

# **Macau in the New Millennium**

**A Study of Macau's Healthcare System**

**«Executive Summary»**



*By*  
**RML & Associates**

**STUDY AND EVALUATION OF THE HEALTHCARE  
SYSTEM**

**«EXECUTIVE SUMMARY»**

*Table of Contents*

	Page
A. The Study.....	3
B. Healthcare System History.....	6
C. System Strengths and Achievements.....	9
D. System Weaknesses.....	11
E. Opportunities for Change.....	13
F. Conclusion.....	34

## EXECUTIVE SUMMARY

### A. THE STUDY

#### **The Consulting Team**

This report is the culmination of more than one year of study, data analysis and evaluation conducted by the highly regarded consulting team assembled by RML & Associates (RML) specifically for this project. The consulting team includes academic professors and other individuals with advanced educational credentials and practical experience in medicine, governmental affairs, law, auditing, accounting, and consultative evaluation of complex health systems, information system design, public health, dentistry, pharmacy, health industry administration, and radiological technical support.

#### **Scope of the Study**

Although RML was hired by the government of the Macau SAR (MSAR) to conduct a Study (Study) of the operation of the government healthcare system, the study could not ignore the private sector because that sector provides a substantial portion of the healthcare services delivered to the citizens of Macau. For example, the government hospital provides more than one half of the local hospitalization services used by the community. The primary care services delivered in the government's health centers provide only about 25% of the services received by the residents of the community. Private practitioners<sup>1</sup> and non-governmental organizations (NGOs) provide about 50% and the remainder is provided by the primary care clinics operated by the Kiang Wu Hospital (KWH).

Since the government is responsible for licensing healthcare practitioners and licensing is one form of quality assurance for the overall system, the Study could have significant impacts outside of the government-operated components of the healthcare system.

---

<sup>1</sup> For purposes of the remainder of this Executive Summary the term "private practitioners" or "private practice" includes NGO and Kiang Wu services.

## **System Data**

We (the RML team) interviewed the department chiefs of the medical departments within the public healthcare system and representatives of administration, information systems, human resources and fiscal services. Various government offices responsible for administration, statistical data, legal matters and treasury management also provided data. We obtained data from and conducted interviews with representatives of private sector institutions, private practitioners, and professional associations. Through interviews, additional information was obtained from individuals representing healthcare service providers in Canton, Hong Kong and Beijing. Comparative data were obtained by searches of the relevant literature, publications and journals. The Study included opinion surveys of patients, employees of the healthcare system, the management of the healthcare system and the medical staff and opportunities for public comments during the consultation period. The team appreciates and relied heavily upon the contributions of those described above.

## **System Analysis**

Our report is based on factual analyses of the data collected as described above. The team's individual and collective knowledge, professional judgment, practical experience and diversified cultural backgrounds also influenced the outcome of our analyses and recommendations. For example, our physician team members have cultural roots in China, Europe and the Philippines and all currently practice medicine in different specialties in America. In addition to their private practice experience, cumulatively they have had academic appointments, served in executive positions in the healthcare industry, held policy making positions in government, been principal consultants for international consulting firms, and had experience as expert witnesses in the courts of America.

## **Preliminary Recommendations and Public Input**

Our preliminary recommendations were presented to the community in a series of public hearings. The hearings were conducted in the late fall of last year and provided a vehicle for feedback at the hearings and also included the opportunity subsequently to submit comments, questions and concerns during the consultation period.

The report describes the historical development of the healthcare system and the current system and makes recommendations for the future. The recommendations are intended to guide the government in its decision-making process to provide the best financially viable healthcare program for the citizens of Macau in the future.

## **B. HEALTHCARE SYSTEM HISTORY**

### **Recent Initiatives**

Beginning in 1992 the government significantly reorganized the components of the healthcare delivery system, but no effort was made to integrate the existing private providers into the delivery model. What this legislation accomplished in part was to facilitate the rapid growth and development of the specialized medical program that was based at the Conde Hospital San Januario (CHSJ). That growth saw a rapid acceleration of costs incurred for the hospital and for physician training services. The impending impact of the transfer of power for the governance of Macau from the Portuguese to the government of the MSAR, of the People's Republic of China, caused the government to enter into a Post Graduate Medical Training program for the Specialization of Physicians that emphasized the utilization of local residents (also called the localization of healthcare professionals) in the government hospital.

Macau also has been an active participant in the World Health Organization (Western Pacific Regional Office) and has aggressively pursued the objectives of the membership. The government adopted the "Health for All by 2000" strategy and achieved all of the goals, by engaging in a three-pronged approach that included Public Health, Primary Care and Hospital-Centered Specialty Care.

### **Public / Environmental Health**

Public health programs were strengthened and expanded. Notable government programs in environmental health improved wastewater treatment and domestic water supply management. Active programs to administer vaccines to the population have been conducted in cooperation with the primary health system. Vaccines include those for prevention of hepatitis and tuberculosis. To combat infant mortality and early childhood death the government has instituted comprehensive prenatal, perinatal and early child development programs. The public health programs are also responsible for monitoring the health status of the population through

statistical analysis of numerous indicators. The health indicators reveal a continuing improvement of the population's health status.

