

# DUBAI CLINICAL SERVICES CAPACITY PLAN 2018-2030







”إن صحة الإنسان هي الأهم والأعلى وبدونها لا تستقيم الحياة البشرية ولا تنعم بالسعادة وطيب العيش.“

**صاحب السمو الشيخ محمد بن راشد آل مكتوم**  
نائب رئيس الدولة رئيس مجلس الوزراء حاكم دبي ”رعاه الله

“Good health is the most important thing. Without it, people cannot enjoy a good living”.

**His Highness Sheikh Mohammed bin Rashid Al Maktoum**  
Vice President and Prime Minister of the UAE and Ruler of Dubai





”يحظى القطاع الصحي في دبي بأولوية قصوى لضمان توفير أرقى الخدمات الصحية وتقديم رعاية نوعية عالية المستوى ترقى إلى أفضل المعايير العالمية، ما يمكننا من تحقيق قفزات نوعية في خدماتنا الصحية وتطوير سياسات واستراتيجيات قادرة على تقييم التحديات الصحية المختلفة بصورة علمية ودقيقة تواكب المتغيرات في هذا القطاع، وبما يعزز طموحنا ببناء قطاع صحي عالمي.“

**سمو الشيخ حمدان بن محمد بن راشد آل مكتوم**

ولي عهد دبي رئيس المجلس التنفيذي

“Dubai highly prioritises its health sector to ensure the provision of the highest quality of health services that are on par with the best international standards. This enables us to develop policies and strategies that are capable of assessing the various health challenges in a scientific and accurate manner thus supporting our ambition to build a leading healthcare sector.”

**His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum**

Crown Prince of Dubai and Chairman of the Dubai Executive Council



”لقد أدركت هيئة الصحة بدبي أهمية التخطيط الصحي باعتباره عملية مستمرة من الأهداف والوسائل لتطوير الخدمات الصحية، فتلاحقت جهودها في إعداد وتنفيذ الاستراتيجيات ووضع البدائل المستقبلية لها.“

**سمو الشيخ حمدان بن راشد آل مكتوم**

نائب حاكم دبي وزير المالية رئيس هيئة الصحة بدبي

“The Dubai Health Authority (DHA) has recognised the importance of health planning as a continuous process that comprises of goals and plans to develop health services. As a result, the DHA has been diligent in preparing and implementing strategies and developing future alternatives.”

**His Highness Sheikh Hamdan bin Rashid Al Maktoum**

Deputy Ruler of Dubai, UAE Minister of Finance and President of the Dubai Health Authority



# الرؤى والتطلعات



حرصت هيئة الصحة بدبي - ضمن سياستها المتجددة - على أن تكون الدراسات والبحوث العلمية والميدانية، هي الأساس في صناعة القرار وصياغة المبادرات والبرامج التطويرية التي تتبنى تنفيذها وصولاً إلى مجتمع أكثر صحة وسعادة.

وتستند الهيئة في مجمل ما تقوم به في هذا الشأن إلى تطلعاتها المستقبلية في نموذج صحي من الطراز الأول يحتذى به عالمياً، أخذة في حساباتها الطلب المتنامي على خدماتها الطبية، وثقة المتعاملين معها، وهدفها الرامي إلى تحقيق رضا وسعادة المجتمع وتحسين رحلة المرضى داخل منشأتها الطبية، وتوفير خدمات عالية الجودة بمعايير عالمية.

ويتوافق مع هذه المحددات والأهداف دراستنا الجديدة.. (دراسة السعة السريرية في إمارة دبي)، التي جاءت مواكبة ومترجمة لرؤى صاحب السمو الشيخ محمد بن راشد آل مكتوم نائب رئيس الدولة رئيس مجلس الوزراء حاكم دبي "رعاه الله"، وتوجيهات سموه الكريمة في البند الخامس من وثيقة الخمسين (طبيب لكل مواطن)، حيث تركز الدراسة على: تقييم وتقدير حجم الطلب على التخصصات الطبية وأعداد الأطباء والكوادر الطبية المساندة والفنية، وعدد الأسرة، إضافة إلى تقييم وتقدير حجم الخدمات الصحية المتوفرة حالياً، وحجم الطلب على هذه الخدمات حتى عام 2030، في ضوء التعداد والنمو السكاني للمواطنين وجميع أفراد المجتمع وأيضاً الزائرين، ورواد معرض إكسبو 2020 دبي.

في هذه الدراسة وخلصتها العديد من المقومات والأسس، التي تمكن الهيئة من قراءة المستقبل بشكل أفضل وأكثر وضوحاً، ومن ثم التعامل مع مقتضياته بالأسلوب الذي يعزز جودة الحياة.

ما نأمله ونتطلع إليه هو أن ينعم الجميع بصحة وسعادة، وأن تكون هيئة الصحة بدبي في الطليعة دائماً.

**حميد محمد القطامي**

المدير العام  
هيئة الصحة بدبي

## VISION AND ASPIRATION

DHA is working towards achieving its vision of building a world-class healthcare system that keeps patient-centered care in mind and provides access to high quality medical services that are on par with international standards.

This is in line with the vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai and in line with the goals of Article five (A doctor for every citizen) of the 50-Year Charter.

Dubai Clinical Services Capacity Plan 2018-2030 (DCSCP) is an important tool that provides us with an in-depth look into clinical services capacity in Dubai so that we can devise evidence-based plans and policies, undertake future facility planning and focus on priority health-service areas.

DCSCP provides essential information and data as well as envisages the demand for clinical service capacity until the year 2030. It evaluates and assesses the demand for medical specialities, doctors, nurses, technicians and number of beds. It also assesses the current number of medical services available and the expected demand for these services, taking into account Dubai's population, visitors and Dubai Expo 2020.

I am confident that the plan will help us achieve a balanced geographical distribution of health services across Dubai and fulfil our vision of providing residents and visitors of Dubai with access to high-quality health services.

**Humaid Al Qutami**

Director General  
Dubai Health Authority





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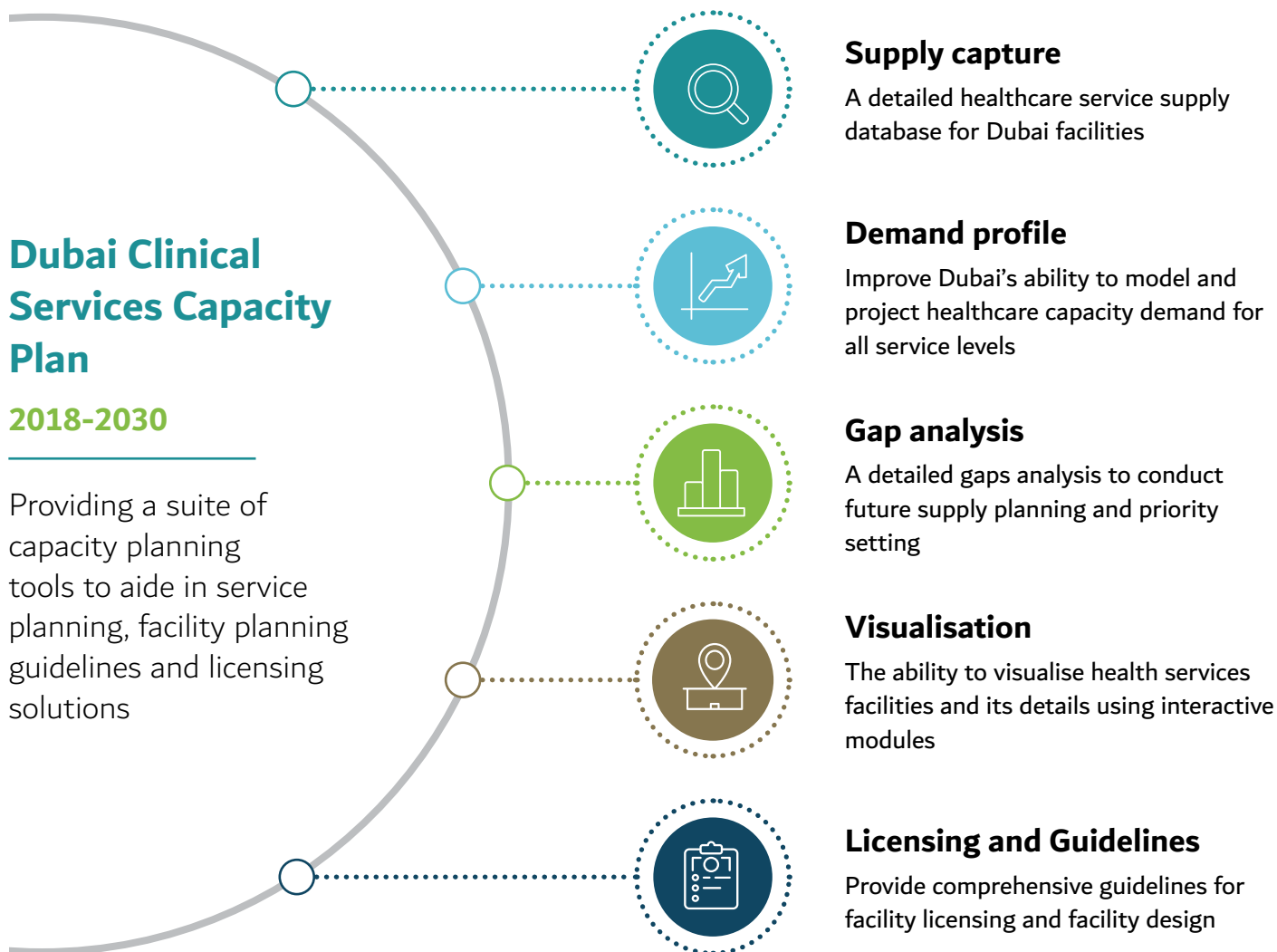
CHAPTER 1

# PROJECT OVERVIEW

This chapter describes the rationale, framework, the main objectives and the benefits of the Dubai Clinical Services Capacity Plan 2018-2030.

