases in costs at the current level of staffing and expenditure. Funding of the identified priorities will require hard decisions to implement some of the actions discussed here.

14.1 Government

The outlook for the Lesotho economy and tax collection suggests that Government revenue will not grow much faster than inflation in the short to medium term. If the Ministry continues to receive the same share of Government expenditure which it has over the last few years (7+%), then it will only be able to maintain its current staff complement, and will struggle to maintain the same level of drug purchases (because of devaluation of the rand).

If the Government were inclined to spend more on health, and less on education, roads or the military, then these additional monies could be used to offset some of the incremental expenditure priorities. Shifting the current allocation of government funds to MOHSW by 1% (up to 8+%) would generate approximately 25-30 million maloti. Whether such a shift is feasible or consistent with the priorities of the country’s leaders (and the electorate) is beyond the scope of the consultants’ expertise. However, no commitments should be made which rely on such a shift until there is clear, concrete and convincing evidence that the Government will make this reallocation and continue it in the long run. Any emphasis on primary care in additional Government funding should recognize that a strong health care system requires a strong District Hospital system---since this is the source of medical expertise and increasingly the place where prevalent disabling conditions---from HIV/AIDS to heart disease and diabetes---are diagnosed and treated. QE II or its successor will remain the District Hospital for Maseru, and should not be ignored in any increment appropriated for primary care.

14.2 Medical Aid Scheme

At the moment, there is no organized medical aid scheme in Lesotho. The University of Lesotho does buy a South African Medical Aid policy for its employees. A few individuals also buy South African health insurance policies, and an unknown additional number of dependents of migrant workers may be covered by Medical Aid policies through the South African employer. Creation of a Medical Aid scheme for Government workers has been discussed, and we are aware that consideration has been
given to such an employee benefit by the Ministry of Public Service. We are also aware that investors in Maseru Private Hospital anticipated the development of a Medical Aid scheme to increase the number of patients who could pay for private hospital admission.

A Medical Aid scheme would be a way of organizing into a “risk pool” funds collected from those who work in the formal sector of the economy. Payments from the Medical Aid scheme would substitute, in part, for fees now paid at the time of an illness. They could also compensate MOHSW and CHAL for some of the costs they now incur in caring for patients with public funds. User fees— even in CHAL hospitals—only cover a fraction of costs. In the proposed new hospital, inpatients with Medical Aid coverage would be placed in single or double rooms. Medical Aid would be charged for their care, perhaps with the patient paying a small daily fee. Our analysis shows that current inpatient costs at QE II are now about 244 maloti per day. An additional 6 million is necessary for nurse staffing now, with another 5 million for adequate maintenance. Our analysis suggests a further 8 million increase in annual recurring cost when the new hospital opens. Thus, there will likely be an increase of approximately 50% in the per diem costs of running the new hospital, without taking into account any competitive salary adjustment. Let us therefore assume a cost of about 400 maloti per day. Assume that the patient pays 20 maloti per day and Medical Aid the remaining 380. If 5% of the hospital’s inpatients have Medical Aid coverage, the hospital would receive 2.27 million maloti per year from insurance payments. This would rise to 4.54 million if 10% of the patients have such coverage, and over 9 million maloti if 20% of the patients have coverage. This should be “new” money for the Hospital. Collection of Medical Aid and user fees should not replace existing MOHSW funding, but should augment existing budgets. Inpatient revenues from Medical Aid beneficiaries could be further augmented by payments for outpatient and emergency care. This “new” money would enable the hospital to defray some of the incremental costs associated with added staffing, maintenance and expendable supplies. The hospital must be able to retain the collected Medical Aid fees in order to supplement the fees it receives from the Ministry.

Employee contributions to the Medical Aid scheme would be collected by payroll deduction and added to the employer contribution. We anticipate that membership in such a Medical Aid scheme would be mandatory for workers earning above a specified amount in the Civil Service and for employees above a similar wage floor in private industries having more than a defined number of employees. To extend coverage to those at the lower end of the wage scale, there would need to be a larger employer contribution (or tax subsidy) in order to cover the cost of a policy.

We estimated the potential annual revenue of a Medical Aid scheme in two parts—Civil Service, and private sector employment. Given the lack of data, both estimates give only a general idea of potential revenue.

a. Civil Service. There are currently 28,271 employees in the Civil Service earning more than 10,000 maloti per year. If we assume that these individuals earn an average of 25,000 maloti per year, a Medical Aid contribution set at
6% of payroll (perhaps 3% from the employer and 3% from the employee) would yield about 42 million maloti per year.

b. The Central Bank of Lesotho reports that between 10% and 14% of the labor force is in formal employment. Lesotho has about 1.2 million residents between the ages of 15 and 65, the assumed working age. Formal sector employment should, therefore, be about 120,000 to 168,000. Subtracting 28,000 for the civil servants earning over 10,000 maloti per year, and an allowance of 10,000 for lower paid civil servants, suggests 80,000 to 130,000 individuals in formal private employment. Using the lower end of this estimate, we assume that half might be captured in a Medical Aid scheme, and that they have average annual compensation of 20,000 maloti. The same 6% Medical Aid payroll assessment could yield 48 million maloti from these private sector employees.

The total potential yield from a Medical Aid scheme (at 6% of payroll) would be on the order of 90 million maloti. Ten to fifteen percent of these collections would go to administrative costs, leaving 76 to 81 million maloti for provider payments.

How much of the available Medical Aid funding might go to support essential facilities? Very little, as these are currently organized. First, there must be restrictions on the use of Medical Aid funds in South Africa or a great deal will “leak” over the border to Ladybrand and Ficksburg and to the specialists of Bloemfontein. There would likely be a rule that care in the Republic of South Africa would be reimbursed only after a referral from the Medical Aid scheme. An alternative would be to set the reimbursable fee well below South African rates. However, some Basotho are already paying for medical services in South Africa, and might view the Medical Aid reimbursement as a partial discount enabling them to use more of such services.

Within Lesotho, Medical Aid funds would certainly be used to pay for private sector visits. We identified 34 physicians in private practice in the country. If they see an average of 20 patients per day, five days per week, 48 weeks per year (allowing for holidays), then there are about 163,000 private visits per year in the country now. Fees are reported to range from around 100 maloti for a simple visit to a general practitioner to 140 or more for a visit to a specialist. Most of the individuals currently using private practitioners would probably be in the Medical Aid scheme. If the Medical Aid fee was set at 80 maloti per visit, then about 13 million maloti might go for the current number of private visits. This could leave about 63-68 million maloti for:

- Additional services from private physicians
- Services in CHAL hospitals
- Services in MOHSW facilities
- Controlled referrals to South Africa

If the MOHSW hopes to capture some Medical Aid payments to supplement its current revenues, it MUST provide a higher degree of service, and charge for those
services that would attract private patients. This means offering private or semi private accommodations in inpatient facilities (at least at the new QE II). Patients MUST be charged the full incremental cost of the private service, plus most of the cost of the basic service, as part of an inclusive private room rate.