### **Primary Care**

In the area of primary healthcare the government opened health centers throughout the territory. The health centers provide basic primary healthcare and medications to all of the citizens of Macau. This is a superior approach and is in marked contrast to the system employed in Hong Kong. The primary care model in Macau emphasizes Family Practice, which is known locally as Specialty General Care. The government's specialty training programs include a residency in Family Practice but they have not produced enough graduates to adequately staff the health centers. The outcome is excessive patient referrals to the more costly treatment rendered by hospital-based specialists and in some cases episodic treatment of chronic conditions.

### **Specialty Care**

Beginning in 1986 the government of Macau entered into a new era as the dominant provider of healthcare services to the community. A substantial portion of the population was made eligible for free specialty care and medications either because of age (young or elderly), specific diagnostic groups (obstetrical, renal failure, cancer, psychiatric, etc.), addiction status, membership in a distinct group (government employees, students, prisoners, etc.) or poverty.

In November of 1999 Macau restructured the healthcare system to revise and improve the 1992 reorganization of the Servicos de Saude (SSM) and reorganized certain of its administrative divisions. Again the private sector providers were not included in the reforms and projections of future costs were not made.

### **Current Issues**

December 20, 1999 inaugurated the new MSAR government. The new leaders are facing many challenges. Among them are rising healthcare costs and the leveling of economic growth. Recognizing the need for a sustainable quality healthcare delivery system for Macau's people, the new

leadership made healthcare one of the highest-priority issues facing the new MSAR government.

This Study is designed to provide an independent assessment of the healthcare system by identifying its strengths and weaknesses, and to make recommendations so that sustainable quality healthcare services are available to the people of Macau.

### **System Strengths and Weaknesses**

Although this view of the stunning changes has been significantly abridged for this summary, the reader should be aware that the health system developed by the government represented massive change in a short period of time. Under those circumstances and with the benefit of hindsight it is apparent that along with the significant achievements, some elements of implementing the program may not have been adequately planned or were implemented hastily. In either case, many opportunities for improvements to the existing system remain.

## C. SYSTEM STRENGTHS AND ACHIEVEMENTS

We began this summary with a discussion of the changes that have occurred in the healthcare system in little more than a decade and now aspire to emphasize some of the real achievements the changes have brought to the citizens of Macau.

### **Public Health**

- Improved health status indicators of community health in the important areas of infant mortality, communicable diseases and life expectancy
- Active inoculation programs involving typical vaccines, Bacilli Calmette-Guerin (BCG) and Hepatitis
- Integration of an inoculation tracking system into the computerized patient index
- On-site school visits by health professionals employed by the Health Department
- Improved government waste and domestic water management programs

### **Primary Health**

- Coverage of basic primary health services when received at the government health centers
- Convenient coverage of pharmaceutical products dispensed through pharmacies participating in the Pharmacy Convention
- Well-developed prenatal care program for normal pregnancies with a referral mechanism for high-risk patients
- Expanded levels of service planned for the Health Center located on Taipa

- Integration of Chinese medicine into one of the Health Centers (Fai Chi Kei)

### **Specialty Health**

- Centralized receiving area for all trauma cases occurring in the community
- Local availability of most diagnostic and treatment modalities that are currently accepted in the practice of western medicine
- Free coverage for all financially needy patients and for specific medical conditions
- Local postgraduate medical education and training programs for a broad range of medical specialties
- Emphasis on training local residents for careers in medicine
- State-of-the-art diagnostic equipment
- Reasonably new and adequately-sized acute hospital facility with convenient access for the public
- Large nursing staff with academic preparation primarily obtained from the nurse training programs at the former government-operated Escola Tecnica dos Servicos de Saude de Macau and the Kiang Wu School of Nursing
- Development of a new school of nursing and revised curriculum under the auspices of the Macau Polytechnic Institute, School of Health Science (Instituto Politecnico de Macau, Escola Superior de Saude)

## D. SYSTEM WEAKNESSES

The government aggressively pursued the goals of the 1992 reorganizations with great success. Despite this success it became apparent that the reorganization did not adequately address the future, the community or anticipate the results of all of the expected changes. The implementation of such an ambitious and desirable program, that has achieved so many of its objectives and by most measures has been phenomenally effective, was nonetheless seriously flawed from the outset for a variety of reasons:

- Cost models were not developed, which took into account the size of the enrolled population, projected utilization rates, projected growth, changes in the age cohorts of the population, or expected future financial resources. Therefore, the implementation did not even consider whether the government could fund its promises and instead assumed that budgetary limitations would control the growth of cost.
- No provisions were made for cost sharing by those citizens with adequate financial means.
- No consideration or planning was given to the impact of the government's healthcare program on private physician practice. Private practice still provides approximately three quarters of the primary care delivered in the region.
- No consideration was given to the Chinese community who represents the vast majority of the population and had historically been served by private practice physicians and the Kiang Wu Hospital. As a result these important elements of the community healthcare system were never integrated into the governments healthcare system.
- Chinese Medicine, historically and culturally ingrained in the preferences of a significant portion of the indigenous population, was not adequately considered.
- An assumption was made that the affluence of Macau, which is an aberration of the economic status of many neighboring jurisdictions, would continue to prosper and would have the ability to continue to expand government services and social welfare benefits to its citizens.

- Specialty training programs were not standardized or subject to oversight by a recognized school of medical education.
- Future community needs for specialists by category were not established. This has resulted in excessive production of certain specialties and shortages of others.
- Relationships with Kiang Wu Hospital and its training programs were not adequately established or incorporated into the government design.
- Rapidly accelerating costs of operating the Health Department, particularly for CHSJ, were not provided for.

