



**STUDY REPORT ON:**

**OPTIMISING THE SERVICE  
MODEL FOR MACAO'S  
NEW OUTLYING ISLAND  
HOSPITAL**

## **STUDY REPORT ON:**

# **OPTIMISING THE SERVICE MODEL FOR MACAO'S NEW OUTLYING ISLAND HOSPITAL**

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## FOREWORD

The Government of the Macao Special Administrative Region is committed to improving residents' health and has a clear policy to invest in health care. The construction of the Outlying Islands Medical Complex is a strong demonstration of this commitment.

The Macao Health Bureau commissioned our team of experienced public health and hospital administration specialists from The University of Hong Kong to conduct a study on the Macao health care system. The focus of the study is primarily to determine the optimal service model and operating mode for the new Outlying Island Hospital within Macao's overall health care system.

This report provides the results of our comprehensive review of possible service model options and makes recommendations on the way forward for the Government to consider. It details the suggested operating mode for the Hospital. The report also offers advice on possible implementation approaches and tender design.

On behalf of the study team, I would like to express our appreciation to the Chief Executive, the Secretary for Social Affairs and Culture, the Director of the Macao Health Bureau and all colleagues in the Government of Macao SAR for affording us the valuable opportunity to conduct this study and for their kind assistance in facilitating our work.

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## TABLE OF CONTENTS

Executive Summary.....	i
Chapter 1 Introduction .....	1
Chapter 2 Background .....	4
Chapter 3 Macao's Current Health Care system .....	9
Chapter 4 Assessment of Macao's overall Health Care System.....	20
Chapter 5 Sustainable Development Direction.....	28
Chapter 6 Outlying Island Hospital Development.....	40
Chapter 7 Viable Operating Models of Outlying Island Hospital .....	44
Chapter 8 Service Mode of New Outlying Island Hospital .....	59
Chapter 9 Financial Arrangements .....	73
Chapter 10 Implementing and Administering the PPP .....	78
Chapter 11 Contracting and Administration .....	83
Chapter 12 Conclusion.....	95
Appendices .....	97
References .....	135

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# EXECUTIVE SUMMARY

## I. INTRODUCTION

1. In August 2020, the Health Bureau of the Macao Special Administrative Region (MSAR) Government commissioned a team of experienced public health and hospital administration specialists from The University of Hong Kong to conduct a study on the Macao healthcare system with a view to optimising the service model and operating mode of the new Outlying Island Hospital within Macao's overall healthcare system.
2. The study was to include the following four interrelated elements:
  - An evaluation of the strengths and weaknesses of the current medical system and future challenges.
  - Based on overseas experience, an analysis of the sustainable development direction of the overall medical system and services of the MSAR.
  - An evaluation of feasible operating models and operating mode for the new Outlying Island Hospital.
  - Provide suggestions on the service mode of the Outlying Island Hospital.
3. This report presents the results of this study, conclusions drawn and makes relevant recommendations. The report also provides advice on the approach and potential technical problems arising from any future tendering process.

## II. KEY RESULTS AND RECOMMENDATIONS

### Evaluation of strengths and weaknesses of existing medical system

4. Over the past twenty years, the MSAR Government has led a series of reforms to build a robust healthcare system, and the achievements are widely recognised as the positive effects have benefited residents. Overall, our assessment shows that Macao has a relatively equitable system that is operating well and provides the residents of Macao with quality healthcare services with an estimated low unmet healthcare need of 3.6% (Jockey Club School of Public Health and Primary Care, 2019).

## *Strengths*

5. The system has achieved impressive health standards being among the very best in the world in terms of life expectancy (80.8 years for men and 86.7 years for women in 2019) and infant mortality rate (averaging 2.4 deaths per thousand live births over the three years to 2019), which are commonly used population health indicators. With its similar ethnic population and pattern of prevailing diseases and culture, Hong Kong shows comparable life expectancies but expends some 30% more per capita on healthcare than Macao.
6. A critical factor in this achievement is the strong policy and financial commitment of the MSAR Government to improve its citizens' health. There is a clear policy to invest in healthcare. The Government has demonstrated this commitment by establishing plans to further develop primary, secondary and tertiary healthcare facilities.
7. One of the most apparent strengths of the MSAR health care system is the relative equity of access to healthcare services that it provides all its residents. Large Government subsidies to public healthcare, combined with an exemption scheme and safety-net, targeted at the poor, make the Macao health care system successful in ensuring that financial ability to pay at the point of service does not prevent low-income individuals from seeking essential health care.
8. The emphasis on primary care is an evident strength of the Macao healthcare system. The ease of access to these primary care services is believed to play an essential part in accounting for better overall system performance. The "Electronic Health Record Sharing System" (eHR) also facilitates sharing patient information between public and private health institutions and contributes to enhanced continuity and integration of care across the system.
9. A further strength of the Macao healthcare system is the relatively high number of doctors per thousand population (2.7) when compared with other systems (Hong Kong (1.9), Canada (2.4) and Singapore (2.4)). This is despite Macao not previously having a medical school to provide a constant supply of doctors. These strengths result in Macao having relatively favourable waiting times compared to Hong Kong public hospitals. Similarly, the total bed occupancy rate across all hospitals (78.3% in 2019) compares favourably with Hong Kong's public hospitals (92%).

## ***Weaknesses***

10. All healthcare systems have some opportunity for improvement. Macao's relatively small population leads to commensurately limited numbers of various clinical cases. It follows that the caseloads of rare medical or surgical diseases will also be small. This, coupled with the rapid development of new medical treatments, and diverse and increasingly complex diseases, has generally hindered the development of tertiary and quaternary medical services resulting in relatively fewer specialist options being available to the residents in the MSAR. The cost of transfers to other jurisdictions in 2019 for treatment not available in the MSAR was MOP 218 million.
11. Over recent years, the Health Bureau has been actively expanding its cooperation with local non-profit-making medical institutions, including buying services for public patients. However, despite this, the services provided by Macao's non-profit-making medical institutions has not been sufficient to enable the Government to fully achieve its goal of diverting patients requiring services that have longer waiting times away from government hospitals. Further, apart from the government subvention to Kiang Wu Hospital and the Health Voucher scheme, there is limited use of public-private-partnership to provide healthcare services in the MSAR.
12. Health spending across the public and private health sectors in Macao in 2018 was MOP 7.19 billion and 2.89 billion respectively, representing an approximate 70:30 split in the public and private healthcare market share. By way of comparison, in Hong Kong, public and private health spending each represented a 50:50 share of total expenditure in that healthcare market. This suggests that there is room for further developing the private sector for a more significant share of the Macao healthcare market, while of course upholding equity in access. A larger, more mature private healthcare sector would offer greater choice for MSAR's residents.
13. Being part of the civil service, public health institutions and their staff are subject to necessarily bureaucratic regulations and culture. This arrangement is similar to the public hospital system in Hong Kong before the establishment of the Hong Kong Hospital Authority, where the public hospital system suffered from inflexibility, inefficiency and low staff morale and was subject to pressure from rising community expectations and increasing demand. Hospital management independent of the Civil Service could allow for greater innovation and adoption of best practices leading to an improved service culture and overall service enhancement.

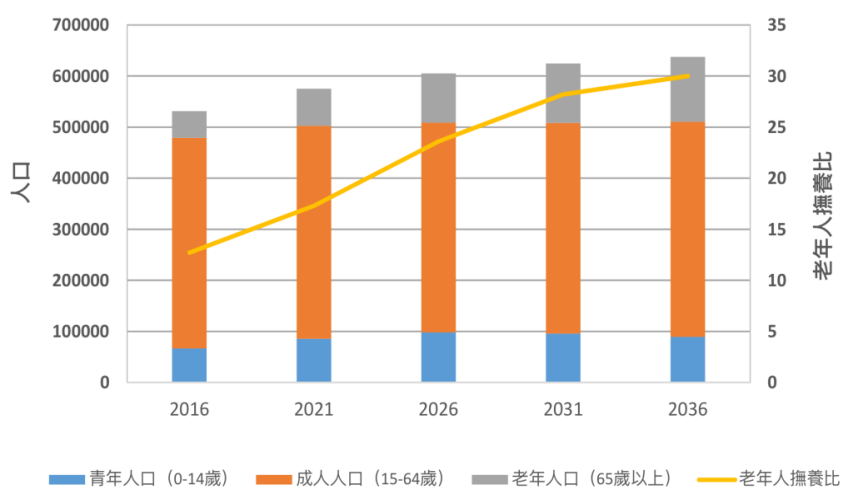
## Future challenges to the existing system

14. Like global challenges facing other jurisdictions, Macao's current healthcare system will face significant challenges in the future, primarily centred on increasing healthcare needs and escalating costs.

### *Increasing healthcare needs*

15. Healthcare needs are increasing due to demographic changes, especially from a rapidly ageing population, and the increasing occurrence of lifestyle-related diseases. As shown in Figure 1, Macao's population structure will continue to age with the proportion of elders (aged 65 or above) estimated to more than double by 2036. The elderly population has much greater healthcare needs requiring, on average, six times more in-patient care than a person aged below 65. Lifestyle-related diseases (for example: from smoking; drug abuse; physical inactivity; and chronic non-communicable diseases (NCDs) associated with an ageing population) are rising. Managing these chronic conditions will increase utilisation of, and hence financial demands, on the health care system.

**Figure 1:** Macao's ageing population



**Source:** Macao Population projections, Macao Bureau of Statistics and Census

### *Rising medical costs*

16. Even without the effect of demographic changes, healthcare costs are likely to continue to rise due to “medical inflation”. These escalating costs are due to advances in medical technology and public expectations for healthcare to keep up with such advances. International experience indicates that adoption of new medical technology alone has caused public medical costs per capita to rise at an average of 1% per year faster than the growth of an economy (as measured by per capita GDP). Additionally, in many advanced economies, irrespective of the rate of economic growth, the real growth rate of total health expenditure exceeds the economy's real growth rate (in GDP) by more than 50%.

### *Further development of specialist medical care*

17. Macao's increasing healthcare needs will place growing demand pressure on Macao's specialist medical services. Thus the MSAR will need to train up or attract more specialist doctors in the longer term to meet these growing service demands and increase Macao's self-sufficiency in supply. In this regard, the opening of the new Outlying Island Hospital will provide highly specialised equipment and require considerable new human resources and technical expertise. It will accelerate Macao's need for a larger number of diverse medical specialists.

### *Threat of infectious diseases*

18. As a consequence of changes in society, technology and the environment, pathogens evolve or spread. The spectrum of infectious diseases is also expanding with the world continuously confronted by longstanding, emerging, and re-emerging infectious disease threats, posing a rising health challenge. These concerns are magnified by rapid population growth in areas with weak health systems, urbanisation, globalisation, climate change and the changing nature of pathogen transmission between human and animal populations. Human vulnerability to microorganisms will therefore be a challenge for all health systems now and in the future.

### **Sustainable direction**

19. Although healthcare systems vary enormously between countries in the way they are configured and financed, our research has highlighted that most face similar challenges, such as changing demographics, together with accelerating rates of chronic disease. Sustainability is seen as a crucial requirement for making healthcare systems fit for the future, able to withstand these impending and ongoing challenges, while providing effective and efficient healthcare that is safe and of a high quality. There is also broad recognition that if healthcare systems continue along current trajectories they will become harder to sustain.

### *Effective health and healthcare systems*

20. Health systems in many countries are implementing various initiatives to tackle their ageing population and increasing prevalence of NCDs. Service delivery models are being re-organised with a rising emphasis on primary and community care components that integrate with secondary and tertiary care through formal linkages and information sharing. Accordingly, Macao's future health system should continue to be primary care based with a long-term strategy developed for enhanced integration of the healthcare system components providing an optimal mix of services.

21. In most countries sampled in our research, some form of private healthcare sector usually co-exists and complements the public sector. Taking reference from Hong Kong, there is significant room to increase the private sector's share of the Macao healthcare market to provide Macao citizens with more choice. Additionally, Macao currently makes limited use of PPPs to mobilise the resources of both the private and public sectors. The MSAR Government should consider making greater use of PPPs to complement the public health system. Clearer positioning of the private sector in Macao's future healthcare system should also be considered in the context of the opening of the Outlying Island Hospital and its operating model.

### ***Leveraging innovation and innovative technology***

22. Innovation and advances in healthcare technology have contributed to improved life expectancy, reduced patients' morbidities and have offered professionals' opportunities to improve healthcare quality and efficiency. In the future, new technologies promise to bring powerful solutions to current problems related to the ageing population, the prevalence and incidence of multi-morbidities and chronic conditions requiring long-term care. Information technology is also vital to move health organisations towards sustainability. Making best use of these available new technologies will require a culture of innovation that continuously improves treatment, efficiency and outcomes. Building a culture of innovation and improvement will therefore be essential to sustaining Macao's healthcare system in the future.

### ***Funding models that drive desired behaviours***

23. In many countries, future health spending is expected to outpace GDP growth due to the ageing population, increased prevalence of chronic diseases and rising expectations. Equally, while the uptake of new technologies can bring solutions to current and projected problems of health systems, new medicines and technologies also raise multiple questions about financial sustainability. The Macao government is now responsible for 74% of the total health expenditure. To ensure the health system's financial sustainability during possible economic fluctuations, Macao should consider a more diverse health financing approach that would be able to meet these challenges and better contribute to the long-term sustainability of the health system, while keeping it equitable and of high quality. The government should also establish a strategic purchasing approach to the sizeable healthcare services it procures from NGOs and private providers to ensure that these are strategic in nature and value for money.

### ***Optimal development, alignment and support of human resource***

24. Macao's expected increasing healthcare demand due to its ageing population will be at a time when the shortage of well-trained healthcare human resources is a universal problem in many advanced countries. Building up and sustaining a healthcare workforce will be vital for many countries to tackle the ageing population. The training, roles, relationships, and capabilities of the healthcare workforce must also evolve to better serve patients with chronic conditions. The skills of health professionals must be expanded to meet these new complexities. This will require vision, leadership and a determined programme of workforce planning and policy, recruitment and retention strategies and increased training and development. Further reform of the licensing regime, as is being currently proposed in Hong Kong, may also be needed.

### ***Effective disease prevention and health promotion***

25. Globally and locally, the world is seeing an increasing number of people suffering from NCDs, which cause ill-health, disability and premature deaths. Many NCDs are closely related to our living habits, including unhealthy diet, physical inactivity, excessive drinking and smoking. Health promotion programmes, along with prevention, are therefore essential components of a sustainable health system. In this respect, Macao's health system already recognises the importance of health promotion and disease management, and the Macao Health Bureau actively engages with the public to take responsibility for their individual health. To build on this well-established foundation, new approaches and channels to deliver health promotion which support and further strengthen existing arrangements and NCD prevention initiatives can be considered.

### ***Strategic alignment with determinants of population health***

26. Population health is of obvious importance to the sustainable development of Macao's overall healthcare system. In that sense, it is recognised that healthcare is an open system with a dynamic interdependency with other economic, social and environmental systems that impact individuals' lives and can affect health outcomes to a large extent. Strengthening the integration and alignment of these systems is therefore a vital part of a sustainable health system in which everyone has a fair and just opportunity to be as healthy as possible. The MSAR Government has demonstrated its commitment to solving people's problems related to housing, transport, healthcare, social security and environmental protection, and recognises the importance of a joined-up response. A continuation of this joined-up approach that addresses the broader, social determinants of health is essential to ensure Macao's population health.

## Evaluation of feasible operating models for Outlying Island Hospital

27. To promote the healthcare system's long-term sustainable development, the MSAR Government needs to review and plan for integration and operation of the new Outlying Island Hospital. This new hospital will help to meet increasing demand and support larger health system goals. It also provides opportunities to introduce reform, increase private sector capacity and patients' choice, and refine tools, instruments and governance systems for strategic purchasing of healthcare services.

### *Feasible operating models*

28. Two broad categories, each with two operating models, were identified and assessed as possible viable operating models for the new Outlying Island Hospital:

**A. Government controlled models:**

**Option 1:** Fully Government Operated and Managed.

**Option 2:** Operated & Managed by a Public Corporation (Corporatisation).

**B. Public Private Partnership (PPP) models**

**Option 3:** PPP - Operate, Manage and Maintain (*public hospital*).

**Option 4:** PPP - Concession (*private hospital*).

### *Optimal operating model for new Outlying Island Hospital*

29. Option 1 is the status quo choice and would mirror the Conde S. Januário Hospital's operating model. Option 2 is the hospital managed and controlled by a new public corporation, similar to the Hong Kong Hospital Authority. Option 3, by design, has the distinct advantage of the private partner bringing in their existing expertise, and human resource and performance management practices that are tried and proven. The introduction of these best practices and innovative approaches can lead to improved quality of care and increased efficiency and contribute to medical system reform in Macao. Option 4 equally provides the opportunity to bring in expertise and a commercial approach. It can also offer significant opportunities to address the public/private imbalance in the current system. However, in many countries where healthcare is seen as a government responsibility, politicians and the community can be uncomfortable with the idea of public patient care being provided in a private, for-profit setting, especially using Government-funded assets. *Table 1* shows a more detailed comparison of the assessed benefits of each of these optional operating models.

**Table 1:** Comparative benefits provided by each assessed model

Benefits	Option 1: Fully Government operated and managed	Option 2: Operated & Managed by a Public Corporation	Option 3: PPP - Operate, Manage & Maintain	Option 4: PPP - Concession (lease)
Expand hospital capacity to meet needs	√√√	√√√	√√√	√√√
Public control maintained	√√√	√√√	√√	
Public acceptance	√√√	√√√	√√	
Employment and training opportunities for new graduates	√√√	√√√	√√√	√√
Lead medical system reform		√	√√√	√√
Public participation in hospital governance		√√	√√	
Introduce new and innovative approaches		√	√√√	√√√
Introduce new systems and culture		√	√√√	√√√
Bring best human resources and performance management practices		√	√√	√√
Able to attract top clinical skills not attracted to a traditional public facility			√√√	√√√
Private partner bears operational risks			√√	√√
Operates on commercial basis which can lead to increased efficiency			√√	√√
Increasing quality by delivering services to contractually defined standards			√√	√√
Improve public/private balance and increase competition			√	√√√
Increased non-government funding for healthcare costs			√	√√
Opportunity to develop medical tourism			√	√√√

30. The decision on which model to pursue must be primarily driven by local health needs and environmental factors (e.g., political, social), assessed against international experience. The threshold of risk and responsibility that the government seeks to allocate - and that a private partner would be willing to accept - are also major determining factors.
- After evaluating each of these four operating models against Macao's sustainable healthcare system needs and challenges going forward, it is considered that Option 3, PPP Operate, Manage and Maintain (public hospital), is the most appropriate operating model for the new Outlying Island Hospital (Recommendation 1).*

31. Such a PPP arrangement, with the right private sector partner, carries the potential for meaningful benefits to be gained for the MSAR Government and Macao's overall healthcare sector. These benefits include greater efficiency (e.g., due to private partners' operational efficiency), and better healthcare management. The private sector partner could be a suitable commercial-for-profit or not-for-profit company. In the Greater Bay Area, the HKU-Shenzhen Hospital is a typical local example of this PPP arrangement.

### **Operating mode for new Outlying Island Hospital**

32. Under the proposed PPP, the private partner (the Operator) would enter into a typically 5-to-10-year agreement to Operate, Manage and Maintain the facility as a public hospital and be responsible for delivering all clinical services. The Government retains ownership of the facility.
33. During the operating term, the Operator must:
- Deliver hospital services to public patients, in accordance with the agreed Service Plans and Specifications, that are of the highest standard of patient care and safety, at all times.
  - Integrate healthcare to public patients and private patients from a single facility to maximise the range and breadth of services available to the community.
  - Maintain hospital facilities to ensure they are fit for their intended purpose.
  - Provide healthcare teaching, training and research within the facility as part of the Macao healthcare system.
  - Introduce innovative practices, and implement any health initiatives at the facility, as required by the MSAR Government.
  - Participate in, and contribute to, Macao's disaster planning.

### ***Role of the new Outlying Island Hospital***

34. Today's clinical services operate within a rapidly changing environment. Therefore, healthcare systems need to undertake a broad range of planning activities to meet future service obligations. Equally, it will be important that the services to be provided by the new hospital align and integrate with Macao's overall healthcare system. ***A Clinical Services Plan (CSP) covering all major Macao hospitals and other operators should be developed to facilitate such alignment and provide a strategic direction for each hospital, addressing the future challenges and meeting the community's long-term healthcare needs (Recommendation 2).*** The support of a suitably experienced external consultant to lead the clinical service planning process could be considered.

35. A vital element of this plan would be to delineate each of these individual hospitals' roles and ensure any service gaps are addressed. Additionally, as there is an established positive correlation between the volume of service provided and the quality and clinical outcomes associated with that service, one key consideration must be the drive to ensure that future services are delivered by providers who can demonstrate proven experience in a given care area, thus ensuring that care quality is optimised for patients. For more specialised services, the need for 'critical mass' must also be considered.

### ***Governance systems, relationships and co-ordination***

36. The Clinical Services Planning process's output is a well-informed and relevant CSP for implementation and subsequent monitoring and evaluation. Ideally, relevant stakeholders and organisations would be involved in the process or have had an opportunity to comment before the CSPs final approval. It then needs to be implemented. This will require the MSAR Government to play an active and strategic role through its leadership policies, co-ordination instruments and purchasing programmes.

### ***Patient services***

37. The MSAR Government would set the number of public patient services to be provided by the hospital on an annual volume basis and at an agreed unit price, similar to the current purchasing arrangement with Kiang Wu Hospital. One aspect that will need to be managed as part of that process is a possible surge in demand stemming from the increase in supply and from patients preferring to attend a new facility rather than an older, existing hospital. Accordingly, consideration may be given to acceptance of non-emergency public patients by the new hospital on a strictly referral basis only for designated services.
38. The Operator would be entitled to provide services to private patients that are complementary to, and do not interfere with, its public patient services in order to maximise the range and breadth of services available to the community. The number of beds designated for private patients would be agreed annually through an Annual Planning mechanism.
39. Several options for segmenting the hospital's public and private services are discussed in the detail report. Additionally, a 'double branding' strategy could be considered to leverage the Operator's likely well-developed brand to capture an incremental market share of private patients, both local and from the wider Greater Bay Area.

### ***Workforce***

40. Building a new hospital and investing in equipment and medical assets will not achieve the desired goals without qualified personnel to run the services. The Operator will be

directly responsible for recruiting and retaining suitably qualified staff and all other workforce matters at the hospital, including ensuring that all staff are adequately trained and accredited and act appropriately.

41. Under the PPP contract, the Operator (as an internationally renowned institution) would be required to bring in a strong Core Management Team lead by a well experienced Hospital Chief Executive Officer. Proposed Core Management Team members must have proven exemplary skill, knowledge and experience to take up designated roles within the hospital.
42. Equally, the Operator would be expected to attract top clinical skills not attracted to a traditional public facility. Many of these medical specialists are likely to need to be recruited from other jurisdictions. *In preparation, the Government may review its regulatory and registration requirements to ensure they are optimised to facilitate this essential recruitment of clinical talents and medical specialists from other jurisdictions (Recommendation 3).*
43. The total number of nurses and other doctors to be recruited, and the timing thereof, will depend on the hospital's service opening plans to be agreed with the Government. While it is understood that the Government has made early allowances in training programmes for these additional requirements, recruiting these staff from Macao's existing medical staffing pool would likely have the effect of artefactually driving wage inflation, which would be detrimental to the project's objectives. *The MSAR Government could consider the effect on Macao's medical staffing pool and the possible impact on wage rates when approving the new hospital's service opening plans (Recommendation 4).*

### ***Corporate governance***

44. The hospital would have a governing board (Hospital Governing Board (HGB)), which could be appointed by the MSAR Government, to perform corporate governance responsibilities. Members could include official, non-official and Operator representatives. The following may be considered:
  - *Official:* Health Bureau and other relevant Government representatives.
  - *Non-official:* external members from healthcare professions, finance and law sectors, and patients and staff representatives.
  - *Operator:* Operator representatives, including the Hospital Chief Executive Officer.

### ***Funding mechanism***

45. A defining feature of a health PPP is the payment mechanism. The payment mechanism

should be structured so that the net remuneration of the Operator is linked to performance, providing incentives to complete activities on time and deliver services at the required performance and quality levels. Generally, payments to the private party in health PPPs fall into three categories: user payments, government payments and bonuses and penalties.

46. Despite this funding by the Government, the operator's financial sustainability would also be dependent on the level of overall demand, particularly from private patients, in the start-up period before the Operator can develop the expected market. Given Macao's relatively small population and its undeveloped private healthcare sector, the Operator's risk of losses in the early period is significant. While the PPP format entails that the Operator accepts financial risks of operations, it may be necessary for the MSAR Government to also accept financial risks during the start-up years above a set level. *The MSAR Government could consider utilising the iterative stages of the tendering process to explore the need to cap any losses by the Operator during the early period of service operation (Recommendation 5).*

#### *Annual Planning mechanism*

47. *An Annual Planning mechanism through which Government agreement and funding approval will be gained for the following financial year should be established (Recommendation 6).* The Operator will utilise this mechanism to plan and establish the hospital's service programmes, human resources plans, and financial budgets for the coming financial year, and gain Government agreement and funding approval. Additionally, this mechanism would also be used to gain agreement on the level of public services to be purchased by the Government and the number of private patient services to be provided by the Operator.
48. The approved annual plan would then form a basis of accountability reporting by the Operator to the MSAR Government.

#### *Implementing the PPP*

49. Successfully implementing a PPP requires appropriate institutional arrangements and a systematic process that facilitate the government's selection of a competent private sector partner, and set and enforce the parameters within which that partner operates.

#### *Institutional arrangements*

50. Government institutional arrangements for PPP project implementation and contract administration can differ widely from country to country, depending on the nature of the PPP and pre-existing institutional roles and capacities. Generally, however, responsibility for implementing and administering a PPP project often falls to the

Government ministry, department, or Government-Owned Corporation responsible for ensuring the relevant asset or service is provided.

51. In this respect, the following two options are proposed:

**Option A:** Establish a dedicated PPP unit within the Health Bureau.

**Option B:** Create a Government-Owned Corporation to be responsible for this PPP.

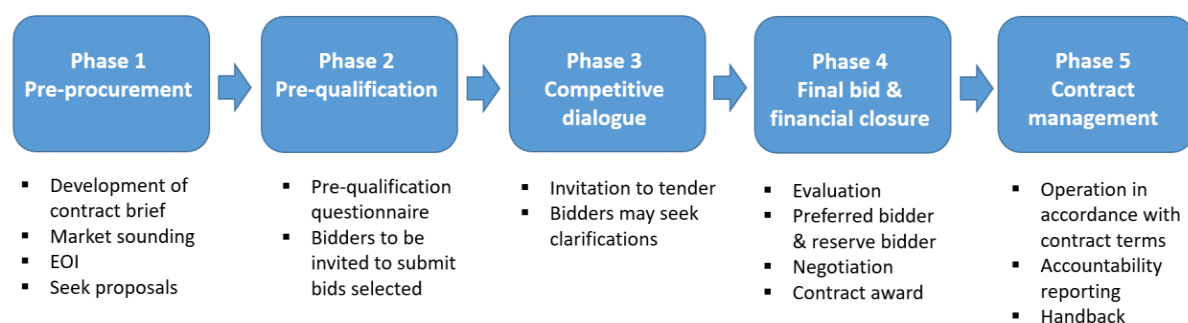
52. Under Option A, responsibility for implementing the Outlying Island Hospital PPP project would be passed to the Health Bureau as the Government ministry responsible for ensuring healthcare services are provided. Under Option B, implementation responsibility would be allocated to a newly created Government-Owned Corporation, similar to the Macao Light Rapid Transit (MLRT) Corporation Limited created to manage the local light rail system.
53. However, it is unlikely that the Health Bureau will already have the in-house skills and capacity needed to successfully implement and administer such a PPP project. Therefore, in both cases, a team aggregating staff with specific knowledge on PPPs will need to be established. *Additionally, as this will be Macao's first hospital PPP project, consideration could be given to gaining the support of an experienced external consultant to lead the tendering process (Recommendation 7).*
54. Furthermore, based on experience in other jurisdictions, the PPP process usually requires new approaches and an element of flexibility often requiring that Government procurement rules be tailored to allow and support the iterative nature of PPP projects. This required flexibility may not be available under current Government procurement rules.

### **Systematic process**

55. Once the PPP strategy has been approved, the PPP needs to be structured by determining the responsibilities, rights and risks to be allocated to each party in the contract. The first step is to develop the initial project concept into key commercial terms - that is, an outline of the required outputs, the responsibilities and risks borne by each party, and how the private party will be paid. The next stage is for the Government to determine the procurement strategy through which the private party will be selected. This process will also determine the operative terms of the contract. *From this process, the allocation of responsibility and risk between the public and private sectors could be clearly laid out in the PPP contract (Recommendation 8).*
56. As in any public procurement, the process should generally be a competitive process where a tender will be initiated to gather competitive bids to select an awardee from several candidates. In this respect, PPP tender processes around the world can have

some variations but in the main contain the same basic features, as shown in Figure 2.

**Figure 2:** Common PPP tender process



**Source:** UNECE, 2012

57. Market sounding and the Expression of Interest (EOI) in the Pre-procurement phase are designed to determine the level of interest and the capability to undertake the contract. *Based on the contract brief, interested parties could be asked to express additional ideas in their EOI that are practical, market acceptable, innovative and beneficial to the Government's formulation of the invitation to tender, e.g., risk sharing, private services, commercial viability, payment mechanism, and so on* (Recommendation 9).
58. In the Pre-qualification phase, bidders could similarly be asked to make innovative proposals, which the Government can adopt at its discretion in the next phase. This iterative process is designed to ensure that the contract is aligned with the reality of the market. Bids may also be iterative, with possibly more than one bid submitted by each proponent.
59. The emphasis on market sounding in the pre-procurement phase and encouraging ideas to make the project more market acceptable are designed to attract sufficient interested parties to make the tendering process competitive. However, the small size of the Macao population, and hence its healthcare market, may make it challenging to achieve such a competitive situation. Also, in keeping with the MSAR Government's prevailing healthcare policy, engaging a business-oriented and commercialised healthcare service provider in this proposed PPP project may not be in the best interest of Macao and its residents. Hence, *if following market sounding, suitably qualified potential PPP service provider partners cannot be identified to achieve a competitive tendering process, other options, such as restricted tender or single tender, should be considered as long as it is in accordance with the MSAR Government procurement policies and procedures.* (Recommendation 10).