## 1.1 Dubai Clinical Services Capacity Plan 2018-2030

Endorsed and supported by the H.E. Humaid Mohammed Obaid Al Qatami, the **Dubai Clinical Services Capacity Plan 2018-2030 (DCSCP)** assists in delivering the 15 Ambitious Strategic Programs of the Dubai Health Strategy 2016 – 2021. The DCSCP aims to develop a Health Network Capacity Plan to benefit patients, investors and the community.



The objectives of the DCSCP are to:

- To capture and validate the current supply of clinical service capacity
- Integrate the planned clinical service capacity approved for development
- Project the demand for clinical service capacity through to 2030 taking account of the Dubai’s resident population and visitors using health service in Dubai from other United Arab Emirates and elsewhere
- Develop scenarios to assess the impact of demand on health service capacity
- Assess the gap in the supply of clinical service capacity for each scenario
- Identify short and long-term priorities and strategies for the development of clinical services
- Develop a mapping tool for displaying the current supply of health service facilities
- Produce a guide to clinical service capacity development and policy recommendations
- Provide comprehensive guidelines for facility licensing and facility design

The DCSCP is a periodic study conducted to understand the current healthcare sector, the demand, supply and existing and future gaps of services. The study was conducted across government and private sectors in Dubai. The data collected and developed was validated and analysed to provide a comprehensive report to guide capacity planning for Dubai healthcare until 2030.

The DCSCP brings together the collaborative efforts of the Dubai Health Authority to create a detailed and practical planning guide that supports the development of the Dubai health sector in delivering efficient, effective, comprehensive and quality services to the community.

The DCSCP was developed by the Policy and Strategy Department, Dubai Health Authority (DHA) but executed collaboratively by DHA and Total Alliance Health Partners International (TAHPI), an experienced and internationally renowned health planning firm.

This report is based on a robust and detailed survey of the current supply of services by facilities and a systematic assessment of the future demand.



“DHA’s Dubai Health Strategy 2016-2021 has three key goals these are: drive innovation and ensure governance, protect and improve population health and ensure patient happiness by providing world-class health services. These goals aim to fulfil DHA’s vision and our focus is working across a continuum of care, starting from early prevention and detection of disease all the way to rehabilitation.”

**Fatima Abbas**

CEO, Strategy and Corporate Development Sector, DHA



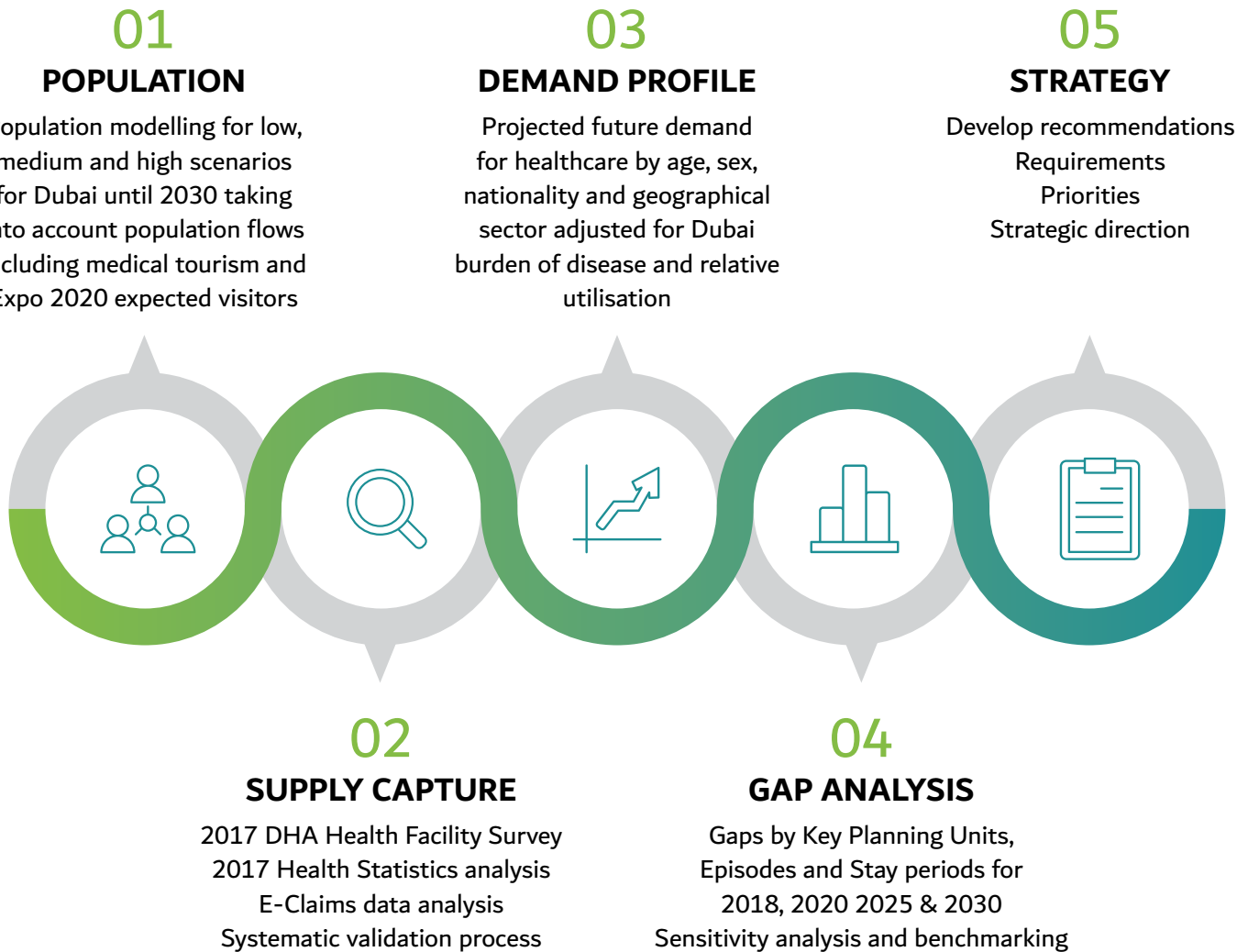
## CHAPTER 2

# METHODOLOGY OVERVIEW

The chapter describes the methodology used to conduct the supply and demand assessment, as well as give an understanding of the areas focused on to identify gaps for development.

## 2.1 Methodology process

A systematic and incremental method was adopted in developing the DCSCP, progressing from population modelling, supply capture, demand modelling and gap assessment. This process and its components are summarised as below.



Initially supply data was gathered by conducting a survey of clinical services supplied in 2017 and validating these results using external data sources such as E-Claims and 2017 Health Statistics data.

Population modelling was performed to project the Dubai population by sector, nationality, age and gender in 5-year intervals up to the year 2030. Health service demand projections were estimated using a statistical tool, the Demand Module, developed using refined international population-based reference datasets, adjusted for burden of disease, to project service demand based on population per capita projections of key utilization and capacity measures for outpatient, inpatient and continuing care service types.

The gaps identified in the key measures is a result of the difference estimated between supply and demand. Further nominal adjustments were made, in consultation with an Expert Panel, to ensure that results are sensitive to local factors and incorporate relative utilization factors which adjust the international reference rates to account for local utilization and efficiency factors relevant to Dubai.

## 2.2 Supply

Supply is the total amount of a services that are available and used by consumers. Supply is defined in this study as the clinical services reported by survey respondents as available and provided at their facility during 2017. Further adjustments were made to supply estimates to account for an incomplete response rate.