We need to emphasize from the outset that the system has accomplished a great deal in a short period of time and incorporates many valuable activities, which not only deserve to receive credit but also need to be preserved into the future.

## **E. OPPORTUNITIES FOR CHANGE**

A consultation study is not the same as a financial audit during which a Certified Public Accountant (CPA) examines the books and records of a company and then provides an opinion that attests to the fairness of the company's financial statements. Thus, the outcome of a CPA examination is normally expected to be positive. Consultation studies, on the other hand, point out areas where a business is not functioning at maximum levels of efficiency and make recommendations for change. The recommendations can be misconstrued and regarded as negative. The objectives of this Study, however, are to seek improvement on the existing System. The recommendations are intended as constructive criticism that would lead to:

- Consumer confidence;
- Increased consumer satisfaction;
- Increased efficiency of operations;
- Improved quality; and
- Opportunities to sustain the current level of services or add additional benefits.

This report contains many recommendations and some alternative approaches to resolving current healthcare issues and improving existing programs. In this summary we highlight some of our recommendations that we consider significant. For a complete discussion of recommendations refer to Chapter V Final Evaluation and Recommendations, and Attachments VI through IX.

Specifically, improvements are needed in the following areas:

- Community
- Comprehensiveness
- Access
- Facilities
- Public Health
- Long-term Viability of the System
- Customer Satisfaction
- Quality
- Communication

- Management
- Operational Efficiency and Financial Performance
- Accountability

- **Improving the community**

Although the community is served according to some set of standards and individual selection, there is no community-wide medical standard for professionals or coordination of the supply of medical services.

- ✓ **Licensing:** The MSAR registers individuals for practicing medicine, nursing and certain other allied medical professions. However, the standards for granting licenses are not very stringent and renewal is perfunctory. We recommend that new physician licensees be required to have successfully completed a hospital-based internship, and that the renewal of licenses should be accompanied by proof of completion of a minimum number of continuing education hours.
- ✓ **Continuing Education:** Continuing medical education should be a mandatory career-long process for all professionals engaged in the practice of medicine or allied health careers because of continuing technological changes.
- ✓ **Cooperative Health Planning Model:** Planning for comprehensive health services has not been effective in Macau and that has resulted in duplication of specialty services. As the community and medical technologies continue to grow, it will need to add costly new specialty services. It is not economically viable to duplicate the same services and in fact such duplication might prevent either KWH or CHSJ from developing and operating a high quality program due to a small patient base.
- ✓ **Shared Services:** It is possible that specialty hospitals such as a rehabilitative hospital or certain specialized outpatient services such as radiation therapy could be developed and conducted as shared services. Thus, we recommend that a strategic plan and the necessary legal machinery be developed to allow partnerships between the government and the private sector.

- **Improving comprehensiveness**

Given the size of the community, we found the scope of services to be relatively comprehensive with most currently accepted western medicine treatments and diagnostic tools available locally. Efforts have also been made to integrate certain system components such as primary, public health and specialty hospital services. Some services are not offered because of existing legislation that limits the use of radiation and family planning. Other services are not offered because the community lacks the qualified staff or equipment. The integration of services could also be improved between primary care, specialty care and post-hospitalization services in nursing home, home health and hospice settings.

- ✓ **Nuclear Medicine:** This service represents a well-recognized diagnostic tool for use in detecting malignancies of the skeletal system, thyroid and certain cardiac conditions. It involves the ingestion or injection of radioactive isotopes with extremely short half-lives and scans with a gamma camera. The service is not available in the community because of existing legislation. We recommend that this be reevaluated for safety, material controls and disposal. The evaluation should be considered as a part of any enabling legislation that would allow the development of this useful diagnostic service.
- ✓ **Radiation Therapy:** This therapeutic service involves the use of a linear accelerator to direct radiation at tumors to shrink them prior to surgery, as a post surgical treatment and for patients with inoperable cancers. Patients are currently referred to Hong Kong, which can be a hardship on the patient and family because the treatments may require several exposures per week and can last up to eight weeks. During this period the patient may experience nausea and other side effects from the treatment that can make the frequent trips a greater ordeal. We recommend that an outpatient cancer center be developed to serve the community. The center would provide radiation and chemotherapy. We suggest that the center be developed using a “Cooperative Health Planning Model” as suggested in “Improving the Community” (see above) because it represents a significant investment and should not be duplicated. If this recommendation were

implemented, in addition to acquiring the linear accelerator, a qualified radiation oncologist would need to be recruited.

- ✓ **Cardiac Surgery:** KWH performs cardiac surgery working with surgical team from Hong Kong. The cardiac surgery training program for the KWH staff has been limited due to a small patient population. The small number of surgeries does not allow KWH's physicians and nurses to develop and maintain their skills. Some cardiac patients pay for the surgeries elsewhere. CHSJ refers most of its cardiac patients to facilities in Hong Kong. We recommend that an evaluation be conducted to determine if the total number of cardiac patients, regardless where the surgeries are performed, is sufficient to support a successful program. In our opinion, the size of the community, morbidity statistics and age cohorts of the population suggest that a viable service could be developed.
- ✓ **PTCA:** The CHSJ has obtained the equipment to perform PTCA (percutaneous transluminal coronary angioplasty) including plaque removal and placement of stents. Physicians that have experience performing this procedure are presently on staff. However, acceptable standards, such as, the American standards of practice, would prohibit performing this procedure without immediately available cardiac surgery back up. Even with the cardiac surgery program at KWH it would not be immediately available. We believe that the government hospital should not pursue this service and instead direct the skills and expertise in place to the cardiac services planning project.
- ✓ **Lithotripsy:** Lithotripsy is a treatment modality using sound waves to disintegrate kidney stones in such a manner as to allow the patient to pass the residue through the urethra. It avoids the intense pain of passing a kidney stone and eliminates more invasive and riskier surgical interventions for stone removal.