## Contract Management

60. While significant attention is given to the tender procurement, evaluation and contract negotiation phases, somewhat less consideration is often given to contract management issues during the service delivery phase. While performance can be driven through appropriately structured performance incentives or abatement regimes, good contract management arrangements are required to ensure performance standards are met, and preferably exceed, expectations throughout the contract life.
61. Performance monitoring, managing change and stakeholder engagement are the three key elements of essential contract management. International experience in health PPPs has demonstrated that issues often arise in the first 12-to-18 months, requiring immediate attention. *An appropriately resourced team aggregating staff with appropriate knowledge and skills should be established early to facilitate effective contract monitoring (Recommendation 11).*
62. Additionally, service needs will inevitably change over a 5-to-10-year contract life span. Accordingly, *the PPP contract should contain a clear, unambiguous basis for handling, agreeing and paying for changes that are required during the life of the contract (Recommendation 12).*

## III. CONCLUSION

63. Overall, our assessment shows that Macao has a relatively equitable system, which is operating well and provides Macao residents with quality healthcare services. Like global challenges facing other jurisdictions, Macao's current healthcare system will, however, face significant challenges in the future primarily centred on increasing healthcare needs and escalating medical costs. Our assessment shows that Macao is well placed to meet these challenges due to the MSAR Government's commitment, its clear policy to invest in healthcare and its sound primary care network that offers all Macao residents easy access to these services. These strengths have enabled Macao to achieve impressive health standards as measured by life expectancy and infant mortality indicators.
64. The construction of the new Outlying Island hospital is a further example of the Government's commitment to invest in its population's health. It will provide significantly increased capacity to meet the growing healthcare needs of Macao's ageing population and support larger health system goals. It also offers an opportunity to introduce reform, increase private sector capacity, and refine tools, instruments, and governance systems in the strategic purchasing of healthcare services. The

recommended Option 3, PPP - Operate, Manage and Maintain (public hospital), will allow the system to take up such opportunities, enabling reform and Macao's healthcare system to better meet its future challenges.

65. In conclusion, Macao can take pride in its healthcare system for its equity of access, affordability and quality of healthcare services. The hospital PPP service model that we have recommended for the new Outlying Island Hospital can lead to the better use of public resources, further gains in quality and will prepare Macao's healthcare system to face the impending and ongoing challenges.

## CHAPTER 1 INTRODUCTION

In August 2020, the Health Bureau of the Macao Special Administrative Region (MSAR) Government commissioned a team of experienced public health and hospital administration specialists from The University of Hong Kong to conduct a study on the Macao health care system. The study results will be utilised primarily to determine the new Outlying Island Hospital's optimal service model and operating mode within Macao's overall health care system.

### 1.1 Scope of study

As set down in the cooperation agreement, the scope of the study includes the following:

- i. A full evaluation of the strengths and weaknesses of the existing medical system, and future challenges.
- ii. Based on overseas experience, an analysis of the sustainable development direction of the overall medical system and services of the MSAR.
- iii. An evaluation of feasible operating models for the new Outlying Island Hospital.
- iv. On the basis of the above analysis, provide suggestions on the service mode of the Outlying Island Hospital.
- v. Advice on potential technical problems arising from any future bidding process.

### 1.2 Study approach

To assess the existing system's strengths and weaknesses, to identify future challenges, and to develop rational and credible options for optimising the operating model and service mode of the new Outlying Island Hospital, every effort has been made to ensure that the assessment is based on the best evidence available to the study team. In this respect, we are most grateful for the information and assistance generously provided by relevant organisations, particularly by the Health Bureau. Key data on which the analysis and findings of this study are based include:

- The Five-Year Development Plan of the Macao Special Administrative Region (2016-2020).

- Health and other statistical data from the MSAR Government Statistics and Census Service, and from the Health Bureau.
- A study titled ‘Building a High Quality and Sustainable Health care System Delivery in Macao’ (2019) by Jockey Club School of Public Health and Primary Care, The Chinese University of Hong Kong.
- Overseas experience to determine which features of different health care systems may be constructively adapted to the Macao context.
- Recommendations for the Use of PPP in universal health care delivery in support of the United Nations Sustainable Development Goals.

### 1.3 Report structure

This report is organized into the following Chapters:

- Chapter 1: Introduction
- Chapter 2: Background
- Chapter 3: Macao’ Current Health Care System
- Chapter 4: Assessment of Macao’s Overall Health Care System
- Chapter 5: Future challenges and Opportunities
- Chapter 6: Outlying Island Medical Complex
- Chapter 7: Viable Operating Models of Outlying Island Hospital
- Chapter 8: Service mode of Outlying Island Hospital
- Chapter 9: Financial Arrangements
- Chapter 10: Implementing and Administrating a PPP project
- Chapter 11: Contracting – Approach, Technical Issues and Administration
- Chapter 12: Conclusion

### 1.4 Deliverables

As per the stated deliverables in the cooperation agreement, the study team has produced and submits this report to the Health Bureau of the MSAR Government providing:

- i. An assessment of the strengths and weaknesses of Macao's overall health care system (Chapter 4).
- ii. Future challenges and an analysis of the sustainable development direction of the overall MSAR medical system (Chapter 5).
- iii. A professional opinion on optimising the service model and mode of service of the new Outlying Island Hospital, including financial arrangements (Chapters 7 to 9).
- iv. Advice on the implementation approach (Chapter 10), tender design and suggested provisions to be included in the tender documents (Chapter 11).

## CHAPTER 2 BACKGROUND

Macao is a Special Administrative Region of the People's Republic of China. It is a part of the Guangdong-Hong Kong-Macao Greater Bay Area (Greater Bay Area) which comprises two Special Administrative Regions and the nine municipalities of Guangzhou, Shenzhen, Zhuhai, Foshan, Huizhou, Dongguan, Zhongshan, Jiangmen and Zhaoqing in Guangdong Province. The total area is around 56,000 km<sup>2</sup>. At the end of 2019, the total population of the Greater Bay Area was over 72 million, with a GDP of USD 1,679.5 billion and GDP per capita of USD 23,371.

### 2.1 Macao population profile

Since the handback, Macao's population has grown rapidly. The end-year population of Macao was 679,600 in 2019 with a growth rate of 1.8% per annum, as shown in *Figure 2.1*. These include some 555,000 local population, 109,400 overseas employees and 15,200 overseas students living in Macao. The gender ratio was 46.7% males and 53.3% females. Further details on 'Macao's population profile' are shown in Appendix 1.1.

**Figure 2.1:** Macao's Total Population and Trend 2015-19



**Source:** Macao Bureau of Statistics and Census (2020)

In 2019 Macao's birth rate was 8.9 and the mortality rate was 3.4, both per 1000 population. The proportion of the elderly population (aged 65 and over) continued its upward trend growing by 0.8% year-on-year to 11.9%, whereas the adult population aged 15-64 dropped by 0.8% to 74.9%. There were 5,979 newborn babies with a birth rate of 8.9 per 1000 population. Nevertheless, the population of Macao continued to age, with the elderly dependency ratio increasing to 15.8% and the ageing ratio rising to 90.3%.

Further, as shown in Table 2.1, and Appendix 1.2, the population is projected to increase to 743,600 by 2026 and to 793,600 by 2036. They also show that Macao is projected to severely age with the ‘ageing ratio’ projected to more than double from 2011 to 2036, and the elderly dependency ratio to more than triple over this same period, putting pressure on health care spending.

**Table 2.1: Projected Age Structure of Macao Population**

年份	2011	2016	2019	2026	2031	2036
年終人口 ('000)	557.4	644.9	679.6	743.6	775.6	793.6
年齡結構 (%)						
少年兒童人口(0-14 歲)	11.8	12.5	13.2	16.2	15.3	14.0
成年人口(15-64 歲)	80.8	77.7	74.9	67.8	66.1	66.1
老年人口(≥65 歲)	7.3	9.8	11.9	16.0	18.6	19.9
總計	100.0	100.0	100.0	100.0	100.0	100.0
老化指數	62.0	78.9	90.3	98.7	121.8	141.6
老年人口撫養比率	9.1	12.7	15.8	23.6	28.2	30.0

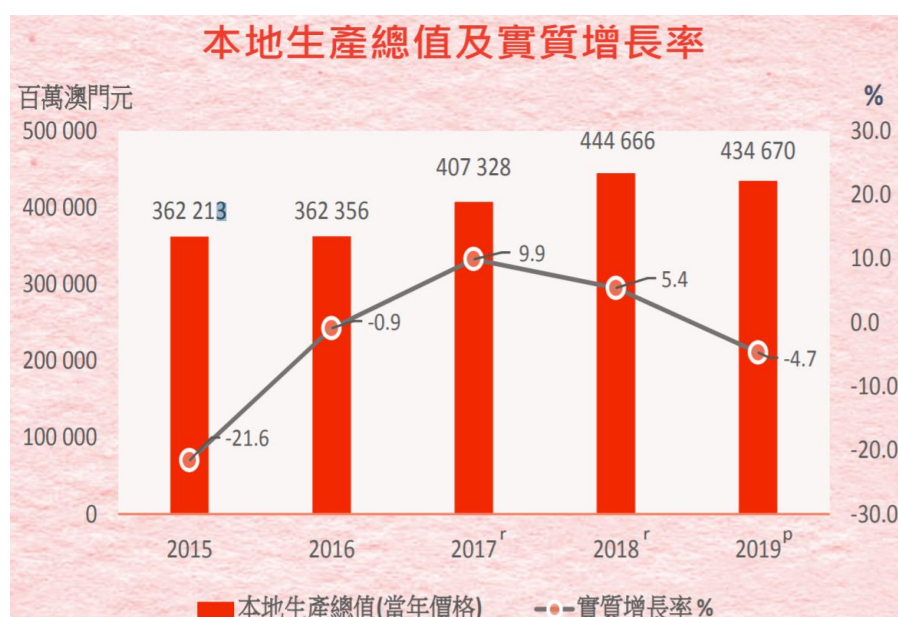
**Source:** Macao Bureau of Statistics and Census

## 2.2 Economic environment

Macao pursues an open economic policy. There is no limit on foreign exchange. It is a free port, has its own customs territory and is an important gateway linking Mainland China with international markets. In the 2020 Report on Index of Economic Freedom released by the Heritage Foundation, Macao's economy was rated "mostly free" for the 12<sup>th</sup> consecutive year, ranking it the 35<sup>th</sup> freest among 180 economies.

Since the establishment of the MSAR, the economy has maintained high growth rates driven mainly by the tourism and casino industries, with such activities accounting for 50.5% of its overall industrial structure in 2018. Between 2015 and 2019 (*Figure 2.2*), GDP grew from MOP 362.2 billion to MOP 434.7 billion, representing a growth of 20%. However, it has been dropping since January 2019. More recently Macao's GDP has been impacted by the Covid-19 pandemic, which has significantly dampened global economic activity.

**Figure 2.2:** Macao's Gross Domestic Product and Real Growth 2015-2019



**Source:** Macao Bureau of Statistics and Census (2020)

Macao's GDP per Capita (2019: MOP 645,000) is one of the world's highest. Macao is a relatively low tax jurisdiction. Median Monthly Employment Earnings in 2019 was MOP 17,000 (Figure 2.3), having increased 13% between 2017 and 2019. Some 11% of Employed residents' monthly employment earnings were more than MOP 60,000.

**Figure 2.3:** Macao's Median Monthly Employment Earnings 2015-2019



**Source:** Macao Bureau of Statistics and Census (2020)

## 2.3 Government health care policy

The MSAR Government maintains its policy of “A sound health care system, putting prevention first”. Emphasis is placed on continuing to improve primary medical care, enhancing the level of specialist medical care and making full use of community medical care resources and effectively using the power of government, non-profit-making and private medical institutions to improve medical services.

Macao's medical and health system is divided into two major systems: government and private. The government medical institutions are mainly responsible for patients with major diseases, long-term patients, and vulnerable groups of people. The private health care system primarily deals with common diseases.

The government also purchases services from the private health care sector for public patients to achieve the goal of diverting hospital patients away from the public system and leveraging the community's overall health care resources.

## 2.4 Major Health Care Related Development Goals 2015-2020

The “Macao Special Administrative Region Five-Year Development Plan 2016-2020” promotes comprehensive, coordinated development in the territory. It stresses that the Government will put people's health first and includes goals, infrastructure projects and initiatives to improve the health care system and build a healthy city.

Two major health care projects were planned to support the establishment of a healthy city by raising Macao's overall health care standard and providing quality medical services to the public:

- i. Expedite Construction of the Outlying Island Medical Complex.
- ii. Construct the Public Health and Infectious Diseases Building.

Other major targets included:

- i. ***Further enhance the Health Care System***

Endeavour to complete the Plan for Improvement of the Medical and Health Care System. Primary health care will remain of a high standard. The ratios of hospital beds, doctors and nurses per 1000 population to be increased to 4.4, 2.6, and 4.0, respectively.

ii. ***Enhance Cooperation Between and Complementary Service Offerings from Government and Non-profit and Privately-owned Health Care Institutions***

Continue support and guidance for the development of the non-governmental health care system through direct and indirect funding models to expand service coverage and enhance flexibility to provide the public with better medical services.

Enhance cooperation between government, non-profit and private medical institutions; and facilitate collaboration and development of the three systems to achieve a complementary effect and a win-win solution through qualification reviews, training, supervision and reasonable funding.

iii. ***Enhance Training of Medical Specialists***

Through regional cooperation, establish a common training base for professional medical personnel and a medical research organisation, set up an academy for specialist training to raise the capability of training medical personnel, improve the system for professional qualification and registration of medical workers and raise the standard of services.

## **2.5 Health Indicators**

In 2019, life expectancy at birth was 80.8 years for men and 86.7 years for women, with an infant mortality rate of 1.5 deaths per thousand live births, averaging 2.4 deaths per thousand live births over the three years to 2019. These basic health indicators compare very favourably with other developed countries.

According to the ICD-10-CM classification system, the leading causes of death in 2019 were: Neoplasms (35.9%); Diseases of the circulatory system (26.8%); and Diseases of the respiratory system (14.3%).

## CHAPTER 3 MACAO'S CURRENT HEALTH CARE SYSTEM

Macao's health care system mainly adopts a government-led strategy of parallel development of government and private medical institutions to meet residents' health care needs. This chapter provides an overview of Macao's current health care system.

### 3.1 Overview of Macao's health care system

Macao's health care system is divided into two major systems: government and private. In terms of the government medical service system, it is mainly composed of community health centres that provide primary care services and the Conde S. Januário Hospital (仁伯爵綜合醫院) (CHCSJ) providing specialised medical care. Community health centres provide free, basic health service to all residents, and implement a tiered consultation system. Patients need to be referred to, and booked by these community health centres, to visit the CHCSJ under the public system.

**Figure 3.1:** Macao Medical System Overview



Public hospitals provide about 40% of specialist medical services, and private hospitals account for some 60%. Among them:

- Outpatient clinics of the CHCSJ and private hospitals account for 20% and 70% respectively.
- Emergency department of the CHCSJ and private hospitals accounts for 60% and 30% respectively.
- Half of the hospitalisation bed days are in public and half in private hospitals.

Through referral and purchase of services arrangements, the MSAR Government also provides free or affordable medical services at private hospitals and private doctors. The objective of doing so is to divert hospital patients away from public hospitals and make better use of all the community's health resources. Residents will also go directly to private doctors at their own expense.

### 3.2 Primary health care services

The MSAR Health Bureau provides about 20% of primary health care services, and private clinics (Western and Chinese medicine) account for about 80%. As shown in Table 3.1, in 2019, there were 716 primary health care clinics that provided some 4.1 million consultations.

**Table 3.1:** Primary health care establishments and consultations

	場所			求診人次 (千)		
	2019	2018	差異	2019	2018	變動 (%)
總數	716	687	29	4,112.2	3,935.2	4.5
政府醫療機構 <sup>a</sup>	13	15	-2	939.1	897.2	4.7
私營診所	703	672	31	3,173.1	3,037.9	4.4
其中：綜合診所	364	326	38	2,289.1	2,051.9	11.6
西醫診所	117	127	-10	354.0	387.1	-8.5
牙醫診所	44	45	-1	33.8	36.4	-7.1
中醫診所 <sup>b</sup>	175	172	3	496.2	562.5	-11.8

**Source:** Macao Bureau of Statistics and Census (2020)

### 3.3 Hospital Provision

In 2019, there was one public hospital and four private hospitals in Macao, including the Ka-Ho Rehabilitation Hospital that opened in April 2019. As shown in Table 3.2, there are 2,066 hospital beds in Macao, of which 1,101 are public beds, and 965 are private hospital beds. This represents some 3.3 beds per 1,000 population. The average inpatient stay was 7.4 days in 2019. The average occupancy rate has increased from 70.8% in 2017 to 78.3% in 2019.

CHCSJ and Kiang Wu Hospital are the two leading hospitals in the MSAR. Both are located on the Macao Peninsula. The CHCSJ is the only government hospital. Kiang Wu

Hospital, a private non-profit general hospital under a large-scale private charity in Macao, provides a choice of health care for Macao people.

**Table 3.2:** Statistics of hospital beds (2019) 各間醫院病床統計（2019）

	仁伯爵綜合醫院	鏡湖醫院	科大醫院	銀葵醫院	合計
總床位	1,101	858	102	5	2,066
住院病床	994	740	60	1	1,795
普通住院	761	627	57	1	1,446
深切治療	12	18	3	0	33
新生嬰兒床	20	58	0	0	78
其他	201	37	0	0	238
非住院病床	107	118	42	4	271

**Source:** Macao Health Bureau

The Macao University of Science and Technology (MUST) Hospital is a non-profit-making hospital affiliated with the Macao University of Science and Technology Foundation. ‘Service Performance’ information for these hospitals is shown in Appendix 3.1.

### 3.3.1 Conde S. Januário Hospital

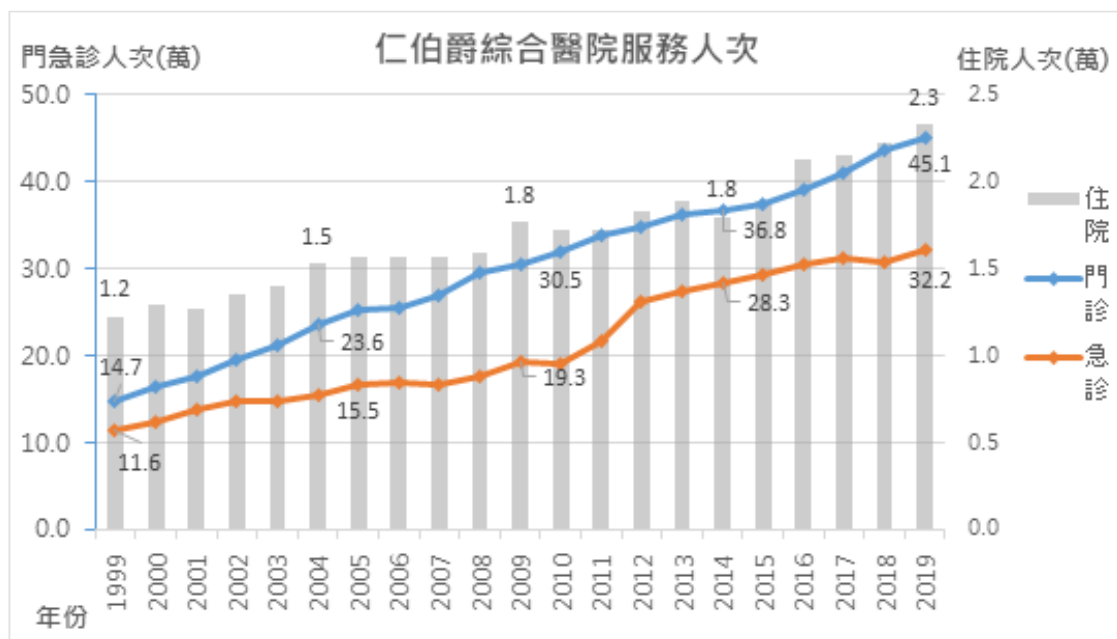
CHCSJ is a public hospital under the Health Bureau, a public body with administrative, financial and property autonomy, supervised by the Department of Social and Cultural Affairs of the MSAR Government. With a history spanning 120 years, the hospital was rebuilt in 1989. Since its re-development, the CHCSJ has become a large modern general hospital, providing emergency services, outpatient services, inpatient services, surgical services, rehabilitation services, day hospital services and dementia clinics. It provides 994 inpatient beds, specialist outpatient and emergency services.

Figure 3.2 shows CHCSJ’s increasing outpatient, inpatient, and emergency attendance levels from 1999 to 2019. During this period, the number of specialist outpatient attendances has increased more than 200% to 451,000; emergency attendances have

increased more than 170% to 322,000, and inpatient admissions have increased by 91% to 23,000. Further details of CHCSJ outpatient attendances by specialty are shown in Appendix 3.2.

The CHCSJ was the first hospital in Macao to be accredited by an international organisation (Australian Council on Healthcare Standards) in 2012, marking the recognition of international standards of health care services in Macao.

**Figure 3.2:** Conde S. Januário Hospital patient activity 1999-2019



**Source:** Macao Bureau of Statistics and Census

### 3.3.2 Kiang Wu Hospital

Kiang Wu Hospital has been continuously providing services for more than a hundred years. The hospital has now developed into a modern comprehensive teaching hospital providing 740 inpatient beds, specialist outpatient and emergency services. In 2019, the number of inpatient discharges exceeded 34,000, the number of specialist outpatient attendances was some 1,249,000, and emergency attendances exceeded 167,000, an increase of 7%, 8% and 4% respectively over 2017 (Appendix 3.1).

### 3.3.3 MUST Hospital

In 2003, MUST established a Chinese Medicine Clinic Centre, which integrated clinical, teaching and scientific research. MUST Hospital was subsequently established in 2006. Retaining the original Chinese medicine services, MUST added western medicine diagnosis and treatment, becoming the first hospital in Macao with integrated Chinese and Western medicine. The inpatient unit was opened in 2007 and has a total of 60 beds.

### 3.4 Demand for specialised medical services

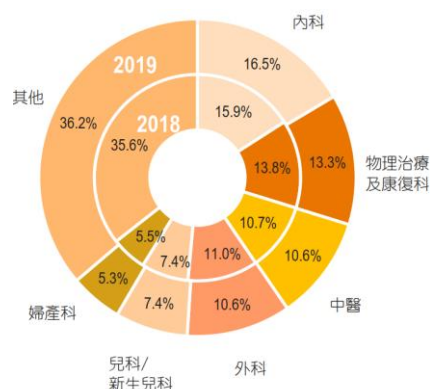
In 2019, there were 1.9 million visits to specialist outpatient clinics, an increase of 12% from 2017, with those aged 65 and above representing 21.8% of the total. There were 489,000 visits to emergency clinics, an increase of 3% from 2017. There were also 62,500 inpatient admissions (+6% from 2017), who were hospitalised for an average of 7.4 days. Around 19,500 surgical operations were conducted, an increase of 6.3% from 2018.

Growth in demand for services provided by CHCSJ from 2009 to 2018 was 45%, 22% and 39% for inpatient, outpatient and emergency services respectively, which is approximately a 4%, 2% and 3% year-on-year increase.

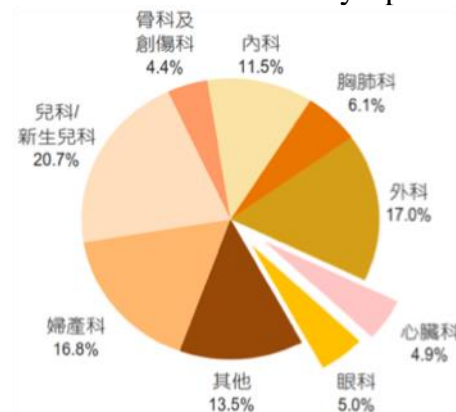
#### 3.4.1 Outpatient Attendances by medical specialty

As shown in *Figure 3.3*, in 2019 internal medicine provided the largest number of outpatient medical consultations at 312,000 (16.5%), followed by general surgery at 201,000 (10.6%) and paediatrics/neonatology at 101,000 (7.4%). Further details are shown in Appendix 3.3.

**Figure 3.3:** Distribution of outpatient medical consultations by Specialty



**Figure 3.4:** Distribution of inpatient medical consultations by Specialty



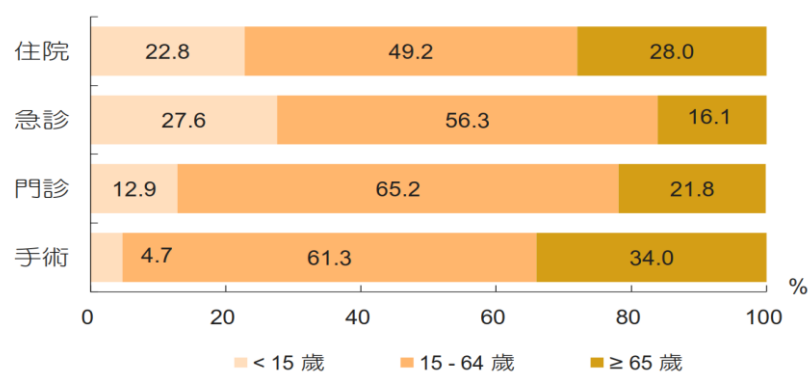
**Source:** Macao Bureau of Statistics and Census (2020)

As shown in *Figure 3.4*, analysed by medical department in 2019, in-patients in Paediatrics / Neonatology (12,922), General Surgery (10,601) and Gynaecology / Obstetrics (10,488) constituted large proportions of the total at 20.7%, 17.0% and 16.8% respectively. Internal medicine and general surgery constituted the largest number of bed days at 74,500 and 69,000, respectively. Further details by specialty on inpatient admissions and bed days are shown in Appendix 3.4.

### 3.4.2 Hospital Service Attendances by gender and age groups

While patients aged 65 and above represent 11.9% of the population, *Figure 3.5* shows that they also represent a higher 28% of inpatient admissions, 16.1% of emergency attendances, 21.8% of outpatient attendances and 34% of surgical operations.

**Figure 3.5:** Hospital service attendances by age group



Source: Macao Bureau of Statistics and Census

### 3.4.3 Service Performance

As shown in *Table 3.3*, the average waiting time for emergency care has increased by 14% from 2015-2018, particularly for Levels 3 & 4.

**Table 3.3:** Average wait time for emergency care at Conde S. Januário Hospital

( 單位 : 分鐘 ) (Unit: in minutes)	2015	2016	2017	2018
成人緊急情況 ( 整體 )	44	43	40	50
Level 1 - Critical	0	0	0	0
Level 2 - Emergency	15	14	14	15
Level 3 - Sub-Emergency	37	36	36	45
Level 4 - Non-Emergency	53	52	47	61
24 小時診所	55	56	57	67
Outside Island Emergency Station	29	28	29	37

Source: Macao Health Bureau

Average waiting time for an outpatient first consultation at the public CHCSJ varies from 10.6 to 94.9 days. Overall average waiting time has decreased from 40.1 days in 2015 to 39.3 days in 2019. The specialty with the longest average waiting time is Orthopaedics and Traumatology at 94.9 days (median 123 days). Further waiting time data by specialty are shown in Appendix 3.5.

#### **3.4.4 Outsourcing/PPP with non-profit-making medical institutions**

Over recent years, the Health Bureau has been actively expanding its cooperation with non-profit-making medical institutions. By purchasing services for public patients from these non-profit-making medical institutions, the pressure on the public health care system is intended to be reduced.

In 2019, the Health Bureau purchased approximately 845,000 medical services from non-profit-making medical institutions in the form of grants and buying service at the cost of MOP 1.28 billion, accounting for some 16.7% of the total Health Bureau expenditure. The services purchased include chemotherapy, radiation therapy, cardiology and cardiac surgery, colorectal cancer screening, children's speech therapy and other referrals.

#### **3.4.5 Patients transferred outside Macao for treatment**

The number of patients transferred outside Macao for treatment has been on a downward trend in recent years, decreasing from 1826 in 2014 to 1318 in 2019 (-28%). This is due primarily to the transfer of cases to the Kiang Wu Hospital, under the buy service arrangement. However, some cases, such as cardiovascular diseases, organ transplants, gynaecological radiation therapy and rare cases require referral to Hong Kong, the Mainland and other jurisdictions for appropriate treatment. The cost of such transfers in 2019 was MOP 218 million.

More than 95% of these patients were transferred to Hong Kong. Some 50% of these patients (709 in 2018) required oncology-related treatments for which demand has increased by 30% since 2014. Cardiology referrals have increased by 24% over this same period. Further data on these transfers outside Macao for treatment by speciality is included in Appendix 3.6.

### **3.5 Health care manpower and professional training**

According to the statistics and census service data and the Health Bureau, there were 1,808 doctors and 2,491 nurses in Macao in 2019, representing respective growth of 3.1% and 1.1% year-on-year. This represented 2.7 and 3.7 doctors and nurses per 1,000 population, respectively.

Further data on the Manpower position by health care staff group is in Appendix 3.7.

#### **3.5.1 Hospital doctors**

In 2019, a total of 893 doctors were engaged in Macao's hospitals, up 7.5% year-on-year. Some 25% of whom were aged under 35. CHCSJ accounted for some 52% of these hospital doctors, with 38% at the Kiang Wu Hospital and 8% at MUST.

Overall, the number of medical specialists in Macao increased by 4.3% year-on-year to 539 in 2019. Specialists in the Health Bureau numbered 320 and are analysed by specialty at Appendix 3.8.

Because there was previously no medical school in Macao, in the past, all doctors completed their studies on the Mainland or overseas. The Health Bureau has always recognised the professional qualifications of various countries and regions. Since 1990, Macao has established a medical professional qualification review and registration system. A list of recognised overseas medical qualifications is maintained.