There are two ways in which the MOHSW can hope to attract revenue from Medical Aid patients for outpatient services. It can offer services in addition to its normal clinic services; for example, charging a higher fee for visits after 2:00 PM or on weekends. It could offer an appointment service and charge a much higher user fee. Or it could allow MOHSW physicians to conduct a carefully controlled private practice and retain the income, thus lowering the amount that the Ministry must pay to retain these individuals for the necessary public services.

Money which flows to CHAL facilities from Medical Aid would be a benefit to MOHSW as well. It could reduce the amount of the subsidy necessary to keep these facilities in operation. Public subsides could be tied to the amount of service given to the poor at basic user fees by CHAL hospitals, which would be encouraged to maximize collection from patients with Medical Aid.

It is beyond the scope of this paper to lay out a plan for creation of a Medical Aid scheme, and all of the changes in financial procedures which MOHSW must adopt in order to maximize the yield to its facilities from Medical Aid. Facilities must be allowed to retain Medical Aid (and general user fee) collections if they are to have any incentive to create these complicated financial systems and make them work. We estimate that revenue up to 65 million maloti MIGHT be available from a Medical Aid scheme to cover MOHSW, CHAL and South African referral costs if everything works smoothly. The Ministry must not underestimate the complexity of such an innovation. However, this is one of the few major sources of additional funding if tax based revenues to the health care system are as static as we predict.

Several arguments can be made against reliance on a Medical Aid scheme, or any other form of health insurance. Compared to unitary tax funded health systems, a larger portion of revenues will be expended on billing and administration, and not on medical services. In a country like Lesotho where only a portion of patients will have Medical Aid coverage, there is risk that a “two tier” medical care system will develop. The tier serving the poor could starve for funds because those with Medical Aid coverage will not support the necessary tax funding to serve the poor. On the other hand, there is already evidence that the more affluent Basotho are seeking care outside the existing MOHSW system. If they receive a higher level of service in the public system (such as semiprivate rooms in a new hospital), they can be encouraged to seek care in the Lesotho national system, and not to cross the border into the Republic of South Africa. If QE II is a better hospital with better amenities for the insured population, but the same quality of medical care for all, it will serve the entire population well. Tax-based funding to meet the service expectations of wealthier Basotho and extend this level of service to the entire population will not be available. Medical Aid funding, coupled with a new level of service at the “apex” hospital, could provide risk pooling for fees to be paid by workers
in the formal economy, plus a higher level of support for an improved public health care system.

To test the reasonableness of these estimates for creating a Medical Aid scheme, it is worth comparing the premium contribution to likely out of pocket medical costs. At a 20,000 maloti salary level, the Medical Aid scheme would collect 1,200 maloti per year (600 from salary deduction) for a covered worker. Our recent cost analysis suggests that QE II--before necessary staffing increases, maintenance allowances and modernization--already costs about 244 per patient day to run. A healthy family of four that had one ten day hospitalization every ten years, and 1.5 private physician visits per member per year (at 100 maloti per visit), has an expected medical “cost” of 850 maloti per year, not including outpatient drugs. Thus, collecting 6% of salary (3% as a payroll deduction) from this population seems reasonable if concrete benefits are delivered in terms of improved service and lower out of pocket costs for patient friendly services.

14.3 User Fees

There are several ways in which user fees might be increased. The first is to adjust for inflation. Before adjusting for any price elasticity (the tendency of volume to fall when prices rise), a doubling of the current fee schedule should yield an additional eight to ten million maloti with current collection procedures. If institutions had an incentive to improve collections, this might more than offset any decline in volume resulting from the higher prices. The higher fees imposed (20 rand for a visit at the QE II outpatient, for example) would still be less, in real terms, than they were a decade ago. This 20 maloti fee would be only 20% of the prevailing private sector fee. If current policies are followed and an individual receives any necessary drugs, tests or referrals in return for a single visit fee, such a charge would be very good value. Of course, there will be a segment of the population deterred from seeking care by this increase in fees. Exemption systems for the poor are not working well. However, with few alternatives to raise revenue, this increase should be considered. CHAL facilities already impose much higher total fees than MOHSW, yet have retained a substantial percentage of their former clientele. Some patients have undoubtedly left for MOHSW facilities, but we noted that demand was generally stronger, particularly for inpatient services, in the CHAL facilities than in many “competing” MOHSW District hospitals.

Another way to increase user fee collections is to impose a higher fee at certain hours when those who are employed can be seen conveniently and with a shorter wait. This is already done at the Maluti Hospital. After normal clinic hours, a patient might be charged two or three times the normal fee. This would still be substantially less than the cost of visiting a private practitioner. Suppose Ministry facilities charged a fee of 40 maloti for a visit to the new “apex” hospital or the Maseru downtown clinic between 1400 and 2000 and on weekends. The fee would include drugs and tests. Staff schedules would be adjusted to keep the clinic operating during these hours; the QE II outpatient service is already open at these times. Patients who present in casualty with minor complaints after 2000 hours would be charged this fee or more. If only 10% of QE II
outpatient and casualty visits fall in these categories, the additional income (above the existing 10 maloti fee) would amount to a half million maloti--enough to cover the current salaries of five registrars. With the added convenience, a new facility, and immediately available tests and X-rays, patients might shift from private practices back to Government facilities with these convenient hours. Perhaps an even larger charge could be made, as long as it remains well below the cost of a private sector visit.

User fees could be used to limit use of the new “apex” hospital for routine primary care. These services would be readily available in the new downtown clinic on the existing QE II site. For most Maseru residents, this site, or the existing filter clinics, will be more convenient than the Botsabelo site. For those who do live nearest to Botsabelo, the new hospital could establish a “local resident exemption” from such a self-referral fee. A patient presenting with a referral from any Maseru clinic or CHAL or District Hospital would be seen at the new facility for the basic outpatient fee. So would any seriously ill patient presenting at the casualty service. Others would pay a multiple of this fee, and be instructed that they have the choice of attending the nearest clinic for the usual fee, or using the private practice facility open after normal clinic hours. Patients called back after initial visits, or instructed to attend a regularly scheduled clinic at the new site, would not pay the self-referral fee.

How much might such a self-referral fee generate? The patient origin analysis shows that a large percentage of QE II visits are for conditions which can be treated in clinics. In our facility plans, we anticipate that as much as half of traditional outpatient (not casualty) volume at QE II would be accommodated at the new downtown clinic. If 20% of the remaining visits to be served at the Botsabelo site were self-referrals, about 13,000 visits per year might be subject to this self-referral fee. If set at 50 maloti above the prevailing per visit user fee, a self-referral fee would generate about 650,000 maloti per year at current volumes.