While the equipment is not as expensive as a linear accelerator it is nonetheless costly and only one would more than adequately serve the community. We therefore recommend that this equipment be acquired and located at whatever institution as the "Cooperative Health Planning Model" suggests. (See Improving the Community.)

- ✓ **Chinese Medicine:** The report devotes a major section (Attachment VIII) to Chinese Medicine; and discusses its cultural roots, the current level of integration of the two styles of medicine on the Mainland and its widespread use in the community. The government healthcare system is largely based on the Western practice of medicine. The Health Department regulates the importation of Chinese medical products. One of the government health centers also offers a Chinese medicine clinic. While Chinese medicine has its critics in the West, who point out the difficulty in regulating dosage and the lack of clinical trials, it has gained acceptance as an alternative therapy for patients not responding to Western medical resources. In Macau, for a significant percentage of the population it is not an alternative but rather the first choice for primary healthcare. Furthermore, in any particular instance, either Western or Chinese medicine may be found to successfully treat certain conditions relatively more efficiently than the other.

We recommend that the government expand the availability of Chinese medicine in the health centers. We also recommend that the government evaluate the provision of Chinese medicine in the specialty hospital setting. If this service were to be offered, Macau's government would need to decide whether it would be integrated into the programs at CHSJ or if it was preferable to provide the service contractually through KWH.

- **Improving Access**

Access to the healthcare system in Macau is very convenient for most of the population. The land area occupied by the MSAR is very small. Health centers are located in multiple locations. In addition a convenient bus system serves most neighborhoods, taxis are plentiful and there is extensive ownership of private automobiles. The presence of typhoons, however, periodically causes the bridges connecting the islands to the peninsula to be closed. While this does not happen frequently it does create access problems for island residents and visitors.

- ✓ **The Islands:** Many members of the public have expressed a desire to have a full service hospital constructed on Taipa. However, the two existing hospitals in the community are only operating at a capacity of

- approximately 70% and both could make more beds available by reducing patient lengths of stay. We, therefore, cannot recommend that a hospital on Taipa should be considered at this time. Planning for the future could take place with a population trigger mechanism that would cause this position to be reevaluated. We recommend that a low-profile ambulance be secured that would allow medical evacuation of patients from Taipa in all but the most severe weather conditions. We suggest that outpatient surgeries be performed at the Taipa Health Center. The surgical capability would allow the health center to perform emergency surgery (for example, caesarian sections, emergency appendectomies and repairs to stop internal bleeding) prior to transferring patients to CHSJ.
- ✓ **Private Practice:** Private practice physicians provide approximately three quarters of the outpatient care. This development is surprising since services at the health centers are free and there is no government subsidy for care provided by private practice physicians. On the other hand, prior to the change in the government health programs, private practitioners provided all the services except to government employees, prisoners and the military. Apparently, patients have developed such strong bonds with their physicians that they are willing to pay for private care. Further, we found that while health insurance as an employee benefit does not exist in Macau and should not be required considering the government's comprehensive health programs, some employers are nonetheless offering paid healthcare services for their employees and families. The employers contract with private practitioners and KWH for these services as a fringe benefit for their employees. We also recommend that the government seriously consider banning the private practice of medicine by government physicians given the inherent conflict of interest with their responsibility in their government employment.
  - ✓ **Scheduling of Appointments:** Patients schedule their appointments for the half-day of the service; however, the appointment is not at a scheduled time. We were told that this policy of the health centers accommodates the cultural habits of the patients. We believe that the significant use of private practitioners and employer contracts with private organizations may be driven in part by the inconvenience of long waits for a primary care physician in the health centers. It is not

healthy to allow undiagnosed patients, who may have communicable diseases, to expose other patients during unnecessarily extended waiting periods in a crowded government clinic. We, therefore, recommend in one of the health centers a pilot project where patients must have scheduled appointments for care.

- **Improving Facilities**

The facilities of the government health system for the most part are adequate in size. In touring the CHSJ facility we noted large areas of vacant space. In addition, the government has purchased additional property adjacent to the CHSJ campus for expansion. We have identified the following areas where facilities appear to be inadequate.

- ✓ **Psychiatric Facility:** We visited the psychiatric facility in Taipa and concluded that it could not support the goals and objectives of a modern mental health program. We believe that this service should be located within or adjacent to the CHSJ hospital so that patients could receive medical interventions in the emergency room if necessary. We recommend an evaluation of the feasibility of a new facility within or adjacent to CHSJ campus.
- ✓ **Rehabilitative Medicine:** This function, currently located within the CHSJ facility, is underutilized. Although physical therapy is currently offered on an outpatient basis, the facility is not supporting a comprehensive outpatient rehabilitation program. Given the population base of Macau there should be enough demand for a properly structured program to operate as a stand-alone, small rehabilitation hospital. We recommend that this option be further evaluated and incorporated into the long-range planning of the Health Department.