Each hospital was visited by a surveyor who distributed the survey forms to a senior hospital executive team. All contents of the survey form were explained to participants and ongoing support was provided during the survey period. A four-week period was allowed for hospitals to collect the survey data and enter this data into the online supply capture module. Outpatient clinic surveys were conducted by telephone interview where surveyors assisted with using the online supply capture tool and provided technical assistance where required.

A survey of planned health facilities was conducted to supplement the capacity survey to account for additional services that will be provided up until 2025. This survey was based on information from DHA's Health Regulation Department, market intelligence and discussion with an Expert Panel.

Following the completion of the survey, post-survey adjustments were performed to accommodate for non-completed surveys and partially completed surveys. This process was accompanied by a comprehensive validation process which cross-referenced the survey results to DHA utilisation and capacity data (Health Statistics 2017) and the recently established E-Claims database. When differences were found, the correct estimates were confirmed by further follow up with facility managers. This provides increased certainty of supply estimates.

## 2.3 Demand

Health service demand uses the TAHPI Demand Module to calculate current and future demand for Dubai's population broken down by age, gender, geographic sectors and nationality status. Demand projections are based on refined international population-based reference health provision datasets to project service demand by key utilisation and capacity measures for outpatient, inpatient and continuing care service types.

Reference datasets have been developed from health service data from Australia, UK, USA, the World Bank, WHO and the OECD for participating countries. The data used is representative of countries with good health status, relatively equitable access to affordable healthcare, and well established and publicly available quality healthcare utilization data for estimating and projecting capacity trends.

These reference datasets have been refined to create best fit regression demand estimates for primary, secondary and tertiary care to a service speciality and casemix level, using at least ten years of historical data to project demand for up to 2030. Age group, gender and nationality specific population rates have been generated for episodes and stay periods. Stay periods have been converted to key capacity measures, such as beds and rooms, based on agreed occupancy rates.

The reference datasets encompass a comprehensive range of service types delivered by contemporary health systems:



**Acute overnight and same day care**



**Emergency department care**



**Non-acute, sub-acute and extended care**



**Outpatient care**



**Operating theatre care**



**Procedural care (Medical Imaging)**



**Critical care**



**Health workforce**



Projections of health service demand measures generated by the Demand Module are further adjusted for known population, health service demand and provision factors, affecting the population both currently and in future years, including: regional and national burden of disease, policy-driven and stimulated population growth or decline, relative utilisation, occupancy, length of stay and percentage same day.

## 2.4 Gap analysis

The gap analysis is calculated by the difference of demand and supply, where a deficit indicates a need for additional capacity and a surplus suggests an opportunity for reallocation of capacity to deficient services. This analysis identifies capacity shortages between the demand on the health care system and the current and planned supply within the Emirate. It is used to identify priorities for development of services, facility and workforce in Dubai to 2030.

All measures are translated into key planning units (e.g. beds, chairs, operating theatres, consultations rooms, full time equivalents) using locally validated operational assumptions such as occupancy, turnover and operational days. Key planning units define infrastructure and workforce capacity units that form the core clinical service delivery environment of a clinical service asset. The following tables describe the infrastructure and workforce KPIs used for the DCSCP gap analysis.

**Table 1: Key Planning Unit definitions and capacity measures**

| KPU Setting              | Capacity Measure      |
|--------------------------|-----------------------|
| Acute Overnight Care     | Beds                  |
| Acute Same Day Care      | Places/Chairs         |
| Non-Acute Overnight Care | Beds                  |
| Intensive Care           | Beds                  |
| Emergency Department     | Bays/Rooms            |
| Operating Theatres       | Rooms                 |
| Outpatients              | Rooms                 |
| Workforce                | Full Time Equivalents |








Each service type is broken down into a comprehensive list of service lines and their included DRGs, each with their own demand growth profile that is sensitive to the population structure changes of Dubai. This service line framework is displayed in Chapter 8 – Appendix.

A sensitivity analysis is performed to compare results with comparative rates and benchmarks, in combination with discussions of the findings with an Expert Panel. For further information on sensitivity analysis please refer to Chapter 8 – Appendix.

## 2.5 Definitions

The reference files applied to Dubai's population catchment calculates several measure variables, such as overnight episodes, same day episodes and outpatient visits, converting them to beds, places and consultations room using stay period estimates. This is then adjusted for standard health service operational measures more suited to Dubai's health system, enabling the investigation of projections by age group, gender, service type, service mode, specialty and casemix groups.

Table 2: Key Planning Unit definitions and assumptions

| Type   | Utilisation Statistic Measure           | KPU Measure         | Assumption   |
|--|---|---------------------|--|
|  <b>Acute Care</b>                  | Same Day Separations                    | Overnight Beds      | Beds = 70% occupancy, 365 days/year,               |
|  | Overnight Separations                   |                     |  |
|  <b>Non-acute Care</b>              | Overnight Stay Periods (days)           | Same Day Places     | Places = 1.5 patient per day/KPU, 248 days/year    |
|  <b>Emergency Department Care</b> | Presentations<br>Stay Periods (minutes) | Emergency Bays      | 70% occupancy, 365 days/year                       |
|  <b>Intensive Care</b>            | Separations<br>Stay Periods (days)      | Intensive Care Beds | 70% occupancy, 365 days/year                       |
|  <b>Outpatient Care</b>           | Occasions                               | Consultation Rooms  | 70% occupancy, 248 days/year, 8 hours/day          |
|  <b>Procedural Care</b>           | Scans                                   | Units               | 70% occupancy, 248 days/year, 8 hours/day          |
|  <b>Operating Theatre</b>         | Operations<br>Stay Periods (minutes)    | Theatre rooms       | 70% occupancy (Elective) 45% occupancy (Emergency) |

Each service type has a service definition framework which categorises service lines based on a list of relevant casemix codes, the framework for acute inpatient care used for this report is shown in Chapter 8 – Appendix.



CHAPTER 3

# BACKGROUND AND CONTEXT

This chapter describes the current Dubai environment and geography, including its health care sector, population and health status.

## 3.1 Health Care Environment

### 3.1.1 Health Sectors

The Dubai healthcare sector is inclusive of government and private entities that are aligned to the overall healthcare strategy and strive to provide quality services that are appropriate, accessible and affordable for the Dubai community.

| HEALTH SECTOR   |   |  |                                  |
|---|---|--|----------------------------------|
|  <p>هيئة الصحة بدبي<br/>DUBAI HEALTH AUTHORITY</p> |  <p>UNITED ARAB EMIRATES<br/>MINISTRY OF HEALTH &amp; PREVENTION</p> |  <p>مدينة دبي الطبية<br/>Dubai Healthcare City</p> | <p><b>PRIVATE<br/>SECTOR</b></p> |

### 3.1.2 Dubai Health Strategy 2016-2021

The Dubai Health Strategy has been designed to be consistent and compatible with Dubai Plan 2021, positioning the Emirate to become a global leader in the delivery of healthcare, and providing a world-class level of healthcare. The strategy development process involved a broad range of stakeholders from the Dubai health ecosystem including both the public and private sectors. The Strategy developed includes 15 strategic programs and more than 100 strategic initiatives to be applied until 2021.



#### VISION

Towards a healthier and happier community



#### MISSION

Transforming Dubai into a leading healthcare destination by fostering innovative and integrated care models and by enhancing community engagement



#### VALUES

- Customer centricity
- Efficiency
- Engaged and motivated workforce
- Accountability and transparency
- Innovation
- Excellence

## 3.2 Population and Demographics

### 3.2.1 Geography

Dubai is one of the seven Emirates of the United Arab Emirates, occupying an area of 4,114 Km square with a population density of 754 persons per square kilometre. Dubai is divided into nine geographic sectors with each sector having a specific mix of population, density, age, gender and nationality.