The largest potential for an increase in user fees lies in charging for private or semi-private accommodation. Our design specifications provide for such accommodations on each ward. At the moment, few patients with money chose to use the private service in the run-down QE II facility. They would rather use a hospital in South Africa. An attractive new facility with accommodations that provide patient privacy, plus good medical and nursing care, could see a significant increase in the use of private beds. The amount of this increase would be highly dependent on the establishment of a Medical Aid scheme, which pools the risk for scheme members and makes such a facility affordable to a much larger percentage of patients.

How much income might be generated by private inpatients? Current costs on the QE II wards are 244 maloti per patient day. In a properly operating new hospital, costs are likely to run 400 maloti per day. For comparison purposes, we note that the rate paid by the Government of Lesotho (and South African Medical Aid patients) in the referral hospitals of Bloemfontein is already nearly 700 rand per day, with physician fees, tests and use of the operating theatre charged in addition. A self referred patient from Lesotho is expected to pay twice these amounts. An inclusive charge of 400 maloti or more per
day in a semi private room in a Maseru facility would be marketable--IF care is good and the facility is well maintained.

We have designed the medical surgical words with up to 40% of accommodation in private and semi private rooms, some of which will be used for isolation or patients with special needs. Let us assume that after the new “apex” hospital opens, 10% of the patients pay a private rate of 500 rand a day. Assuming 80% occupancy, the revenue generated from these charges would total about 5 million maloti per year. The total amount which might be collected in this way will be extremely dependent on:

- The quality of medical care and facility maintenance
- The availability of Medical Aid (see the analysis above using a Medical Aid reimbursement rate of 380 maloti per day).

Because the number of persons able to afford private or semiprivate inpatient service will be highly dependent on the total enrollment on a Medical Aid scheme, and the payment rules under such a scheme, a decision to offer a private service should be carefully considered in the light of plans for Medical Aid. However, getting patients who can pay to use the new “apex” hospital has a strong non-financial advantage. As users of the facility, they will have a strong interest in its effective operation. If private patients go elsewhere, they will be less willing to support the facility and the necessary Government budgets.

14.4 Private Practice Plan

One way to augment the salaries of MOHSW physicians would be to permit these individuals to have private practices. In addition to the fees which they collect in these practices, patients can be charged for the use of laboratory and diagnostic facilities in the hospital outpatient clinic. If admitted to the hospital, patients who have the ability to pay could be placed in private or semi-private rooms and charged the user fees outlined above.

In one sense, such an arrangement already exists. A number of Basotho physicians have established private practice, but return to the Ministry to conduct specialty clinics at set times during the week. Their total income is a combination of the contract fees paid by MOHSW for service in these clinics, plus the net income from their private practice.

The risks of permitting private practice are substantial. Unscrupulous physicians may pressure patients to leave the clinic and attend the private practice. Doctors may spend too much time on their private practice, thus “shortchanging” the MOHSW. On the other hand, many (if not most) patients with money do not now attend clinics, and prefer the privacy and added convenience of private practice. The MOHSW cannot tap into the funds which these individuals are willing to spend for health care. Existing restrictions prevent non-Basotho doctors from conducting private practices, so they
cannot legally follow the lead of their Basotho colleagues in combining public and private practice. If the MOHSW cannot pay enough to retain good non-Basotho physicians, it should strongly consider permitting controlled private practice by these doctors, certainly those with experience and advanced qualifications.

In our facility design, we recommend the construction of additional space on the site to accommodate these private practices. The offices would be open after clinic hours, or whenever the doctor’s contractual commitments do not require him to attend clinics or round on the inpatient wards. An appointment system can make visits more convenient for those who cannot spare time away from their employment. Fees could be collected centrally, with the hospital retaining a portion to cover the costs of the office space. Or the doctor could collect the fees and pay rent to the hospital. Patients could be referred directly to the hospital facilities for lab tests, X-rays and similar services, which would be charged to the patient. Monitoring and controls must be in place to assure that doctors do not “shortchange” their MOHSW obligations.

How much might be realized through such a system of private practice? If a doctor saw only five private patients a day at 100 maloti per visit (approximately the prevailing charge for a non specialist visit in Maseru today), then this would generate about 120,000 maloti per specialist in additional revenue—an amount almost equal to the difference between Lesotho and South African physician compensation. If the authority to practice privately was extended to specialists alone at QE II, 37 doctors would be covered with a potential for additional fees of 4.4 million per year. This does not include the amounts which the hospital might realize by charging these patients for tests and semi private or private inpatient accommodation.

14.5 Savings

14.5.1 Referrals to South Africa

In Chapter 5, we estimated that current referrals to tertiary institutions in Bloemfontein are costing MOHSW a minimum of 10 million rand a year (if claims incurred are paid), and possibly more. Every year, 1,000 to 2,000 citizens of Lesotho benefit from referrals. Approximately 2,400 referrals were issued in FY2000-2001, but some patients were referred more than once. Some of these individuals were in advanced states of incurable disease, and their life was not significantly prolonged by the referral. While a number of individuals would suffer seriously if referrals were terminated, and a few would die, the health system would not collapse. Faced with the alternative of further deterioration of District Hospital services used by the majority of the population, or the inability to run a good “apex” hospital in Maseru, termination of referrals may be a painful but necessary measure.
14.5.2 District Hospital Closure

Our review of District hospitals showed active outpatient services. However, the Ministry District Hospitals reviewed (Leribe, Mohales Hoek, Berea) did not have the staff and/or functioning equipment to offer the full range of expected inpatient services (medicine, surgery, obstetrics and pediatrics) at acceptable levels of quality. As noted in the MCDI report, some CHAL hospitals are operating well below their designed bed capacity. We observed low inpatient occupancy in the MOHSW facilities that we visited outside Maseru. The transport infrastructure of the country continues to improve, at least in the lowlands. Closing the inpatient services in some District Hospitals to save money is not, therefore, unthinkable—particularly if Lesotho cannot recruit an adequate number of doctors to keep all facilities functioning at the desired levels.

If inpatient services are closed, it would be desirable to continue the operation of the busy outpatient services, transporting seriously ill patients by ambulance for admission to the nearest functioning District Hospital. There are several locations in the country where the transport time to the nearest alternative inpatient facility may be less than one half hour.

There are probably two areas where total closure of inpatient services should not be considered. In remote mountain regions, even small hospitals should retain a limited inpatient service which can handle obstetric emergencies (C-sections), and perhaps care of local residents with TB. Other cases would be referred to the nearest inpatient facility, except in an emergency when transport is unavailable. Closing District Hospitals at the fringe of the Maseru region is also likely to substantially increase demand on the “apex” hospital in the capital city, and should be considered only as a last resort.

In general, we find closure of an inpatient service is preferable to closure of a small number of beds in each of several facilities. If they are to function as real District Hospitals, they must have a critical mass of key physicians and nurses and functioning laboratory, X-ray and theatre facilities, plus a laundry, kitchen, etc. Major savings will be achieved only if these central services, as well as the wards, are closed and the inpatient buildings “mothballed.”