- **Improving public health**

From the time the government health system was established to the present there is ample statistical evidence to support the conclusion that the health of the public has improved. There are areas of the public health programs that can be strengthened to further improve the community's health status.

- ✓ **Family Planning:** Family planning services are available in the health centers. With the objective of a sustainable quality healthcare system, and in light of the long-term financial implications of population trends, the government of Macau should develop a long range policy regarding family planning, public health and population control. The concept of zero population growth has been publicly debated in many countries and with successful implementation in some.
- ✓ **Dental Health:** We recommend that the water supply be treated with adequate levels of fluoride so as to curtail the incidence of dental caries in young children. We also recommend that additional dental coverage be made available in the health centers to curtail the long waits for routine examinations and treatment.
- ✓ **Tuberculosis Control:** Macau has an active vaccine program for tuberculosis using the BCG vaccine that has had a positive impact in reducing the level of TB in the community; however, BCG is not totally effective and Macau is in a part of the world with a high incidence of TB. The public health statistics indicate a much higher level of active TB in Macau when compared to western statistics. We, therefore, recommend that additional efforts be placed on screening programs and that observed medication therapy be either offered or required.
- ✓ **Environment:** One aspect of the environment is workplace safety. We could find no evidence that effective programs are in place to regulate this area. Most businesses in Macau are accustomed to operating in an unregulated environment. However, the government that provides a civic entitlement to a comprehensive free healthcare system is often left financially responsible for the consequences of workplace accidents and injuries. We recommend that the government develop recommendations on workplace safety that are supported by practices in other countries.

Sewage and waste disposal appear to have adequate government oversight, resources and support. Because of the potential for

industrial development on the islands, there needs to be additional regulation of airborne pollutants.

- ✓ **Food Hygiene:** The law requires the Health Department to assure the regulation of food hygiene in public eating places, retailing and food manufacturing activities. The regulations, however, lack the ability to cite, fine and require correction of unsafe practices. Because Macau has a significant tourist industry and because it is committed to improving the health status of the residents we recommend that the existing regulations be reviewed and the enforceability be strengthened.
- ✓ **Epidemiology Statistics:** Re-assess the empirical data collected and statistical trends maintained for a more comprehensive analysis of the health of the population.
- ✓ **Technical Units:** The technical units, which include the traditional functions of public health, should be separated from the Primary Care function and empowered as a separate organization.

- **Long-term Viability of the System**

The sustainability of the healthcare services at the existing level depends largely upon the MSAR government's ability to control the rapid increases in healthcare costs, and/or the government and citizens' ability to provide the needed financial resources. Rapidly-rising healthcare costs contrasted with the much slower-rising GDP means the current level of healthcare services, as limited by the GDP growth rate according to Article 105 of the Basic Law, is ultimately unsustainable. In the short term, the MSAR government may be able to sustain the current level of services by improving the operational efficiency of the System. In the longer term, unless the inverse relationship of declining GDP and rising healthcare expenditures changes and the growth in the population slows to reasonable limits, the current level of services may suffer.

- ✓ **Increasing Government and Healthcare Costs.** In light of the minimum projected increases in demand and budget described below, we need to look at what resources the government may have. To

begin we go back to the historic growth record for government expenditures and healthcare costs. In the seven-year period that ended in 1999 total government expenditures increased by 60% while the healthcare budget increased by approximately 120%. Thus, healthcare costs are already growing at a faster pace as a portion of government resources from an historical perspective.

The prospects for future growth in the economy of China and the surrounding territories are viewed by many to be positive. However, the slowdown of the economy in the United States, the significant reductions forecast for technology and the possibility of a major financial collapse in Japan do not bode well for the Asian economy. Because the continued growth in the healthcare expenditure threatens to curtail other worthwhile government programs it is prudent to find ways to limit the projected future growth of the healthcare budget.

- ✓ **Increasing Demands:** The healthcare costs per capita increased from 1,461 patacas in 1993 to 2,822 patacas in 1999, a 93.16% increase during a seven-year period or approximately a 15.5% increase per year. If this trend continues, in 2009, the projected per capita healthcare costs would be at 7,196 patacas. Total healthcare costs will then increase to 3,777.9 million patacas from the 1999 level of 1,234.7 million patacas, or a 206% increase from the current level.

The above-projected level does not take into account the rapidly increasing component of the 65-years and older population.

The 65-years and older component of the population, which stood at 7.7 percent in 1999, is relatively low when compared to many western countries. However that component is increasing rapidly. In the seven years ended in 1999 that age group had increased by about 23% (or 3.8% per year) from approximately 27,300 in 1993 (about 7% of a total population of 390,000) to 33,600 in 1999 (7.7% of a total population of 437,000). The total population during the same period only increased by 12% from 389,984 in 1993 to 437,455 in 1999. This net increase can be explained by immigration of residents from the Mainland and other countries, a lower infant mortality rate and increased longevity. Annual population growth rates during this

period averaged approximately 2% a year (12% for a seven-year period from 1993 through 1999).

There is no reason to believe that the population growth trends noted above will not continue in a similar fashion during the next ten years. If they do then in 2009 the population of Macau could increase by 20% to approximately 525,000 and the 65 and older component could be approximately 46,000, calculated at an 3.8% annual increase from the current level of 33,600, or about 8.8% of the total population.

Healthcare costs are increasing world wide as increased life expectancy and the attendant chronic illnesses that come with increased age require diagnosis and treatment. In the United States health planning models suggest that the population over the age of 65 requires four times as much specialty care as does the population as a whole.