Figure 2: Dubai land sectors and sector size (km<sup>2</sup>)

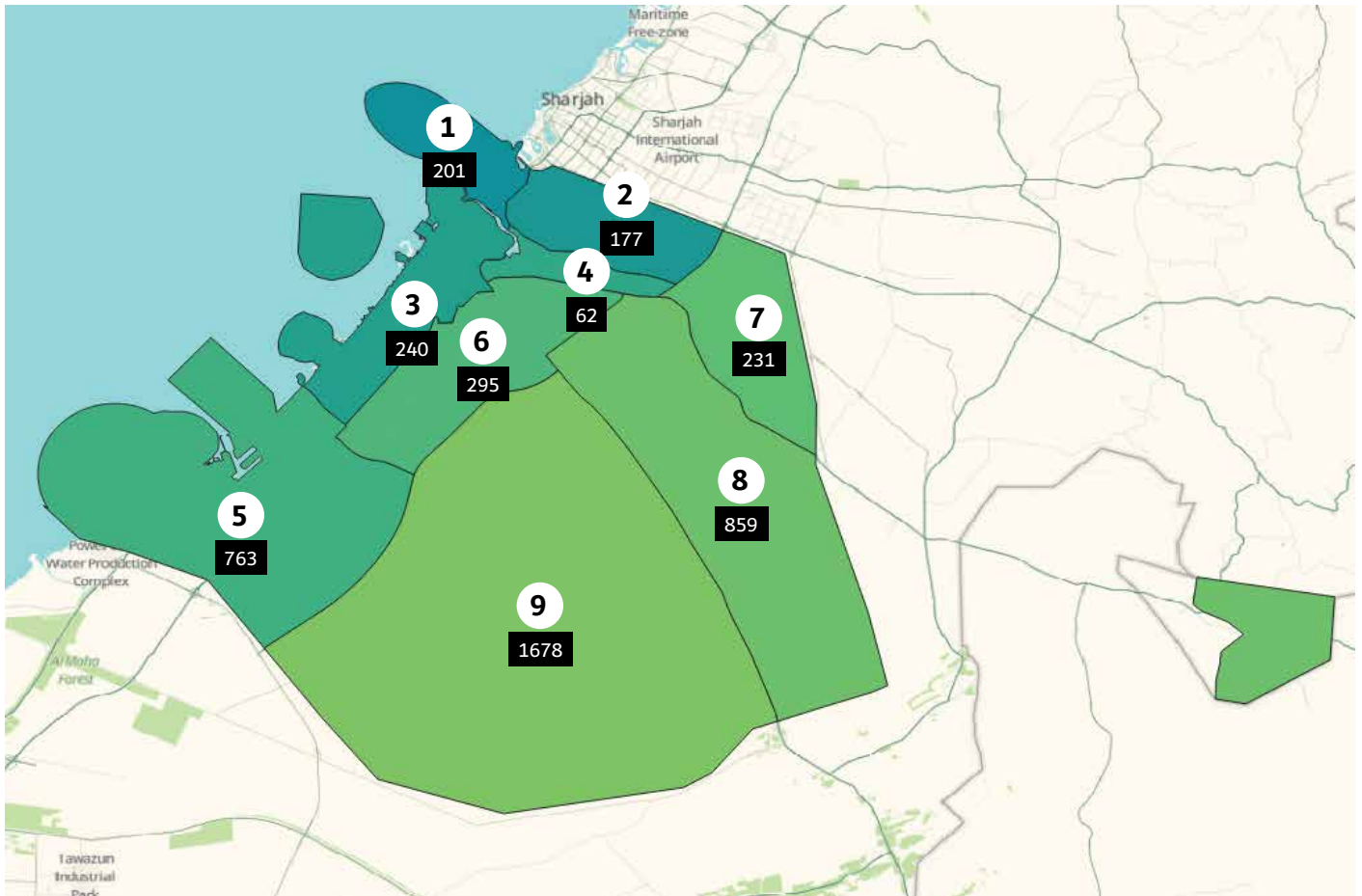
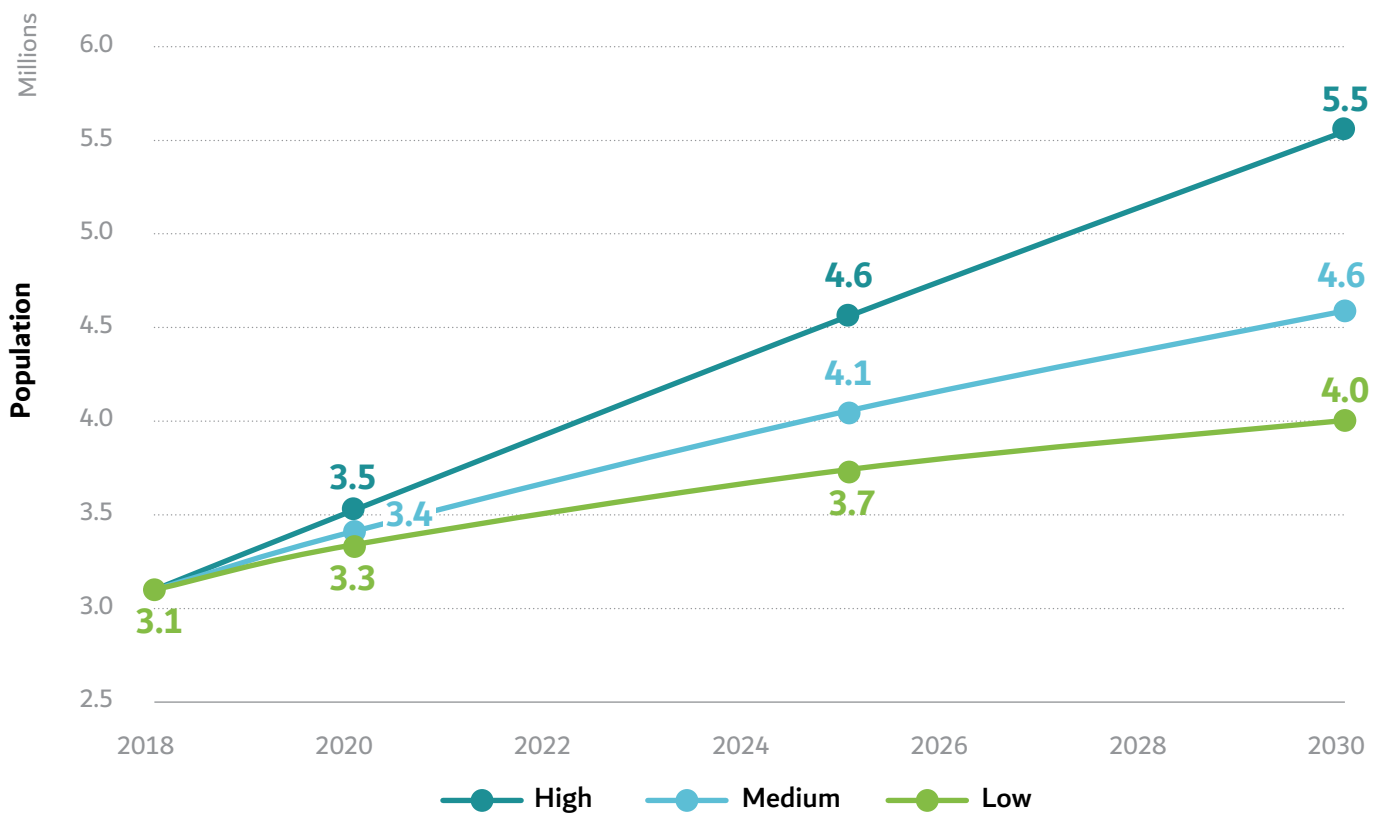


Figure 1: Population projection scenarios, 2018 to 2030



The **medium scenario** is used as the agreed projections for capacity planning, where the population is expected to increase on average 4% per annum from 3.1 million in 2018 to 4.6 million by 2030. For further information on population modelling, please refer to Chapter 8 – Appendix.

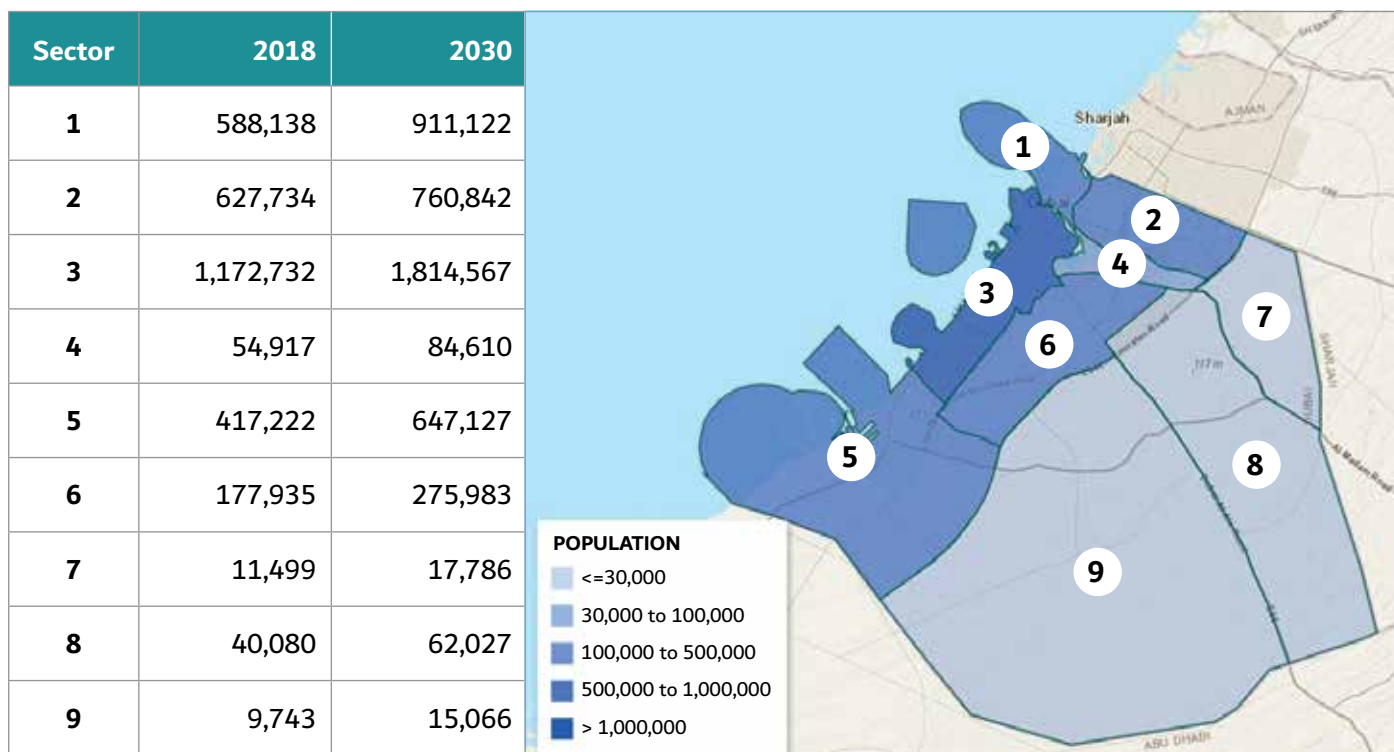
The accurate projection of health service demand is significantly influenced by a population’s age and gender structure with people in the high dependency age groups of 0-4 and 60+, and fertile women having higher service demand than other population components. Also, it is crucial that a clear understanding of the sector residency location and their expected growth is understood so that services and facilities can be estimate for locations of growth and need.