More recently, MUST has established a medical school (private) offering a Bachelor of Medicine and Bachelor of Surgery, commencing in the 2019-20 academic year. The Macao Academy of Medicine was established in 2019, replacing Macao's previous medical internship system. The Academy has 12 sub-academic colleges, including internal medicine, surgery, anaesthesiology, orthopaedics, obstetrics and gynaecology, paediatrics, family medicine, community medicine, pathology and radiology.

#### **3.5.2 Hospital nurses**

In 2019, 1,741 nurses were engaged in Macao hospitals, up by 5.7% year-on-year. Nurses at the CHCSJ accounted for some 61%, at the Kiang Wu Hospital 32% and MUST 6%.

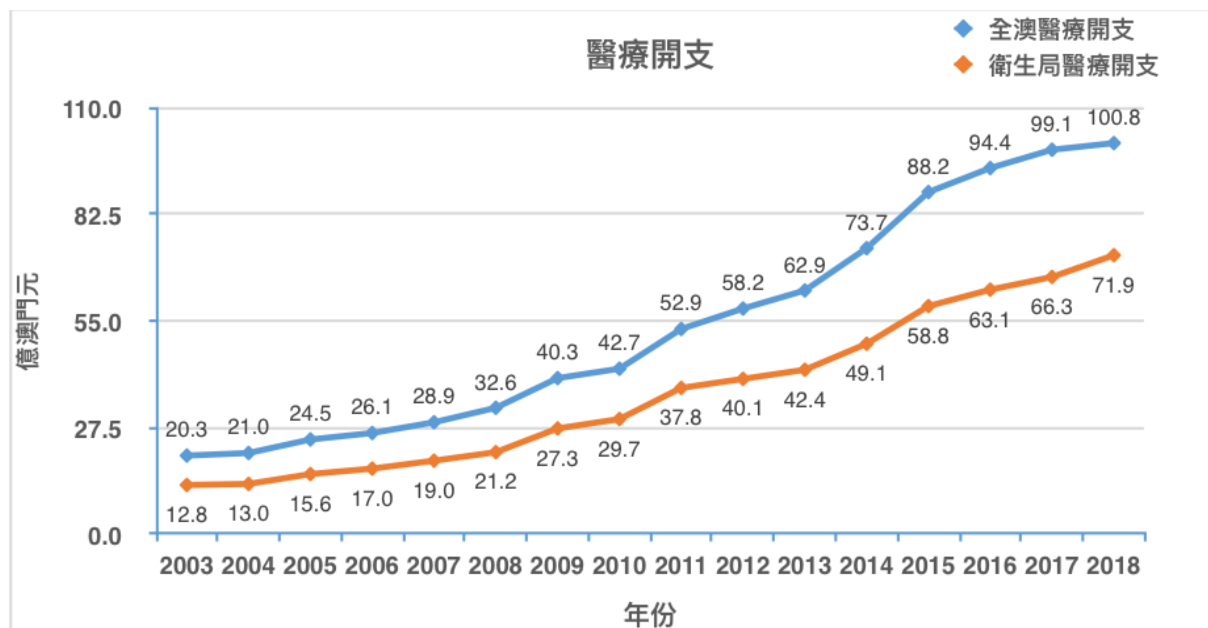
There are two nursing schools in Macao, the Polytechnic Institute of Higher Health and Kiang Wu Nursing College of Macao, with an average of 120 nursing students graduating

each year. A new nursing academy is under construction at the Outlying Island Medical Complex.

### 3.6 Health care financing

As shown in *Figure 3.6*, Macao's annual total health spending in 2018 exceeded MOP 10 billion, some 5 times the 2003 total of MOP 2.03 billion. During the same period, public health spending rose from 1.28 billion to 7.19 billion, some 5.6 times the 2003 level, of which 70% of the expenditure was for CHCSJ.

**Figure 3.6:** Changes in Macao's medical expenditure from 2003 to 2018



**Source:** Bureau of Statistics and Census (2020)

As shown in Table 3.4, per capita medical expenses increased from MOP 11,859 in 2014 to MOP 15,269 in 2018, representing an increase of 28.8%. Over this same period, public sector health expenditure as a percentage of the total medical spending has remained relatively stable, averaging 73.6%.

**Table 3.4: Macao Medical Expenditure** 本澳醫療開支

	2014	2015	2016	2017	2018
本澳醫療開支(百萬澳門元)	7,374	8,820	9,439	9,911	10,081
人均醫療開支(澳門元)	11,859	13,749	14,615	15,271	15,269

公共部門醫療開支佔本澳醫療開支的百分比 (%)	71.9	74.5	74.0	74.3	73.3
個人醫療開支佔本澳醫療開支的百分比 (%)	28.1	25.5	26.0	25.7	26.7
本澳醫療開支佔本地產總值的百分比 (%)	1.7	2.4	2.6	2.4	2.3
公共部門醫療開支佔政府開支的百分比 (%)	9.2	10.2	10.3	9.8	9.2

**Source:** Macao Health Bureau

The largest source of funds to pay for public medical expenses is government tax revenue. The Government's is investing in medical resources to improve the health care system and build a healthy city to improve the health of Macao residents.

Health Bureau expenditure in 2019 was MOP 7.69 billion, an increase of 500% over MOP 1.28 billion in 2003. As per **Table 3.5**, staff costs represent 48% of Health Bureau expenditure, drugs 18%, purchase of medical services from local medical institutions 17% and the cost of sending patients outside Macao for medical treatment 3%.

**Table 3.5: Health Bureau Expenditure (MOP million)**

	2015	2016	2017	2018	2019
人員	2,622.2	2,948.7	3,220.2	3,416.9	3,728.1
藥物	1,070.4	1,163.2	1,140.5	1,226.8	1,356.0
醫療消耗品、試劑	226.9	238.8	265.6	295.0	319.4
清潔費、保安及管理費	89.8	82.5	92.5	92.1	105.1
電費	58.7	64.5	63.3	63.6	71.8
向本地醫療機構/社團的資助購買服務	1,081.9	1,035.4	1,111.8	1,243.0	1,281.1
送往外地診治費用	283.4	229.9	239.7	228.5	240.3
<b>衛生局總開支</b>	<b>5,883.5</b>	<b>6,306.2</b>	<b>6,633.7</b>	<b>7,193.1</b>	<b>7,691.9</b>

**Source:** Macao Health Bureau

### 3.7 Public medical services fees and charges

Macao currently implements a medical security and welfare system. Fees and charges for public medical services are regulated under the relevant law. In 2018, the Health Bureau's public medical service income was MOP 83.28 million. Compared with the total Health

Bureau expenditure of MOP 7.193 billion in that year, the ratio of public medical service income to expenditure was some 1.16 to 100.

Under this medical security and welfare system, residents can use primary health care services in health centres free of charge. Free specialist medical services are available to pregnant women, children, primary and secondary school students, and elderly people aged 65 or above. Local people suffering from specific diseases such as cancer, infectious diseases and mental illness can also enjoy free specialty medical services. As shown in Appendix 3.9, in 2018, some 55% of the local population were entitled to free government specialist medical care. According to statistics, some 85% of specialty outpatient visits, 70% of emergency services and 82% of inpatient services are free of charge. A Medical Voucher Subsidy Scheme is also in operation. The amount of medical bills settled through this scheme in 2018 was MOP 2.6 billion. Further details of this Scheme are shown in Appendix 3.10.

Other local residents enjoy a 30% waiver of the set fee for specialist services. For foreign employees holding an identification card, the charge rate is 100% of the set fee. For those holding other documents, the rate is 200% of the set fee.

For residents who do not fall within the scope of free medical care, and are unable to pay public medical fees because of financial difficulties, the MSAR Government has put in place a safety-net mechanism to waive all or part of specialist medical service fees.

For some complex and rare cases, when there is a lack of local technical or human resources to provide the necessary health care services locally, after approval by the Outpatient Diagnosis and Treatment Committee of the Health Bureau, the eligible patients can be sent outside Macao for treatment. The relevant fees for these patients are waived.

### **3.8 Health insurance levels**

According to the results of a Health Bureau questionnaire survey, assisted by the Statistics and Census Bureau, more than 52.2% of Macao residents already have some form of medical insurance. A further survey by MUST shows that 61.1% have participated in medical insurance.

## **CHAPTER 4      ASSESSMENT OF MACAO'S OVERALL HEALTH CARE SYSTEM**

The preceding chapters have provided background and description of Macao's current health care system. This chapter provides an assessment of this system by examining its strengths and weakness.

### **4.1      Strengths**

Macao's medical system comprises government, not-for-profit (NFP) and private medical institutions, which are government-led and cooperate in providing the MSAR with a range of health care services. This tripartite model is well understood and is mainly accepted by Macao residents.

#### **4.1.1      World-class population health indicators**

The system has achieved impressive health standards being among the very best in the world in terms of life expectancy (80.8 years for men and 86.7 years for women in 2019) and infant mortality rate (averaging 2.4 deaths per thousand live births from 2017-2019), which are commonly used population health indicators. Hong Kong, with its similar ethnic population and pattern of prevailing diseases and culture, shows similar life expectancies but expends at least 30% more per capita on health care than Macao.

#### **4.1.2      Strong MSAR Government policy and financial commitment**

A key factor in this achievement is the strong policy and financial commitment of the MSAR Government to improve its citizens' health. It has a clear policy to invest in health care. In 2012, the Government demonstrated this commitment by establishing plans for the further development of primary, secondary and tertiary health care facilities. It established planning parameters of providing one community health centre for primary care for each 50,000 to 70,000 of the population or being within 15-20 minutes walking distance. Today, more health centres are being built to provide public primary health care services. Additionally, CHCSJ has been redeveloped, and construction of the Outlying Island Medical Complex is well underway. Through the leadership of Health Bureau, SOPC waiting times have been shortened in the last few years.

In the 2019 policy address, the MSAR Government restated its commitment to “improve medical services and prioritise prevention”, building Macao as “a healthy city, to improve citizens’ health”. In recent years, they have also established the Macao Academy of Medicine, and expedited amendments to the System for Professional Qualification and Licensing for Medical Workers. The Government has also committed to strengthening cooperation with cities in the Greater Bay Area by improving co-ordination in the areas of cross-border elderly care, health care and medical services to provide its citizens with more choices.

#### **4.1.3 Equity of access to health care services**

One of the most apparent strengths of the MSAR health care system is the relative equity of access to health care services that it provides all its residents. Equity in access is defined as equal access to adequate services across different income groups. Large Government subsidies to public health care, combined with an exemption scheme and safety-net targeted to the poor, make the Macao health care system successful in ensuring that financial ability to pay at the point of service does not prevent low-income individuals from seeking essential health care. Public sector health expenditure as a percentage of the total medical expenditure has remained relatively stable, averaging 73.6%. Under this system, local residents can use primary care services in health centres free of charge, and some 55% are entitled to free government specialist medical care. A Health Voucher subsidy scheme is also in operation. For other citizens, a medical assistance mechanism is in place so that they will not be denied medical treatment due to lack of means. This contributes to a low unmet health need in Macao of 3.6% (Jockey Club School of Public Health and Primary Care, 2019).

#### **4.1.4 Favourable waiting time**

Waiting times are another key measure of access. The performance of the Macao health care system as measured by Accident & Emergency and SOPC waiting times is superior to Hong Kong. Overall average waiting times for the first appointment at the CHCSJ has decreased from 40.1 days in 2015 to 39.3 days in 2019, but varies from 10.6 to 94.9 days across specialities. While this compares favourably with SOPC waiting times in Hong

Kong's public hospitals, it is noted that some Macao stakeholders consider these waiting times can be further shortened.

Total bed occupancy rate across all of Macao's hospitals stood at 74.4% for 2018 and 78.3% for 2019 compared to 92% in Hong Kong's public hospitals. This again shows that the percentage of unmet health need in Macao is relatively low.

#### **4.1.5 Emphasis on Primary care**

The emphasis on the primary care system is a clear strength of the Macao health care system. The ease of access to these primary care services is believed to play an essential part in accounting for better overall system performance. Traditionally the private sector has played a significant role in providing primary health care services. Widespread and easy to reach public health centres, where services are well organised and free, now also play a key role. In 2019, public funding was responsible for 56.2% of all primary care services, including private practitioners through the Health Voucher Scheme.

#### **4.1.6 Affordability**

Affordability is a further factor in evaluating the performance of a health care system. Affordability centres on out-of-pocket costs (including health insurance premiums and paying for a health care service not covered by insurance) relative to a person's earnings. The MSAR Government provided some 74% (2018) of all health care expenditure, either directly through public health care services, or indirectly through purchasing services from the private sector, including NGOs and other not-profits. The remaining 26% is out-of-pocket payments, representing a smaller percentage than in Hong Kong (34%). For out-of-pocket expenses, a survey conducted by the Statistics and Census Bureau showed that more than 52.2% of Macao residents already have some form of medical insurance cover. Separately, a Household Survey showed 51% of out-patient consultations are supported by insurance or self-paid with a median out-of-pocket expense of approximately MOP 300. The median in-patient out-of-pocket expense for hospitalisation bills, for those required to pay, is MOP 10,000.

#### **4.1.7 Number of doctors**

Macao has more doctors per thousand population (2.7) compared to Hong Kong (1.9), Canada (2.4) and Singapore (2.4) but less than the United Kingdom (3.7). This is despite Macao not previously having a medical school to provide a constant supply of doctors. The MUST has now opened its new medical school in the 2019/20 academic term, admitting 50 students initially in that academic year. This should help in providing a constant supply of local doctors for Macao in the future.

Equally, in the past, the system of training for specialists in Macao was not well established with each hospital undertaking its own training. The Macao Academy of Medicine for the training of medical specialists has recently (2019) been established. The establishment of both the medical school and the Academy are important steps in the continuous improvement of the MSAR's health care system.

#### **4.1.8 Electronic Health Record Sharing System**

The launch in February 2017 of the “Electronic Health Record Sharing System” (eHR Pilot Program) to facilitate sharing information resources between public and private health institutions was a significant step to help provide improved health services to Macao residents. Through the eHR platform, the clinics under the public primary health care network, the Kiang Wu Hospital and the CHCSJ have mutual access to the data of patients. This sharing of patient medical information contributes to enhanced continuity and integration of care, as well as the better integration of different health care services for the benefit of individual patients. It also contributes to improved efficiency and quality of care by providing health care professionals with timely access to comprehensive patient information and enhances cost-efficiency by minimising duplicate investigations and treatments.

### **4.2 Weaknesses**

#### **4.2.1 Population size**

Macao's relatively small population leads to commensurately limited numbers of various clinical cases. It follows that the load of rare medical or surgical diseases will also be

small. Doctors providing specialised services need a reasonable caseload to maintain professional expertise and skills in that area, and often to retain their accreditation. This, coupled with the rapid development of new medical treatments, and diverse and increasingly complex diseases, has meant that the development of some specialist medical services in the MSAR has been challenging. Consequently, the market for specialist medical services in Macao is not fully developed and lacks a degree of uniformity, resulting overall in relatively fewer specialist options being available to the residents.

#### **4.2.2 Development of tertiary and quaternary services**

This limited patient load of rare medical or surgical diseases also hinders the development of tertiary and quaternary medical services in the MSAR. Additionally, secondary care specialties, such as psychiatry, geriatrics and occupational medicine, are less well developed, and radiation therapy is currently not available in the public sector. This has led many Macao residents who attend the CHCSJ to comment that its specialist medical services are not fully adequate. Accordingly, where the CHCSJ is unable to provide the necessary treatment to patients due to limitations, such as medical resources and technical conditions, these patients will be referred to local private medical institutions, or to medical institutions outside Macao (such as Shenzhen and Hong Kong) for treatment through the Referral Committee. The number of patients transferred to these other jurisdictions has reduced in recent years, mainly due to the transfer of cases to the Kiang Wu Hospital under the complementary resources agreement. However, some cases such as cardiovascular diseases, organ transplants, gynaecological radiation therapy and rare cases continue to require referral to other jurisdictions for appropriate treatment. The cost of medical transfers to other jurisdictions in 2019 was MOP 218 million.

#### **4.2.3 Limited use of Public Private Partnerships (PPP)**

Over recent years, the Health Bureau has been actively expanding its cooperation with local non-profit-making medical institutions. This includes the purchase of health care services from the private sector, such as obstetrics, accident and emergency services

from Kiang Wu Hospital, and primary care and outreach care from other NGO institutions. Kiang Wu Hospital, for example, offers services such as radiotherapy and cardiac surgery, which are not available in CHCSJ. However, despite this, the services provided by Macao's non-profit-making medical institutions has not been sufficient to enable the Government to fully achieve its goal of diverting patients requiring services that have longer waiting times away from government hospitals. Additionally, while there are regular meetings between the Health Bureau and respective parties on issues related to service subvention and mutual collaboration, methods and tools to ensure these purchased services are strategic, of suitable quality and value for money are not yet fully developed. Further, apart from the government subvention to Kiang Wu Hospital and the Health Voucher Scheme, there is limited use of PPP to provide health care services in the MSAR.

#### **4.2.4 Limited Development of Community and Outreach Care**

The average length of stay at CHCSJ in 2018 was 10.5 days compared to 5.8 days in Hong Kong's public hospitals. The limited availability of rehabilitation beds accounts partly for this longer length of stay. Another factor is likely to be that community and outreach care in Macao is less well developed. This has been acknowledged and plans made for expansion of such services. Similarly, as with many countries, the interface between medical and social care can be further enhanced. These situations can sometimes make it “difficult to discharge” patients or result in “bed-blocking” where, for example, the patient lives in an old building without lifts.

#### **4.2.5 Underdeveloped private medical sector**

Macao's medical system is composed of public and private medical institutions (including not-for-profit). Both sectors play essential roles in meeting the health needs of Macao residents. Health spending in the public and private health sectors in Macao in 2018 was MOP 7.19 billion and 2.89 billion respectively, representing an approximate 70:30 split in public and private shares of the health care market. By way of comparison, in Hong Kong, public and private health spending each represented a 50:50 share of total spending in that health market. This suggests that there is room for further developing the private

sector for a greater share of the Macao health care market. A larger, more mature private health care sector would offer an increased choice for the MSAR's residents, as well as likely help drive further improvements in service quality. This would require the roles of the public and private sectors to be more clearly defined as it is understood that private doctors believe that the roles of the private sector are currently unclear. As 67% of doctors work in the private sector in Macao, further enhancements in this sector can be considered. For example, for private sector specialists, the choice of hospitals where they can admit their patients for inpatient care is limited. This poses significant limitations on private sector specialists who may need admission rights to facilitate their practice.

#### **4.2.6 Nursing shortage**

In 2019, there were 2,491 nurses in Macao, representing a ratio of 3.7 nurses per 1,000 population. Overall, this ratio is low when compared to Hong Kong (7.1) and the average of OECD countries (8.8), such as Australia, United Kingdom and New Zealand. The Government has recognised this and in the “Macao Special Administrative Region Five-Year Development Plan 2016-2020” sought to increase the number of nurses per 1000 population to 4.0. However, overall, there continues to be a shortage. This shortage is largely in the private and community sectors where, for example, NGOs find it difficult to attract nurses to do community outreach care. If this shortage continues, it may put the Macao medical system under heavy pressure in future.

#### **4.2.7 Limited flexibility**

As noted above, public health sector expenditure in Macao in 2018 was MOP 7.19 billion, representing some 70% of the total. Being part of the civil service, public health institutions activities such as procurement, infrastructure projects, administrative affairs, and the introduction of technology are subject to public sector regulations and must comply with the established Government-wide system. Equally, staff working in public health institutions are part of and subject to civil service regulations and culture. Recruitment, promotion, remuneration, assessment, and deployment are regulated by the legal system of public office. This arrangement is similar to the public hospital system in Hong Kong before the establishment of the Hong Kong Hospital Authority, where the

public hospital system suffered from inflexibility, inefficiency and low staff morale and was subject to intense pressure from increasing costs, rising community expectations, and increasing demand. Hospital management independent of the Civil Service may support an improved service culture, enable greater innovation and more flexibility in human resource matters.

### **4.3 Overall Assessment**

Over the past twenty years, the MSAR Government has led a series of reforms to build a strong health care system, and the achievements are widely recognised as the positive effects have benefited all residents.

Overall, our assessment shows that Macao has a relatively equitable system, is operating well and provides the residents of Macao with quality health care services with a low percentage of unmet need (3.6%). The system has achieved impressive health standards as measured by life expectancy and infant mortality indicators. A sound primary care network that offers all Macao residents easy access to primary health care services in their neighbourhoods is the cornerstone of the system. The commitment of the MSAR Government and the leadership provided by the Health Bureau are vital drivers to optimise Macao's health care services and to safeguard the health of the public.

Another critical factor is the Government's clear policy to invest in health care. The Government devotes considerable resources to meeting Macao residents' health care needs. In 2018, public sector health expenditure represented some 9.2% of total government expenditure. This was 74% of all annual health care expenditure in Macao. The investment of the new Outlying Island Hospital will also provide the opportunity to further develop the level of specialist medical care and introduce medical technology advancements and best practice methods of service delivery.

## CHAPTER 5 SUSTAINABLE DEVELOPMENT DIRECTION

This chapter examines challenges to the existing system and evaluates the sustainable development direction of the overall the MSAR's medical system going forward.

### 5.1 Future challenges to existing system

Like global challenges facing other jurisdictions, the current health care system will face significant challenges in the future, including increasing health care needs, increasing prevalence of chronic diseases, rising medical costs, growing health awareness and expectations, and a rising burden on future generations. These challenges to the health care system are primarily centred on increasing health care needs and escalating costs.

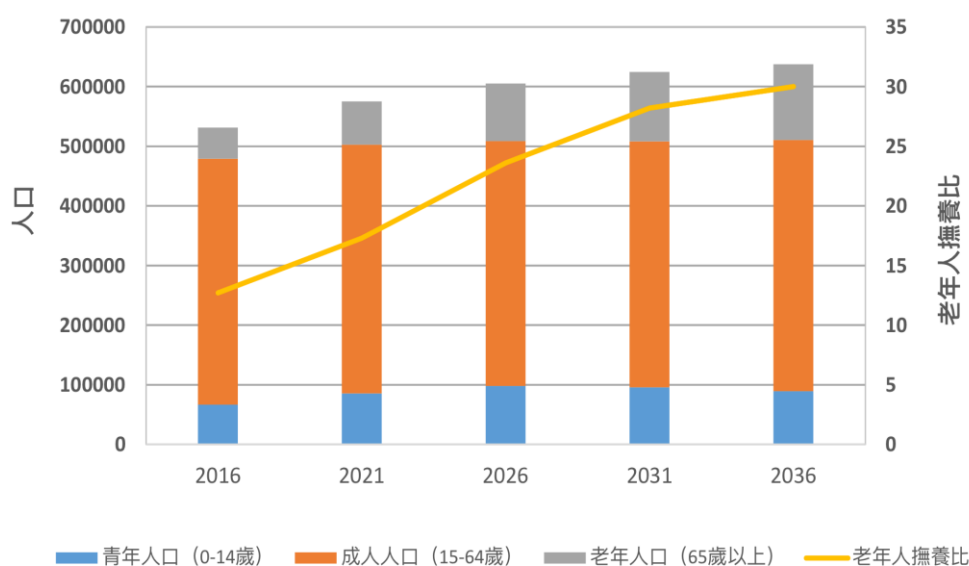
#### 5.1.1 Increasing health care needs

Health care needs are increasing due to demographic changes, especially from a rapidly ageing population, and the increasing occurrence of lifestyle-related diseases.

Macao's total population rate of natural increase is projected to decrease from 0.75% in 2016 to 0.09% in 2036. Over this same period, the number of live births per thousand population per year is similarly projected to fall from 11.0 to 6.3 and the median age to increase from 37.9 to 41.4 years. The changing age structure of the projected population can be seen in *Figure 5.1* and Appendix 1.2. Overall these projections show that Macao's population will continue to age.

**Figure 5.1:** Macao's ageing population

Projection of total population, age structure and elderly dependency ratio, 2016 - 2036

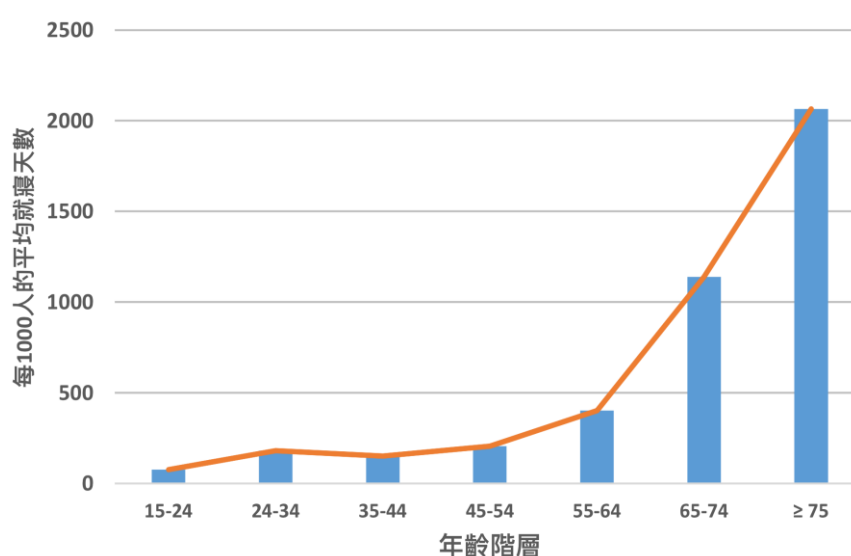


**Source:** Macao Population projections 2016 (base year) – 2036, Macao Bureau of Statistics and Census

The percentage of elders (aged 65 or above) in the population is estimated to more than double from 9.8% in 2016 to 19.9% in 2036. This variation can also be seen from the change in the elderly dependency and ageing ratios. From 2016 to 2036, the elderly dependency ratio<sup>1</sup> is projected to increase from 12.7% to 30.0%, and the ageing ratio<sup>2</sup> from 78.9% to 141.6%. Additionally, 54% of Macao's local population aged 65 or above has one or more chronic diseases. The elderly population consequently has much greater health care needs, e.g. a person aged 65 or above uses on average six times more in-patient care (in terms of bed-days) than an adult person aged below 65 (*Figure 5.2*).

**Figure 5.2:** The elderly population has greater health care needs

Number of hospital bed days utilised by age groups (2019)



**Source:** Macao Bureau of Statistics and Census (2020)

Lifestyle-related diseases (e.g. from smoking; drug abuse; and physical inactivity and chronic non-communicable diseases associated with an ageing population) are rising. The WHO attributes the elderly population's rapid size increase to a change in the leading causes of death, from infections to chronic non-communicable diseases. These chronic conditions may include hypertension, high cholesterol, arthritis, diabetes, heart disease, cancer, dementia, and congestive heart failure. Heart disease, stroke, and cancer have

<sup>1</sup> Number of elders aged 65 and over as a percentage of the number of working age persons (aged 15-64).

<sup>2</sup> Number of elders aged 65 and over as a percentage of the number of youths (aged 0-14).

been the leading chronic conditions that have had the most significant impact on an ageing population. Managing these chronic conditions will increase utilisation of, and hence financial demands, on a health care system.

At the same time, the completion and opening of a series of large-scale tourist resort facilities and sports venues, together with the recent opening of the Hong Kong-Zhuhai-Macao Bridge, will likely continue to increase demand for medical services in Macao.

***Without continuing efforts, these increasing health care demands will likely result in waiting times for public specialty care increasing considerably.***

### **5.1.2 Rising medical costs**

Even without the effect of demographic changes, health care costs are likely to continue to rise due to “medical inflation”. These escalating costs are due to advances in medical technology and public expectations for health care to keep up with such advances.

Advances in medical technology can lead to a rise in medical costs in several ways. Improved and often more expensive diagnostic methods may allow diseases to be detected earlier or more effectively treated. Similarly, new and often more costly treatments and drugs may appear for diseases perhaps previously considered incurable or untreatable. These new and better treatments may result in longer lives of patients with chronic illnesses or other conditions, who may, in turn, require more extended treatment. New medical technology may also require more substantial investment in both equipment and human resources.

Along with the advancement of technology, there is growing expectation among the public for health care to keep up with the latest technological developments, and a growing tendency for health care consumers to obtain second opinions and demand alternative health care services, which can lead to a higher cost of health care. This is, at least in part, fuelled by improved access to medical information and increasing health awareness.

International experience indicates that adoption of new medical technology alone has caused public medical costs per capita to rise at an average of 1% per year faster than the

growth of an economy (as measured by per capita GDP). Additionally, in many advanced economies, irrespective of the rate of economic growth, the real growth rate of total health expenditure exceeds the economy's real growth rate (in GDP) by more than 50%.

### **5.1.3 Increasing burden on future generations**

Without some form of reform, public health expenditure in Macao is expected to increase further in the foreseeable future due to the ageing population, medical inflation, and the new Outlying Island Hospital opening. Under such circumstances, and with the MSAR Government funding 74% of total health care expenditure from government revenues, the burden on Macao's future generations will increase. Having an ageing population means that the working population's proportion will continue to decrease (*Figure 5.1*). Increased funding for public health care is also likely to be at the expense of funding for other public services. The increasing health expenditure funded by government revenue may thus pose a growing burden on future generations of the working population.

### **5.1.4 Further development of specialist medical care**

Resident's increasing health care needs will place growing demand pressure on Macao's specialist medical services. Thus, the MSAR will need to train up or attract more specialist doctors in the longer term to meet these growing service demands and increase Macao's self-sufficiency in supply. In this regard, the new Outlying Island Hospital opening will provide highly specialised equipment and require considerable new manpower and technical expertise. It will accelerate Macao's need for a greater number of medical specialists.

Doctors providing specialised services need at least a reasonable caseload to keep up with the professional expertise and skills in their area, and often to maintain their accreditation. Given Macao's relatively small population, attracting and retaining the required medical expertise may prove challenging, particularly given the trend towards increasing sub-specialisation. With Government policy support, this may be addressed by drawing a greater mix and volume of patients in the future from the Greater Bay Area with its over 72 million population.