New technology that serves to reduce costs in other industries actually increases cost in healthcare by allowing interventions and treatments. New diagnostic testing often is not a replacement for historic analytical techniques, but is in addition to the traditional path.

Development of new drugs by the international drug companies require costly research and clinical trials before becoming available in the market. The companies have patent protection during which they recover their research costs, earn profits for shareholders and fund additional research and development for new drugs. Therefore, the cost of the pharmaceutical component in health care delivery is growing even faster than the increasing demand for service.

- ✓ **Budget Caps:** The government of the MSAR has indicated a desire to limit the growth of government services in harmony with the growth of the GDP. Government-sponsored health programs in most areas of the world have demonstrated a propensity to grow at rates faster than the economy as a whole because of increasing consumer awareness of health service, new technology, new drugs, new surgical interventions, increasing life spans and other reasons. To cap health programs inevitably leads to a decline in facilities, increasing waits for services and implicit rationing of services. While we think budget control is important and potentially part of the solution to controlling

- the rate of growth of healthcare expenditures, we recommend that there are other more effective options to deal with spiraling health care costs.
- ✓ **Operational Efficiency:** Most complex systems initially deal with problems by hiring additional staff rather than evaluating processes or establishing productivity standards for operation. We recommend that the government evaluate delivery models that can more efficiently deliver the healthcare services the community needs. This could involve restructuring existing systems or contracting out services on a competitive bid basis. We also recommend that the productivity of the existing healthcare delivery staff receive special attention. New mandates for matching resources to workload and changing pay practices to accommodate more efficient operations are needed. We believe there are ample opportunities to save money in the existing system without limiting service. This approach is not an endless source of funding because savings from improved efficiency are attributable usually to variable costs such as salary and wages; however, it should be one of the first avenues addressed.
  - ✓ **Co-payment and Cost Sharing:** When services are free there is no incentive to exercise judgment as to the quantity of services consumed or the setting in which they are received; for example, there is currently no financial barrier for using the emergency room as a medical clinic simply because the hours of operation are convenient. Free service to all eventually creates a barrier to necessary care for citizens without financial resources and can result in a decline in the health of the population, because precious public resources could be wasted unnecessarily for the sake of convenience instead of need. The approach of Macau to “Health for All” is certainly a well-intentioned approach with the ability to benefit not only individuals but also the community. We recommend that the government consider implementing a co-payment for outpatient visits and hospitalizations. We suggest that the co-payment be on a sliding scale from zero to some upper limit based on the financial resources of the recipients. It has been demonstrated that even a small co-payment could dampen the demand for services yet would not limit access to services for the people with less financial means.

- ✓ **Creating Fee for Service for Certain Treatments:** The government provides some services that are considered optional and would not impair the health of the individual or the community if they were not treated. This includes a significant amount of the plastic surgery performed at CHSJ and might include fertility services as well as other services. We recommend that the government identify those services and establish a patient fee for providing such services as an additional form of revenue enhancement for the system.

- **Improving customer satisfaction**

Citizen complaints about government health services have appeared in the press, television, and radio and have been expressed to government officials, but no significant effort has been made to identify or mediate the sources of citizen complaints.

- ✓ **Defining Service Objectives:** We recommend that the government begin to focus on customer satisfaction by defining service objectives, such as waits for elective surgery, the first visit with a specialist, clinic waiting times, visiting hours, etc. The objectives should be made known to the staff and the community. On the one hand, the employees of the government should know what is expected of them. On the other hand, the public should be aware what the standard of practice is and that they are receiving the standard treatment and not being treated differently than anyone else.
- ✓ **Operating Room Schedule:** Most businesses have both internal and external customers. A frequent complaint from the health department's internal customers (the surgeons) was that there were inadequate operating room hours available to allow them to be more responsive to the needs of their patients. We recommend that the administration of the hospital take a more aggressive role in expanding the number of operating room hours available by setting goals, reorganizing and providing additional resources if necessary.
- ✓ **Opinion Surveys:** If a service organization is to be truly customer driven, it needs to monitor patient satisfaction. A number of approaches are available that vary from appointing a patient

representative for each patient admitted to serve as a focal point for gathering information on a concurrent basis regarding patient dissatisfaction with the treatment received, to a system where questionnaires are provided at discharge or mailed to the patient some time after discharge. We recommend that the government regularly conduct public opinion surveys about its service and tabulate the results, focus attention on improving the problem areas identified, and measure the progress by historical comparison.

- ✓ **Grievance and Complaint Protocol:** Unresolved complaints are not handled on a systematic process. We recommend that the government establish a grievance and complaint protocol that is in writing and involves internal investigation and feedback to the patient. The government may wish to establish a board or commission to provide oversight and review of the complaint resolution process. The use of a board or commission will provide for impartial resolution of issues.

- **Improving Quality**

It is difficult to assess the quality of care actually being delivered by the government health system other than by anecdotal evidence or crude measurements, because of inadequate records concerning outcomes and processes.