### 3.2.3 Sectors

Dubai is divided into nine geographic sectors to assist with the planning of the distribution of infrastructure capacity including healthcare facilities.

Population projections were conducted separately for each of the nine sectors using best fit probabilistic modelling from historical trends with 2006 as the base year (using sectorial population data reported from Dubai population bulletins and the 2012 Dubai Clinical Services Capacity Plan).

Table 3: Projected Population by Sector

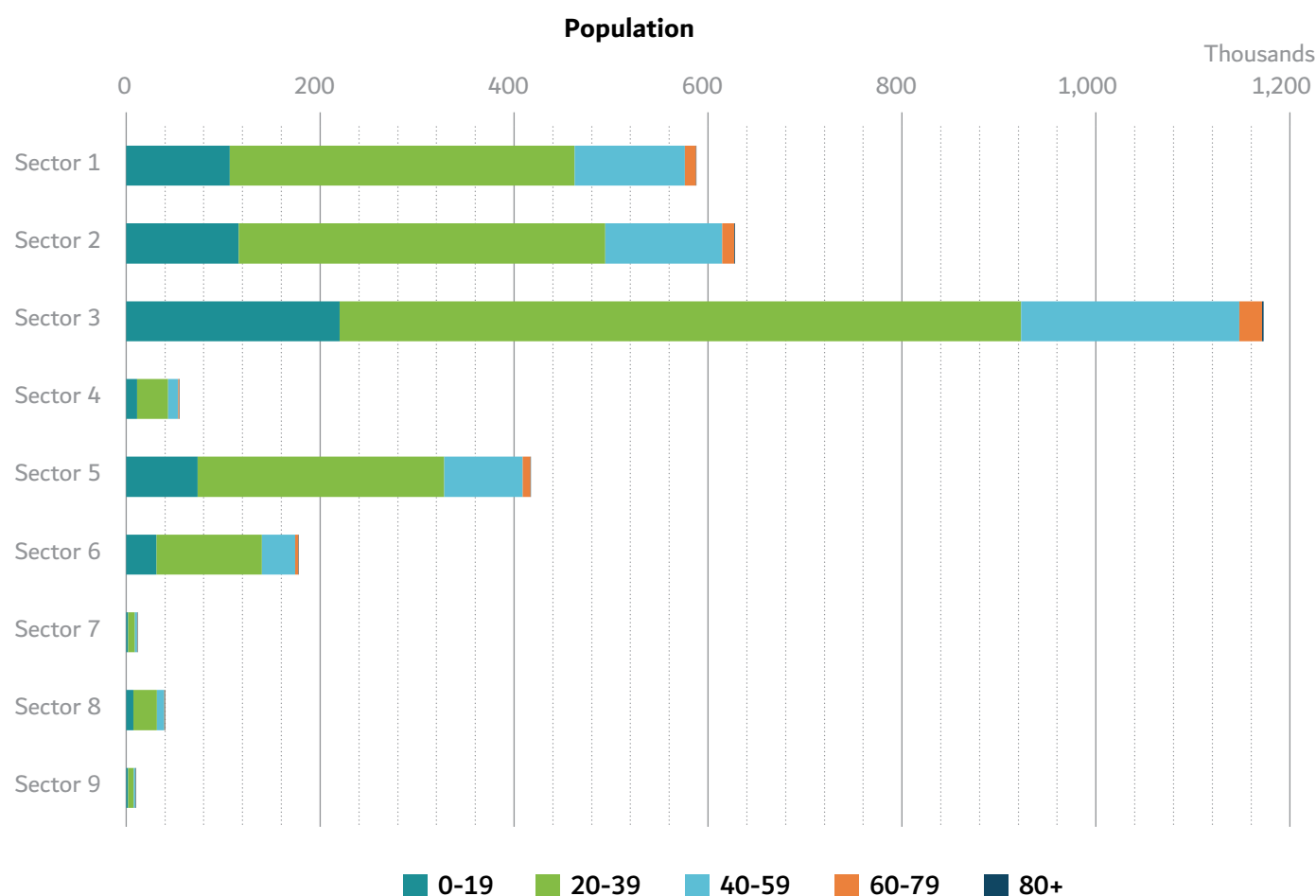


“To account for the influx of population growth and the percentage of the elderly population, it is important that we plan for this growth for the coming years and to do that our health service planning efforts will ensure our communities are offered the best possible services.”

**Dr. Nahed Monsef**

Director, Strategy and Governance Department, DHA

Figure 3: Age group distribution, by sector, 2018



### 3.2.4 Age, gender and nationality profile

The population structure of Dubai displays a relatively young population and comprised by a majority of 67% males and 90% non-nationals.

Table 4: Medium scenario population profile, 2018 and 2030

|             | Population       | Nationals | Non-Nationals | Male      | Female    |
|-------------|------------------|-----------|---------------|-----------|-----------|
| <b>2018</b> | <b>3,100,000</b> | 298,356   | 2,801,644     | 2,091,765 | 1,008,235 |
| <b>2030</b> | <b>4,589,131</b> | 414,625   | 4,174,506     | 2,967,911 | 1,623,220 |

The demand for healthcare is a needs-based demand that is sensitive to the age, gender and nationality composition of the population. This population composition has been analysed through the quantification of demand on all service types by per capita rates for each 5-year age group, gender and nationality category. This results in highly sensitive analysis on the population profile by dividing the population into 72 sub-categories, ensuring that demand is specific to different growth scenarios.