### **5.1.5 Threat of infectious diseases**

As a consequence of changes in society, technology and the environment, pathogens evolve or spread, and the spectrum of infectious diseases is expanding with the world continuously confronted by longstanding, emerging, and re-emerging infectious disease threats posing a rising health challenge. The concern is magnified by rapid population growth in areas with weak health systems, urbanisation, globalisation, climate change and the changing nature of pathogen transmission between human and animal populations. The Severe Acute Respiratory Syndrome (SARS) outbreak in 2003, influenza A (H1N1) in 2009, Middle East Respiratory (MERS) Syndrome in 2012, H7N9 avian influenza in 2013, Ebola Virus Disease (EVD) in 2014, Zika virus epidemic in 2015 and now the Coronavirus disease 2019 (COVID-19) pandemic illustrate the challenges to public health prevention and control efforts. These threats differ widely in terms of severity and probability. They also have varying consequences for morbidity and mortality and for a complex set of social and economic outcomes. Therefore, human vulnerability to microorganisms will be a challenge for all health systems now and in the future.

## **5.2 Sustainable direction**

Although health care systems vary enormously between countries in the way they are configured and financed, our research has highlighted that most face similar challenges, such as changing demographics, together with accelerating rates of chronic disease. Sustainability is seen as a crucial requirement for making their health care systems fit for the future, able to withstand these impending and ongoing challenges, while providing effective and efficient health care that is safe and of high quality.

Additionally, the rising cost of health care in many countries has compelled them to focus on sustainability as a means to reduce operating costs (Hudson & Vissing, 2013). There is also broad recognition that, if health care systems continue along current trajectories, they will become harder to sustain. These changing conditions are at a time when the public is seeking further improvements in both the quality of services provided and the scope of treatments available. It poses a significant challenge. Possible solutions will have significant implications for existing health care systems in many countries.

Sustainable health care systems are therefore important to policy-makers, public and private health care providers, the health care workforce, patients and the society as a whole. Our research, however, found that not everyone means the same thing when they speak about ‘sustainable health care’ (Muzyka et al., 2012). Nevertheless, it requires a more comprehensive, more holistic approach that involves adapting health care delivery models, health promotion, disease prevention, corporate social responsibility, and, at its broadest level, considering the sustainability of everything that impacts health and well-being. Hence it depends on both internal and external factors.

Similarly, there is no definitive universal framework or guideline, nor is there a single ‘one-system-fits-all’ approach, for health care to achieve sustainability. However, successful health care sustainability initiatives – often involving technological innovation, preventive care and consumer-focused models – are occurring in many places. Our research results serve to inform the strategies Macao can consider adopting to build a sustainable health system which can effectively tackle ageing and other challenges.

### **5.2.1 Effective disease prevention and health promotion**

Globally and locally, the world is seeing an increasing number of people suffering from non-communicable diseases (NCD), which can cause ill-health, disability and premature deaths. The World Health Organisation (WHO) has estimated that NCDs cause approximately two-thirds of total deaths. Recognising that prevention of NCDs is an essential priority in health care development, the WHO publicised the Global Strategy for the Prevention and Control of NCD in 2000 and called on its Member States' health authorities to establish their own national policy frameworks for the prevention and control of NCDs. In this regard, countries like Australia, Singapore, United Kingdom, Canada, the United States and Sweden have developed their own national NCD prevention and control policies.

Many NCDs are closely related to our living habits, including unhealthy diet, physical inactivity, excessive drinking and smoking. Health promotion, as defined by the World Health Organisation, aims to engage and empower individuals and communities to increase control over these aspects of their health. Effective health promotion programmes are also needed to enable a system to refocus on specific prevention efforts

to prevent illnesses before they emerge. Health promotion programmes, along with prevention, are thus essential components of a sustainable health system.

Macao's health system already recognises the importance of health promotion and disease management. The Macao Health Bureau actively engages the public to take responsibility for their individual health. Initiatives, such as “自家健康，自家管理” introduced in 2015, aim to raise public awareness and engage residents to adopt a healthy lifestyle. Self-management stations are set-up in hospitals, health centres and community facilities to provide easy access for the public to monitor their blood pressure and other health parameters. In 2009, the Committee for Chronic Disease Prevention was formed to target five major disease categories, including cardiovascular disease, diabetes, chronic respiratory diseases, kidney illness, and cancer. Vaccination is also a vital element of the MSARs prevention strategy with a significant increase in the number of influenza vaccine doses provided in the last decade.

*To build on this well-established foundation, new approaches and channels to deliver health promotion that support and further strengthen existing arrangements and NCD prevention initiatives can be considered. This can include increased use of digital health promotion channels and digital tools.*

### **5.2.2 Effective health and health care systems**

Health systems in many countries are trying different initiatives to tackle the ageing population and increasing prevalence of NCDs. Service delivery models are being re-organised with a rising emphasis on primary and community care components that integrate with secondary and tertiary care through formal linkages and information sharing.

Primary health care facilities are often mentioned as preferred settings for strengthening prevention and promotion activities. They can also contribute to better outcomes for less money within a health care system because they can address health care issues at an early stage and effectively help to prevent them. In addition, these models are increasingly being organised around the health needs of individuals and families and are intended to relieve the pressure on hospitals through reducing demand for hospital beds. Therefore, a sustainable health care system needs to emphasise strong primary care facilities that

allow for patient-centred, easily accessible, and comprehensive services. ***Accordingly, it is suggested that the future health system in Macao should continue to be primary care-based and a long-term strategy may be developed for enhanced integration of the health care system components with an optimal mix of services.***

In most countries sampled in our research, there is some form of private health care sector, which provides health care to private patients who pay via health insurance or self-payment, and to those non-private patients paid for by government under various models. Public and private health care systems usually co-exist and complement each other. In some countries, such as the UK, there is significant involvement of the private sector in publicly financed health care through Public Private Partnerships (PPP) and the like. Macao currently makes limited use of PPP to provide health care services (para 4.2.3). ***The MSAR Government should consider making greater use of PPP with the private sector to complement the public health system.***

Taking reference from Hong Kong, there is significant room to increase the private sector's share of the Macao health care market. A reasonably sized private health care system will provide Macao citizens more choice and can provide the public system with relief should it become overwhelmed, such as during infectious disease outbreaks. ***Clear positioning of the private sector in Macao's future health care system should be considered in the context of the opening of the Outlying Island Hospital and its operating model.***

In Germany, for example, some public hospitals have been privatised, resulting in greater efficiency and enhanced quality outcomes. Similarly, in Australia, PPP models have been used to mobilise the resources of both the private and public sectors. ***An enhanced public-private partnership for the operation of the Outlying Island Hospital would likely promote a synergistic relationship between the two sectors.***

### **5.2.3 Leveraging innovation and innovative technology**

Innovation and advances in health care technology over the last 50 years have contributed to improved life expectancy, reduced patients' morbidities and offered professionals opportunities to improve health care quality and efficiency. In the future, new

technologies, such as genetics and precision medicine, 3D printing, robotics and artificial intelligence, promise to bring powerful solutions to current problems related to the ageing population, the prevalence and incidence of multi-morbidities and chronic conditions requiring long-term care. Information technology is also vital to move health organisations towards sustainability since it can help to increase efficiency and create tools for sustainability. ***Many countries and health care organisations have developed health information or e-health strategy. Accordingly, the MSAR Government should consider adopting similar health information or e-health strategy.***

The Macao Government has demonstrated its continuing commitment to developing a “Digital Macao” that adopts smart technology and promotes smart health care to realise in-depth integration of information technology and city modernisation. An electronic record sharing system has been implemented connecting CHCSJ, health centres and Kiang Wu Hospital and providing their health care staff with more complete and comprehensive health information of any patient seeking care in these institutions. Making best use of these available new technologies also requires a culture of innovation that continuously improves treatment, efficiency and outcomes. Accordingly, health care leaders globally are increasingly looking to embed and sustain a culture of continuous improvement in their organisations. Continuous improvement is a systematic, sustainable approach to enhancing the quality of care and outcomes for patients. ***Building a culture of innovation and improvement will therefore be important to sustaining Macao’s health care system in the future.***

#### **5.2.4 Funding models that drive desired behaviours**

In many countries, future health spending is expected to outpace growth in GDP due to the ageing population, increased prevalence of chronic diseases and rising expectations. Equally, while the uptake of new technologies has the potential to bring solutions to current and projected problems of health systems, new medicines and technologies also raise multiple questions about financial sustainability. (McClellan, K.A., Avard, D., Simard, J. and Knoppers, B.M., 2013.) In making sure their health system would be accessible, affordable and sustainable, policymakers elsewhere are leveraging a mix of funding sources. In Australia, for example, the government encouraged consumers to buy

health insurance by offering 30% tax rebate and mandating cheaper premiums to early buyers. This led to the number of insured Australians increasing from 30% to 45%.

The Macao government is now responsible for 74% of the total health expenditure. *To ensure financial sustainability of the Macao's healthcare system during possible economic fluctuations, consideration could be given to introducing a diverse health financing approach that would be able to meet these challenges and better contribute to the long-term sustainability of the health system.*

Strategic purchasing can also be used, for example, to improve the health system performance through effective allocation of financial resources to providers. Indicators to measure the quality of service and patient satisfaction can be incorporated (Chandra et al., 2013).

#### **5.2.5 Optimal development, alignment and support of human resources**

Macao's expected increasing health care demand due to its ageing population will be at a time when the shortage of well-trained health care manpower is a universal problem in many advanced countries. Therefore, building up and sustaining a health care workforce will be important, as it is for many countries, to tackle the ageing population. Lessons from Hong Kong over the past ten years highlight the importance of taking early measures to increase manpower and capacity in order to avoid long waiting times. The training, roles, relationships, and capabilities of the health care workforce must also evolve to better serve the needs of caring for patients with chronic conditions, predicated upon the rapid escalation in chronic health problems around the world. *To provide effective care for chronic conditions, the skills of health professionals in Macao must be expanded to meet these new complexities. This will require vision, leadership and a determined programme of workforce planning and policy, recruitment and retention strategies and increased training and development.*

The opening of the new Outlying Island Hospital is important for the long-term sustainable development of Macao's health care system. As well as providing additional capacity, it will also introduce new technologies to improve clinical diagnosis and treatment capabilities. *To meet these new specialist's medical manpower needs and*

*those for the whole health system, the Macao Government may work together with the Macao Academy of Medicine to determine the specialist requirement and the development of new specialties and subspecialties.* This will need to include strategies, such as taking up the Greater Bay Development opportunity, to ensure a broader case-mix necessary for adequate professional development and overall health care advancement.

#### **5.2.6 Strategic Alignment with determinants of population health**

Population health is of obvious importance to the sustainable development of Macao's overall health care system. In that sense, it is recognised that health care is an open system that has a dynamic interdependency with other economic, social and environmental systems that impact individuals' lives and can affect health outcomes to a large extent. These social determinants of health are outside of the health care system and are often beyond an individual's control. *Strengthening the integration and alignment of the health, economic, social and environmental systems is therefore a vital part of a sustainable health system in which everyone has a fair and just opportunity to be as healthy as possible.* The need for such alignment across these systems, particularly in respect of marginalized populations, has become more acute in many countries as the world faces the COVID-19 pandemic and plans for an equitable recovery.

Unfortunately, in many countries the services and support designed to intervene on these determinants – such as housing, transportation, water and sanitation, educational reforms, and legal services and supports – are often disconnected from health care programmes tasked with improving health. As health systems take into consideration the social determinants of health, it has become clear that broader strategies are needed. Integration of policy and practice with other sectors and building healthy and health creating communities is required.

The MSAR Government has demonstrated its commitment to solving people's problems related to housing, transport, health care, social security and environmental protection, and recognises the importance of a joined-up response. Under the leadership of Secretary for Social Affairs and Culture, 13 governmental bureaus came together to form a cross-

functional team “養老保障機制跨部門策導小組” to formulate a comprehensive service plan for elderly persons for the next ten years. The objective of the plan is to put in place services that will meet rising needs among elderly persons in the coming years. Additionally, the Government has implemented policies to build Macao as a healthy city with the aim to improve citizens’ health. Its objectives include providing a clean and safe environment and ensuring a fundamental standard of nutrition, drinking water, housing, income, security and work. *A continuation of this joined-up approach that addresses the wider, social determinants of health is essential to ensuring Macao’s population health.*

## CHAPTER 6 OUTLYING ISLAND HOSPITAL DEVELOPMENT

### 6.1 Providing better medical care and services to the public

The rapid development of the outlying islands in recent years, the completion of a number of public housing projects and the gradual migration of the resident population to the outlying islands and new development areas made it necessary to re-plan Macao's medical service to re-balance its geographical distribution of health services.

To this end, in 2011, the MSAR Government formulated a construction programme to further improve the Government's medical service to its population. This included building the new Outlying Island Medical Complex to provide better medical care and services to the public, and improve the overall health standard of Macao.

### 6.2 Outlying Island Medical Complex

The Outlying Island Medical Complex (*Figure 6.1*) is currently under construction. It is the largest medical building complex ever built in Macao, with a floor area more than four times that of the present CHCSJ. It is expected that with the enhancement of the medical environment, technology and human resources, it will become one the keys to improving medical services in Macao.

**Figure 6.1:** 離島醫療綜合體總體規劃圖



The Island Medical Complex will cover an area of about 75,822 square metres and have a total floor area of about 420,000 square metres, with seven buildings to be built in two phases, including the General Hospital Building, Auxiliary Facilities Building, Integrated Services Administration Building, Nursing College, Staff Hostel Building, Central Laboratory Building, and in the later phase of the project, a Rehabilitation Hospital. The basic functions of each building are shown in Appendix 6.1.

### 6.3 General Hospital Building

The General Hospital Building will cover an area of about 14,000 square metres with a total Gross Floor Area (GFA) of approximately 161,550 square metres, largely divided into East and West Wings (*Figure 6.2*) and is planned to have a total of 1,087 beds.

**Figure 6.2:** General Hospital Building – Planned East and West Wings



Sitting on a common podium, the West Wing is mainly divided into specialised medical facilities with a tower of 12 floors (5th to 16th floors) and the East Wing is an emergency centre and an outpatient centre with a tower of six floors (5th to 10th floors). The entrance to the emergency centre is located on the ground floor, and the main entrance to the clinic is located on the first floor. Located in the south and north of the lot, there will be bus stops, escalators and elevators for the public to access the reception

lobby in the General Hospital Building. It is also planned that the future Seac Pai Van section of the Light Rail Transit will include a stop at the new hospital.

The standard ward floor of the West Wing is divided into two nursing units on each floor, and on the East Wing has one nursing unit on each floor and one detention ward.

## 6.4 Planned settings and services

In addition to the existing medical departments, such as an emergency centre, specialist outpatient clinics, day clinics, and surgery centre, there is also cancer treatment, nuclear medicine and transplant centres. The planned settings and clinical services for each floor of the General Hospital Building are shown in *Figure 6.3*, and the distribution of the main functions are further detailed in Appendix 6.2.

**Figure 6.3:** Planned Settings and Services for each floor of General Hospital Building

樓層		主要功能	用途屬性
十六樓	綜合住院	預留病房	醫療
十五樓		骨髓移植中心 / 腫瘤科	醫療
十四樓		肺科 / 腎科	醫療
十三樓		內科	醫療
十二樓		外科	醫療
十一樓		神經科 / 泌尿科 / 骨科	醫療
十樓	院	機電設施	急 留病房 醫療 / 機電
九樓	大樓	兒科病房 / 耳鼻喉科 / 眼科	診 預留病房 醫療
八樓		兒科與新生兒重症監護 / 產科	住 預留病房 醫療
七樓		婦產科	院 預留病房 醫療
六樓		心科 / 心科重症監護	大 預留病房 醫療
五樓		重症監護 / 燒傷科	樓 人工生殖中心 醫療
四樓	裙樓	啡咖廳 / 機電設施	餐飲 / 後勤
三樓		普通門診 / 手術室 / 心血管心術中心	醫療
二樓		普通門診 / 日間診療中心	醫療
一樓		大堂 / 普通門診 / 眼科中心 / 神經科學中心 / 腎科及透析中心 / 婦產科中心	醫療
地面層		急救中心 / 影像科	醫療
地庫一夾層		機電設施	後勤
地庫一層		腫瘤中心 / 中央藥房 / 電腦部	醫療 / 後勤
地庫二層		核醫學 / 腫瘤治療中心 / 中央消毒中心 / 物資供應	醫療 / 後勤

## 6.5 Planned construction and commissioning

In total, the Outlying Island Medical Complex's construction is expected to cost more than MOP 10 billion. Construction includes related roads, infrastructure works and electricity supply. The new Hospital will be equipped with a state-of-the-art automated

system for handling garbage and medical waste, as well as a wide range of ‘green features’.

The Outlying Island Medical Complex (except for the Rehabilitation Hospital) construction schedule completion date is September, 2022. Six months are then reserved for the installation and commissioning of additional equipment during which the entire project is to be tested and commissioned.

The main buildings of the Outlying Island Medical Complex are planned to commence operation in 2023.

## **6.6 Allocation of facilities in the Outlying Island Medical Complex**

The General Hospital Building has been designed as a single facility with high acuity services, including Emergency Services, and high volume services, such as General Outpatient and Day Clinics, on the lower podium floors. Operating theatre suites, critical care inpatient areas (ICU, CCU) and general wards on the upper floors with Oncology on the highest floors. These departments have been individually planned and equipped to meet the specialty requirements of their respective departments, and their vertical and horizontal adjacencies reflect a holistic hospital approach rather than a series of clinical units that can be managed independently.

The General Hospital Building is supported by a number of other separate buildings within the Medical Complex. These buildings include an Auxiliary Building for Support Services, an Administrative Services Building and a Clinical Laboratory Building. Hospital service delivery in the General Hospital Building will likely require the essential support of the functions housed within these adjacent buildings to operate. Currently, it is understood that the logistics and support services are designed to serve the General Hospital Building under one Operator.

## CHAPTER 7 VIABLE OPERATING MODELS OF OUTLYING ISLAND HOSPITAL

In order to promote the long-term sustainable development of the medical and health system, the MSAR Government needs to review and plan for integration and operation of the new Outlying Island Hospital. Previous chapters have highlighted Macao's expected increasing health care demand due to its ageing population and increased prevalence of chronic diseases, and that the current heavy reliance on public health care expenditure may be challenging to sustain in the longer term. This new Hospital will help to meet this increasing demand and support larger health system goals. It also provides opportunities to introduce reform, increase private sector capacity, and to refine tools, instruments and governance systems in the strategic purchasing of health care services.

This chapter analyses and evaluates the future viable operating and service models of the new Hospital in order for it to be optimised and to promote the development of medical care in Macao. Two broad categories, each with two operating models, are identified and assessed as possible viable operating models for the Outlying Island Hospital:

### A. Government controlled models:

**Option 1:** Fully Government operated and managed.

**Option 2:** Operate & Managed by a Public Corporation (Corporatisation).

### B. Public Private Partnerships (PPP) models

**Option 3:** PPP - Operate, Manage and Maintain (*public hospital*).

**Option 4:** PPP - Concession (*private hospital*).

## 7.1 Government controlled models

### 7.1.1 Option 1: Fully Government operated and managed

The MSAR Government would operate the new Hospital as a Government hospital under the Health Bureau, effectively mirroring the existing CHCSJ. All financial activities (such as procurement, budget execution, cost management, etc.), infrastructure construction, political affairs, policy development, and the introduction of technology, etc. would be subject to the regulations of the public ministry system. Similarly, staff working in the Hospital would be subject to civil service regulations and culture. Recruitment, promotion, remuneration, assessment, and deployment would be regulated by the Human Resources system of public office.

#### *Advantages/ Benefits*

- More likely to be supported by the community as this was the original proposal.
- Operationally straight forward as there are already existing civil services regulations governing the operations of a public hospital.
- Similarly, existing systems, procedures and policies could be mirrored in the new hospital.
- Staff could be shared/rotated between the two public hospitals.

#### *Disadvantages/ Risks*

- Government funding requirements will be substantial and comparable to the existing public hospital.
- Although there would be new facilities, less likely that change from current service delivery approach would be introduced, delivery would remain the same.
- System limits the degree of staff development and ability to promote a service and improvement culture.
- Due to the relatively rigid governance framework, little room for hospital management to introduce reform to improve performance and accountability.
- Staff recruitment subject to civil service procedures.
- Opportunities to improve the current administrative and operational efficiency in public hospital operations would be less likely.

### **7.1.2 Option 2: Operated & Managed by a Public Corporation (*Corporatisation*)**

This option is a similar model to the Hong Kong Hospital Authority. The MSAR Government would introduce legislation to ‘corporatize’ the operation and management of the new hospital. In this model, the Outlying Island Hospital would become a non-governmental statutory organisation with all members of the governing board appointed by the Government. Board members may include Government, patient, staff representatives and members from the business sector able to introduce and cultivate best business practices.

In addition to governing the hospital, the governing board’s functions would specifically include improving the efficiency of its hospital services and encouraging public participation in the operation of the Hospital. It would have autonomy and flexibility in Human Resources Management, procurement and supplies, service contracting, etc. without undue bureaucracy. Its staff would not be Civil Servants nor subject to those conditions of service.

#### ***Advantages/ Benefits***

- Remains fully under government control and accountability.
- Politically likely to be acceptable to the community as it is a public hospital under a Government-appointed board tasked to improve service.
- Public participation in the Hospital’s governance and operations (e.g. community advisory body, donation and fundraising).
- Hospital management will be less rigid when compared to a Government-run hospital and, depending on the legislation, management reforms to improve efficiency and become more patient focussed could be introduced.
- Able to recruit and bring in new expertise, systems and build a new culture.
- If successful, the new Government corporation could eventually take over the management of the existing public hospitals, as well as becoming part of the territory-wide health care management reform.

#### ***Disadvantages/ Risks***

- Need to legislate for the new corporation.
- Establishment of the new organisation, with a new approach to service delivery,

will take a number of years and be dependent on the calibre of board members and ability to attract and retain suitable hospital management experts.

- Funding requirements will be substantial and comparable to the existing government hospital.
- Need new infrastructure to monitor the performance of the new corporate.
- May be seen as the first step towards corporatisation of health care services.

## 7.2 Public Private Partnership (PPP) models

Public-Private Partnerships (PPP) are long-term arrangements signed by a government or a public agency – on behalf of the public sector – and a private sector partner –who will be responsible for managing parts of or the whole infrastructure, like a hospital. The private sector partner could be a suitable commercial-for-profit or not-for-profit company. The HKU-Shenzhen Hospital is a typical local example of this PPP arrangement.

Although there is no simple answer to the appropriate mix of public and private financing in health care delivery, PPP has emerged as a promising tool to provide governments with alternative methods of financing, infrastructure development and service delivery across countries at various stages of economic and social development. A growing number of governments from low to high-income countries are exploring health care PPP projects to improve hospital infrastructure and to deliver both non-clinical and clinical services. ***Importantly, experience has shown that PPP works only when both partners benefit from the relationship, and the expected benefits are made clear in advance*** (Mitchell, 2003).

By partnering with the private sector through PPP arrangements, governments gain access to more flexible and innovative practices, such as the introduction of comprehensive IT systems and performance-based human resource management practices, allowing them to expand capacity and improve service delivery more efficiently. For example, ***Service Delivery PPP provides an opportunity to introduce innovative care models that can improve health care outcomes and increase the potential for savings by better managing high-cost patients in lower-cost settings.***

For the private sector, PPP provides an opportunity to gain access to new markets at a lower risk profile, while contributing to the public good. Although public health care

markets typically come with lower potential returns on investment, they offer opportunities to increase volume and market share and allow the private sector to diversify their investment and service delivery portfolio.

Traditionally, PPP involves the private sector designing, financing and building the health care facility. More recently, governments have engaged the private sector to deliver services through a range of health care PPP known as ‘asset-light’ options to operate, manage and maintain, and to deliver services. Relevant key drivers for this kind of health care PPP include the need for:

- Improved management skills to improve the quality and cost-efficiency of health care delivery.
- Stronger and more efficient procurement and supply chain.
- Additional services/skills (e.g., specialty services) or expanded service capacity.

***The PPP types proposed in Options 3 and 4 can maximise the potential for innovation and efficiency in the private sector and allow the Health Bureau to focus on quality and regulation rather than service delivery. In both options, the operational risks are transferred to the private partner.***

#### **7.2.1 Option 3: PPP - Operate, Manage and Maintain (public hospital)**

The MSAR Government provides capital funding and builds the hospital facility. The Outlying Island Hospital remains a public hospital and belongs to the network of Government health care services. Public control is maintained. The MSAR Government, as the public partner, specifies services that are required to be delivered for public patients, purchases at a contracted price and has the power to control and inspect, as well as regulatory and sanction authority.

The private partner, as the Operator, operates, manages and maintains the Hospital and delivers all services (clinical and non-clinical). Responsibility and risks for operations and service provision are thus transferred from the government partner to the private partner, while the financial risk for operation and maintenance may be shared. The private sector partner manages and delivers all services at its own expense and risk for an agreed set period of time, typically for 5 to 10 years, and subject to renewal. The

private partner is responsible for daily management control but must comply with the performance requirements set out in the Service Deed (Appendix 8.1). In many cases, the private partner provides working capital only, and in others, also minor equipment and working inventories. Hospital staff are directly employed by the private partner.

The private partner directly serves the patients while the Government partner is responsible for setting hospital vision and missions and purchasing required public patient services. To provide an incentive for performance improvement, the private partner may also be awarded an additional amount for achieving certain targets. In addition, the private partner could be permitted to serve a set level of private patients, including those from the Greater Bay Area, who have medical insurance or are self-paying for services received.

The private partner's profit will in part be due to how innovative they are and how efficiently they run the Hospital. Hence, there is an incentive for the Operator to bring in new and innovative approaches, better business practices and management expertise in order to achieve deep and lasting change. The private partner also has the advantage of being able to introduce more flexible procurement and compensation arrangements.

### ***Advantages/ Benefits***

- The key advantage is that the gains that result from a private sector Operator can be achieved without leasing/transferring government assets to the private partner allowing public control to be maintained.
- The Operator, as a renowned organisation, brings in a strong, very experienced Core Management Team and should be able to attract similarly experienced clinicians.
- Operational risk is transferred to the private sector Operator.
- By design, private partners bring new human resources and performance management practices that are significantly different from public management norms, including greater use and enforcement of performance management standards.
- The right private partner can introduce new and innovative approaches, utilise

more flexible procurement and compensation arrangements to achieve operational gains, improved quality of service and could lead medical system reform in Macao.

- Operator contracts can be relatively easier to develop and can be less controversial than Concession (Option 4) contracts.
- May include community participation in the hospital's governance and operations (e.g. community advisory body, donation and fundraising).
- As the private partner operates on a commercial basis, public patients may enjoy higher quality health services at the same or less unit price when compared to a Government-run service.
- Having a private patient element will increase the choice for Macao residents and also provide an opportunity to attract clients from the Greater Bay Area, increasing the mix and volume of patients in the future to support the development of speciality services.

### ***Disadvantages/ Risks***

- The principal risk is that the private partner may not deliver the required services or at the required quality. Therefore, the contract should contain appropriate grievance, appeal, and termination provisions.
- Risk that the private partner may under-invest in asset maintenance, as the assets are provided by government, and not purchased by the private partner.
- Government needs to set up a new bureaucracy and effective tools to monitor the performance of the private provider.
- If the private partner is paid an incentive payment, safeguards are required to prevent overstatement of achievements and 'cream skimming' (9.2.1).
- As a largely public hospital, main funding requirements will continue to fall to the Government.

### **7.2.2 Option 4: PPP - Concession (lease)**

PPP concessions are arrangements with a private sector partner in which ownership of a hospital facility remains in public hands, but where the private partner is granted a

medium-term lease for operating and maintaining the facility as a private hospital with various degrees of underlying risk allocated to the public and private parties. All initial capital investments are made by the public sector, and the Operator provides the service at their expense and risk. Cost of maintenance and some replacement is also passed to the private partner. Thus, the risks of the investment are again borne by the public sector, and the operational risks are borne by the private partner. The private sector partner provides health care services primarily for private patients and also for an agreed number of public patients. The lease contract incorporates clear performance indicators and stringent government and industry standards that must be met. The concession period typically ranges from 10 – 15 years (Medium-term). The hospital Operator remains accountable under the lease terms to the Government.

In this form of PPP, payments can take place in both directions. The concessionaire pays the government for the concession rights. This may be a one-off at the beginning plus annual charges based on a pre-agreed formula. The government pays the concessionaire for health care services to public patients specified under the contract. To help ensure the commercial viability of the concession, the government may also provide an explicit or implicit guarantee to reduce the level of commercial risk taken by the private partner and protect against the risk of lower than expected revenues, especially during the initial years of the PPP. The concessionaire will typically also require assurances as to fee levels and increases over the term of the lease, and a compensation/review mechanism, if demand and fee levels do not meet projections.

### ***Advantages/ Benefits***

- Provide increased choice to Macao residents.
- Focus on performance-based standards, enhanced quality control and assurance, and contractual accountability can lead to higher quality and customer satisfaction.
- As the private provider operates on a commercial basis, public and private patients may enjoy health services at the same or less cost when compared to a Government-run service.
- Can bring in new and innovative approaches and better business and management expertise which can provide competition and may lead the reform of Macao's health care system.
- Provide an opportunity for Macao to develop medical tourism to attract clients

from the Greater Bay Area, increasing the mix and volume of patients in the future to support the development of speciality services.

- The Government may no longer be required to commit resources for maintenance of a very expensive state of the art health care facilities.
- Private partner bears commercial/operational risks.
- The Government may generate income from the Operator for the use of the facility.