- ✓ **Total Quality Management:** Quality management is a process-oriented approach to complex functions. It includes work simplification where processes are documented and measured. It applies not only to patient care quality but also to customer satisfaction, efficiency of operations, maintenance of facilities and a myriad of other aspects of a business operation. It is team-based and relies on the participation not only of administrators and managers but importantly on the input of the rank and file employees who actually perform the tasks. Thus, we recommend that a comprehensive program of Total Quality Management be developed and implemented throughout the Health Department organization and its subparts.
- ✓ **Data Collection and Coding:** At the government hospital the medical staff performs limited coding in regard to services rendered, diagnoses and discharge disposition. The coding is entered into the Patient

- Index system. The completion of the coding is not enforced by medical staff rules or administrative edict and has historically been very incomplete. Further, the coding is not comprehensive enough to measure quality or process effectiveness. To overcome this situation we recommend that coding clerks be trained and assigned to the medical records and that a comprehensive abstract be developed for each hospital stay and outpatient visit.
- ✓ **Clinical Information System:** The existing clinical information systems are inadequate, not universally available, not integrated into a comprehensive clinical information system, and not integrated with the financial systems. Much of the clinical orders, communication and results reporting systems rely on multi-part forms that are manually generated and routed by messenger throughout the hospital complex. Further, the patient census is not a real time system so results are frequently misrouted and lost. Our recommendations suggest that the present systems be replaced by a comprehensive clinical management system that must include an order entry and results reporting module.
  - ✓ **Medical Record:** The medical record is the foundation for recording significant process events in a systematic and organized manner. In such a system a qualified individual not associated with the case could review the chart and determine the patient's history, complaint, diagnostics performed, therapeutic interventions, medications given, outcome and condition at discharge. Any errors or omissions occurring during the patient's stay would also be obvious. The existing medical record needs to be expanded and to be more logically organized. We have recommended a minimum level of content, suggested a method of organization and implied a problem-oriented approach.
  - ✓ **Medical Staff Peer Review:** Peer review creates an organized system where the activities and judgments of individual practitioners are subjected to the scrutiny of their peers. It is intended as an educational and coaching process that in time will improve patient care quality, insure more uniform approaches, result in cost reductions and tend to reduce patient length-of-stay.

- ✓ **Medical School Affiliation:** The teaching program is not affiliated with any medical school or university. The teaching programs, methods of evaluation of students and the comprehensiveness of training are subject only to the objectives of the current chief of each medical department. Therefore, the training is not uniform, not consistent and cannot be said to meet the standards of a well-known university. We have recommended that the postgraduate medical education program obtain an affiliation agreement with a respected medical school on the Mainland or preferably in Hong Kong. The professors at the medical school would establish minimum standards for the various residencies, approve curricula and would also have continuing oversight responsibilities. Eligible CHSJ physicians would receive appointments as faculty members of the medical school.

- **Improving Communication**

It was obvious during our interviews that major problems in communication existed within the Health Department. The lack of effective communication created a sense of mistrust and feelings of insignificance in the organization and generally led to unnecessary misunderstandings.

- ✓ **Self-governing Medical Staff:** The medical staff is currently extremely fragmented into more than twenty departments without an effective system of communication. There is also little or no standardization between departments as to the frequency of formal meetings, sharing of minutes, standards of practice, taking of calls, dealing with substandard practice or discipline of physicians who are not performing. The Department of Intern Doctors (DID) committee controls the medical departments' staffing and the chiefs of the departments often are not consulted in regard to their departments' needs or specifications for new hires.

We recommend that the number of medical departments be sharply reduced and the medical staff be separately organized and operated under medical staff by-laws, rules and regulations.

The new position to be titled the Chief of Medical Staff should be appointed by the Secretary of Social Affairs and Culture. The rules of

conduct, minimum educational requirements, discipline of staff members should be subject to the by-laws, rules and regulations of the self-governing medical staff.

For matters having a financial or budgetary impact the medical staff's recommendations would be given to the administration of the hospital for review and action. There should be an executive committee of the medical staff with representatives from each medical department along with a representative from both administration and nursing. The Chief of the Medical Staff should chair meetings and assure that minutes are kept. A regular item of business should be a review of the minutes of the meetings of the departments that were held since the last meeting of the executive committee. Action items would be comprised in part of those issues that were referred to the executive committee by the departments.

These recommendations are a major undertaking and will consume resources and will require a time commitment from the leadership of the medical staff; therefore, a relatively long time period must be allowed for planning, design and implementation.

✓ **Consolidation of Medical Staff Departments:** Our recommendation for consolidation is very specific. We have identified the following seven departments to encompass the entire medical staff and they are:

- Medicine
- Surgery
- Pediatrics
- Obstetrics and gynecology
- Emergency medicine
- Diagnostic specialties, and
- Rehabilitative Medicine

We further recommend that the medical staff have the opportunity to provide input into the final determination of the number of separate departments and which departments are consolidated.

- ✓ **Mission and Vision:** The Health Department must develop a formal mission statement that succinctly describes its mission as an organization. This will require the input of key policy makers and influencers within administration and the medical staff because they all may have different ideas and priorities. A further statement that codifies the vision of the future development of the organization should be prepared at the same time. All employees should be aware of the organization's mission and vision. The organization's mission and vision statements should be incorporated into the annual budget's goals and priorities.

- **Improving Management**

The Health Department's organizational structure follows strict channels of command with little or no delegation of authority or responsibility. This type of management style does not encourage creativity and does not promote effective communication among staff members. As a result, the individual's goals may not be congruent with the organization's goals.

This is not to say that every department or individual is not committed, but the staff's awareness of their individual responsibilities and their individual authority in relation to the organization is low.