Figure 4: Dubai population by age, gender and nationality, 2018

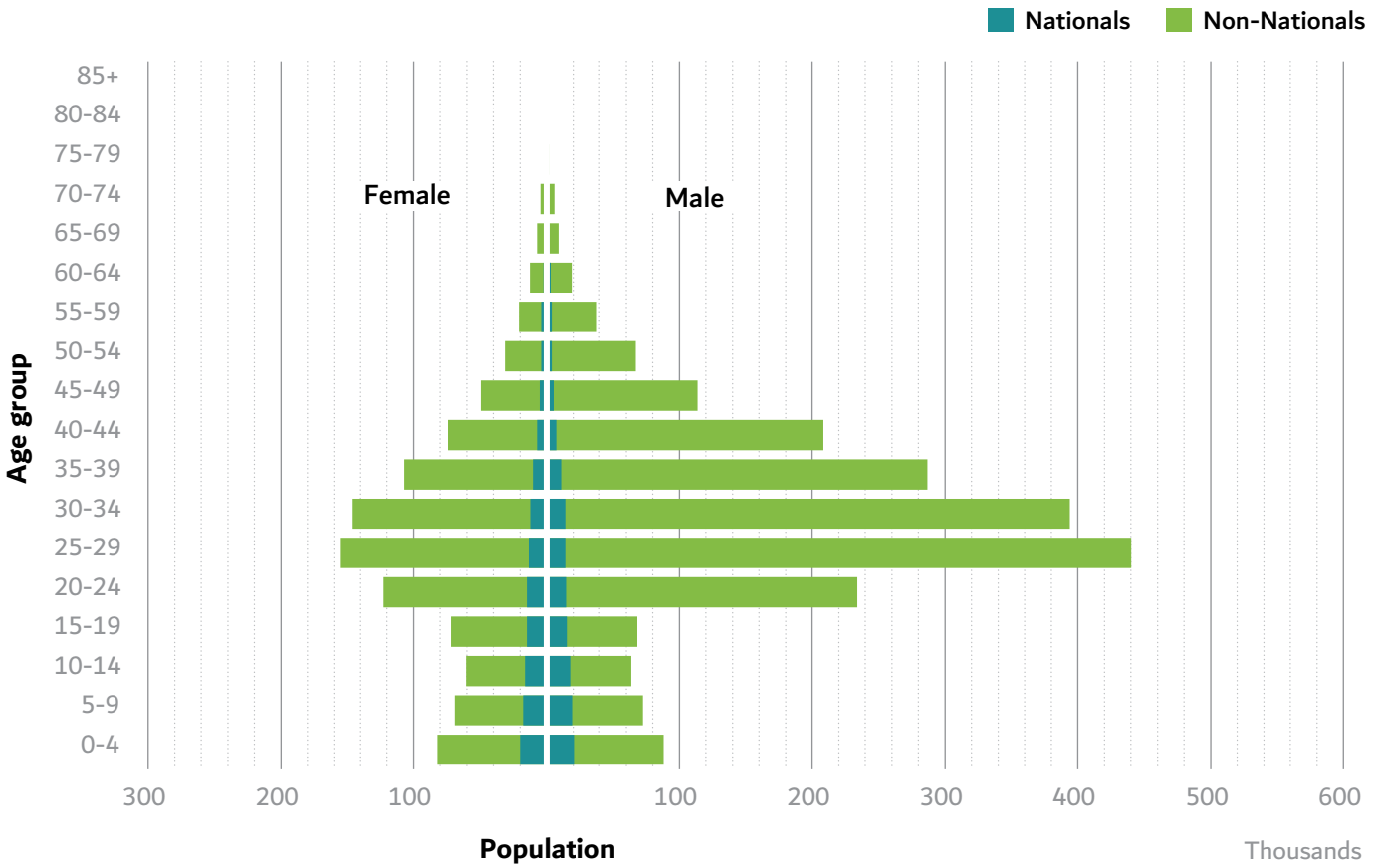
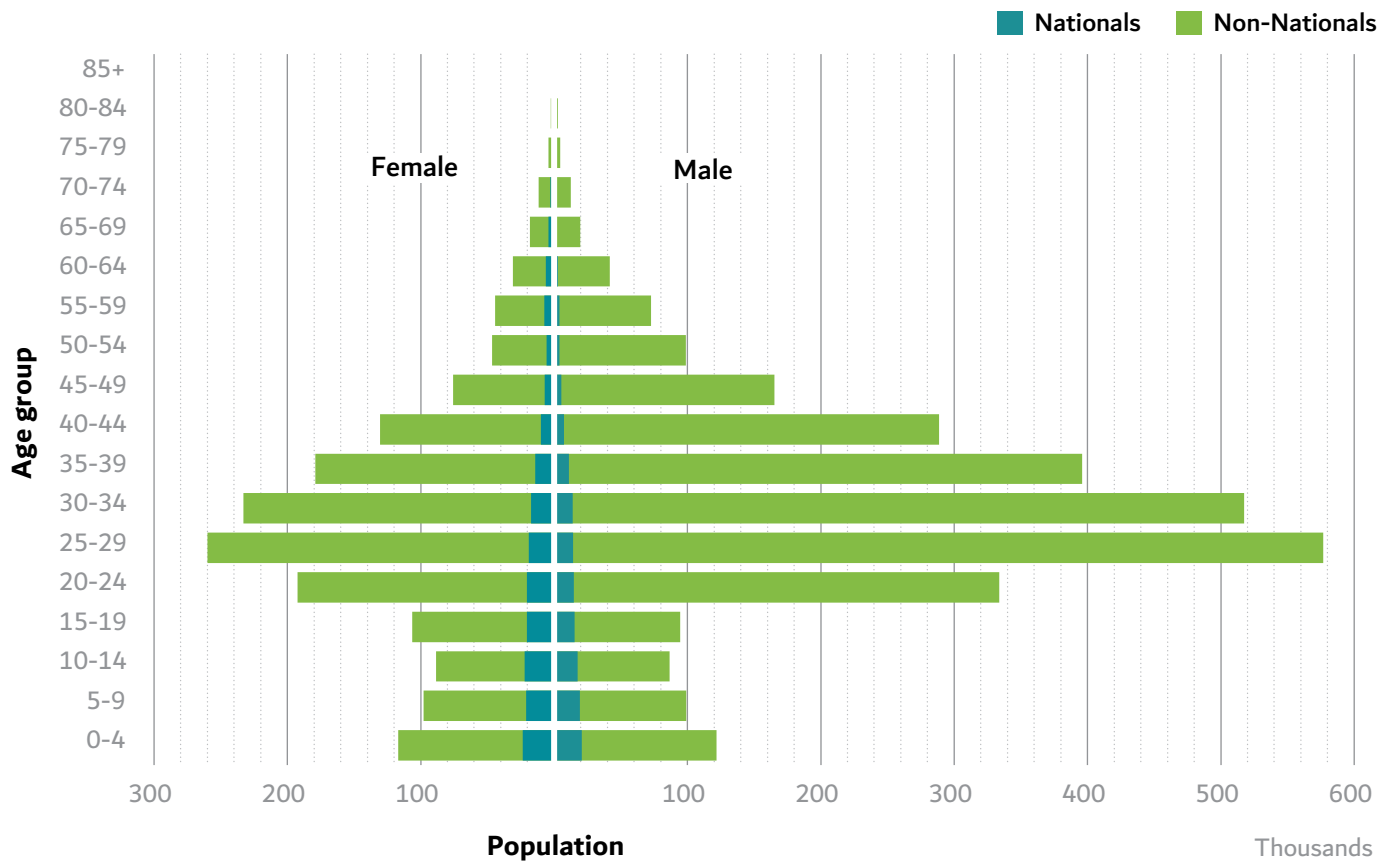


Figure 5: Dubai population by age, gender and nationality, 2030





The 2030 population profile of Dubai displays an aging population for both nationals and non-nationals, which results in an increase in health service utilisation and associated costs. This increase in demand not only increases total activity but also shifts demand to specific age-related specialties and service types.

### 3.2.5 Economic Environment

The World Bank provides estimates of 2017 GDP per capita for the world's nations and regions., the table below shows a selection of countries' GDP per capita ranking in AED. The UAE places just below the average 'high income countries' per capita rate of 41,211, at a ranking of 22. While Dubai is below the average 'high income countries' per capita rate, at a ranking of 28 (Dubai Economic Report 2017, World Bank 2017).

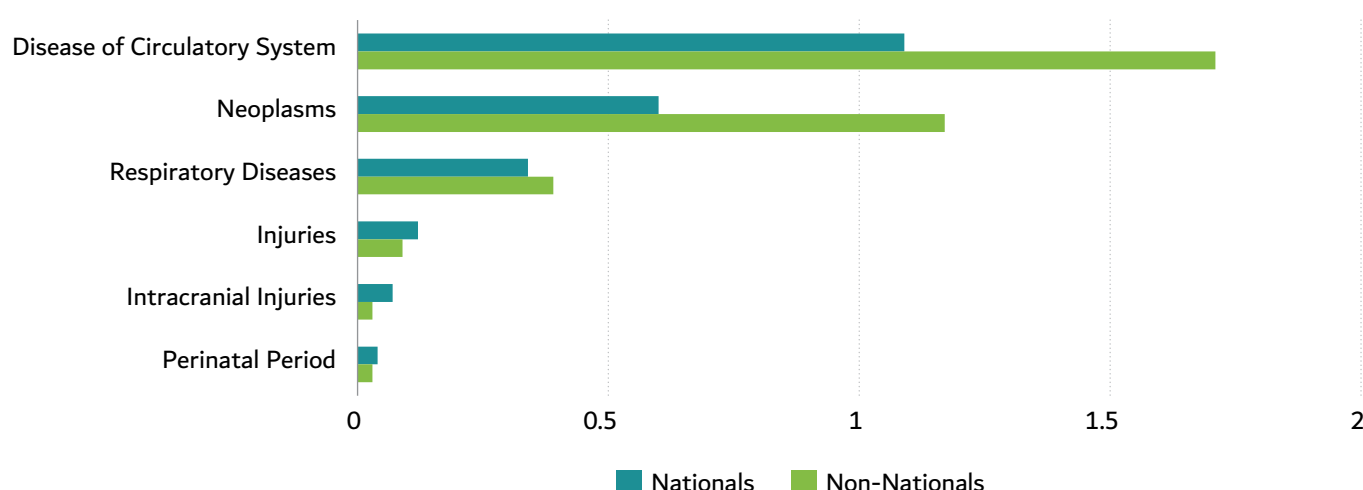
Table 5: GDP per capita by Selected Country (USD)

| Ranking | Country              | 2017 GDP per capita, USD |
|---------|----------------------|--------------------------|
| 1       | Luxembourg           | 104,103                  |
| 7       | Qatar                | 63,505                   |
| 8       | United States        | 59,531                   |
| 11      | Australia            | 53,799                   |
| 12      | Sweden               | 53,442                   |
| 22      | United Arab Emirates | 40,698                   |
| 28      | Dubai                | 38,000                   |

### 3.2.6. Health Status

Dubai's health status has been closely studied and discussed in its 2017 Dubai Annual Health Statistics Report from which this section has drawn key measures. Life expectancy in Dubai in 2017 was 80 years for total population, 79 years for males and 81 years for females. The figure below shows that lifestyle diseases and its effects, such as heart disease and cancer, are the main causes of death in Dubai. Early screening and prevention strategies, highlighted by the 15 Strategic Programs from the Dubai Health Strategy 2016 – 2021 report, are now at the top of the health agenda for the Health Authority to improve the quality of life and reduce deaths of the Dubai population.