To estimate the possible savings from closing the inpatient service in a single District Hospital, we reviewed the cost analysis of Mohales Hoek (see Appendix 8). We use this facility only as a point of reference, and are not advocating the closure of this particular inpatient service. The total recurrent costs of the facility are approximately 6.9 million maloti, of which 3.6 million were allocated to the inpatient service. Inpatient is a relatively low proportion of total cost (52%), confirming the high level of outpatient activity and the very limited services actually offered on the inpatient wards. If the inpatient services were closed, the associated buildings and services secured, and the outpatient services and supervision of health centers continued, the Ministry should be able to save 3.6 million per year—providing it can discharge the staff or transfer them to posts at facilities requiring additional staffing. Since Mohales Hoek is one of the larger District Hospitals (134-140 beds), we estimate that the savings from closing a single
District Hospital inpatient service will vary from 2 million to 4 million maloti per year, depending on the size and current activity level on the inpatient service.

14.6 Global AIDS Fund

For years, health aid from the developed to the developing world, particularly official government to government assistance, has been focused on capacity development; loans or grants to build new facilities, training of staff, support for developing new management and financing systems. Support for recurring expenditures was limited to topics of major interest to the donors: family planning, safe motherhood, perhaps some drugs for the control of communicable disease.

There appears to be a developing consensus in the West that something more is necessary because the global burden of disease is focused in developing countries, notably in sub-Saharan Africa. There is also a rising awareness that high disease burdens—particularly infectious diseases striking in childhood and the reproductive years—are a barrier to more rapid economic development. Finally, increasing awareness of the catastrophic consequence of the AIDS epidemic is making Western Governments rethink the funding of health projects. The recent report to the Director General of WHO by the Commission on Macroeconomics and Health, led by development economist Jeffrey Sachs, is a good statement of these arguments.

The Global Fund for AIDS (and TB and Malaria) is the most significant manifestation of these changing attitudes. It seems likely that there will be additional money available to Lesotho from this Fund to address some of the costs of HIV/AIDS and the associated rise in TB caseload. If the Fund were to provide US$1 per year per citizen towards these costs, the Ministry of Health could anticipate 20 to 25 million maloti per year to offset the increasing costs of drugs and supplies to treat patients with AIDS.

14.7 Value of the Kingsway Property

QE II Hospital is situated on one of the most valuable pieces of real estate in Lesotho, on the main street in the center of the government and commercial activities of the capital. Even with the construction of the recommended Kingsway satellite clinic, the move of the hospital to Botsabelo will free up much of the old QE II site for commercial development. If the downtown satellite clinic is located elsewhere in the center of Maseru, the entire site could be sold or leased.

The Government, not MOHSW, owns the QE II site. Nevertheless, it makes sense to dedicate the economic value of this site to the health care system, which it now serves. If the land is sold for use upon completion of the Botsabelo facility, financing could be arranged to use the sale price of the site to fund the Government’s contribution to capital
costs. In the alternative, if the site is leased, the annual lease revenue could increase the funding available to MOHSW every year.

The consultants did not attempt to value the Kingsway property. We are aware that commercial developers have approached the Government. If a new apex hospital is constructed at Botsabelo or elsewhere, the Government should negotiate to obtain the highest possible sale price or lease income from the site. To prepare for these negotiations, we recommend the Government obtain an independent valuation of the site as the finance plan for a new hospital is developed.

14.8 Summary

Table 14.1 summarizes the sources of “funding” which might be tapped for the health system in Lesotho. No one should underestimate the difficulty of realizing even one of these sources in the amounts shown. The capacity to do them all is very questionable.

We particularly caution against “double counting” some of these funding sources. There is clearly overlap between the amounts that might be realized by increased user fees and MOHSW affiliated private practice and the amounts theoretically available from a Medical Aid scheme. If the Government pursues a Medical Aid plan, more detailed calculations will be necessary to estimate the likely revenue impact. It will clearly be several years before such a system could be up and running successfully.
Table 14.1: Possible Sources of Additional Resources for the Health Care System

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<th>Source</th>
<th>Increased Revenue</th>
<th>Decreased Expenditure</th>
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<tr>
<td>Government</td>
<td>25-30?</td>
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<td>(Shift additional 1% of Gov. revenue to health)</td>
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<td>Medical Aid</td>
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<td>User Fees</td>
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<td>. Inflation Adjustment</td>
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<td>. Timing</td>
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<tr>
<td>. Self Referrals</td>
<td>0.6+</td>
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<td>. Private Inpatient Service</td>
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<tr>
<td>Private Practice Plan</td>
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<tr>
<td>Suspend Referrals to South Africa</td>
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<td>10</td>
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<tr>
<td>Close District Hospital</td>
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<td>Inpatient Service (per hospital)</td>
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<tr>
<td>Global AIDS Fund</td>
<td>20-25</td>
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<tr>
<td>Lease of Kingsway site</td>
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<td><strong>TOTAL</strong></td>
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<td><strong>12-14 million +</strong></td>
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Chapter 15

Review of Findings and Recommendations

The team is confident of its recommendation that a single new hospital at the Botsabelo site, combined with an outpatient clinic at the current QE II site (integrated with the management of the new hospital), is the appropriate replacement for the existing QE II. We have indicated the scope and size of the facility which we believe is justified by existing and projected medical need.

However, we cannot recommend construction of a new hospital in a vacuum. A new hospital should be built only IF:

- An adequate number of professional positions are filled to keep both QE II and District Hospitals functioning adequately (at least as well as they did a decade ago).

- Maintenance is adequately funded and properly managed so that civil works and equipment are operating when needed.

To do these things, maintain an equitable level of funding of CHAL facilities, and meet the needs of the expanding number of AIDS patients will clearly take more money than the Ministry will receive from traditional sources. We have attempted in this document to cost the priorities, to indicate possible sources of funding, and to inform the difficult decisions which the Ministry must make. In this chapter, we briefly review our recommendations, and set out several pre-requisites which must be fulfilled before a new QE II is constructed. Unless the necessary funding decisions are made, and the pre-requisites met, even the best built hospital will quickly fail to function as intended in the health system.

15.1 Criteria for Recommendations

The following criteria have guided our work. We sought a recommendation that will:

1 - Have affordable recurrent costs for the overall health system
2 - Provide decent and reasonably equitable medical care
3 - Be designed to use human resources, particularly nurses and physicians, realistically
4 - Be politically acceptable
5 - Make sense to the donors and lending agencies

It is of the utmost importance that the government recognize the solution to the crisis in Lesotho district hospitals and QE II does not lie solely within the MOHSW. Coordinated action by the ministries responsible for finance, economic planning and
public service will be needed for a new QE II to meet its goals and for the existing system to recover prior to the new QE II becoming operational in 5 to 7 years.

There is no more complex entity within the Public Service than QE II. The very significant downward trend of the last 10 years requires a bold, focused and sustained multi-ministerial approach to creating an organizational, budgetary and personnel framework that a modern hospital requires to operate successfully. Unless the organizational framework of QE II is modernized and brought into line with the needs of the institution, new buildings will decay, equipment will continue to break and not be repaired and staff shortages will grow.