- ✓ **Delegation of Responsibility to Department:** We have recommended that the managers of functional support units and medical departments be provided with very specific responsibilities, have their authority delineated and periodically have their performance as an effective manager evaluated on how effectively they have met the goals.
- ✓ **Budget Planning, Execution and Analyses:** The annual budget must be developed by the responsible managers based on Health Department guidelines. Then the Finance Department should assemble the preliminary budgets and review the outcome with either administration or a budget committee. If revisions are required they should be negotiated with responsible managers. When the budget is

finalized each manager must commit to delivering a set level of performance within the budget amount and any budget restrictions.

- ✓ **Information Systems:** The existing information systems are inadequate to meet the needs of delegated management. Departmental budget reports should be prepared monthly and distributed to managers. The budgets should be based on forecasted revenue and workloads. Workload statistics come primarily from the clinical information systems that record admissions, patient days, test volumes and other measures of workload that potentially impact the cost of operations. The current systems should be replaced by an integrated financial and clinical system that produces periodic reports for management.

- **Improving Operational Efficiency and Financial Performance**

Very little emphasis is currently given to productivity and efficiency of operations. Often department managers are not consulted in regard to the level of staffing required to deliver the necessary services within their units. Staff levels are not adjusted based on changing workload.

- ✓ **Pay Equity:** We suggest that the existing method of compensating the medical staff should be revamped to eliminate the emphasis on overtime and instead focus on qualifications, responsibility and productivity. There are also significant equity problems in the existing pay system. For example, interns and residents are paid at levels close to that of fully qualified and experienced physicians. Senior administrative positions in some cases are compensated at lower pay levels than their subordinates.
- ✓ **Productivity:** We recommend that work productivity standards be established for each department and in many instances for each individual employee. The achievement of the work standard should be monitored frequently and staffing levels adjusted according to workloads and other resources available.
- ✓ **Part-Time Employment:** We recommend that the Health Department employ a portion of the staff on a part-time or hourly

basis. Because the workload varies in both the hospital and the clinics, it is inefficient to staff all the positions with fixed full-time salaried employees. With part-time employees the managers would then be able to call in employees or schedule employees off duty in response to changing workload.

- ✓ **Pharmacy Convention:** Our examination of the Pharmacy Convention found that the health system was being overcharged or paying a premium for a number of the drugs that are dispensed under this system. We also found that the controls were not adequate to insure that all prescriptions were appropriately ordered. Further, we found that standard numbers of doses by contractual agreement are not responsive to physician orders, create waste and potentially create health risks to patients. On the other hand, we felt that the system was especially convenient to the patients and saved the government the cost of hiring additional pharmacists and carrying larger inventories of drugs in each health center.

We, therefore, recommend that the Pharmacy Convention be renegotiated with the input of knowledgeable buyers of pharmaceutical products, that pricing be per dose and that drugs being dispensed be entered into the Patient Index system.

- **Improving Accountability**

The Health Department currently operates with a great deal of autonomy. It has its own bank accounts, establishes policies for employees that in some cases are inconsistent with the rules against which other civil servants are accountable. It has the ability to transfer line items in the budget based on its own assessment of priorities. Large expenditures do require approval of the Secretary for Social Affairs and Culture. There are laws and regulations that limit the independent actions of the Health Department. However, these controls should be reviewed for effectiveness. We believe that a certain amount of flexibility is important, but this must be balanced with organizational responsiveness.

- ✓ **Delegation of Authority:** We recommend that a plan to delegate certain flexibility to the Health Department be developed so that it

will have the ability to respond to changing conditions. In a system of delegation the agency so delegated will be accountable to the Secretary and will work closely to insure that the organization is meeting potentially changing government, budgetary and administrative policies.

- ✓ **Flexibility in Operations:** We recommend that the Health Department have limited ability to substitute one line item of expenditure for another. This limitation should be subject to limits in amounts in response to organizational needs. However, we also recommend that those changes be communicated to the Secretary on a current and regular basis.
- ✓ **Oversight:** Organizations provided with delegated authority to exercise responsible changes to the annual budget must also accept that the operation of the delegated function will be subject to oversight by financial and policy-making departments within the various agencies of the government.

## F. CONCLUSION

*Process management for the Study's recommendations:* A discussion of an approach to review, analyze, modify and adopt recommendations for the implementation phase.

Our report is lengthy and contains numerous recommendations, some of which could be adopted almost immediately, and some that will require further study and longer time frames to implement. For example, the development of a self-governing and organized medical staff, construction of facilities, and evaluating, selecting and implementing new information systems will take time to plan and fully implement. Budget limitations will also prevent all suggestions from receiving a high priority even when they could be implemented quickly.

We recommend that a committee be formed to prioritize recommendations for implementation. The committee could be composed of government representatives, healthcare providers and interested community members. The committee's recommendations could be given to a specific individual or organization to cause the necessary actions to be taken and to monitor the implementation progress.

*Post implementation audit and review:* A report card for the community.

We would like to see each and every recommendation implemented, but we also recognize that local decisions need to be made to develop a program that fits the political and budgetary realities of the community. We would, however, be very disappointed if the report was filed without action and no positive benefits were ever received or progress made. Therefore, we would recommend a post-implementation review phase to this project as defined below.

Subsequent to issuance of this Study and a reasonable time to consider, adopt and implement the recommendations, an independent body should review the System and its organizations to determine compliance with the recommendations. The outcome of this review would be a report card, which would define for the government and the community the effectiveness of the

implementation efforts. The report would also verify to the extent possible the savings realized as a result of this Study.