Figure 6: Major Causes of Death in Dubai in 2017 by Nationality, per 1,000 capita



Under-5 mortality in Dubai is presented below. The differences between nationality groups of the rates of the causes of death represent the different exposures children of each group face.

- Twenty Six percent of under 5 deaths were due to Prematurity and Low Birth Weight in 2017, of which Non-Nationals were 65%
- Thirty five percent of deaths were due to the next three causes: Congenital Anomalies, Birth Asphyxia and Birth Trauma, Causes Originating from Perinatal Period. Forty-two percent of these causes of death are for Nationals.

Figure 7: Major Causes of Under-5 Death in Dubai in 2017 by Nationality.

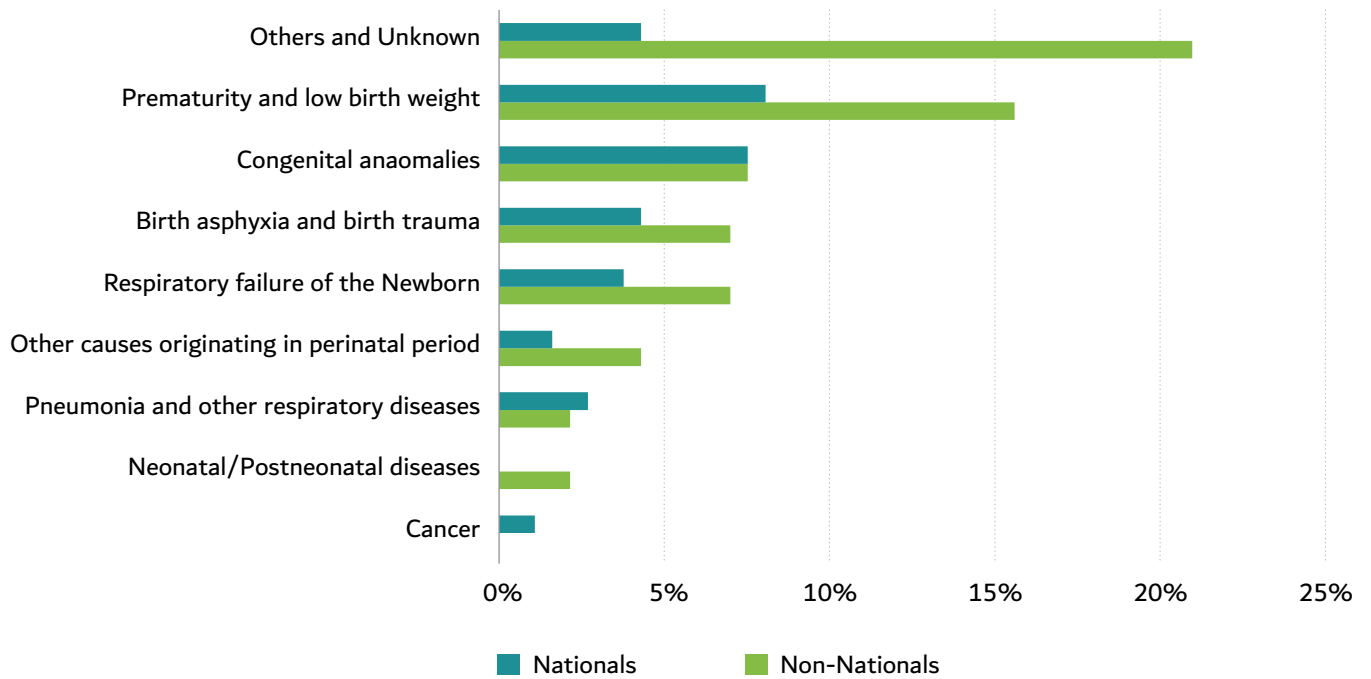
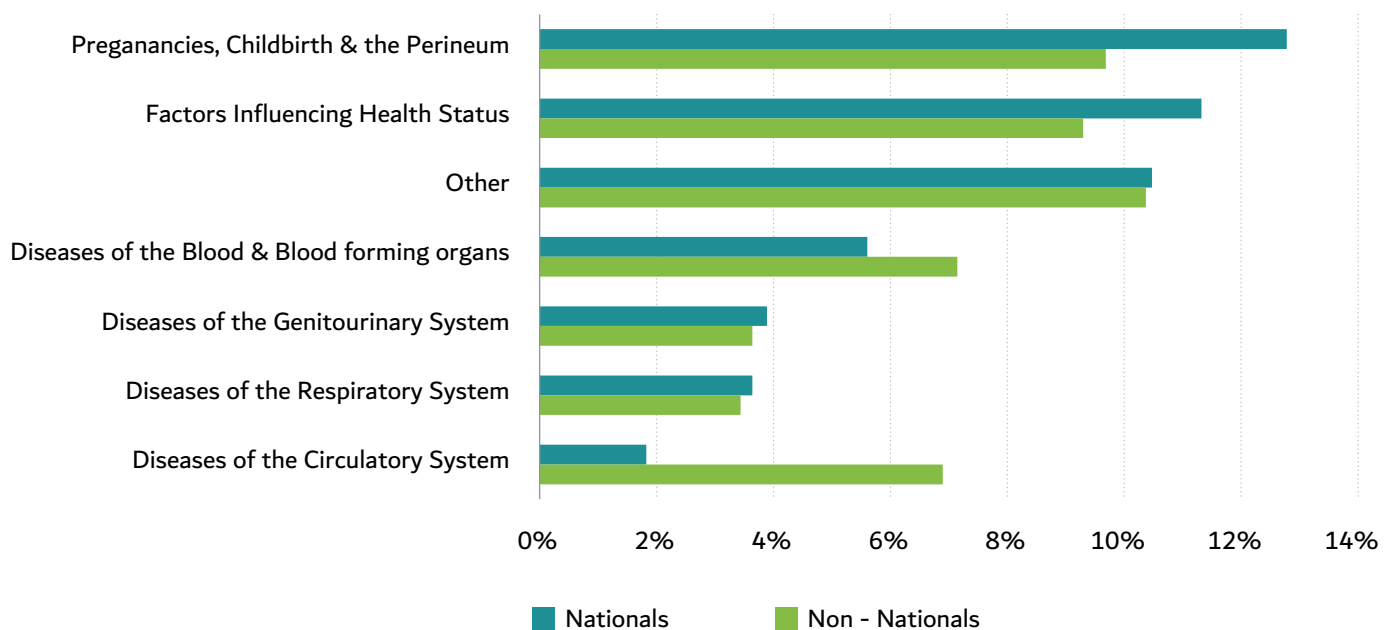


Figure 8: Major Causes for Hospital Admission in Dubai in 2017 by Nationality



Like the rest of the world, the Middle Eastern region’s population has experienced a shift from infectious diseases and childhood illnesses to non-communicable diseases. This notion paired with the increasing life expectancy suggests that the population of UAE is now living for longer with their disabilities, which can cause pain, limit mobility and impair the senses. The most recent Burden of Disease study in 2017 conducted by the Institute for Health Metrics and Evaluation (IHME) reported the following metrics for UAE.