### ***Disadvantages/ Risks***

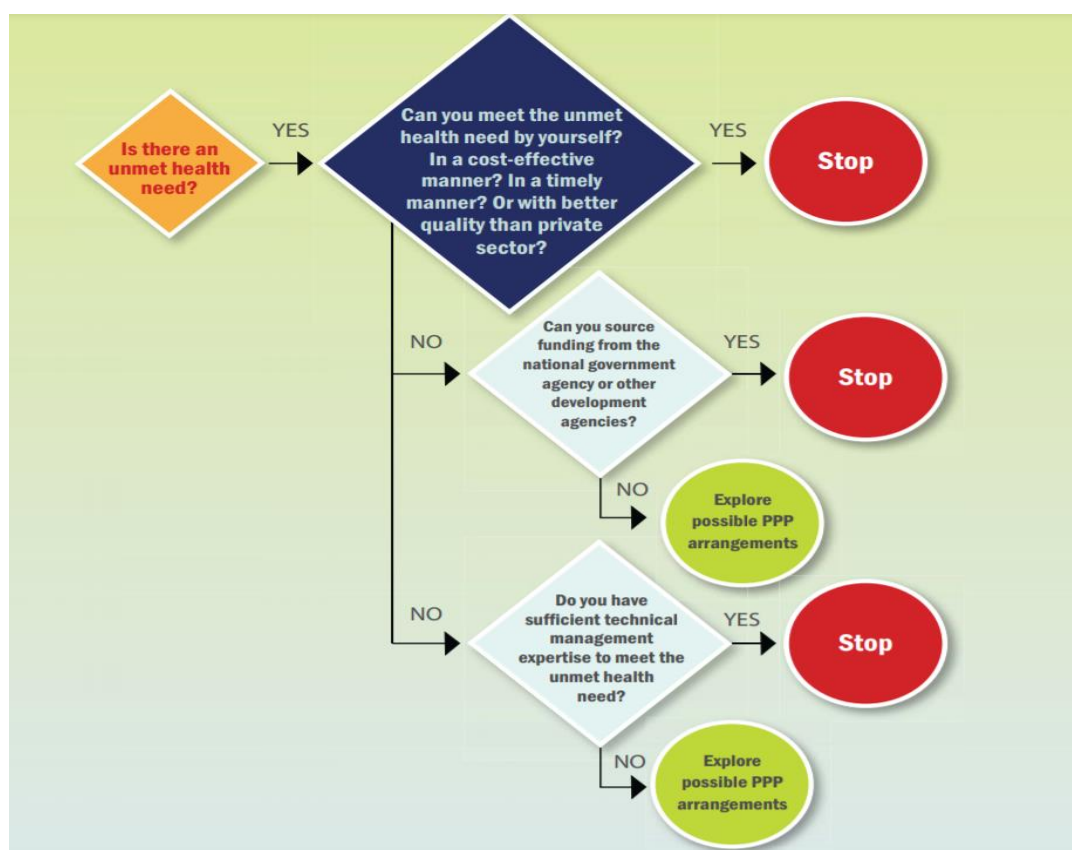
- Maybe seen as privatising the delivery of hospital services making it less politically desirable
- Can be complex to implement and administer.
- Negotiation between parties and making a deal can require some time.
- May require close regulatory oversight.
- Contingent liabilities to the government in the medium and long term.

## **7.3 Optimal operating model for Outlying Island Hospital**

The decision of which model to pursue needs to be driven largely by local health needs, and environmental (e.g., political, social) factors, assessed against overseas experience. The threshold of risk and responsibility that the government seeks to allocate - and that a private partner would be willing to accept - are also major determining factors.

*Figure 7.1* shows a useful, simplified tool provided by the Asian Development Bank for determining the optimal model. Inherent in this tool is the principle that if a fully government-operated and managed hospital (Option 1) can meet the unmet health care need, cost-effectively and with better quality than the private sector, it should be selected.

**Figure 7.1:** Simplified tool for determining the optimal model



**Source:** Asian Development Bank (2013).

While likely to be politically acceptable to the community, weaknesses in the current system (para 4.2) and futures challenges to the system (para 5.1) indicate that simply mirroring the current public hospital through Option 1 would not meet these conditions. In particular, it would not bring new technical management expertise or innovation to achieve reform either of the overall system or in hospital operations. Delivery, be it in a new facility, would most likely remain the same.

Option 2, operated and managed by a public corporation, is likely also to be politically acceptable to the community and has the additional advantage of hospital management being less rigid when compared to a government-run hospital, as well as having a reform focus. However, starting up a new corporation and setting up a new system, without the prior advantage of existing systems and technical expertise, would likely take some years to realise. Transferring existing health care staff from the Civil Service to support this model would create administrative complexities without gaining new expertise, nor

changing the culture. Delivery approaches would again likely remain the same, at least in the shorter term.

Option 3, PPP (*Operate, Manage and Maintain*), by design, has the distinct advantage of the private partner bringing in their existing expertise, and human resource and performance management practices that are tried and proven. The introduction of these best practice, innovative approaches can lead to improved quality of care and increased efficiency, and can contribute to medical system reform in Macao. These gains that result from a private sector Operator can be achieved without leasing/transferring government assets to the private partner, allowing public control to be maintained. The emphasis on private patient services will be less than Option 4, but it can start to address the public-private imbalance and develop Greater Bay Area and medical tourism opportunities.

Option 4, a PPP - *Concession* model, equally provides the opportunity to bring in expertise and a commercial approach. It can also provide greater opportunities to address the public/private imbalance in the current system, to increase competition and provide more choice for patients. Being a private hospital would more likely permit the Greater Bay Area and medical tourism opportunities to be taken up more substantially than Option 3. However, in many countries where health care is seen as a government responsibility, politicians and the community can be uncomfortable with the idea of public patient care being provided in a private, for-profit setting, especially using Government-funded assets. Further, public control would be less than in these other models, and the opportunity for community participation in the hospital's governance would likely be restricted. The tendering process and regulation will be more complex than Option 3. Also, as a for-profit, private hospital, the vision and sense of social responsibility of the private partner may not fully align with that of the MSAR Government.

Table 7.1 provides a comparative summary of the benefits provided by each of these optional operating models.

**Table 7.1:** Comparative benefits provided by each model

<b>Benefits</b>	<b>Option 1: Fully Government operated and managed</b>	<b>Option 2: Operate &amp; Managed by a Public Corporation</b>	<b>Option 3: PPP - Operate, Manage and Maintain</b>	<b>Option 4: PPP - Concession (lease)</b>
Expand hospital capacity to meet needs	√√√	√√√	√√√	√√√
Public control maintained	√√√	√√√	√√	
Public acceptance	√√√	√√√	√√	
Employment and training opportunities for new graduates	√√√	√√√	√√√	√√
Lead medical system reform		√	√√√	√√
Public participation in hospital governance		√√	√√	
Introduce new and innovative approaches		√	√√√	√√√
Introduce new systems and culture		√	√√√	√√√
Bring best human resources and performance management practices		√	√√	√√
Able to attract top clinical skills not attracted to a traditional public facility			√√√	√√√
Private partner bears operational risks			√√	√√
Operates on commercial basis which can lead to increased efficiency			√√	√√
Increasing quality by delivering services to contractually defined standards			√√	√√
Improve public/private balance and increase competition			√	√√√
Increased non-government funding for health care costs			√	√√
Opportunity to develop medical tourism			√	√√√

*After evaluating each of these four operating models against Macao's sustainable health care system needs and challenges going forward, it is considered that Option 3, PPP Operate, Manage and Maintain (public hospital), is the most appropriate operating model for the new Outlying Island Hospital (Recommendation 1).*

Such a PPP, with the right private sector partner, carries the potential for meaningful benefits to be gained for the MSAR Government and Macao's overall health care sector. These benefits include greater efficiency (e.g. due to private partners' operational efficiency), and better health care management. The HKU-Shenzhen Hospital is a local example of this type of PPP contract where such benefits have been achieved by introducing a renowned Operator. Other examples can be found in Brazil, where the number of treated patients increased by 30% after the introduction of a private operator in 12 new public hospitals, constructed and financed by the government (Taylor et al. 2002). Another example that shows the benefits of taking over a public hospital by a private operator is St. Goran's hospital in Stockholm, Sweden. The private operator has not only improved the quality of service but also the hospital is now able to treat 100,000 more patients annually with the same resources (Hjertqvist, 2000). Similar improvements in operational efficiency were experienced in Germany from the introduction of private operators of public hospitals, allowing increased patient volumes at the same level of funding. Quality of services is retained through Government oversight and public reporting. These international examples show that changing the medical service model for the new Outlying Island Hospital to PPP can lead to better use of public resources.

## **7.4 Major risks associated with PPP**

### **7.4.1 Political will**

Arguably the most critical enabling condition for PPP is political will. It represents political backing and a clear long-term commitment to private sector collaboration and PPP. Lack of, or changes in, political will are often key reasons for failure to attract private sector interest or to project failures. The private sector is less likely, for example, to invest resources and time into bidding on PPP projects if there is low certainty of public sector commitment. *Strong political support for the project therefore needs to be demonstrated over the immediate and longer terms.*

### **7.4.2 Unsuitable partner**

PPP fails for a variety of reasons, but one of the most common is the selection of an unsuitable 'private sector partner'. PPP contracts are long-term: getting the right partner for a lengthy relationship is essential. The private sector partner needs to be able to

significantly improve service performance beyond what the public sector would achieve. They also need to be able to introduce new management mechanisms and thinking for the development of the medical sector in Macao, introduce new technologies, and improve the overall medical technology level. Without a reputable and truly competent partner, objectives may not be fully achieved by either party. *The choice of private sector partner should, therefore, be guided by well thought through criteria in accordance with Macao's specific needs and situation.* International best practices should be leveraged in the process of soliciting bids and awarding contracts (Chapter 10).

### **7.4.3 Inappropriate risk allocation can have a material impact on viability**

A key feature of PPP is that the public sector and the private sector share both risks and responsibilities. *The appropriateness of the allocation of risks and responsibilities is a critical factor in the success of a PPP.* The private partner is granted a medium-term contract for operating, managing and maintaining the hospital with various degrees of underlying risk allocated to each partner. In the recommended option, all initial capital investments can be made by the public sector, and the Operator provides the service at their own expense and risk (including clinical performance). Thus, the risks of the investment are borne by the public sector, and the operational risks are borne by the private partner. *Achieving an appropriate balance between risk and reward for each party of the PPP through the contract terms and conditions and payment mechanisms will be essential for attracting a suitable private partner and the long-term success of the project.* If the PPP agreement is highly regulated and restrictive without sufficient financial incentive, it is less likely that a renowned organisation would be willing to take on such a partnership because it may be financially untenable (para 9.4). An example of possible risk sharing is shown at Appendix 7.1.

### **7.4.4 Upsetting balance of existing system**

The new Outlying Island Hospital is planned to have a total of 1,087 beds, an increase of some 50% on the existing total number of Macao's hospital beds. This is a significant increase and thus requires careful planning. The development of a Clinical Service Plan (CSP) for both the existing CHCSJ and the new Outlying Island Hospital will be important to delineate the roles of each hospital and to ensure any service gaps are

addressed. It will also be important to consider the future role of Kiang Wu Hospital in providing public medical services and the impact the opening of the new Hospital may have on the level of public patient services purchased by the Government from that Hospital.

Similarly, the opening of the new Outlying Island Hospital could upset the balance between primary, secondary and tertiary care in the MSAR. A surge in demand is common when supply is increased, the hospital is better run, or quality of service is improved. *This highlights that the emphasis on primary care as the core and the need for the two-way referral mechanism to remain strong* (para 8.5).

#### **7.4.5 Public partner capacity and contract management**

PPP require strong public partner capacity to manage the contractual risks. This can represent a major shift - transitioning from the role of managing facilities and delivering care directly, to one of holding others accountable for delivery, via contract performance management. Ensuring the enforcement of clinical quality and performance standards under the contract terms has proven a challenge for many governments, especially as performance is tied to payment. This shift requires a range of expertise, including project planning, contract management, legal, finance, risk management and monitoring and evaluation.

Investment in capacity building to ensure that these skills are in place will be critical. The assistance of hospital accreditation agencies to identify appropriate clinical standards and to perform periodic reviews to ensure that quality standards delivered by the Operator remain in line with industry benchmarks can also be considered. *Success in the implementation of the PPP will nevertheless hinge on the drafting of a clear and mutually binding contractual agreement that includes adequate flexibility for both partners to adapt to constantly changing demands in the health sector.*

## CHAPTER 8 SERVICE MODE OF NEW OUTLYING ISLAND HOSPITAL

Based on the analysis and recommendations in previous Chapters, this Chapter describes the proposed service mode of the new Outlying Island Hospital under Option 3.

### 8.1 The proposed Public Private Partnership (Option 3)

Under the proposed PPP, the private partner (*the Operator*) would enter into a typically 5 to 10 year agreement to *Operate, Manage and Maintain* the new Outlying Island Hospital as a public hospital and be responsible for delivering all clinical services. The Government retains ownership of the facility. A sample Service Deed is included in Appendix 8.1.

During the operating term, in accordance with the Service Deed, the Operator must:

- Deliver hospital services to public patients, in accordance with agreed Service Plans and Specifications, that are of the highest standard of patient care and safety at all times and in accordance with all Macao Health Policies.
- Integrate health care to public patients and private patients from a single facility to maximise the range and breadth of services available to the community.
- Maintain hospital facilities to ensure they are fit for their intended purpose.
- Provide health care teaching, training and research within the facility as part of the Macao health care system.
- Introduce innovative practices, and implement any health initiatives at the facility, as required by the MSAR Government.
- Participate in, and contribute to, the Macao disaster planning and measures in accordance with the directions of the Macao Government

Under the Service Deed, the Operator remains accountable to the MSAR Government, and the Government pays the Operator for the services provided to public patients. The quantity of these public patient services is agreed by the MSAR Government on an annual volume basis and at an agreed unit price (Chapter 9) through a proposed Annual Planning mechanism (paras 9.3 & 11.6). The quantity of private patient services the Operator can provide would be similarly subject to an annual agreement through this mechanism.

## 8.2 Facilities

The hospital facility managed and operated by the Operator covers all buildings and infrastructure within the Outlying Island Medical Complex necessary for proper hospital operations, including:

- General Hospital Building – encompassing emergency departments, surgical centres, specialist clinics, inpatient wards, and specialised facilities, as well as logistics facilities, such as CSSD and laundry rooms;
- Auxiliary Facilities Building;
- Central Laboratory Building (except public health laboratories)
- Integrated Services Administration Building; and
- Staff Hostel Building.

Basic functions of each building are shown in Appendix 6.1.

## 8.3 Role of the new Outlying Island Hospital

The current planning and design for the Outlying Island Hospital, as shown in Appendix 6.2, indicate that the Hospital will provide comprehensive secondary services, including an emergency centre, specialist outpatient clinics, day clinics, surgery centre, and maternity. It will also provide a range of tertiary services, including cardiology, oncology, nuclear medicine, kidney and bone marrow transplant centre, with cardiology and oncology having the greatest number of patients currently sent outside Macao for such care. These clinical services are supported by other core services, including ICU, radiology, pharmacy and pathology, which are essential for their successful provision.

However, it is important that the services to be provided by the new Hospital align, integrate and adapt to changing patterns of Macao's health needs while making the most effective use of overall health care system resources.

*A Clinical Services Plan (CSP) covering all major Macao hospitals and other operators should be developed to facilitate such alignment and provide a strategic direction for each hospital, addressing the future challenges and meeting the community's long-term health care needs (Recommendation 2).*

A key element of this plan would be to delineate the roles of each of these individual hospitals and to ensure any service gaps are addressed. Additionally, as there is an established positive correlation between the volume of service provided and the quality and clinical outcomes associated with that service, one key consideration must be the drive to ensure that future services are delivered by providers who can demonstrate proven experience in a given care area, ensuring that care quality is optimised for patients. For more specialised services, the need for ‘critical mass’ must also be considered.

### **8.3.1 Clinical Service Plan (CSP)**

Today’s clinical services operate within a rapidly changing environment. Health care systems therefore need to undertake a broad range of planning activities to meet future service obligations. The aim of clinical services planning is to provide an overarching clinical strategy, mapping out future service models and delineating the role of individual hospitals so as to enhance the service quality, address future challenges and meet the long-term health care needs of the community. It engenders coordination between various organisations within a health care system (both public and private) or between sub-units of an organisation. A CSP usually has a planning horizon of 10 to 15 years and guides future service development.

The Hong Kong Hospital Authority has, for example, formulated CSPs<sup>3</sup> for each of its clusters to map out future service models and delineate the role of individual hospitals to guide future service development. Further, international examples can be found in Canada<sup>4</sup>, Australia<sup>5</sup> and New Zealand<sup>6</sup>.

The CSP would address the key challenges facing Macao’s health care system described in Chapter 5, including an ageing population, changing population health profile, rapid

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<sup>3</sup> [https://www.ha.org.hk/visitor/template106.asp?Parent\\_ID=10221&Content\\_ID=224120&Dimension=100&Lang=ENG&Ver=HTML&Change\\_Page=1](https://www.ha.org.hk/visitor/template106.asp?Parent_ID=10221&Content_ID=224120&Dimension=100&Lang=ENG&Ver=HTML&Change_Page=1)

<sup>4</sup> [http://www.centraleastlin.on.ca/~media/sites/ce/uploadedfiles/Home\\_Page/Report\\_and\\_Publications/Integrated\\_Priority\\_Reports/CSP\\_Final\\_Report\\_Posted\\_March\\_27\\_2009.pdf](http://www.centraleastlin.on.ca/~media/sites/ce/uploadedfiles/Home_Page/Report_and_Publications/Integrated_Priority_Reports/CSP_Final_Report_Posted_March_27_2009.pdf)

<sup>5</sup> <https://www.austin.org.au/Assets/Files/Austin%202025%20Clinical%20Services%20Plan.pdf>

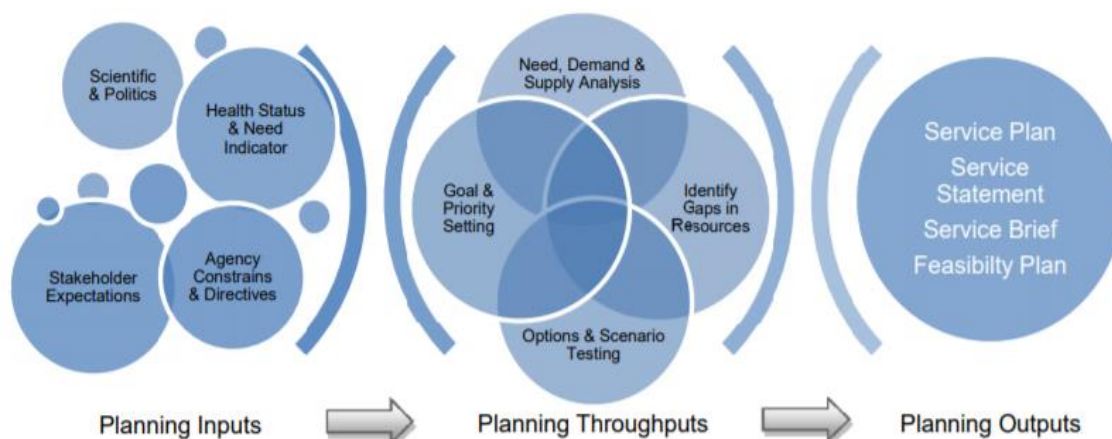
<sup>6</sup> <http://www.midcentraldnhb.govt.nz/Publications/AllPublications/Documents/RCSPFinal%20Draft.pdf>

advances in technology and rising health care costs.

### 8.3.2 Planning process

Clinical service planning for Macao's major hospitals should consider how clinical services have already developed over time, and how they should respond to future challenges.

**Figure 8.1:** A systematised approach to Clinical Service Planning



**Source:** Tahpi (2014)

Figure 8.1 describes a systematised approach to Clinical Service Planning. Using such an approach would involve a systematic assessment of Macao's health service self-sufficiency, capability and capacity, both broadly from a health system-wide perspective and from an individual clinical service perspective, and requires an understanding of:

- Macao's demographic and population characteristics of the community.
- Utilisation patterns of local health services.
- Effectiveness of the existing health service profile in meeting community requirements.
- Projected future demand for health services by service types and specialities.
- Service gaps that may exist either currently or in the future.
- How services may be developed to address those gaps.

Risks, both clinical and financial, would also be assessed in determining clinical service priorities. Other activities can include gathering relevant data, scenario analysis and actively engaging stakeholder groups. *The support of a suitably experienced external consultant to lead the clinical service planning process may be considered in order to gain an international perspective, as has been used by Hong Kong Hospital Authority.*

The output is a well-informed and relevant CSP for implementation, and subsequent monitoring and evaluation.

### **8.3.3 Role delineation**

Role delineation is a planning tool used to define the level of clinical complexity for each service specialty that is to be provided at a particular facility. It can also refer to the classification of the level of clinical services based on the sophistication of their service delivery models, including factors such as the range of clinical support services available and staff mix necessary for the clinical service to be delivered safely.

CHCSJ and Kiang Wu Hospitals provide emergency and referral-driven services. A similar role is planned for the new Outlying Island Hospital. As such, each of these hospitals will require the necessary core services (accident and emergency, general medicine, general surgery, orthopaedics & traumatology, obstetrics and gynaecology, neonatology and paediatrics, intensive care, etc.) and clinical support services (anaesthesia, pathology, radiology, etc.) needed to support their respective emergency departments. The ‘critical mass’ necessary to sustain quality standards of care and clinical efficiencies will need to be considered in determining the roles these hospitals will play in providing other specialised services such as cancer, cardiac, thoracic, vascular care, etc.

The delineated roles of these hospitals will support the MSAR health care system by aligning their service development for more integrated and patient-centred care, while meeting the escalating service demand.

### **8.3.4 Service Models**

The models of care employed must be taken into account as it directly relates to a service’s capacity to effectively respond to need. Following the identification and specifications of gaps in services, a number of service model options would be generated to identify the best option to address future needs. Service models to be considered should be based on best practice standards and be evidence-based. Working with stakeholders, service model options would be mapped according to their ability to address established goals and objectives. The acceptability, feasibility and ease of implementation of each option should also be considered (Eagar et al., 2001).

## 8.4 Governance systems, relationships and co-ordination

The Clinical Services Planning process's output is a well-informed and relevant CSP for implementation and subsequent monitoring and evaluation. Ideally, relevant stakeholders and organisations would be involved in the process or have had an opportunity to comment before the CSPs final approval. It then needs to be implemented. This will require the MSAR Government to play an active and strategic role through its leadership policies, co-ordination instruments and purchasing programmes. *These tools and governance systems should be reviewed and refined as necessary to ensure their ongoing effectiveness.*

## 8.5 Patient Services

The following categories of patients will be served by the Outlying Island Hospital:

- Emergency.
- Outpatients.
- Day patients.
- Inpatients.

### 8.5.1 Public patients

The MSAR Government would set the number of public patient services to be provided by the Outlying Island Hospital on an annual volume basis and at an agreed unit price, similar to the current purchasing arrangement with Kiang Wu Hospital, through a proposed Annual Planning mechanism (para 9.3 & 11.6).

One aspect that will need to be managed as part of that process is a possible surge in demand stemming from the increase in supply and from patients preferring to attend a new facility rather than an older, existing hospital. This may be accentuated if its services are perceived as being of higher quality, or the hospital is better run. *Accordingly, consideration may be given to acceptance of non-emergency public patients by the new Hospital on a strictly referral basis only for designated services. Emergency patients should be encouraged to attend and ambulance services directed to the closest emergency service to minimise their travel time.*

### 8.5.2 Private patients

The Operator would be entitled to provide services to private patients that are complementary to, and do not interfere with, the public patient services in order to maximise the range and breadth of services available to the community. The number of beds designated for use by private patients in the Outlying Island Hospital would be agreed annually through the Annual Planning mechanism (paras 9.3 & 11.6).

While the Outlying Island Hospital is designed, and would operate, as a single facility, private patient wards may be separated from public wards by re-designating the Emergency Block (6/F-10/F) as the private patient block. Alternately, the currently reserved 6/F – 9/F in the Emergency Block could be designated for these patients. This would allow a degree of segmentation of public and private services.

### 8.5.3 Double branding

In addition to segmenting the Hospital's public and private services, a 'double branding' strategy could be considered to leverage the likely well-developed brand of the Operator in order to capture an incremental market share of private patients, both local and from the wider Greater Bay Area. This would also likely increase opportunities to grow Macao's medical tourism.

**Figure 8.2:** Three health care double branding examples



The most common approach is to use what is called a 50/50 linked double brand, where the partners' names are given equal weight and aligned alongside each other, sometimes separated by a typographic device such as a dash (-) or a slash (/). Three such health care double branding examples are shown in *Figure 8.2*. In making such branding choices, care will need to be taken to minimise any possible brand blurring and to ensure the core values are compatible.

## **8.6 Fees and charges**

Fees and charges for public patient services at the Outlying Island Hospital should be regulated under the relevant law and administered under Macao's medical security and welfare system. These are collected by the Operator directly from service users and netted against payments to be made by the Government to the Operator for these public patient services.

Where possible, all-inclusive fee packages, or an estimated total fee, should be available to private patients to ensure that there is fee transparency.

Having a private patient element in the new Hospital will increase the choice for Macao residents and also provide an opportunity to attract clients from the Greater Bay Area, increasing the mix and volume of patients in the future to support the development of speciality services.

## **8.7 Supporting services**

The Outlying Island Hospital should be responsible for providing/contracting out its own supporting services except where the Government considers that the benefits of economies of scale can be gained from a consolidated service for both the CHCSJ and the Outlying Island Hospital from a single source.

## **8.8 Workforce**

Building the Outlying Island Hospital and investing in equipment and medical assets will not achieve the desired goals without qualified personnel to run the services. The Operator will be directly responsible for the recruitment and retention of suitably qualified staff and all other workforce matters at the Hospital, including ensuring that all staff are properly trained and accredited and act appropriately.

### **8.8.1 Core Management Team**

Under the PPP contract, the Operator (as an internationally renowned institution) would be required to bring in a strong Core Management Team lead by a well experienced Hospital Chief Executive Officer. Proposed members must have proven exemplary

skill, knowledge and experience to take up designated roles within the hospital. Bidders should demonstrate that their proposed Core Management Team meets these requirements during the tender process (para 10.4.2). Changes to core management team members during the contract period should be required to be approved by the Government under the contract requirements.

### 8.8.2 Medical staffing

The opening of the Outlying Island Hospital will require many additional medical staff, particularly specialists. The total number and specialties will depend on the Hospital's service opening plans to be agreed with the Government. Many of these medical specialists are likely to need to be recruited from other jurisdictions. In this respect, an advantage of the proposed PPP is that the renowned partner will be expected to be able to attract top clinical talent not normally attracted to a traditional public facility. *In preparation, the Government may review its regulatory and registration requirements to ensure they are optimised to facilitate this essential recruitment of clinical talents and medical specialists from other jurisdictions* (Recommendation 3). By way of example, Hong Kong has a current need to attract overseas clinicians to come and work in its public hospital system and is thus proposing a reform of its medical licensing regime to make it easier to do so.

The total number other doctors to be recruited, and the timing thereof, will depend on the hospital's service opening plans to be agreed with the Government. While it is understood that the Government has made early allowances in training programmes for these additional requirements, recruiting these staff from Macao's existing medical staffing pool may likely have the effect of artefactually driving wage inflation, which might be detrimental to the project's objectives. *The MSAR Government could consider the effect on Macao's medical staffing pool and the possible impact on wage rates when approving the new hospital's service opening plans* (Recommendation 4).

A further option, for consideration, would be for the Operator to also appoint local medical practitioners as 'visiting specialists' to undertake sessions at the Hospital and to have admitting rights for private patients.

### **8.8.3 Nursing and Allied Health staff**

Ideally, nursing staff would also be recruited locally. However, as noted earlier (para 4.2.6), Macao has an overall nursing shortage, at least in the shorter term. The completion of the Nursing College at the Macao Outlying Island Medical Complex in October 2019 will increase the number of training places for nurses available and help to reduce this shortfall. Nevertheless, recruiting all of the required large number of nurses for the new hospital's opening locally may similarly drive-up competition for these scarce resources and create wage inflation. Again, it is likely that some additional nurses, particularly experienced nurse specialists, will need to be imported requiring a possible freeing up of the health care Human Resources market place in Macao.

Similar issues will apply to the recruitment of specialist allied health staff.

## **8.9 IT systems**

Like other modern hospitals, Hospital Information Systems (both clinical and non-clinical) will be an essential part of the new Hospital's operations, contributing to improved patient outcomes and creating an efficient facility. Electronic health care records in many countries are transforming the way health care facilities operate by storing all patient records and investigation results centrally providing instant access for medical staff and improving doctor-patient interactions.

To enhance the continuity of care, and to facilitate the transition of patients between different levels of care and between the public and private sectors, the Outlying Island Hospital's Hospital Information Systems should be linked to Macao's eHR platform. This sharing of information will contribute to enhanced continuity and integration of care for the benefit of patients. Disease surveillance and compilation of health statistics to support policy formulation and undertaking research for medical purposes will also be improved.

Responsibility for procuring, commissioning and funding the hospital's IT systems is discussed in para 9.1 and responsibilities during the service period under para 9.2.4

## 8.10 Major Medical Equipment

Responsibility for procuring, commissioning and funding the Hospital's major medical equipment is similarly discussed in para 9.1 and responsibilities during the service period under para 9.2.4.

## 8.11 Teaching hospital

As a Government built facility, the Hospital should be obliged to support education, training and scientific research. ***It is therefore proposed that the MSAR Government should fund agreed teaching and research activities*** (paras 9.2.2 & 9.2.3). Negotiation and agreement will need to be reached separately with relevant health care training bodies for the establishment of these arrangements. Also, as part of its obligations under the contract, the Hospital will need to obtain accreditation from the respective Colleges of the Macao Academy of Medicine for the training of medical specialists (both basic and higher) for the doctors in training at the Hospital. Similarly, the Hospital could be required to gain relevant accreditation and provide on-site training for nursing and allied health professions.

The number of health care professionals to be required to participate in the Hospital's training programmes annually could then be agreed through the Annual Planning mechanism (paras 9.3 & 11.6).

## 8.12 Corporate Governance

The Hospital should have a governing board (Hospital Governing Board (HGB)), which could be appointed by the MSAR Government, to perform corporate governance responsibilities. Board members could include official, non-official and Operator representatives. The following may be considered:

- *Official*: Health Bureau and other relevant Government representatives.
- *Non-official*: external members from health care professions, finance and law sectors, and patients and staff representatives.
- *Operator*: Operator representatives, including the Hospital Chief Executive Officer

The MSAR Government could also appoint the HGB Chairperson.