15.2 Actions Before a New Hospital is Built

As plans for a new facility are being developed, there are other pressing and urgent needs:

- Maintenance and staffing at QE II must be improved long before a new hospital can be built.

- District hospital services must be restored to the level we observed 10 years ago. Strong district hospitals provide and support essential primary care services as well as providing necessary first level inpatient care. District hospitals with acceptable inpatient services have the potential to control some demand on the apex hospital.

These actions must precede the opening of a new hospital. We outline below concrete steps which the Government must take now. In the final sections of the chapter, we discuss the approach to the critical resource allocation decisions which must also be made.

15.2.1 Maintenance and Repair Strategy

We recommend the appointment---as soon as possible---of a senior experienced architect/engineer/building specialist as Facilities Manager and an experienced biomedical engineer as Equipment Maintenance Manager. Initially, both will be based at QE II and serve the entire MOHSW, with appropriate staff focused on the activities at the apex hospital. If the recommended autonomy of a new referral hospital is achieved, then that hospital should have its own facilities manager, with the MOHSW Facilities Manager responsible for overall policy and the maintenance of the rest of MOHSW facilities. The Equipment Manager might well continue to be based at the referral hospital, with the maintenance shop at this facility repairing biomedical equipment from throughout the MOHSW system.
The Facilities Manager should have full responsibility for the programmed upkeep and maintenance of all the health facilities, including the services of water, electrical, plumbing, and mechanical and site development. The maintenance of buildings should be distinguished and budgeted separately from the maintenance of equipment. He must have an annual Dedicated Maintenance Budget of 0.5% of the Capital Cost of the facilities. This recommendation should be confirmed with a line-item in the budget before the implementation of the new hospital commences, preferably in the next fiscal year.

The Terms of Reference for the appointment of the Facilities Manager are as follows:

Primary Accountability:

The Facilities Manager shall be responsible for the implementation of the project maintenance and repair strategy by programming and supervising the upkeep of all the health facilities, including water, electricity & site development works. The position should be at such a senior level that Ministry guidelines can be adjusted so that he may independently contract directly for repairs and preventive maintenance up to an agreed level, without having to go through the Ministry of Works. He / she will report directly to the PS MOHSW.

The job will be considered satisfactorily performed when;

a) A complete and accurate mapping record has been prepared for each and every facility in his/her province of responsibility.

b) A site layout and condition report has been completed for each of the facilities, including site utilities and services.

c) An approved maintenance and repair strategy program is being successfully implemented and recorded.

d) A maintenance culture is taking shape throughout the country.

Specific Responsibilities:

1. Prepare an accurate survey of the entire health facilities stock with drawings for site layouts, buildings, services - water, electricity, drainage and external works.

2. Record the age, construction and condition of each facility. A dated photographic record of the facility would help.

3. From the information collected, prepare a deterioration curve/graph for the country to assist programming and budgeting.


5. Prepare a maintenance needs-assessment, prioritized as follows for the facilities:
   i. immediate - critical for health and safety of the users
   ii. short-term - to preserve and prevent serious deterioration
   iii. long-term - for quality of building and site finishes
6. Prepare a maintenance program/implementation chart for the annual work-plan.
7. Develop guidelines for budgeting of maintenance programs.
8. Review standards and methodologies including maintenance management techniques and implementation strategies.
9. Investigate, cost and compare contract versus in-house implementation strategies including single operatives, mobile teams and central work units.
10. Report to PS/MOHSW with recommendations, in respect of the alternative methodologies, which should be logical, easy to implement and yield immediate benefit. The report should distinguish repairs, preventive and normal maintenance.
11. Prepare detailed specifications for rehabilitation works, up to the agreed level, to be independently carried out in accordance with Government procedures. Major works above the authorized level will be implemented in the normal manner as capital works. It is clear that the level of independent contracting authority must be substantially higher than is now allowed.
12. Ensure the adequate training of in-house operatives and develop performance criteria.
13. Maintenance by contract will be procured in accordance with transparent and approved procedures for Direct Contracting, Local Shopping and National Competitive Bidding.
14. Supervise works in progress, including material tests, to ensure specified standards.
15. Keep log sheets and detailed records of all works done.
16. Tabulate lessons learned in respect of site layouts, building design and the durability of materials for future briefing of consultants for new capital works.
17. Make recommendations for renewal of all health facilities.

Qualifications:

- Graduation from a recognized university with a degree in a related building, engineering or architectural discipline.
- An advanced degree in construction, organization and management will be an advantage.
- 5 years minimum practical field experience, job control and audit procedures with emphasis on preparation of tender documents, multi-contracts supervision, administration, certification for progress payments and project management.
- 5 years minimum practical experience in building (O+M) organization and management of similar building stock at a senior level including Maintenance and Repair Strategy funding needs.
Quality of Experience:
- Should have a proven reputation for achieving project construction timetables and delivering projects within cost.
- Should demonstrate management skills with a flair for organization and an ability to take the lead.
- Should have considerable experience with administrative, procedural and control innovation capabilities.
- Should demonstrate a proven ability to motivate, lead and discipline staff.

The Terms of Reference for the Equipment Manager are similar in scope and responsibility, although the technical qualifications and tasks are somewhat different. S/he should be responsible for developing and administering a dedicated budget covering scheduled preventive maintenance and emergency repairs of all medical equipment, plus periodic replacement of all but the most expensive items of medical equipment. S/he should develop a detailed annual budget, approximating 10% of total hospital budgets less the amount dedicated to Facilities Maintenance and Repair (0.5% of capital cost each year).

Primary Accountability:

The Equipment Manager shall be responsible for development and implementation of an equipment maintenance and repair strategy that will minimize the “downtime” of key equipment such as X-rays, anesthesia machines and ventilators, electrocardiograms and other medical devices. The position should be at such a senior level that Ministry guidelines can be adjusted so that he may contract directly for repairs and preventive maintenance up to a level agreed in advance with MOHSW and Ministry of Finance. He /she will report directly to the PS MOHSW.

The job will be considered satisfactorily performed when;

a) A complete and accurate inventory of biomedical equipment used by the MOSHW has been completed, with details noting the location and age of each machine and its current level of operability.

b) An approved preventive maintenance and repair program is successfully implemented and recorded.

c) Turnaround time for unscheduled equipment maintenance is substantially reduced.

d) Equipment break downs are no longer a reason for the failure of District Hospitals and QE II to meet performance expectations.

e) A quantitative goal for availability or “downtime” is set and met for each major equipment category.

Specific Responsibilities:

1. Prepare an accurate inventory of the location, manufacturer and condition of each important item of medical equipment.
2. From the information collected, develop a schedule for equipment replacement so that all key equipment is operating within its “useful life” by the end of five years. Set priorities for equipment replacement based on medical need and repair costs.
3. Review technical skills available in Lesotho and recommend staffing and position descriptions for biomedical repair personnel.
4. Develop an annual budget for the Equipment Maintenance Department, including personnel, contract services, purchase of parts and adequate transport.
5. Prepare a comprehensive preventive maintenance manual for each major equipment type.
6. Prepare a maintenance needs-assessment, prioritized as follows:
   I. immediate - critical for health of existing patient
   ii. short-term - necessary for facility to meet its expected medical role
   iii. long-term - necessary to reduce equipment downtime
7. Hire and supervise the agreed biomedical equipment repair staff.
8. Develop guidelines for budgeting of equipment maintenance based on equipment type and age. Develop guidelines for “useful life”/replacement of standard items of equipment. Prepare annual equipment procurement budgets consistent with these guidelines.
9. Investigate, cost and compare contract versus in-house implementation strategies including mobile technicians, a central repair shop and contract maintenance.
10. Develop guidelines for both preventive maintenance and “one off” emergency repair contracts for equipment items which cannot be reliably maintained by MOHSW staff. The ability to award such contracts on an accelerated basis must be agreed.
12. Ensure the adequate training of in-house technicians and develop performance criteria. To the extent that preventive maintenance is delegated to facilities, develop detailed training manuals and training programs for staff at these facilities.
13. Maintenance by contract will be procured in accordance with transparent and approved procedures for Direct Contracting, Local Shopping and National Competitive Bidding.
14. Supervise repairs in progress, including spot checks of repairs and preventive maintenance by both MOSHW staff and contractors.
15. Keep repair logs on major equipment at QE II and monitor repair records for equipment at other facilities.
16. Tabulate lessons learned in respect of maintainability and recommend changes in equipment specifications based on this experience.
17. Participate in the evaluation of new biomedical equipment considered for purchase by MOHSW. Estimate life cycle costs for proposed equipment purchases.
Qualifications:
- Graduation from a recognized university with a degree in electrical or biomedical engineering.
- Strong practical experience in the repair and maintenance of hospital equipment.
- 5 years minimum field experience in contract management and staff supervision for equipment repair in a health care setting.
- 3 years experience in budget planning and organizational development in hospital equipment maintenance.

Quality of Experience:
- Should have a proven reputation for increasing the reliability of equipment and reducing downtime.
- Should demonstrate management skills with a flair for organization and an ability to take the lead.
- Should have considerable experience with administrative, procedural and control innovation capabilities.
- Should demonstrate a proven ability to motivate, lead and discipline staff.

15.2.2 Retention of User Fees

The literature on user fees in developing countries is equivocal. The one clear message from the research literature is that user fees will fail if the health care institution does not retain the fees collected and use them to improve service. If fees are returned to the central treasury, the institution has little incentive to maximize collections within the existing scheme. It has no incentive to propose improvements which might increase collections by charging for services for which patients will pay more (such as semi-private inpatient accommodation). And services will NOT improve if the fee collections do not supplement the tax funds provided by the Health Ministry and improve perceived service quality, thus justifying the fees to the users.

We recognize that existing Government policy sweeps all user fee collections into the Treasury, and requires health care institutions to operate within an appropriated budget. We respectfully suggest that it would be better to appropriate the maximum available amount of tax levy funding for health, and to supplement this with the full amount of user fees received within approved collection policies. There are risks of fraud at the level of user fee collection, but these occur whether the institution or the Ministry ultimately receives the fees. Initially, the retention of user fees might be pilot tested at QE II, where the financial management will be more sophisticated. If successful, this revenue retention policy could then be pushed downward to lower levels of the health system after the establishment of sound controls and auditing procedures.

We strongly recommend that financial rules be revised to permit the charging institution to retain all properly collected user fees. The CHAL hospitals illustrate how user fees can keep afloat institutions which cannot subsist on Government subventions
alone. The flexibility which CHAL facilities have in the use of their user fees explains why they are often able to maintain equipment (and services) which the Ministry cannot.

Each major institution (QE II replacement, MOHSW and CHAL District hospitals) should eventually be authorized to retain user fees collected, subject to proper accounting and banking arrangements. Funds collected at primary health care centers should probably be retained at the level of the District, and used to defray the costs of staffing and drugs at the health centers. To the maximum extent feasible, facility managers should have the freedom to use the collected fees to supplement funds received from tax revenues. Performance bonuses for staff are desirable if basic levels of Government compensation are low. The facility manager must have the ability to direct the funds received to the most critical repairs, as well as procurement of supplies and equipment.

To implement such a system of retained user fees will require training at two levels. Financial staff must be educated (and audited) so that proper collection and accounting procedures are followed. This task will become far more complex if a Medical Aid scheme is implemented. At the same time, managers must be trained in the use of the monies. How are basic Ministry funds or staffing allocations to be used, and how can user fees supplement this? How can existing procurement systems be used in conjunction with retained fee collections? How are priorities to be set when user fees are less than the demand for spending? How can the manager improve quality and maximize fee collections without violating basic patient entitlements? What does the manager do if fee collections fall short of projections? A visit to institutions within health systems that have successfully permitted retention of collected fees should be an important part of this training.

15.2.3 Management Autonomy for a New “Apex” Hospital

QE II hospital, even in its present condition, is the most complicated single operation run directly by the Government of Lesotho. To function effectively, a complex mix of professional skills must be coordinated with sophisticated equipment and an array of imported supplies (drugs, equipment) to deliver good health care. A break down in any part of the system means that care is less than optimal, or not delivered at all.

Civil service procedures developed to coordinate far flung colonial administrations at a time of poor communication. Usually, an agency working within such a system had only one cadre at the forefront of it operations--policemen, teachers, soldiers. One civil servant could usually be interchanged for another if staffing were short. Other purchased inputs were simple and locally available--food, horses, perhaps books and paper. Time was rarely critical--no one died if a position was not promptly filled, or a book order delayed. This is not the case in a modern hospital. A missing drug, an absent radiographer, a broken laboratory machine--any fault can compromise the care a patient receives. Coordinating all of these things so that professional skill is
brought to bear on each patient’s illness is a complicated task not anticipated in the
design of existing Government finance and personnel systems.

For these reasons, more and more public hospitals, particularly the most
complicated “apex” hospitals, are being given a degree of autonomy in their operation.
Papers in Appendix 9 discuss examples in Singapore, Great Britain and the United States.
At a minimum, such autonomy usually includes the following:

- The ability to hire, fire and promote staff:
  ---Power to create or modify job descriptions.
  ---Power to set compensation levels within general guidelines and
  approved budgets.
  ---Delegation of hiring authority under agreed guidelines.
  ---Ability to award modest amounts of incentive compensation.
  ---Ability to make merit based promotions.
  ---Power to hold disciplinary hearings, and take disciplinary actions
  subject to guidelines agreed with Ministry of Public Service.
  ---Ability to set and amend work rules, subject to limited negotiation with
  employee representatives.

- The ability to directly plan (and pay for) orders of supplies and equipment:
  ---Ability to make direct disbursements to providers based upon agreed
  documentation requirements, and subject to periodic audit.
  --Ability to issue purchase orders for most purchases.
  ---Ability to conduct competitive contract procurements after proper
  advertising.