The HGB should establish Board committees as it considers necessary to support its work, including Hospital Medical Committee, Finance Committee, Human Resources Committee and Audit & Risk Committee, as proposed in their organisational plans (para 11.4.2). The HGB should be required to submit an annual accountability report to the MSAR Government.

### **8.13 Clinical Governance**

The Hospital should establish a clinical governance framework through which the Operator is accountable for ensuring, and continuously improving the quality of its services, and safeguarding high standards of care throughout the care delivery process (11.4.2). This will include key personnel with suitable knowledge and experience and organisational structures with well-defined roles and responsibilities to lead and oversee activities that continuously improve service quality and patient safety, e.g. establishment of a Clinical Governance Committee.

Another key professional committee that may be established is the Hospital Medical Committee, established by the Board, to act on behalf of all doctors practising in the Hospital, grant admitting privileges and determine the scope of practice. The Committee will also advise on the introduction of advanced and new medical technology and medical equipment for the Hospital.

The Hospital should establish a mechanism for the monitoring, reporting and handling of clinical incidents and a system for handling complaints. Within 36 months from the Service Commencement Date, the Hospital could also be required to obtain accreditation from a qualified international accreditation agent recognised by the International Society For Quality In Health Care (ISQua).

### **8.14 Stakeholder communication and engagement in population health**

Health PPP projects have been found to fail if the clinicians are not engaged, and politicians and the population do not support them. This issue is particularly important when transforming a public facility into a PPP. To address this, the Operator should establish processes and structures by which individuals from the community, stakeholder organisations and the hospital work collaboratively to identify the health care needs most important to residents and pursue meaningful strategies through which the hospital can work to address those needs and be of most benefit to the community.

For example, the Hospital could establish a Patient Liaison Committee or Community Liaison Committee. Such strong relationships between health care organisations and consumers have been shown to be connected to a host of benefits for all parties, including lower readmission rates, better adherence to treatment plans and reduced lengths of stay.

### 8.15 Accountability reporting

In accordance with the contract requirements, the hospital Operator should ensure transparency and provide:

- An Annual Plan (to be agreed with the MSAR Government).
- Monthly performance reports against targets, KPIs and clinical indicators.
- Monthly activity reports and statistics.
- Workforce reports.
- Clinical and corporate incident reports.
- Complaints data and management report.
- Annual audited financial reports.
- Ad hoc reports as requested by the MSAR Government.

### 8.16 Payment mechanism

A defining feature of a health PPP is the payment mechanism. The payment mechanism should be structured in such a way that the net remuneration of the Operator is linked to performance, providing incentives to complete activities on time and deliver services at the performance and quality levels outlined in the Service Deed.

Generally, payments to the private party in health PPPs fall into three categories:

- ***User payments:*** These are payments collected by the Operator directly from public patients who are required to pay and private patients self-funding or indirectly through health insurance.
- ***Government payments:*** These are payments made by the government to the Operator for public patient service delivery, procurement of major equipment, teaching and research, etc.
- ***Bonuses and penalties:*** PPP contracts may also include bonus payments that are paid if specified outputs are achieved or, conversely, deductions in payment or penalties payable by the Operator if certain specified outputs or standards are

not achieved.

A PPP payment mechanism could include some or all of these types of payment, which should be fully defined in the contract and should include specification of the timing and mechanism for making the payments in practice (World Bank 2017).

### **8.17 Enabling environment**

The MSAR Government should ensure the establishment of an enabling environment so that partnering with the private sector through this PPP contract adds value to its health care system. This means establishing the regulatory and legal framework, a stable political and macro-economic environment, strong oversight institutions and governance systems for advocacy and transparency.

## CHAPTER 9 FINANCIAL ARRANGEMENTS

This chapter sets out suggested financial arrangements between the MSAR Government and the Operator under the proposed PPP contract.

### 9.1 During commissioning period

The Government will fund and construct the Hospital buildings, associated infrastructure and install necessary plant and equipment and will remain the owner of these assets. Commissioning the Hospital for service opening will then require procurement and installation of medical and other non-medical equipment, IT systems, and furniture. This activity could be the responsibility of the Government or the Operator. Under both options, Government funding would be required to commission the hospital.

#### 9.1.1 Option 1: Government responsible for procurement

Under this option, as an integral part of the hospital development, the Government would be responsible for procuring and installing those assets (e.g. major medical equipment, IT systems, and so on) that it considers necessary for the commencement of the Hospital's services taking into account the role delineation and future capacity requirements of the Hospital. However, such an approach may decrease the flexibility and the opportunity for the Operator to introduce the innovation sought by the MSAR Government through its adoption of a PPP approach.

#### 9.1.2 Option 2: Operator responsible for procurement

The second, and recommended, option allows the Operator to match the procurement of major medical equipment, IT systems, and so on with their development plans for the Hospital. Applicants would be required to propose a 5 Year Major Equipment Procurement Plan (including IT systems) and Budget as a part of their tender bid, and this would be part of the tender assessment. The MSAR Government would only fund approved items included in this Plan, and the aggregate amount of spending would be strictly controlled by the pre-agreed budget.

### 9.1.3 Commissioning plan and team

The Operator would need to establish a commissioning team to get the Hospital ready for service opening. This would include procurement of approved items, staff recruitment and training, and so on. Each bidder could be required to propose a Commissioning Plan, associated staffing plan, and budget for these activities to be funded as agreed by the MSAR Government in their bid.

## 9.2 During service period

It is suggested that Government funding for public patient services, teaching, training, research, etc. during the service period could be planned and controlled through an Annual Planning mechanism (paras 9.3 & 11.6). Funding would be provided for each year at approved levels and subject to performance bonuses and penalties. The Operator would be permitted to generate additional income by the provision of private patient services and other hospital-related business initiatives and donations.

### 9.2.1 Public patient services

As required by the Service Deed, the new Outlying Island Hospital would primarily provide hospital services to public patients largely paid for by the MSAR Government. Clearly the quantity and fees to be paid for these public patient services may need to be controlled within an agreed quantity and budget.

It is suggested that the agreed level of subsidised services to be provided in the Hospital by the Operator for the initial two years should be established and agreed through the tendering process and for subsequent years, through the Annual Planning mechanism. The quantity of services to be provided in the Hospital would take into the account the delineated role of the Hospital (para 8.3), the Operator's development plans, the estimated demand and quantity of these same services to be provided by other hospitals. The other factor is the service unit fee to be paid. Two options are suggested for establishing fee levels in the *initial two years*:

**Option 1:** All bidders could be required to submit proposals on fee levels for each

subsidised service in their tender bid. However, with no DRG based information available, this would be a difficult requirement for most bidders not already established in Macao and may well cause them to overestimate costs to minimise their financial risk.

**Option 2:** Pay the same fee levels as the Government pays to Kiang Wu Hospital. This option is preferred as it has the advantage that both hospitals would be paid the same fee for the same service. It would, however, require these fees or the relevant formula to be provided to pre-qualified bidders in the tender documents.

For subsequent years, the current method used by the MSAR Government to calculate fee levels for services provided by Kiang Wu Hospital could be applied to services provided by the Outlying Island Hospital. *Consideration could also be given to establishing a new funding formula for patient services, possibly based on DRGs, activity-based funding models and average costs of subsidised hospitals.* Moreover, a discount mechanism to drive efficiencies could be established based on the higher degree of role delineation achieved through the CSP process and efficiencies able to be achieved through associated economies of scale.

***Measures to mitigate potential 'cream skimming' risk will also need to be put in place.***

This type of risk refers to choosing patients for some characteristic(s) other than their need for care, which enhances the profitability or reputation of the provider. Under the Macao fee payment scheme, this could mean accepting less ill patients.

### **9.2.2 Designated teaching and training**

As could be required by the Service Deed, the new Outlying Island Hospital may provide health care teaching and training within the hospital as part of Macao's health care system. As this is for the benefit of Macao as a whole, it would normally be funded by the Government.

Requests for clinical placement in the following financial year, initiated by the relevant educational body, could be subject to agreement by the Hospital and funding approval from the Government, as part of the Annual Planning process.

### **9.2.3 Designated research budget**

Similarly, the new Hospital may facilitate research within its facility in accordance with the Service Deed. Again, this would normally be funded by the Government and could be incorporated in the Annual Planning process.

### **9.2.4 Funding for new and replacement Major Equipment & IT Systems**

Subject to mutually agreed changes as part of the Annual Planning process, all new major equipment & IT systems procurement should be in accordance with the Hospital's 5 Year Major Equipment Procurement Plan and Budget, approved by the Government as part of the tendering process.

The Operator would subsequently be responsible for funding the maintenance and replacement of these items.

### **9.2.5 Hospital buildings**

The Government should fund and maintain the buildings structure, external parts and the external envelope of the Hospital and relevant plant and equipment. Works related to Government-owned new development initiatives should also be funded by the Government.

It is suggested that the Operator be responsible for funding maintenance of the interior parts of the Hospital's buildings (including day-to-day maintenance, overhaul and refurbishment of plant and equipment) as this again provides the opportunity for innovation and encourages greater efficiency and a business case approach.

### **9.2.6 Minor equipment and furniture**

It is further suggested that the Operator be responsible for funding new and replacement minor equipment and furniture during commissioning and the service period.

## **9.3 Possible need for capped financial losses in start-up period**

Despite the agreed funding by the Government, the financial sustainability of the Hospital would also be dependent on the level of overall demand, particularly from

private patients, in the start-up period before the Operator can develop the expected market. Challenges noted in Chapter 5 related to Macao's relatively small population and the needs for developing more specialised services highlight this point. Initially, revenue may be lower and costs higher than anticipated. It is a significant financial risk very likely to be considered by potential bidders as losses could occur during this early period, and this may therefore negatively impact on the level of competition that can be achieved in the tendering process.

While the PPP format entails that the Operator accepts financial risks of operations, it may be necessary for the MSAR Government to also accept financial risks during the start-up years above a set level, i.e., any losses by the Operator during the early period would be capped at a value to be agreed during the tendering process. Accordingly, *the MSAR Government could consider utilising the iterative stages of the tendering process to explore the need to cap any losses by the Operator during the early period of service operation* (Recommendation 5).

#### 9.4 Annual Planning Mechanism

*An Annual Planning Mechanism through which Government agreement and funding approval will be gained for the following financial year should be established* (Recommendation 6). As can be seen from the above, the Annual Planning mechanism as proposed will play a key role through which Government agreement and funding approval may be gained for the following financial year. Additionally, this mechanism would be used to gain agreement on the level of private patient services to be provided by the Operator.

Subject to Government approval, a budget with designated components on subsidised services, teaching, etc. would be established and paid monthly to the Operator. The Operator will then be able to plan and establish the Hospital's forward programmes, manpower planning and financial planning for the coming financial year.

An end year reconciliation would be conducted, based on the Operator's actual provision and performance. Any overpayments, performance bonuses or penalties would be adjusted in the Annual Plan for the following year.

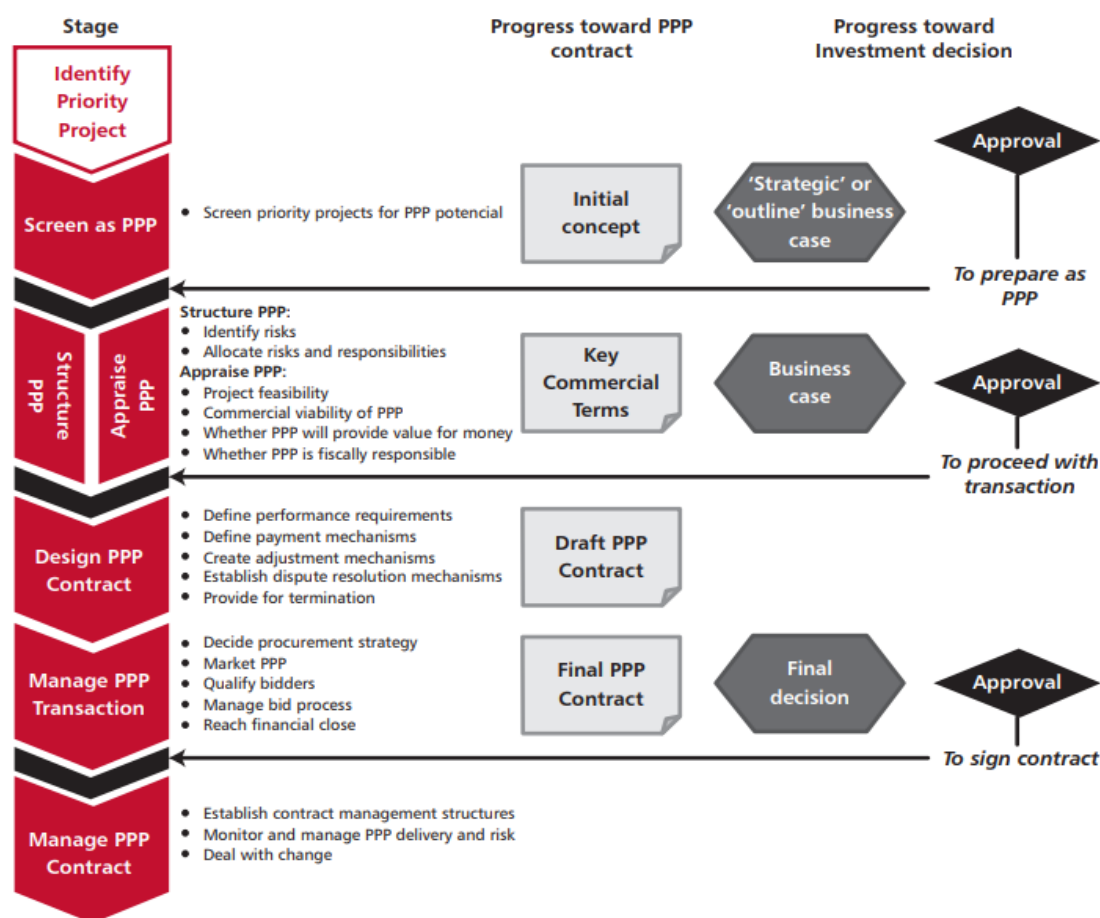
## CHAPTER 10 IMPLEMENTING AND ADMINISTERING THE PPP

Successfully implementing a PPP requires a systematic process and appropriate institutional arrangements that facilitate the government to select a competent private sector partner, and set and enforce the parameters within which that partner operates. This chapter looks at the PPP implementation process and management responsibility options to meet these requirements.

### 10.1 PPP Process

A sound PPP process must be efficient and transparent and be followed consistently to effectively control the quality of a PPP project. *Figure 10.1* depicts such a typical, well defined PPP process.

**Figure 10.1:** Typical PPP process



**Source:** The PPP Reference Guide Version 2.0 (2016).

Once the PPP strategy has been approved, the PPP needs to be structured by determining the responsibilities, rights, and risks to be allocated to each party in the PPP contract. The first step is to develop the initial project concept into key commercial terms - that is, an outline of the required outputs, the responsibilities and risks borne by each party, and how the private party will be paid. The next stage is for the government to determine the procurement strategy through which the private party will be selected. *From this process, the allocation of responsibility and risk between the public and private sectors could be clearly laid out in the PPP contract (Recommendation 8).* It will also determine the effective terms of the contract.

While structuring, procurement and negotiation of quality PPPs are important to the success of the project, effective administration of the contract, particularly when it comes to dealing with change that inevitably occurs, is also required after financial close.

## **10.2 Responsibilities for implementation and contract administration**

Government institutional arrangements for PPP project implementation and contract administration can differ widely from country to country, depending on the nature of the PPP and pre-existing institutional roles and capacities. By default, however, responsibility for implementing and administering a PPP project often falls to the Government ministry, department, or Government-Owned Corporation responsible for ensuring the relevant asset or service is provided. Nevertheless, to be successful, they should have expertise in PPP procurement and contract management, and experience in dealing with the private sector. It is therefore necessary that these responsibilities for implementation and administration of the Outlying Island Hospital PPP be assigned to a Government agency that has the incentives, information, and competence to discharge the responsibilities.

In this respect, the following two options are proposed:

**Option 1:** Establish a dedicated PPP unit within the Health Bureau.

**Option 2:** Create a Government-Owned Corporation to be responsible for this PPP.

### **10.2.1 Establish a dedicated PPP unit within the Health Bureau**

The Health Bureau is the Government ministry responsible for ensuring the service is provided. Under this first option it is therefore proposed that the Health Bureau be allocated responsibility for the Outlying Island Hospital PPP project. It is possible, however, that this Bureau will not already have all the skills needed within its existing capacity to implement and administer the PPP project successfully. A team aggregating staff with specific knowledge on PPPs will therefore likely need to be established. Additional support from other Government agencies, such as legal, may also be required. The MSAR Government may need to make concerted efforts to develop this capacity as early as possible. *Additionally, as this will be Macao's first hospital PPP project, consideration could be given to gaining the support of an experienced external consultant to lead the tendering process (Recommendation 7).*

Under this option, tendering should be conducted under the established public sector procurement rules. Experience in other jurisdictions has, however, shown that Government procurement rules may need to be tailored to allow and support the development and iterative nature of PPP projects (Chapter 11).

### **10.2.2 Government-Owned Corporation to be responsible for this PPP**

The establishment of PPPs usually require new approaches, policies and capabilities to support their implementation and management, as well as an element of flexibility. The wide range of skills required may also be new to the public sector and represents one of the key challenges for implementing a PPP project. For these reasons, an alternate option to create a new Government-Owned Corporation to be responsible for this PPP may therefore be considered.

An example of such an approach in Macao is the establishment of a Government company, the Macao Light Rapid Transit (MLRT) Corporation Limited under the Administrative Regulation No. 8/2019 of the MSAR, to manage the operation and maintenance of the local light rail system. The day-to-day operations and maintenance of the light rail system was then contracted to MTR (Macao). Such an approach may also be considered for the Outlying Island Hospital PPP project.

### **10.2.3 General principles to guide institutional arrangements for PPPs**

In considering its preferred approach, the following general principles can be used by the MSAR Government as a guide:

- Build on existing institutional responsibilities and processes.
- Design the institutional architecture appropriate to the likely scale of the task.
- Assign responsibilities to agencies that have the incentives, information, and competence to discharge the responsibilities and clearly define any institutional relationships.
- Avoid creating overlaps and additional coordination needs.

### **10.2.4 Preferred Option**

Under existing institutional responsibilities, the Health Bureau already has relevant overall health system and regulatory responsibilities. Building on these by adding operational aspects of the Outlying Island Hospital PPP project may conflict with these existing responsibilities.

The Outlying Island Hospital PPP is a high value project that in terms of scale and time period could justify the establishment of a new Government-Owned Corporation with ongoing responsibility for it. Additionally, in the event that the Government needs to exercise its Step-in Rights or an Operator Termination Event occurs, such a corporation would be better positioned to take over hospital operations, including the employment contracts of local staff and other established supplier/service contracts, thus ensuring a seamless transfer.

In both options, a team bringing together staff with specific knowledge on PPPs will need to be established. This dedicated PPP unit within the Health Bureau, as noted above, will also need to rely on additional support from other Government agencies creating additional coordination needs and alignment of priorities. A dedicated Government-Owned Corporation may have greater flexibility to source its own commercial/financial and/or legal capabilities.

Both options are workable, however, Option 2 has a number of features that may make

it superior. The preferred option will, however, ultimately need to be compatible with the macro-institutional structure of the MSAR Government and the level of decentralisation that it considers desirable.

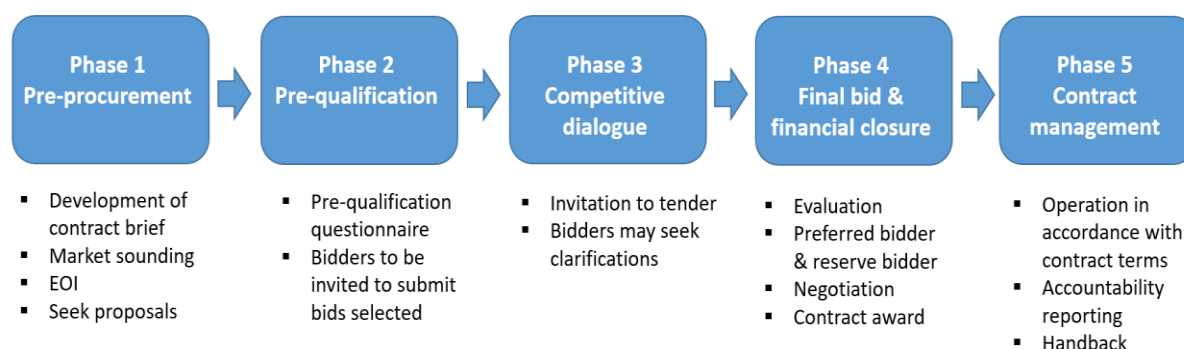
## CHAPTER 11 CONTRACTING AND ADMINISTRATION

This chapter examines the approach and potential technical issues in the tendering process, and subsequently contract administration.

### 11.1 Overall tendering process

As in any public procurement, the process should generally be a competitive process where a tender will be initiated to gather competitive bids to select an awardee from among a number of candidates. PPP tender processes around the world can have small variations but generally contain the same basic features, as shown in *Figure 11.1*.

**Figure 11.1:** Common PPP tender process



**Source:** UNECE, 2012

While the tender process will necessarily ultimately follow the applicable MSAR legal requirements and published procurement rules and guidelines, relevant factors for determining the selected approach will include the potential time constraints, the extent and nature of competition identified during the market testing, the cost of the bid process, and so on. Nonetheless, it will be important that emphasis is placed on the Pre-procurement and Pre-qualification Phases to ensure effective competition and the right private partner is found.

### 11.2 Pre-procurement

Market sounding and the Expression of Interest (EOI) in the pre-procurement phase are designed to determine the level of interest and the capability to undertake the contract.

A common method is to advertise the contract by publicising details of the project in relevant forms of mass media, such as journals or newspapers locally as well as in Mainland China and overseas. The advertisement should set out the basic details of the project and invite expressions of interest and comply, as relevant, with WTO requirements. A focused roadshow to increase awareness of the project should also be considered. Interested private sector parties register their interest in bidding for the project.

*Based on the contract brief, interested parties could be asked to express additional ideas in their Expression Of Interest (EOI) that are practical, market acceptable, innovative and beneficial to the Government's formulation of the invitation to tender, e.g., risk sharing, private services, commercial viability, payment mechanism, and so on (Recommendation 9).*

*Suggested structure and contents of the EOI document are shown in Appendix 11.1.*

The emphasis on market sounding in the pre-procurement phase and encouraging ideas to make the project more market acceptable are designed to attract sufficient interested parties to make the tendering process competitive. However, the small size of the Macao population, and hence its healthcare market, may make it challenging to achieve such a competitive situation. Also, in keeping with the MSAR Government's prevailing healthcare policy, engaging a business-oriented and commercialised healthcare service provider in this proposed PPP project may not be in the best interest of Macao and its residents. Hence, if *following market sounding, suitably qualified potential PPP service provider partners cannot be identified to achieve a competitive tendering process, other options, such as restricted tender or single tender, should be considered as long as it is in accordance with the MSAR Government procurement policies and procedures.* (Recommendation 10).

### 11.3 Pre-qualification

All countries undertaking PPP projects have some procedure for pre-qualifying interested parties for participating in the bidding process. Pre-qualification is a stage within the tender where the capabilities and capacity of the prospective bidders are

assessed so as to ensure that only bidders who meet essential requirements and have the requisite technical ability, capacity, financial standing and experience to carry out the contract successfully are permitted to bid. This is referred to as a ‘two-stage tender process’. The aim should be to select a stated maximum number of qualified candidates conducted through an ‘interactive or dialogued process’ and some ‘negotiated procedure’.

The pre-qualification document should have three parts: *Information to Applicants*; *Service Deed information*; and *Information Required from Applicants*. Additionally, for transparency purposes and to ensure objectivity, the pre-qualification document should set out the methodology and criteria to be used to evaluate applicants. These should be: quantitative and verifiable; based on verifiable experience, not future commitments; and right-sized to fit the project (both technical and financial criteria).

*Suggested structure and contents of the pre-qualification document are shown in Appendix 11.2.*

The pre-qualification document should be sent out to those private sector parties who expressed an interest (EOI) in the project. After the closing date, the pre-qualification criteria are applied to the responses received and those bidders the Government determines are eligible to submit bids are selected. Typically, at least four but no more than five bidders are selected so as to ensure meaningful competition without overburdening the process. The maximum number of bidders the Government wishes to pre-qualify through this Pre-qualification Exercise could be set out in the pre-qualification document.

#### **11.4 Information required from Applicants in pre-qualification**

Applicants are suggested to be required to submit the following information in their pre-qualification applications:

**Category 1:** Information that serves to demonstrate the fulfilment of essential requirements. Applicants must meet all of these essential requirements set out in the Pre-qualification Document.

**Category 2:** Information on an applicant’s capability in undertaking the operation of the Hospital (assessed and be given marks during the technical assessment of the application).

**Category 3:** Innovative proposals invited to be made by applicants.

#### **11.4.1 *Category 1: Essential requirements***

Based on experience from other jurisdictions, it is suggested that essential requirements could include the nature and status of the applicant (e.g. a single entity not being a Partnership or a Joint Venture) and required number of years of experience in managing tertiary hospitals (e.g. at least 10 years). Applicants should meet all of these essential requirements (Pass/Fail).

#### **11.4.2 *Category 2: Capability to undertake operation of the hospital***

The following information on an applicant’s capability to undertake the operations of the Hospital, which will be assessed and be given marks during the technical assessment, is suggested:

##### **A. Execution Plan**

##### ***1. Organisation Plans***

The Operator must implement and maintain a sustainable structure and system for the Hospital, which ensures that the provision of quality hospital services is effective and efficient, and achieves the Hospital’s mission and functions.

Applicants should provide a proposal of the Hospital’s organisation structures, and a timeline for introduction, including:

- Hospital Governing Board and all Board Committees;
- Executive structure;
- Clinical structure and committees; and
- Administrative structure and committees.

Applicants could also be required to provide proposals for establishing the following systems:

- Clinical governance;
- Clinical accountability;
- Clinical risk management;
- Corporate risk management;
- Complaints handling; and
- Stakeholder and community engagement.

## ***2. Service Opening and Development Plan***

Applicants would refer to the Service Deed for information on the clinical services to be provided by the Hospital and provide the following:

- 5-year Plan to Develop Specialised Services;
- 5-year Plan on Phased Bed Provision; and
- 5-year Plan on Phased Outpatient Service Provision.

## ***3. Human Resourcing Plan***

Applicants should propose a Resourcing Plan on the Core Management Team, grade structures for doctors, nursing and allied health and numbers of staff needed for the phased opening of the Hospital. The Resourcing Plan should include the following:

- Description of the proposed Core Management Team together with the proposed qualifications and experience requirements;
- Grade structure for doctors, nursing and allied health with provision of information on rank, qualification and experience; and
- Numbers of staff by grade according to their opening plan.

## ***4. Major Equipment Procurement Plan (including IT systems)***

Applicants should propose a 5-year Major Equipment Procurement Plan to

match proposed service opening and development plans proposed above.

#### **B. Applicants proposed Management Team Experience**

Applicants should demonstrate that their proposed Core Management Team for managing the hospital (i.e. Hospital Chief Executive Officer and his/her direct subordinates) has substantial years of experience in managing a tertiary hospital. Direct subordinates mean those directly reporting to the Hospital Chief Executive Officer.

#### **C. Financial Capability of the Applicant**

Applicants should demonstrate their financial capacity to sustainably operate the hospital over the term of the operating contract, e.g. by providing copies of their audited financial accounts for the past three years, and so on.

### **11.4.3 Category 3: Innovative proposals from the applicants**

Applicants could also be invited to make innovative proposals for hospital service opening and development, for obtaining sufficient resources, term of the contract, risk-sharing, and so on.