- The ability to contract for services (including maintenance) within broad
  guidelines designed to prevent corruption.

- The ability to shift funds between budget categories:
  ---To move unspent funds from one item on the chart of accounts to
  another.
  ---To move funds available from vacant positions to other unfunded
  vacant positions, or to other objects of expenditure.
  ---To move amounts (within a predetermined limit) from a general
  emergency reserve to particular items of expenditure.

These freedoms are usually accompanied by the authority to retain and spend fee
earnings (discussed above). Often, some discretion in the setting of salary levels (or
bonus compensation) is permitted. Medical policies and fee schedules can be adjusted
within guarantees that the facility provide defined levels of service to the poor and meet
public health objectives.

Such autonomy does not mean that a hospital becomes “private” in the sense that
a government telephone company becomes private if it sells shares to investors. The
Government can retain control of the land and title to the buildings. The hospital cannot enter an unrelated business, nor can it invest large amounts of capital without Government approval. Its ability to incur debts is usually limited.

There are a number of ways in which this autonomy can be achieved. The hospital may be transformed into a parastatal (like the Lesotho Highlands Development Authority) with more control over its budget and personnel. Existing personnel may be given the choice of joining the new institution outside the Civil Service (with proper preservation of pension rights), or they can remain with “the Ministry.” A Board of Directors assumes responsibility for oversight of operations and selection of senior managers. The Government can retain a voice in management by appointing some members of the Board. Each year, the hospital must submit audited accounts, justify any change in the tax subvention which it receives, and must report on the manner in which it has fulfilled its duty to the public.

An alternative, less sweeping approach is to hire a management contractor with authority to assign staff, enter contracts, make purchases and coordinate operations. Such arrangements are apparently in place in South Africa, and the necessary technical expertise exists in the RSA. A manager’s compensation can be linked to financial and service performance, although such contracts require substantial sophistication in a small oversight staff at the Ministry.

This contract arrangement is less than ideal because the manager usually has little control over staff operating under Public Service rules (and paid unrealistically low Government salaries). The contractor can be expected to bring greater sophistication to operations and financial management, and the hospital will likely encounter fewer equipment breakdowns. But under such an arrangement, the contractor may not be able to minimize staff turnovers, vacancies, and non-performing workers.

Contracts for operation of the kitchen and the laundry at QE II suggest that the contract model can improve hospital services in Lesotho. In fact, the contract model does not seem to have been carried far enough, since the contractor is not responsible for upkeep of the equipment, some of which is now out of service. If authorized, a competent contractor might have been able to price necessary maintenance and repairs--even equipment replacement--into his fee.

Whether the Government moves towards institutional independence and parastatal status, or towards a more limited management contract, the shift should occur before commitment to a new hospital. In this way, skilled managers of modern hospitals can be brought into the planning of the new building as well as the operation of the existing facility. Without the flexibility inherent in a new management arrangement, the new “apex” hospital,” somewhat more technically complex than the existing QE II, will not run well. Equipment breakdowns will begin almost immediately. The Ministry should move quickly to evaluate the options for more autonomous management. As a first step, senior officials should visit some of the more successful examples of these autonomous
arrangements to see how they work, to understand how the interests of the poor and the public health are protected, and to test the different options for achieving autonomy.

15.3 Making Choices

Chapter 14 describes and attempts to quantify possible new revenue sources and major budget reductions. Minor cuts in other areas are just likely to exacerbate the problems outlined here. Chapter 13 estimates the cost for meeting the priority needs today and the additional costs of running the new hospital.

In conjunction with other Ministries, MOHSW must determine if any of the major incremental funding sources will be implemented (shift in the share of Government revenue going to health, a Medical Aid scheme). Then the Ministry must examine the other actions more clearly within its own control (budget cuts, user fees, private practice) or for which it is now negotiating (Global AIDS Fund). With a realistic assessment of achievable revenues, the Ministry must then choose from the list of priority expenditures. It may be necessary to return to the list of savings and new revenues if essential items are not funded. If funds are inadequate to implement the priorities and fund the incremental costs of a new hospital, then the Ministry should not proceed with construction until it knows how these costs will be covered.

The following actions are pre-requisites to proceeding with the new hospital. Actions to increase the funds available to MOHSW must occur on the same timetable. We have suggested dates at which these milestones might be reached.

1 – Substantial management autonomy for QE II
   a. Review precedents in other countries. Fall 2002
   b. Develop detailed list of delegated powers. Spring 2002
   e. Board of Directors and Administrator in place. April 2004
   f. New management procedures defined (delegated contracts authority, etc.) Fall 2004.
   g. Change in personnel status. Jan 1, 2005

2 – Substantial increase in funding for the maintenance of civil works and medical equipment nationwide.
   a. New Facilities Manager appointed. Nov. 2002
   b. Equipment Manager appointed. Jan 1, 2003
   c. Increase QE II maintenance budget to 3,000,000 maloti. Fiscal 2003
   d. New contracting procedures and policies for facilities and equipment maintenance in place. Fall 2003.
   e. MOHSW gets 0.5% of capital cost for facilities maintenance. 2004 budget.
   f. Increase QE II total maintenance budget (including buildings {0.5% of capital cost} and small equipment replacement) to 6 million. 2005 Budget.
3 - Compensation adjustments for physicians and nurses
   b. Survey of housing allowance preferences. Jan 1, 2003

4 - Legal private practice for all physicians, Basotho and expatriate, employed or under contract to government or CHAL
   a. Review existing laws/expatriate contracts and developed proposed language changes. Jan 1, 2003
   b. Enact changes in laws and contracts. July 1, 2003
   d. “Supplementary” private practices permitted to open. July 1, 2004
   e. Open private practice building at new hospital (on completion).

5-A new CHAL agreement increasing existing subsidies and retaining incentives for CHAL to collect and retain user fees.
   (Since this activity is underway, we do not suggest a schedule. It should happen as soon as possible.)

6. Supplementary staffing.
   QE II nurses
   • Funding in 2004 budget.
   • Recruiting begins July 1, 2003.
   District doctors
   • Create positions in 2004 budget.
   • All positions filled with properly trained staff----July 2005.

15.4 What Constitutes Success?

As in all matters of health care, there is a difference between process and outcome measures to monitor management success. Process measures are listed immediately above and below this section. But health outcomes are most important. It is beyond the scope of this paper to select a particular performance measure. All of the following measures can be monitored to assess performance as the system develops. Merely measuring mortality will be an inappropriate outcome measure—death rates will go up inevitably over the next several years because of the AIDS epidemic. However, the following can be monitored to test the success of the immediate reforms, and later of the more sweeping reforms which should accompany the completion of the new hospital.
Interim performance measures:

- Availability of key items of medical equipment (“downtime” for X-ray machines, anesthesia machines, etc.)
- Number of District Hospitals missing one or more key medical services (pediatricians, obstetrics, medicine, surgery).
- Numbers of patients at QE II from outside Maseru city who require only District Hospital care (based on periodic surveys of patients in house)
- Total number of surgical admissions (an increase will likely be an indicator of improving quality of service/accessibility). Some increase in medical admissions is likely inevitable due to the AIDS epidemic.