## **11.5 Further relevant tender requirements**

### **11.5.1 Building Maintenance**

The MSAR Government will fund and construct the hospital buildings and remain the owner of the buildings. The Operator contract should make clear which party will be responsible for the maintenance of the hospital buildings. Dividing this responsibility on an external and internal basis is the usual practice, as follows:

*The Government will maintain the buildings structure and external parts including slopes, roads and the external building walls of the Hospital. Works related to Government-owned new development initiatives will also be funded by the Government. The Government will hand over the hospital buildings to the Operator for management and maintenance upon their completion of construction on dates specified by the Government.*

*The Operator shall take over the hospital buildings on an “as-is” basis and must inspect them before the Service Commencement Date. The Operator will then be responsible for funding maintenance of the interior parts so that the buildings continue to be fit for purpose, including touch-up, floor, day-to-day maintenance covering plant and equipment items, including overhaul and refurbishment work.*

### **11.5.2 Hospital Accreditation Requirement**

Hospital accreditation is widely adopted internationally as a useful measure to sustain and improve the quality of health care services. CHCSJ is already accredited by the Australian Council on Healthcare Standards (ACHS). It is an important means by which the MSAR Government can ensure the quality of health care services provided by the new Hospital. All bidders should therefore commit to the Hospital obtaining and retaining international accreditation by a body recognised by ISQua within a period acceptable to the MSAR Government, as follows:

*Within 36 months from the Service Commencement Date, the Operator will undertake to obtain accreditation for the hospital from a qualified accreditation agent recognised by ISQua. The Operator shall maintain the accreditation obtained until the end of the Contract Service Period.*

### **11.5.3 Data Protection**

The Operator will have access to and be the custodian for confidential medical and other personal data. Given the sensitivity of such data, it will be important to include requirements for its proper handling and safeguarding in the terms and conditions of the contract, such as:

*The Operator should:*

- a. Comply with its obligations under the relevant Data Protection laws.*
- b. Only use the Personal Data as reasonably required in connection with the provision of the Services.*
- c. Comply with the procedures or processes notified to the Contractor by the*

*Government with respect to Personal Data from time to time.*

- d.** *Report to the Government any occurrence of the following as soon as practicable after its occurrence: any unauthorised access; unauthorised; or accidental disclosure of Personal Data held by the Hospital.*

#### **11.5.4 Step-in rights**

The insertion of step-in rights provisions or protective or intervention schemes is an important security mechanism, which provides comfort to stakeholders. The principal reason the Government may step-in is the non-performance or default of the Operator of its commitments that will have an adverse impact on the Hospital's operations. Such a provision could include the following:

*The MSAR Government will have a right to Step-In to the role of the Operator and assume the Operator's service delivery obligations if any the following occurs:*

- a.** *An event or circumstance which:*
  - i.** *Prevents the performance of the Operator's activities under normal circumstances*
  - ii.** *Poses a serious threat to, or causes or is likely to cause material damage or material disruption to:*
    - *the health or safety of persons;*
    - *the environment;*
    - *any real or personal property; or*
    - *the safe and secure performance of the Operator's activities and the operation of the Facility*
  - iii.** *Will require the provision of Services or alternate services materially greater than those requirements set out under the contract; or*
  - iv.** *Requires the MSAR Government to exercise any of its responsibilities or functions at law*
- b.** *An Operator Termination Event is deemed to have occurred following failure*

*by the Operator to remedy a default in accordance with the Service Deed or failure to comply with a prevention plan; or*

- c. *A 'force majeure event' occurs which also constitutes a Step-In Event*

#### **11.5.5 Exit Management Plan**

To ensure the smooth transition and continuity of the Hospital's services, the contract could require the Operator to develop and submit an *Exit Management Plan* to be activated in the event of termination or expiry of the contract, such as:

*The Operator should, prior to commencement of hospital operations, submit to the MSAR Government a draft Exit Management Plan to ensure the orderly transition of the services from the Operator to the Government or any third party designated by the Government in the event of termination or expiry of this contract for any reason. The Operator should also conduct a review on a two (2) yearly basis of the Exit Management Plan and update it as required.*

#### **11.6 Annual Planning mechanism**

An Annual Planning mechanism is the means by which the Operator should plan and establish the Hospital's programmes, manpower planning and financial planning for the coming financial year. It is also the means by which Government agreement and funding approval could be gained, as relevant, and be a basis of reporting. The following is the suggested wording for this requirement:

*The Operator shall set up an Annual Planning mechanism for advanced planning of Hospital programmes, manpower planning and financial planning for the following Financial Year. The programmes shall be in line with and for achieving the mission and function of the Hospital. The programmes shall be agreed on by the Government and the Operator.*

#### **11.7 Contract Management**

While significant attention is given to the tender procurement, evaluation and contract negotiation phases, rather less consideration is often given to contract management

issues during the service delivery phase. While performance can be driven through appropriately structured performance incentives or abatement regimes, sound contract management arrangements are required to ensure performance standards are met, and preferably exceed, expectations throughout the contract life.

### 11.7.1 Contract Monitoring

To facilitate effective contract monitoring, an Executive Steering Committee, co-chaired by representatives from the Macao Health Bureau and the Operator, may be jointly established to enable and maintain effective operational interfaces, review progress against identified targets, and to review and resolve any operational issues as these are identified.

International experience in health PPPs has demonstrated that issues often arise in the first 12 to 18 months, requiring immediate attention. These may relate to demand, costs, delays in payments, or start-up problems. *An appropriately resourced team aggregating staff with appropriate knowledge and skills should be established early to facilitate effective contract monitoring (Recommendation 11).*

### 11.7.2 Performance Monitoring

Performance monitoring is a key part of the PPP contract administration. The principal objective of performance monitoring will be to ensure that the MSAR Government receives the service the Operator has agreed to deliver and to confirm the risk allocation on an ongoing basis as agreed in the PPP contract. *Therefore, the priority is to ensure that the performance monitoring mechanisms set out in the PPP contract are properly followed and that risks, as allocated in the contract, remain with the Operator.*

In performing the Services, the Operator must achieve the targets, Key Performance Indicators (KPIs) and quality standards set out in the Service Deed. This includes, for example, managing waiting lists and strict triage times in the Emergency Department. KPI are also relevant to the service payment process. The Operator's Monthly Service Payment may be abated to the extent that the Operator fails to meet the target for any KPI and a bonus may be given where they are exceeded.

The Operator should therefore be required to record and report on its performance against this performance regime. *Examples of structures for contract monitoring and*

*KPIs for Service Volume, Quality Improvement, Efficiency and Human Resources are shown in Appendix 11.3.*

The MSAR Government should rely on the Operator's reporting to some extent but should also make itself comfortable that the performance data provided is accurate. The key is to ensure that the level of detail, format and frequency of performance reporting is adequate. A variety of additional verification methods can also be used, including user satisfaction surveys, spot checks and testing, inspections, and reviews of complaint logs and help desk records. Auditors and other agents may also be appointed for independent reviews or audit, as and if required.

Established KPIs may also need to be reviewed annually for amendment, update or substitution by the MSAR Government to ensure they are fit for purpose.

### **11.7.3 Putting in place procedures to manage change**

Service needs will inevitably change over a 5-to-10-year life span. Accordingly, *the PPP contract should contain a clear, unambiguous basis for handling, agreeing and paying for changes that are required during the life of the contract* (Recommendation 12).

The MSAR Government should carry out periodic PPP contract reviews. These reviews should identify any variations required by a changing environment and assess the Operator's overall performance under the PPP contract. If a radical departure is needed, consideration could be given to cancelling the existing contract with appropriate compensation and seeking new tenders for the remainder of the contract term.

### **11.7.4 Stakeholder management**

External stakeholders, such as members of the public or end-users of the service, will need to be engaged and managed by both the Health Bureau and the Operator. Other key stakeholders that may be considered are other government departments, legislators and non-government health care providers, such as Kiang Wu Hospital.

Effective communication will likely be the key to establishing and maintaining positive relationships. Therefore, the MSAR Government could establish a communication strategy and plan to address communication requirements with all relevant stakeholders. The plan should be activated once a decision to go down the PPP path is made and should

evolve throughout the various stages of the PPP.

The communication strategy could include an awareness campaign, regular progress updates, and mitigation measures for any issues affecting end-users and/or the community, crisis communication procedures, clear protocols for responding to queries from the public and media enquiries and a dedicated website for disseminating key-controlled messages.

## CHAPTER 12 CONCLUSION

Overall, our assessment shows that Macao has a relatively equitable healthcare system which is operating well and provides Macao residents with affordable, quality healthcare services. The system has achieved impressive health standards, being amongst the very best in the world in terms of life expectancy and infant mortality rate - two commonly used population health indicators. Also, waiting times for public hospital services compare favourably with those in Hong Kong's public hospitals.

A key factor in this achievement is the MSAR Government's policy to invest in health care to improve its citizens' health. Over the past twenty years, the Government has led a series of reforms to build a strong health care system, and the achievements are widely recognised as their positive effects have benefited all residents. A sound primary care network has been developed that offers all Macao residents easy access to primary health care services in their neighbourhoods and is the cornerstone of the system. Clearly, the Government's ongoing commitment and the leadership provided by the Health Bureau are vital drivers to optimise Macao's healthcare services and to safeguard the health of the public. However, as with global challenges facing other jurisdictions, Macao's current healthcare system will face significant challenges in the future, primarily centred on increasing healthcare needs and escalating medical costs.

Our evaluation shows that Macao is well placed to meet these challenges. Our research of overseas experience serves to inform possible future strategies the Government may consider adopting to address these challenges and to further enhance the sustainability of its healthcare system. These include leveraging innovation and innovative technology, making greater use of PPP with the private sector to complement the public health system and using strategic purchasing to improve the health system performance.

The construction of the new Outlying Island Hospital is an example of the Government's commitment to invest in its population's health. It will provide significantly increased capacity to meet the growing healthcare needs of Macao's ageing population and support larger health system goals. It also offers an opportunity to introduce reform, further develop the level of

specialist medical care and introduce medical technology advancements and best practice methods of service delivery. The recommended PPP model (Operate, Manage and Maintain) will allow the system to take up such opportunities, facilitating reform and enabling Macao's healthcare system to meet its future challenges.

Successfully implementing the PPP will require a systematic process and appropriate institutional arrangements that enable the Government to select a competent private sector partner, and to set and enforce the parameters within which that partner operates. Achieving an appropriate balance between risk and reward for each partner will also be essential to attracting a suitable private partner and to the long-term success of the project. This may include the sharing of financial risk, especially in the early period.

It will be important that the services to be provided by the new Hospital align, integrate and adapt to the changing patterns of Macao's health needs. We have therefore recommended that consideration be given to conducting clinical services planning for Macao's major hospitals in order to provide an overarching clinical strategy, mapping out future service models and delineating the role of these individual hospitals.

Building up and sustaining a healthcare workforce to meet the population's growing healthcare needs will also be important. While it is understood that early allowances were made in relevant healthcare staff training programmes for the opening of the new Hospital, the possible impact of significant local recruitment on wage rates should be considered when approving the new hospital's service opening plans. The Government can also work with the Macao Academy of Medicine to establish the specialist requirement and the development of new specialties and subspecialties in due course.

In conclusion, Macao can take pride in its healthcare system for its equity of access, affordability and quality of healthcare services. The hospital PPP service model that we have recommended for the new Outlying Island Hospital can lead to the better use of public resources, further gains in quality and will prepare Macao's healthcare system to face the impending and ongoing challenges.

## APPENDICES

- 1.1 Population Profile
- 1.2 Population Projection Indicators (total population)
- 3.1 Service Performance by major hospital
- 3.2 Specialist outpatient visits at CHCSJ
- 3.3 Out-patient Consultations by Specialty Department
- 3.4 In-patients by Specialty Department 2019
- 3.5 Waiting time for outpatient first consultation at CHCSJ
- 3.6 Number of patients transferred outside Macao for medical treatment by speciality
- 3.7 Manpower position by staff groups
- 3.8 Number of specialists in the Department of Health
- 3.9 免費專科醫療覆蓋的人群比例
- 3.10 Medical subsidy scheme
- 6.1 離島醫療綜合體總體規劃圖
- 6.2 綜合醫院大樓各層主要功能分佈
- 7.1 Sample of allocation of risk for hospital PPP project
- 8.1 Sample Structure for Service Deed
- 11.1 Sample EOI Structure and Contents
- 11.2 Sample Pre-qualification Document
- 11.3 Examples of structure & KPIs for contract monitoring and reporting

## Population Profile

### 人口概況

	2015	2016	2017	2018	2019
自然增長率 (‰) Natural Growth Rate	7.9	7.5	6.8	5.9	5.5
出生時平均預期壽命 (整體) Average life expectancy at birth (overall)	83.2	83.3	83.4	83.7	83.8
出生時平均預期壽命 (男) Average life expectancy at birth (male)	79.9	80.2	80.3	80.6	80.8
出生時平均預期壽命 (女) Average life expectancy at birth (female)	86.3	86.4	86.4	86.6	86.7
出生率 (‰) Birth rate	11.0	11.0	10.1	9.0	8.9
新生嬰兒 New born Babies	7,055	7,146	6,529	5,925	5,979
死亡率 (‰) Mortality	3.1	3.4	3.3	3.1	3.4
死亡人數 Death numbers	2,002	2,248	2,120	2,069	2,282
初生嬰兒死亡率 (‰) Infant mortality rate per 1,000 live births			2.3	3.4	1.5
初生嬰兒死亡數 Number of new born infant deaths			13	15	7
嬰兒死亡率 (‰) Infant mortality			2.3	3.4	1.5
嬰兒死亡數 Number of infant deaths			15	20	9
孕產婦死亡數 Number of maternal deaths	0	1	0	2	0
期末外地僱員 Field employees at the end of the period	181,646	177,638	179,456	188,480	196,538
准許居留人士 Persons allowed to stay	1,784	1,447	1,527	1,074	967

## Population Projection Indicators (total population)

## 總人口指標

指標	2016 (基準年)	2021	2026	2031	2036
年終人口	644 900	709 600	743 600	775 600	793 600
本地人口	531 400	575 900	605 400	624 500	637 500
居澳外地僱員	100 900	119 900	123 900	136 300	140 800
居澳外地學生	12 600	13 800	14 300	14 800	15 300
年平均增長率 (%)	3.0	1.9	0.9	0.8	0.5
出生率 (‰)	11.0	10.0	7.8	6.3	6.3
死亡率 (‰)	3.4	3.8	4.1	4.7	5.4
自然增長率 (‰)	7.5	6.2	3.7	1.6	0.9
性別分佈 (%)					
男性	47.4	47.2	47.4	47.7	47.9
女性	52.6	52.8	52.6	52.3	52.1
性別比 (女=100)	90.0	89.5	90.2	91.0	91.9
年齡結構 (%)					
少年兒童人口 (0-14 歲)	12.5	14.9	16.2	15.3	14.0
成年人口 (15-64 歲)	77.7	72.5	67.8	66.1	66.1
老年人口 (≥65 歲)	9.8	12.6	16.0	18.6	19.9
撫養比率及老化指數 (%)					
撫養比率	28.7	37.9	47.6	51.3	51.2
少年兒童撫養比率	16.0	20.6	24.0	23.1	21.2
老年人口撫養比率	12.7	17.3	23.6	28.2	30.0
老化指數	78.9	84.3	98.7	121.8	141.6
年齡中位數 (歲)	37.9	38.7	40.0	41.1	41.4
住戶總數	189 200	210 700	221 500	231 900	238 300

## Service Performance by major hospital 主要醫院的服務表現

		仁伯爵綜合醫院			鏡湖醫院			科大醫院			銀葵醫院		
		2017	2018	2019	2017	2018	2019	2017	2018	2019	2017	2018	2019
<b>Inpatient services</b> 住院服務	Inpatient discharge episodes 住院病人出院人次	21,543	22,239	23,305	31,918	32,825	34,066	4,413	3,670	3,568	464	390	417
	Bed occupancy rate (%) 床位佔用率	82.7%	81.6%	82.2%	68.9%	70.6%	76.4%	52.6%	45.4%	46.2%	94.0%	96.0%	72.0%
	Total patients length of stay (days) 病人留院總日數	226,568	232,401	244,476	217,655	225,800	234,060	11,517	9,942	10,120	343	350	261
	Average length of stay (days) 平均留院日數	10.5	10.5	10.5	6.8	6.9	6.9	2.6	2.7	2.8	0.7	0.9	0.6
	Day patient discharge episodes 日間病人出院人次	45,597	50,307	50,253	-	-	-	-	-	-	-	-	-
<b>A&amp;E services</b> 急診服務	Total attendance 總護理數目	311,736	307,826	321,877	161,365	157,169	167,507	-	-	-	-	-	-
<b>Outpatient services</b>	Specialist outpatient (SOP) attendance 專科門診護理數目	410,495	435,689	451,221	1,160,770	1,220,920	1,249,292	103,353	105,887	121,066	19,250	26,000	30,570

門診服務	Allied Health (outpatient) attendance 專職醫療（門診） 護理數目	5,779,684	6,288,283	6,417,916	1,679,926	1,832,234	1,950,981	1,679,926	1,832,234	1,950,981	4,913	5,080	3,622
<b>Community &amp; outreach services</b> 社區及外展服務		695,907	764,108	845,264	-	-	-	-	-	-	-	-	-

## Specialist outpatient visits at CHCSJ

## 仁伯爵綜合醫院專科門診人次

	2015	2016	2017	2018	2019
專科門診總人次	374,210	392,431	410,474	435,727	451,217
麻醉科	4,449	4,189	4,191	5,144	5,641
心臟科	17,436	18,098	19,053	21,536	20,675
外科	17,404	20,880	21,796	21,680	24,093
矯形外科	12,165	13,963	16,013	15,941	17,664
皮膚科	20,385	23,793	26,967	28,655	27,077
口腔科	9,156	9,888	10,484	10,908	10,008
婦科	12,613	12,072	10,971	12,093	12,261
血液科	12,072	11,910	12,491	13,808	13,990
腫瘤科	18,732	20,474	22,247	24,772	25,873
失智症診療中心	714	888	1,314	1,468	1,767
物理治療及康復科	10,399	11,853	11,193	11,071	10,874
內科	62,086	64,280	64,360	66,795	69,118
腎科	15,882	16,210	16,632	17,320	17,181
神經外科	4,528	4,788	4,898	5,416	5,932
產科	6,827	7,917	5,943	5,817	6,048
眼科	21,889	20,481	23,355	26,000	30,746
骨科	29,947	30,538	30,394	32,451	32,845
耳鼻喉科	20,810	20,653	21,286	21,835	22,051
航空醫學	152	159	168	211	224
兒科	15,084	15,525	15,305	15,027	15,247
胸肺科	13,394	13,473	14,035	15,128	16,143
精神科	28,838	30,981	35,643	38,371	39,113
泌尿科	16,992	17,978	19,133	20,052	22,722
急診門診	1,042	1,173	1,755	2,907	2,637

## Out-patient Consultations by Specialty Department

按專科統計的門診求診人次

人次 No.

專科 Medical Department	2017	2018	2019
總數 Total	1 698 346	1 788 267	1 891 678
內科 Internal Medicine	276 412	284 870	311 631
物理治療及康復科 Physiotherapy and Rehabilitation	233 848	247 041	251 769
中醫 Chinese Medicine	185 030	191 627	200 895
外科 General Surgery	188 546	197 020	201 119
兒科/新生兒科 Paediatrics/Neonatology	126 143	132 331	140 082
婦產科 Gynaecology/Obstetrics	94 530	99 118	101 015
皮膚科 Dermatology	97 699	101 268	107 500
耳鼻喉科 Otorhinolaryngology	78 896	84 289	90 079
眼科 Ophthalmology	73 665	78 042	86 469
血液腫瘤科 Haematological Oncology	52 068	58 915	60 425
口腔科/牙科 Stomatology/Odontology	47 987	47 715	47 554
骨科及創傷科 Orthopaedics and Traumatology	33 574	35 281	38 096
結核病防治 Tuberculosis Prevention and Treatment Centre	..	..	14 474
兒童綜合評估 Children Comprehensive Evaluation Centre	..	..	6 167
其他 Others	209 948	230 750	234 403

## In-patients by Specialty Department 2019

## 按專科統計的住院病人

2019	住院病人 In-patients		
專科 Specialty Department	當年入院 Admission	離院 Discharge	留院總日數 Bed Days
總數 Total	61 380	61 333	463 619
婦產科 Gynaecology/Obstetrics	10 437	10 431	44 251
兒科／新生兒科 Paediatrics/Neonatology	12 807	12 821	64 180
外科 General Surgery	10 489	10 618	68 822
內科 Internal Medicine	6 965	7 606	74 398
胸肺科 Pneumology	3 719	3 794	32 665
骨科及創傷科 Orthopaedics and Traumatology	2 633	2 526	46 780
心臟科（包括冠心病深切治療部） Cardiology (Including C.I.C.U.)	2 984	3 065	23 640
眼科 Ophthalmology	3 140	3 137	6 242
耳鼻喉科 Otorhinolaryngology	1 072	1 072	5 374
精神科 Psychiatry	572	588	24 903
血液科／腫瘤科 Haematology/Oncology	964	949	10 627
老人科 Geriatrics	619	685	12 166
物理治療及康復科 Physiotherapy and Rehabilitation	63	185	5 814
其他 Others	4 916	3 856	43 757

**Waiting time for outpatient first consultation at CHCSJ (Unit: in days)**  
**仁伯爵綜合醫院專科門診首次輪候時間（單位：日數）**

	Average 平均					Median 中位數				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
整體	41.1	37.7	44.0	44.3	39.3	-	-	-	-	-
心科	30.6	44.9	73.6	68.1	67.3	19.0	34.0	62.0	53.0	75.0
外科	38.5	28.0	32.9	37.0	28.0	27.0	14.0	22.0	29.0	14.0
矯形外科	59.7	16.4	12.8	14.2	10.6	72.0	10.0	9.0	12.0	7.0
皮膚科	17.2	8.1	8.5	10.4	14.8	11.0	4.0	4.0	7.0	14.0
口腔科	12.6	20.9	24.3	27.6	22.9	8.0	21.0	23.0	33.0	25.0
婦科	60.3	33.9	58.5	46.5	34.9	50.0	25.0	56.0	36.0	27.0
血液科	75.1	70.6	45.4	23.6	46.8	82.0	76.0	18.0	21.0	30.0
腫瘤科	55.9	18.3	24.7	14.9	31.5	54.0	19.0	29.0	13.0	29.0
物理治療及康復科	51.3	42.2	64.5	78.7	66.5	31.0	10.0	43.0	72.0	63.0
內科	18.4	22.3	24.4	23.4	16.0	9.0	15.0	14.0	14.0	7.0
腎科	44.5	23.7	29.1	48.8	53.9	44.0	20.0	28.0	52.0	45.0
神經外科	14.1	12.9	13.9	13.8	11.9	8.0	7.0	8.0	8.0	7.0
產科	42.6	32.2	73.6	44.1	24.7	35.0	24.0	71.0	36.0	11.0
眼科	20.7	75.8	66.5	52.5	36.9	13.0	76.0	72.0	56.0	42.0
骨傷科	107.0	80.4	87.9	76.9	94.9	134.0	104.0	104.0	97.0	123.0
耳鼻喉及頭頸外科	19.9	32.3	13.6	24.3	25.7	14.0	35.0	7.0	15.0	21.0
兒科	32.7	29.0	33.0	32.2	31.8	17.0	20.0	22.0	25.0	25.0
胸肺科	65.1	35.5	36.8	33.5	27.5	57.0	28.0	28.0	24.0	27.0
精神科	19.3	18.2	16.8	17.4	17.8	16.0	16.0	16.0	17.0	18.0
泌尿科	64.5	46.4	51.5	55.5	31.3	85.0	54.0	57.0	62.0	29.0

## Number of patients transferred outside Macao for medical treatment by specialty 按專科送往外地診治概況

	2014	2015	2016	2017	2018	2019
<b>送往外地診治人數</b>	<b>1,826</b>	<b>1,887</b>	<b>1,674</b>	<b>1,351</b>	<b>1,424</b>	<b>1,318</b>
香港地區	1,788	1,852	1,646	1,310	1,290	1,272
中國	8	10	10	20	112	20
葡萄牙	5	6	6	2	3	4
其他	25	19	12	19	19	22
<b>送往外地診治人次</b>	<b>3,019</b>	<b>3,374</b>	<b>3,522</b>	<b>3,332</b>	<b>3,567</b>	
內科	127	138	106	52	50	
普通外科	137	212	216	205	243	
婦科	166	204	87	49	55	
兒科	234	281	284	287	266	
心科	352	364	394	438	436	
骨科	143	146	167	180	207	
血液科	168	176	176	214	205	
腫瘤科	541	567	599	588	709	
胸肺科	170	214	191	215	253	
腎科	199	159	235	195	253	
腸胃科	25	32	49	32	16	
泌尿科	16	59	53	35	27	
神經外科	96	79	112	102	125	
矯形外科	12	25	20	36	24	
物理治療暨康復科	113	117	123	115	107	
眼科	195	221	224	192	164	
耳鼻喉科	233	257	258	248	259	
口腔科	45	40	45	23	27	
皮膚科	9	18	13	5	5	
神經病科	20	33	34	30	35	
感染科	1	1	70	10	23	
其他	17	31	66	81	78	
<b>送往外地診治醫療費用 (億澳門元)</b>	<b>2.01</b>	<b>2.24</b>	<b>2.15</b>	<b>2.11</b>	<b>2.28</b>	<b>2.18</b>

備註：

1. 送往外地診治人次是按病人於相關專科以疾病診斷作統計。
2. 送往外地診治醫療費用是按所屬年度病人的項目費用作統計。

## Manpower position by staff groups

## 員工組別的職位

Year 2019	衛生局	仁伯爵綜合醫院	鏡湖醫院	科大醫院	銀葵醫院	私家診所	其他
Medical 醫生	662	467	338	72	16	679	41
Chinese medicine 中醫	8	0	18	19	1	538	106
Dentist 牙醫	14	1	16	0	0	247	0
Nursing 護士	1,324	1,066	554	102	19	208	284
Allied Health 專職醫護	506	305	130	39	19	180	862
Management / Administration 管理／行政	2,146	964	1,025	129	42	0	0
Supporting 支援							
Others 其他							
<b>Total 合計</b>	<b>4,660</b>	<b>2,803</b>	<b>2,081</b>	<b>361</b>	<b>97</b>	<b>1,852</b>	<b>1,293</b>

## Attrition rate by Staff groups

## 員工組別的流失率

2019	衛生局	仁伯爵綜合醫院
Medical, (Medical, TCM, Dentist) 醫生（醫生、中醫、牙醫）	2.8%	（資料已包括於 衛生局數字內）
Nursing 護士	2.9%	
Allied Health 專職醫護	1.1%	
Management / Administration 管理/行政	3.3%	
Supporting 支援		
Others 其他		
Total 合計	2.9%	

# Number of specialists in the Department of Health

## 衛生局專科醫生數目

	2015	2016	2017	2018	2019
<b>專科醫生數目</b>	<b>273</b>	<b>297</b>	<b>315</b>	<b>308</b>	<b>320</b>
病理解剖科	9	8	10	9	8
麻醉科	11	10	12	13	15
心臟科	9	9	10	7	7
普通外科	13	17	16	15	18
整形外科	5	6	6	7	7
皮膚科	5	5	5	4	4
口腔科	3	4	4	4	4
消化導內窺鏡科	1	1	1	1	1
胃腸科	1	1	2	2	3
血液科	8	7	8	8	9
腫瘤科	5	6	7	7	5
物理治療及康復科	7	7	7	7	7
內科	21	22	18	22	20
法醫科	4	5	5	5	5
腎科	5	6	7	5	4
神經外科	6	5	5	5	6
神經科	3	4	3	3	4
婦產科	16	16	15	16	16
眼科	5	6	7	8	8
骨傷科	8	8	9	9	10
耳鼻喉科	5	5	7	5	6
臨床病理科	10	10	10	9	10
兒科	15	17	17	17	20
胸肺科	8	9	10	8	10
精神科	13	15	17	17	17
影像科	11	11	12	10	10
深切治療部	6	6	6	6	6
泌尿科	6	7	7	6	8
急症醫學	7	12	18	18	17
家庭醫學	38	42	44	45	44
公共衛生	9	10	10	10	11

## 免費專科醫療覆蓋的人群比例

免費人群類別	比例	資料來源／備註
65 歲或以上人士	74,100	統計暨普查局《2018 人口統計》
10 歲或 10 歲以下小童	35,000	統計暨普查局《2018 人口統計》 (由於 5 至 10 歲已包括於「中小學生」統計，因此只顯示 0 至 4 歲兒童人口。)
孕產婦	5,925	統計暨普查局網站、以 2018 年出生嬰兒數估算
中小學生	79,450	教育暨青年局網站、2018/2019 學年資料
教學人員	7,131	教育暨青年局網站、2018/2019 學年資料
特殊病患人士	24,000	以衛生局有關腫瘤科、精神科、愛滋病、傳染性疾病、毒癮等診治個案資料估算
因患病而無經濟能力支付護理費用	861	以衛生局 2018 年申請醫療援助獲批個案計算
殘疾人士	6,497	社會工作局殘疾評估登記證網站、由於部分與其他類別人士重覆，以 2018 年約 5 成資料估算
公務員	31,583	行政公職局網站、2018 年 9 月資料
囚犯	1,458	統計暨普查局網站、2018 年資料
<b>合計</b>	<b>266,005</b>	
本地人口估算	479,000	統計暨普查局網站、以 2018 年總人口扣除外地僱員資料估算
<b>免費專科醫療覆蓋的人群比例</b>	<b>55.5%</b>	

## Medical subsidy scheme

## 醫療補貼計劃執行概況

	2014 年度	2015 年度	2016 年度	2017 年度	2018 年度
已結算醫療券金額（億澳門元） The amount of medical bills settled (MOP 100 million)	2.72	2.69	2.73	2.75	2.61
使用醫療券人數 Number of people using medical vouchers	467,149	462,409	470,140	473,926	458,221
使用醫療券人次 Frequency of people using medical vouchers	-	965,183	948,636	890,219	822,986
參與的業界數目 Number of participating industries	748	755	753	737	965
綜合診所 General Clinic	214	232	243	251	-
西醫 Western	227	217	205	187	400
中醫 Chinese medicine	236	237	239	236	328
牙醫 Dentist	66	63	62	58	178
治療師 Therapist	5	6	4	5	59

備註：2018 年度起參與醫療補貼計劃需以個人牌照參加。

Note: From FY2018, participation in the Medicaid Program will be subject to an individual license.

## 離島醫療綜合體總體規劃圖

各棟大樓的基本功能如下

項目	具體設施	用途屬性
綜合醫院	急診、手術中心、專科門診、住院病房，並將設核醫學、放射治療中心、移植中心及日間門診中心等專科設施，及消毒中心和洗衣房等後勤設施；消毒中心還負責為仁伯爵綜合醫院提供消毒服務	醫療
輔助設施大樓	倉庫、廚房、保安中心等，為綜合體內各主要醫療大樓提供能源及日常的醫療和後勤物資	倉儲／能源
綜合服務行政大樓	醫院行政管理、專業技能培訓的場所	行政
員工宿舍大樓	在出現大型公共衛生事件時，為綜合體內留守的前線醫護人員提供臨時休息場所	住宿
護理學院	護理學的教學大樓	教學
中央化驗大樓	公共衛生化驗所、藥物檢測中心、捐血中心、血庫、殮房等，為綜合醫院、康復醫院和其他公共醫療設施（如衛生中心）提供各類化驗和檢驗服務	化驗
康復醫院	（正在設計，以滿足未來人口老化及康復治療服務的需求）	醫療

**Distribution of the main functions of the various levels of the General Hospital Building**  
**綜合醫院大樓各層主要功能分佈**

樓層	綜合醫院大樓各層主要功能分佈		
	住院大樓	急診大樓	面積 (m <sup>2</sup> )
<b>RF</b>	梯屋、電梯機房、冷卻塔及機房等		2,044.63
<b>16F</b>	預留發展		3,993.41
<b>15F</b>	骨髓移植中心		3,992.55
	- 病房區 8 床		
	- 診區 6 間診室		
	- 單採區		
	- 冷凍實驗室		
	皮膚、眼、耳鼻喉科、口腔科病房區 38 床		
	VIP 病人區 1 床		
<b>14F</b>	肺功能科病房區 46 床		4,067.10
	腎科病房區 44 床		
<b>13F</b>	內科病房區（兩區）共 89 床		4,067.22
<b>12F</b>	普通外科病房區（兩區）共 95 床		4,065.96
<b>11F</b>	普通外科病房區（兩區）共 95 床		5,584.04
<b>10F</b>	機電層	羈留病房區 46 床	6,067.94
<b>9F</b>	兒科病房區 49 床	病房層 47 床	6,118.28
	腫瘤科病房區 44 床		
<b>8F</b>	新生兒重症監護病房區 14 床	病房層 47 床	6,120.78
	特殊新生兒病房區 10 床		
	兒科重症監護病房區 8 床		
	新生兒重症病房區 2 床		
	產房 11 床		
	剖腹產手術室 2 間		
<b>7F</b>	婦科病房區 49 床	病房層 47 床	6,123.80
	產科病房區 38 床		
<b>6F</b>	心血管重症監護病房區 20 床	病房層 47 床	6,101.53

	心血管病房區 38 床		
<b>5F</b>	重症監護病房區	人工受孕中心	6,141.15
	- 重症監護隔離病房 12 間	- 人工受孕室 2 間	
	- 重症監護室 6 間	- 診室 4 間	
	- 重症燒傷隔離病房 2 間	- 體外受精實驗室 1 間	
	- 重症監護加護病房 18 間	預留發展空間	
<b>4F</b>	員工餐廳及廚房		8,409.19
	機電房		
<b>3F</b>	普通手術室 2 間		11,002.17
	急診手術室 2 間		
	五官、眼科手術室 1 間		
	泌尿科手術室 1 間		
	神經外科手術室 1 間		
	骨科手術室 1 間		
	混合形手術室（Hybrid OT）1 間		
	手術室預留發展空間		
	手術準備區		
	術後恢復區		
	肺科門診 5 間診室		
	內科門診 11 間診室		
	皮膚科門診 6 間診室		
	普通科門診 10 間診室		
<b>2F</b>	內鏡逆行胰膽管造影室（ERCP）2 間		11,083.54
	內鏡室 5 間		
	血管造影室 2 間		
	小型手術室 4 間		
	手術準備區		
	術後恢復區		
	心臟科門診 7 間診室		
	泌尿科門診 6 間診室		
	外科門診 12 間診室		
	耳鼻喉科門診 6 間診室		
	口腔科門診 6 間診室		

	血液科門診 6 間診室	
<b>1F</b>	<p>醫院大堂</p> <hr/> <p>腎科及洗腎中心</p> <p>-腎科診室 6 間</p> <p>-透析 36 床/椅</p> <p>婦產科中心 診室 12 間、超聲室 4 間</p> <p>神經科學中心 診室 8 間</p> <p>眼科中心 診室 5 間、激光治療室 5 間（其中一間為預留發展）</p> <p>兒科門診 診室 6 間、注射室 2 間、哺乳室 2 間、治療室 1 間、兒童觀察室 1 間</p> <p>骨科門診 診室 6 間</p> <p>抽血化驗</p>	11,817.89
<b>GF</b>	<p>影像科</p> <hr/> <p>- 診室 3 間</p> <p>- X 射線室 5 間</p> <p>- 螢光透視室 2 間</p> <p>- 血管造影室 1 間</p> <p>- 超聲室 5 間</p> <p>- 骨密度測試儀室 2 間</p> <p>- 乳房 X 射線室 1 間</p> <p>- 乳房活檢室 1 間</p> <p>- CT 室 3 間（其中一間為預留發展）</p> <p>- 磁力共振室 3T 2 間、1.5T 1 間</p> <p>- PET-CT 室 3 間（其中一間為預留發展）</p> <p>- 單光子正電子 CT 室 2 間</p> <p>- 放射性藥物實驗室 1 間</p> <p>急</p> <p>- 搶救室 1 間</p> <p>- CT 室 1 間、X 射線室 1 間</p> <p>- 急診區 17 床</p> <p>- 觀察區 15 床、透析 4 床</p> <p>- 診室 3 間、治療室 2 間</p> <p>- 胸腔 X 射線室 1 間</p>	13,550.57

	- 實驗室 1 間 配藥房	
<b>B1M</b>	羈留車停車區及入口 機電房	4,654.60
<b>B1</b>	腫瘤中心 - 診室 6 間 - 化療區 30 床/椅 - 混合劑室 1 間 藥品儲藏室 - 藥品儲藏區 - 配藥區 - 化療藥品室 1 間 - 靜脈注射藥品分配室 1 間 員工停車場	16,406.76
<b>B2</b>	放射治療中心 - 診室 10 間 - 準備/恢復區 - 螺旋斷層放射治療室 1 間 - 射波刀治療室 1 間 - 直線加速器室 2 間 - CT 模擬器室 2 間 - 磁力共振模擬器室 1 間（預留發展） - 放射性實驗室 - 預留發展治療室 4 間 迴旋加速器 中央消毒中心 員工停車場	20,136.01
面積合計：		161,549.12

## Sample of allocation of risk for hospital PPP project

### 醫院公私合營計劃風險分配樣本

Risk Category 風險類別	Description 內容	Government 政府	Private Partner 私營合作夥伴
<b>Consents 同意</b>			
Planning approvals 審批規劃	Risk of obtaining planning/building approvals 獲得規劃／審批樓宇的風險	√	
	Responsibility for complying with relevant planning approvals 遵守相關規劃審批的責任	√	
Hospital licence 醫院牌照	Responsibility for obtaining private hospital licence 獲得私家醫院牌照的責任		√
<b>Design, Construction &amp; Commissioning 設計，建築及投入營運</b>			
Design risk 設計風險	Risk that the design does not allow the Operator to comply with the performance requirements of the agreement 設計上讓營運者未能依據協議所述達到表現及要求的風險	√ (pre- handover) (移交前)	√ (post-handover) (移交後)
Construction risk 建築風險	Risk that hospital construction will not be completed on time and budget 醫院建築物未能如期及按預算完成的風險	√	
Defects risk 缺陷風險	Risk that defects are identified following completion of construction 建築物完成後發現缺陷的風險	√ (within 180 days of handover) (移交後 180 日內)	√ (> 180 days) (多於移交後 180 日)
Equipment 設備	Responsible for selection, procurement and commissioning of major equipment, furniture, other equipment & IT Systems 負責選擇、採購及試用重大設備、傢俬、其他設備和資訊科技系統		√
<b>Operational 營運</b>			

Risk Category 風險類別	Description 內容	Government 政府	Private Partner 私營合作夥伴
Fit for purpose/ability to meet performance requirements and service levels 符合目的／能力以滿足績效要求及服務水平	Risk that the design of the hospital is not fit for purpose and able to deliver the required services 醫院設計未能符合目標且無法提供所需服務的風險	√ (pre- handover) (移交前)	√ (post-handover) (移交後)
Accreditation requirements 認證要求	Risk that the hospital will not meet hospital accreditation requirements 醫院未能符合認證要求		√
Commercial risk 商業風險	Demand for, type and the actual volume of services do not meet estimates/agreements 服務需求、類型及實際量未能符合估計／協議		√
Operational risk 營運風險	The risk that operational costs exceed estimates over the life of the partnership 營運成本超越合營期間的估算		√
Performance / KPIs 表現／關鍵績效指標	Not able to meet required standards for KPIs 未能達到關鍵績效指標的要求		√
Utilities 水電設施	Ensuring continuous supply sufficient to perform hospital operations and uninterrupted services 確保時刻提供足以讓醫院不間斷營運的水電設施	√ (pre- handover) (移交前)	√ (post-handover) (移交後)
Asset management 資產管理			
Life cycle costs 生命週期成本	The risk associated with the costs of maintaining the building and replacement and refurbishment of Plant and equipment over operating term. 在經營期內與建築保養、更換及翻新大樓及設備的成本相關的風險。	√ (external building) (大樓外牆)	√ (Internal building) (大樓內部)
	The risk associated with the costs of replacing and refurbishing all medical equipment items and IT systems over the operating term.		√

Risk Category 風險類別	Description 內容	Government 政府	Private Partner 私營合作夥伴
	在經營期內與更換及翻新所有醫療設備和資訊系統成本相關的風險。		
<b>Change in laws/policy 法律／政策變更</b>			
Legal and regulatory risks 法律及監管風險	The risk that a change in legislation/regulations may impact the operations of the hospital. 立法規章變更可能影響醫院營運的風險。	√ (costs above a specified threshold) (成本超過指定門檻)	√ (costs up to a specified threshold) (成本達到指定門檻)
Tax risk 稅務風險	Risk of changes in income tax rules 所得稅規則變更的風險		√
<b>Political risk 政治風險</b>			
	Risk of adverse political events 負面政治事件的風險	√	
<b>Force majeure 不可抗力</b>			
Force majeure 不可抗力	The risk that a ‘force majeure event’ will prevent the Operator from performing its obligations under the agreement 發生「不可抗力事件」導致營運者未能履行協議規定義務的風險	√	√
<b>Financial Risk 財務風險</b>			
Funding risk 資金風險	Risk of providing funds to meet design and construction and initial major equipment costs 提供資金以支付設計、建造及初期重大設備成本的風險	√	
Operating loss 經營虧損風險	Risk that the costs of operating the hospital exceed the revenue (i.e. Loss making) 醫院經營成本大於收入（即虧損）的風險	√ (Losses above specified threshold for defined period) (虧損大於特定時間內所定的門檻)	√ (Losses below a specified threshold for defined period) (虧損少於特定時間內所定的門檻)

<b>Risk Category</b> 風險類別	<b>Description</b> 內容	<b>Government</b> 政府	<b>Private Partner</b> 私營合作夥伴
			√ (Operating Losses outside defined period) (於特定時間以 外的經營虧損)
Foreign exchange rate risk 外幣匯率風險	Risk of movements in foreign exchange rate 匯率變動的風險		√
Operating insurance premium risk 經營保險費風險	Risk of inability to obtain insurance or a material increase in insurance premiums 無法受保或保費大幅增加的風險		√

## Sample Structure for Service Deed

### 服務契約的架構樣本

#### **Project objectives**

##### **項目目標**

Specify the *New Outlying Island Hospital* project aims and objectives and role with the overall Macao Health care system.

具體說明新離島醫院項目之目標及在整個澳門醫療系統中所扮演的角色。

#### **Clinical services and features of the hospital**

##### **醫院門診服務及特質**

List the minimum clinical services to be provided and any specific performance criteria

列出需提供的最低限度臨床服務及任何特定績效準則

#### **The hospital will feature:**

##### **醫院將會提供：**

- a. xxx hospital beds;  
xxx 張病床
- b. a xx-space emergency department  
xx 空間的急症室
- c. xx operating theatres;  
xx 間手術室；
- d. state-of-the-art intensive care and critical care units;  
設備先進的深切治療部及危重症監護部；
- e. a modern inpatient mental health facility; and  
一個現代化的精神科住院設施；及
- f. xx car spaces.  
xx 個泊車位

#### **Purpose of Service Deed**

##### **服務契約目的**

1. To provide for the performance of the services, and the operation, management, and maintenance of the Facility  
提供設施服務、營運、管理及維修保養

2. To ensure that:  
確保：
  - a. Services are continuously provided at all times during the Term;  
在合約期內持續提供服務；
  - b. The Facility is and continues to be fit for Intended Purpose; and  
該設施現已及將持續符合預定用途；及
  - c. The Facility is operated by the Operator, having regard to the Project Objectives  
營運者根據計劃目標營運此醫療設施

## **Contents**

### **內容**

#### **1. Operators Service Obligations**

##### **營運者服務職責**

e.g. Services to public patients in accordance with approved Service Plans and Service Specifications

例如根據服務計劃及規格，為公共病人提供服務。

#### **2. The Operator must perform the Services having regard to the highest standards of patient care and safety at all time.**

營運者必須時刻提供最高水準及安全的醫護服務。

#### **3. Licensing**

##### **牌照**

The Operator must ensure that, at all times during the Operating Term, the hospital has all required licences.

營運者必須保證在整個營運期內持有一切所需牌照。

#### **4. Accreditation**

##### **認證**

The Operator must obtain accreditation for the Hospital from a qualified accreditation agent recognised by the International Society for Quality in Health care within 36 months from the service commencement date.

在服務啟用後 36 個月內，營運者必須為醫院從國際醫療認證機構認可的合資格機構中取得認證。

#### **5. Disaster Networking/ Planning**

##### **災難網絡／規劃**

The Operator must participate in, and contribute to, the Macao Government Disaster Planning and Measures in accordance with the directions of the Macao Government。

營運者必須按照澳門特區政府的指示，參與澳門特區政府的災難規劃和措施。

## **6. Health Initiatives**

### **醫療舉措**

The Operator shall implement any Health Initiative at the Facility as required by the Macao Government.

營運者須依照澳門特區政府的要求，在設施內推行任何醫療計劃。

## **7. Private Patient Services**

### **私家病人服務**

In operating the private patient services, the Operator:

在營運私家病人服務時，營運者：

- a. must ensure that the provision of Public Services and the performance of its obligations under this document are in no way prejudiced or compromised  
必須根據本文件所述，確保公共服務的表現及責任在任何情況下也不受損害或影響
- b. is only entitled to provide services to private patients that are complementary to, and do not interfere with, the Public Services  
只有在不干擾及與公共服務互補的情況下，才可以向私家病人提供服務
- c. must ensure, at all times, the number of beds designated for use by Private Patients is not more than the number periodically approved by the MSAR Government.  
任何時候也必須確保私家床位數目不多於澳門特區定期批核的數目

## Sample EOI Structure and Contents

### 意向書結構及內容樣本

#### 1. Introduction

##### 簡介

The purpose of conducting an expression of interest (“**EOI**”) exercise is to invite market feedback, on a non-committal basis, on a PPP project to maintain and operate a private acute tertiary hospital with provision for public patients based on a service/procurement contract with Government.

徵求意向書（EOI）的目的，是以不須承諾的方式，就建議的公私合營計劃，根據與政府簽訂的服務／採購合約，維持和營運一間為公共病人提供第三層醫療服務的私營急症醫院，探測市場的反應。

*Location: XXXXX*  
地點：XXXXX

*Date of commencement of operation: XXXXX*  
啟用日期：XXXXX

*Bed capacity: XXXXX*  
病床數目：XXXXX

*Service scope and facilities: XXXXX*  
服務範圍及設施：XXXXX

*Service standards* – should meet the requirements in relation to the relevant laws of Macao.  
服務標準——應符合澳門相關法例的要求。

#### 2. Details of the site:

##### 興建地點的詳細資料：

XXXXXXXXXXXXXXXXXXXXX  
XXXXXXXXXXXXXXXXXXXXX

#### 3. Information to be included in the EOI by the respondents:

##### 回覆者須在意向書中列明的資料：

#### Section I: Particulars of the Respondent

##### 第一節：有關回覆者的資料

##### a. Identification of the Respondent

###### 用於識別回覆者的資料

- i. Name of the organisation.  
機構名稱。
  - ii. Local contact address in Macao, if applicable.  
澳門本地聯絡地址（如適用）。
  - iii. Web site URL and logo.  
網站 URL 及機構標誌。
  - iv. Key contact person (Name, Title, Mailing address, Telephone, E-mail).  
主要聯絡人（姓名、職位、郵寄地址、電話、電郵）。
- b. Organisational information of the Respondent  
回覆者所屬機構資料
- i. Brief description of the history of the Respondent as an organisation.  
簡單介紹回覆者的機構歷史。
  - ii. Details of the directors, shareholders, intermediate and ultimate holding company or beneficial owner, and government or state ownership of the Respondent.  
有關回覆者之董事、股東、中間人和最終控股公司或實益擁有人，以及政府或國家擁有權的詳細資料。
  - iii. Details of its activities in and/or outside of Macao, if any.  
回覆者在澳門及／或以外的活動之詳細資料（如有）。
  - iv. Description of its experience and expertise in operating and managing western medicine hospitals.  
描述回覆者在營運和管理西醫醫院方面的經驗和專業知識。
  - v. Potential partnership with industry players and relevant organisational information of the potential partner(s).  
與行業參與者的潛在合作夥伴關係，以及潛在合作夥伴的相關機構資料。

## **Section II: Proposed Hospital Operation**

### **第二節：建議的醫院營運方式**

- a. *Summary of the proposed Hospital Operation:* Description that summarises the proposed Hospital Operation.  
*建議醫院營運方式的摘要：描述建議醫院營運方式的摘要。*
- b. *Summary of the Hospital's governance structure, clinical accountability model and clinical risk management.*  
*醫院管治架構、臨床責任模式及臨床風險管理的摘要。*
- c. *Summary of clinical services to be provided in the Hospital:*  
*醫院將提供的臨床服務摘要：*

- i. clinical activities; and  
臨床活動；及
  - ii. nature and scope of services including, if any, clinical services for specific diseases (e.g. stroke care from acute management to rehabilitation).  
服務性質和範圍，包括針對特定疾病的臨床服務（如有）（例如中風的緊急治療到康復護理）。
- d. *Staff arrangements:* The estimated manpower requirements for running the Hospital and the manpower plan.  
員工安排：估計營運醫院所需的人力及相關計劃。
- e. *Financial model:* Description of the budgeting arrangements for the Hospital development and the proposed financial model, including:  
財務安排模式：描述醫院發展的預算及建議的財務安排模式，包括：
  - i. nature and source of investments required (for operations, maintenance, etc.);  
所需投資的性質及來源（用於營運、維修保護等）；
  - ii. sources of income; and  
收入來源；及
  - iii. proposed allocation of profits (e.g. profit directed to the improvement/extension of hospital services).  
建議的利潤分配（例如利潤用於改善／擴展醫院服務）。
- f. *Implementation timeframe:* The development timeframe upon taking possession of the Hospital, and in the case of development by phases, the nature and scope of services and manpower to be provided in each phase.  
推行時間表：在接收醫院後的發展時間表。當中若涉及分階段發展，需包括每個階段需提供的服務性質和範圍，以及人力安排。
- g. *Other feedback and comments:* Any key issues and concerns of the Respondent, and any factors that may affect the interest of the Respondent.  
其他回饋和意見：回覆者任何重要問題和關注事項，以及任何可能影響回覆者利益的因素。
- h. *Collaboration with other healthcare services providers/education institutions:* Details of proposed collaboration in the following areas:  
與其他醫療服務提供者／教育機構的合作：並就下列各項提供建議合作的詳細資料：
  - i. any proposals for staff cross-attachment among the Hospital, other public and private healthcare facilities, and/or educational institution and the expected benefits; and

就醫院、其他公共及私人營醫療機構和／或教育機構之間員工交換計劃的任何建議以及預期效益；及

- ii. benefits of the proposed collaboration.  
建議合作的好處。

**Additional information**  
其他資料

**Sample Structure for Pre-qualification Document**  
**資格預審文件結構樣本**

**This Pre-qualification Document** could comprise the following structure:  
此資格預審文件可包括以下結構：

- |                                                                         |                                       |
|-------------------------------------------------------------------------|---------------------------------------|
| Part (I)                                                                | Information to Applicants.            |
| 第一部分                                                                    | 申請人須知。                                |
| Part (II)                                                               | Service Deed Information.             |
| 第二部分                                                                    | 服務契約資料。                               |
| Part (III)                                                              | Information Required from Applicants. |
| 第三部分                                                                    | 申請人提供的相關資料。                           |
| Appendices (other information, ideas & proposals to be made by bidders) |                                       |
| 附錄（投標者應提供的其他資料、意見及建議）                                                   |                                       |

**Part (I): Information to Applicants**  
**第一部分：申請人須知**

***Information on the Hospital***  
**醫院資料**

1. Site location;  
興建位置；
2. xx hospital beds;  
xx 張病床；
3. xx operating theatres;  
xx 間手術室；
4. State-of-the-art intensive care and critical care units;  
設備先進的深切治療部及危重症監護部；
5. Clinical services and features of the hospital  
醫院的臨床服務和特點

Types of clinical services to be provided by the successful tenderer (but not limited to):

成功投標者將提供的臨床服務類型（亦可能包括其他服務）：

- a. Emergency Medicine 急診
- b. etc. 等等

Details of Teaching, Training, Education and Research to be undertaken  
將進行的教學、培訓、教育及研究活動的細節

## **Part (II): Service Deed Information**

### **第二部分：服務契約資料**

The Project adopts a Public-Private Partnership (“**PPP**”) model.  
此計劃採用公私合營（PPP）模式。

Description of the proposed PPP model, including:  
提議的公私合營模式說明，包括：

- Hospital is being built on the Site, which is land owned by the MSAR Government.  
醫院正於澳門特區政府所擁有的土地上興建。
- Government will own the Hospital.  
政府將擁有醫院。
- Government may also fund major equipment, furniture and equipment and IT Systems that the Government considers necessary for the commencement of Hospital Services taking into account the eventual role delineation and future capacity of the Hospital.  
政府可能會鑑於醫院的最終角色及其未來的服務能力，就其認為啟動醫院服務所需的主要設備、傢具、儀器及資訊科技系統撥款。

### **The Pre-qualification Exercise**

#### **資格預審**

Purpose of this Pre-qualification Exercise.  
資格預審的目的。

Since this is the first time the Macao Government will undertake a PPP program to operate a hospital, the Government would like to, in addition to identifying Pre-qualified Tenderers, obtain ideas which are practical, market acceptable, innovative and beneficial to the Government’s formulation of the Invitation to Tender. Applicants may provide such ideas conducive to the development of the Hospital under Category 3 information.

由於這是澳門政府首次透過公私合營計劃經營醫院，政府不僅須確定投標人符合資格，亦希望得到實用、獲市場認可、創新而有助政府制定招標文件的構思。申請人可在第三類資料下，提供有利醫院發展的建議。

The Government will prequalify not more than **X** numbers of Applicants as Pre-qualified Tenderers through this Prequalification Exercise.  
在是次資格預審中，政府不會邀請多於 **X** 名申請人參加資格預審。

### **Part III: Information required from Applicants**

#### **第三部分：申請人提供的相關資料**

**Category 1** - information that serves to demonstrate fulfilment of essential requirements.

**第一類**——足以證明符合必需要求的資料。

Applicants should meet all of the essential requirements set out in the Pre-qualification Document.

申請人應符合資格預審文件中列明的所有必需要求。

#### **Eligibility and Other Criteria**

##### **所需資格和其他條件**

e.g.

例如

- a. An applicant must be a company limited by guarantee under the Laws of Macao or an NGO or such like  
申請人必須是根據澳門法律成立的有限公司或非政府組織等
- b. An applicant must have at least x years of aggregate experience in managing tertiary hospitals  
申請人必須具有至少總計 x 年管理提供第三層醫療服務醫院的經驗

#### **Category 2**

##### **第二類**

Information on an Applicant's capability in undertaking the operation of the Hospital to be assessed and given marks during the technical assessment of the Application.

有關申請人營運醫院能力的資料，將在是次申請的技術評估過程中接受評估，並獲得評分。

### **Information required for Part II**

#### **第二部分的所需資料**

#### **Execution Plan - Organisation Plan**

##### **執行計劃——組織計劃**

e.g. Clear organisation charts of the Board of Directors and the Committees, the Hospital Administrative Structure and the Hospital Committees within, and the Executive Committee Structure and the Hospital Committees within.

例如董事局和委員會、醫院內部的行政架構和各類委員會，執行委員會架構及醫院委員會的清晰組織架構圖。

## **Execution Plan – Service Opening and Development Plan**

### **執行計劃——服務啟用及發展計劃**

Applicants may describe the implementation plan on the proposed phased services provision in the initial two (2) years of the Service Period and expected services provision throughout the Service Contract Period.

申請人可描述在服務期首兩年提議分階段提供的服務，以及整個合約期內預計會提供服務的實施計劃。

## **Execution Plan– Resourcing Plan**

### **執行計劃——資源計劃**

The Resourcing Plan could include the proposed Core Management Team and the Grade structure for medical, nursing and allied health with information on rank, qualification and experience.

資源計劃可包括建議的核心管理團隊及醫療、護理和專職醫療人員的職位架構，當中包括職級、所需資歷和經驗等資料。

## **Experience of the Applicant’s Proposed Management Team**

### **申請人提議管理團隊的經驗**

Applicants shall demonstrate that the Applicant's proposed Management Team managing the Project have adequate expertise and experience.

申請人應證明由其建議用於管理項目的管理團隊，具備足夠的專業知識和經驗。

## **Financial Capability of the Applicant**

### **申請人的財務能力**

Information to enable the applicant’s financial capability to be assessed.  
用於評估申請人財務能力的資料。

## **Category 3**

### **第三類**

Information submitted through invited proposals from the Applicants to reflect market initiatives, which are conducive to the Hospital development. These will be considered by the Government in formulating requirements at the Tender stage.

獲邀投標的申請人可在建議書內提交能反映市場舉措而有利醫院發展的資料。政府將在招標階段制定要求時考慮這些因素。

## Sample structure & KPIs for contract monitoring and reporting 合約監督和報告的結構及關鍵績效指標例子

### STRUCTURE 結構

An Executive Steering Committee, jointly established and co-chaired by representatives from the Health Bureau and the Operator, maybe established and meet regularly to maintain an effective operational interface, review progress against identified requirements, and review and resolve any operational issues as these are identified.

衛生局及營運者代表可共同成立及主持執行指導委員會，並定期舉行會議，以維持有效的營運、根據已確定的要求檢討進度，並在確定這些要求後檢視及解決所有營運上的問題。

### MANAGING ACTIVITY AND VOLUME

管理活動及服務量

#### *KPI on Service Volume 服務量關鍵績效指標*

##### **Inpatient 住院病人**

Number of inpatient discharges and deaths

住院病人出院和死亡人數

Number of inpatient patient bed days

住院病人的住院日數

Number of A&E attendances

急診求診人次

Number of A&E follow-up attendances

急診覆診人次

##### **Outpatient 門診**

Number of specialist outpatient (clinical) attendances – First

專科門診（臨床）就診人次 – 首次

Number of specialist outpatient (clinical) attendances – Follow-up

專科門診（臨床）就診人次 – 覆診

Number of specialist outpatient (clinical) attendances – Total

專科門診（臨床）就診人次 – 總數

Total number of primary care attendances

接受基層醫療服務病人總數

Number of allied health (outpatient) attendances

專職醫療（門診）就診人次

## PERFORMANCE REQUIREMENTS AND PERFORMANCE MANAGEMENT

### 績效要求及績效管理

The Operator's performance could be managed under a performance management framework which includes the service specifications and key performance indicators (KPIs) detailing the nature and quality of the services to be provided (outcomes-based service levels)

可使用績效管理框架管理營運者的表現。這框架包括服務規範及詳細列明需要提供服務的性質和質素的關鍵績效指標（KPI）（以結果為基礎的服務水平）

### *KPI for Quality Improvement*

#### 改善質素的關鍵績效指標

#### **Waiting Time 輪候時間**

Waiting Time for Accident and Emergency Services

急診服務輪候時間

Percentage of A&E patient attendances seen within target waiting time

*[for each of triage category I, II, III & IV]*

在目標輪候時間內得到診斷的急診病人百分比

*[分別以第一、第二、第三及第四類分流級別計算]*

Waiting Time for Specialist Outpatient New Case Bookings

預約專科門診新症的輪候時間

Waiting Time for Allied Health Outpatient New Case Bookings

預約專職醫療門診新症的輪候時間

Waiting Time for Elective Surgery, e.g. total joint replacement

非緊急手術的輪候時間，例如全關節置換手術

Waiting Time for Diagnostic Radiological Investigations

放射診斷檢查的輪候時間

#### **Appropriateness of Care**

治療的適切性

Standardised admission rate for A&E patients (%)

急診病人的劃一入院比率（%）

Unplanned readmission rate within 28 days for general inpatients (%)

普通科住院病人在出院後 28 天內未經預約的再入院率（%）

#### **Infection Rate**

感染率

MRSA bacteraemia in acute beds per 1 000 acute patient days

急症病床中每 1,000 個急症住院日數出現耐甲氧西林金黃色葡萄球菌菌血症（MRSA bacteraemia）的比率

## ***DISEASE-SPECIFIC QUALITY INDICATORS***

### **特定疾病的質素指標**

[These would be chosen based on relevance to a hospital's clinical services and volume]

〔將根據與醫院臨床服務和服務量而定〕

#### **Hip Fracture: Waiting Time for Surgery**

髖部骨折：手術輪候時間

Percentage of patients indicated for surgery on hip fracture with surgery performed  $\leq 2$  days after admission through A&E

透過急症室入院後  $\leq 2$  天進行髖部骨折手術患者的百分比

#### **Diabetes Mellitus Control**

糖尿病控制

Percentage of diabetes mellitus patients with HbA1c  $< 7\%$

HbA1c 控制在  $< 7\%$  的糖尿病病人百分比

#### **Cardiac Services: Access to Effective Cardiac Care Services**

心臟科服務：獲得有效的心臟醫療服務

Percentage of acute myocardial infarction patients prescribed with Statin at discharge

出院時獲處方他汀類藥物的急性心肌梗塞病人百分比

Percentage of ST-elevation myocardial infarction patients received primary percutaneous coronary intervention

接受基本冠狀動脈介入治療術治療 ST 段升高心肌梗塞病人的百分比

### ***KPIs on Efficiency***

#### **有關效率的關鍵績效指標**

#### **Operating Theatre Utilisation 手術室使用率**

Utilisation rate of scheduled elective OT sessions (%)

預定安排的擇期手術室節數時段使用率 (%)

#### **Bed Management 病床管理**

Inpatient bed occupancy rate (%) – Overall

住院床位佔用率 (%) – 整體

Average length of stay (days) for general inpatients

一般住院病人的平均住院日數

### ***KPIs on Human Resources***

#### **人力資源的關鍵績效指標**

**Manpower 人手**

Manpower position 人手職位

Attrition (wastage) rate (%) 損耗率 ( % )

Resignation number and rate 離職人數及比率

**Injury on Duty 因工受傷**

Number of injury on duty cases per 100 FTE staff

每 100 名全職員工因工受傷的人數

Number of injuries on duty leave days taken per 100 FTE staff

每 100 名全職員工因工受傷的休假天數

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