Performance measures with new QE II in place:

- Number of nosocomial infections:
  - QE II
  - District Hospitals
- Number of deaths due to cervical cancer
- Number of appropriate referrals to QE II (for services not provided at District Hospitals). Should increase.
- Number of unnecessary referrals to QE II (for services which should be provided at District Hospitals). Should decrease.

15.5 Moving Forward

The decisions necessary to open a new QE II are too complex to make and implement within the existing structure. MOHSW, not the Ministry of Works, must act as the responsible client in the design and construction of the new hospital. To follow the process outlined in Appendix 1, action is required at three levels:

1. Create a national multi-ministerial Health Sector Reform task force with CHAL participation. This is required to guide the process of rationalizing and improving the entire health system and making critical decisions about new revenue sources. This task force should be formed as soon as possible, with time to deliberate before the next budget cycle and recommend changes in health care funding.

2. Appoint a regularly convened “users group” at the level of QE II, including consultants, nurses, and technical and financial personnel. This group will interact with the architect to develop the detailed design and be sure that it fits within available capital and operating funds. Senior MOHSW management, advised by the users group, should be appointed as a Project Implementation Committee to make design decisions (see Appendix 1). A consultant reporting directly to the MOHSW should be hired to update the operating cost estimates as the design progresses. The Project Implementation Committee should be
selected while financing for the new facility is negotiated. All appointments should occur before the competition to select the design team.

3. Appoint a small group of bright dedicated staff, knowledgeable about health matters, to carry forward the decisions of both groups. At the moment, all technically qualified personnel are constantly busy with patient care or day-to-day management. There is no one to draft an agreement, obtain additional information, or follow through on most previous policy decisions. The Planning Unit can help in this work, but there will now be much more to do. One or two young physicians could be assigned half time to staff these groups. This would be excellent training for future management responsibilities. These individuals should be in place as soon as possible, probably at the beginning of the next budget year.
Contact List:
Key Informants, Organizations, and Facilities Visited

Ministry of Health and Social Welfare

Hon. DR. P.M. Sekatle  Honorable Minister, MOHSW
Mr. T. Kitleli  Principle Secretary, MOHSW
Mrs. M Rasephuntsa  Deputy Principle Secretary, MOSW
Dr. T. Ramatlapeng  Director General for Health Services, MOHSW
Mrs. M. Makhakhe  Director of Health Planning and Statistics Unit, MOHSW
Mr. Albert  Development Accountant
Mrs. M. Khuele  Chief Economic Planner, MOHSW
Mr. Motlatse Letsiba  Senior Accountant
Miss M. Matji  Head, Statistics Unit, MOHSW
Mrs. Matrako  Planning
Mrs. Mari Moimoe  Assistant to the Financial Systems Consultant
Mrs. Ntho  Financial Controller
Mr. Steven Perkins  Financial Systems Consultant
Mr. E. Qureshi  Procurement Advisor, MOHSW
Mrs. N. Sefako  Senior Economic Planner, MOHSW
Miss R. Sello  Procurement Officer, MOHSW
Mr. Ernest Tlali  Director of Laboratory Services
Mr. M. Thhomola  Estate Manager, MOHSW
Ms. T. Tiheli  Chief Nursing Officer, MOHSW

Queen Elizabeth II Hospital

Dr. McPherson  Medical Superintendent, QEII
Mrs. Khoali  P.N.O.
Mrs. Makhupane  Hospital Administrator
Mrs. Julia Chere  Clerical Assistant for Human Resources
Dr. Cooper  Specialist Consultant Physician, QE II
Mrs. Jaase  HAA
Ms Mosa Masupha  Foreman for construction contract
Mrs. Mohale  Pharmacist
Dr. Mohapi  Consultant Surgeon, QE II
Dr. Monyamame  Head Internal Medicine
Dr. Moorosi  Head of Lab. Services
Dr. Nair  Head of ENT
Raleomile Motsoane  PTO Maintenance
Mrs. Ntisa  Accountant, QE II
Mrs. Ntsekhe  Chief Pharmacist, QE II
Dr. Olaruntoba  Consultant Surgeon, QE II
Dr. Phiri  Head of Pediatric Department, QE II
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Free State Health Department, RSA
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Ireland Aid
Ms. C. Hannon Attache (Development Cooperation)
Dr. K. Lerotholi Health Program Advisor

LAPCA
Dr. M. Moteetee Chief Executive

Leprosy Hospital, Botsabelo
Mr. C. Rakotsane Administrator

Maluti Hospital
Dr Hurlow Superintendent

Maseru City Council
Mr. BL Mahlahe Director Planning and Development
Mantai Phaila Senior Lands Officer
Ntsbo Putsoa PTO
MD Tlaba Department of Land Survey and Physical Planning LSPP

Maseru Private Hospital
Mrs. M. Letsie Matron
Mrs. M. Thoo Managing Director
Medical Care Development International (MCDI)

Dr. Christopher Schwabe  Health and Public Finance Consultant

Medical Council

Mrs. Mamotena  Registrar

Medi-Clinic Hospital (formerly Hydromed), Bloemfontein, RSA

Irene Kruger  Credit Manager
Ms. Sonja Pienaar  Head of Reception

Ministry of Planning

Geoffrey West

Ministry of Works, Maseru

Mr. Relebihile Ramaili  Architect

Mohlomi Hospital

Mrs. M. Ranthimo  Senior Nursing Officer
Sr. Makhanya N.S  TB Ward
Ms. B. Manyeli  TB Ward
Sr. Masoabi N.S  TB Ward

National Drug Service Organization

Mr. O.M. Mohales  Finance and Administration Manager

RHSP

Simon Kananelo Malhleha  Mechanical engineering
Kajia A H Mnzava  Project Coordinator
Scott Hospital

Ms M. Hoeane       Senior Nursing Officer
Mr M. Makara       Scott Hospital

Sechaba Consultants

David Hall         Director
Thuso Green        Managing Director
Deborah Wason      Sechaba Consultants

St. Joseph’s Hospital

Dr Monese          Superintendent

Universitas Hospital, Bloemfontein, RSA

Dr. Kabane, CEO

World Bank

Dr. Julie Mclaughlin Senior Health Specialist, Africa Region
Carin Lenngren Martin Architecte SAR

World Health Organization (WHO)

Dr. Tshabalala      Country Officer
Mrs. M.C. Bebey-Khen Administrative Officer

Additional Facilities Visited

Ficksburg Hospital, RSA
Mabote Filter Clinic
National Hospital, RSA
Proposed Site for new Referral Hospital Botsabelo
Qoaling Filter Clinic
Universitas Hospital, RSA
Zastrone Hospital, RSA
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