**Table 6: UAE burden of disease indicators, 2017 (IHME 2017)**

| Rank | Causes of death by rate      | Causes of Premature death (YLLs) | Causes of disability (YLDs) | Causes of death and disability (DALYs) |
|------|------------------------------|----------------------------------|-----------------------------|--|
| 1    | Ischaemic heart disease      | Road injuries                    | Drug use disorders          | Drug use disorders                     |
| 2    | Road injuries                | Ischaemic heart disease          | Low back pain               | Road injuries                          |
| 3    | Stroke                       | Stroke                           | Headache disorders          | Ischaemic heart disease                |
| 4    | Other malignant neoplasms    | Other malignant neoplasms        | Diabetes                    | Low back pain                          |
| 5    | Diabetes                     | Congenital defects               | Depressive disorders        | Diabetes                               |
| 6    | COPD                         | COPD                             | Neck pain                   | Headache disorders                     |
| 7    | Chronic kidney disease       | Diabetes                         | Other musculoskeletal       | Stroke                                 |
| 8    | Drug use disorders           | Chronic kidney disease           | Anxiety disorders           | COPD                                   |
| 9    | Self-harm                    | Drug use disorders               | COPD                        | Neonatal disorders                     |
| 10   | Lower respiratory infections | Self-harm                        | Neonatal disorders          | Depressive disorders                   |



## CHAPTER 4

# SUPPLY ANALYSIS

This chapter contains the results of the supply analysis following the completion of the Emirate-wide Health Care Facility Survey and followed by a validation processes performed with Health Statistics, E-Claims and other sources of supply data.

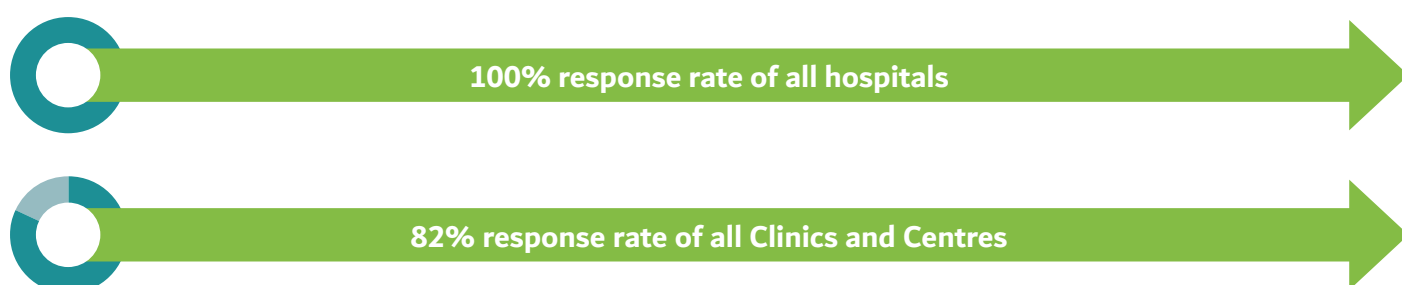
## 4.1 Survey Responses

A total of 1,561 surveys were distributed to actively licensed facilities within the jurisdiction of Dubai Health Authority, Ministry of Health, Dubai Healthcare City and the private sector, with a high response rate as shown in the table below.

Table 7: Response Rate for the 2017 Dubai Health Care Facility Survey



PRIVATE  
SECTOR



The distribution of completed surveys by sector and facility type have been shown below

Table 8: Distribution of Completed Surveys by Sector and Facility Type

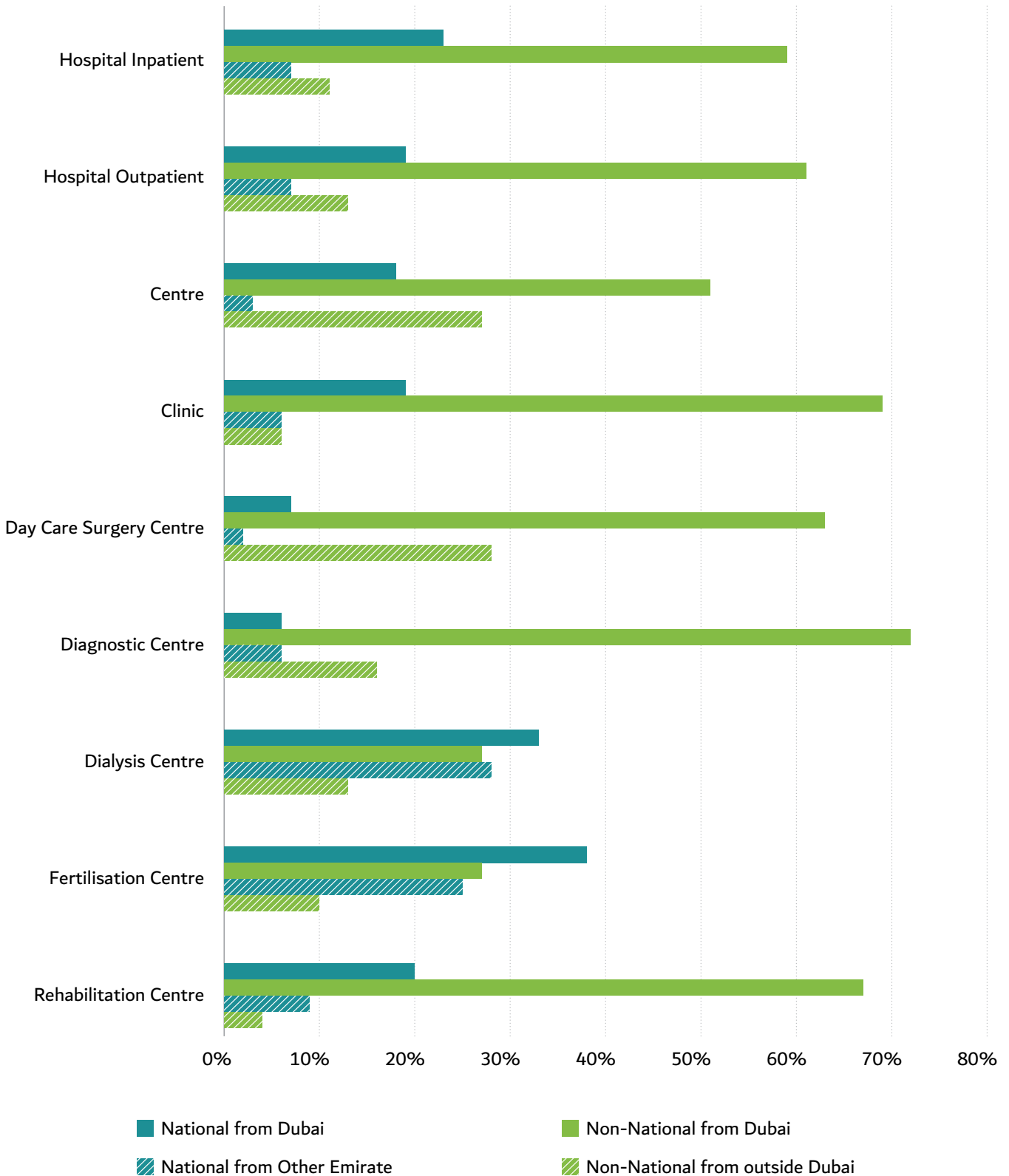
| Type                    | Sector     |            |            |           |           |           |          |          |          | Total        |
|-------------------------|------------|------------|------------|-----------|-----------|-----------|----------|----------|----------|--------------|
|                         | 1          | 2          | 3          | 4         | 5         | 6         | 7        | 8        | 9        |              |
| Centre                  | 8          | 8          | 38         |           | 1         | 9         | 1        |          |          | 66           |
| Clinic                  | 162        | 85         | 641        | 18        | 30        | 49        |          |          |          | 1,002        |
| Day Care Surgery Centre | 4          | 1          | 25         |           | 1         | 2         |          |          |          | 33           |
| Diagnostic Centre       | 6          | 2          | 14         |           |           | 1         |          |          |          | 23           |
| Dialysis Centre         |            |            | 2          |           |           |           |          |          |          | 2            |
| Fertilisation Centre    |            |            | 4          |           |           |           |          |          |          | 4            |
| Hospital                | 5          | 6          | 23         |           | 2         |           |          | 1        |          | 37           |
| Rehabilitation Centre   | 3          | 13         | 66         | 1         | 2         | 3         |          |          | 1        | 89           |
| <b>Total</b>            | <b>188</b> | <b>115</b> | <b>813</b> | <b>19</b> | <b>36</b> | <b>64</b> | <b>1</b> | <b>1</b> | <b>1</b> | <b>1,256</b> |

Following the completion of the survey, a supply validation process was performed to assess the concordance between the survey responses and the Dubai Health Statistics 2017 report using DHA E-Claims records for the year 2017 as a secondary validation source. This analysis formed the basis of current supply, which was then enhanced by the inclusion of planned supply for licensed facilities expected to be commissioned within the next 5 years.

### 4.1.1 Residency of Patients

The survey captures the activity generated by nationals and non-nationals from Dubai and for those from outside Dubai. Most activity is generated by non-nationals from Dubai, however the proportion differs based on the facility type as seen in the figure below.

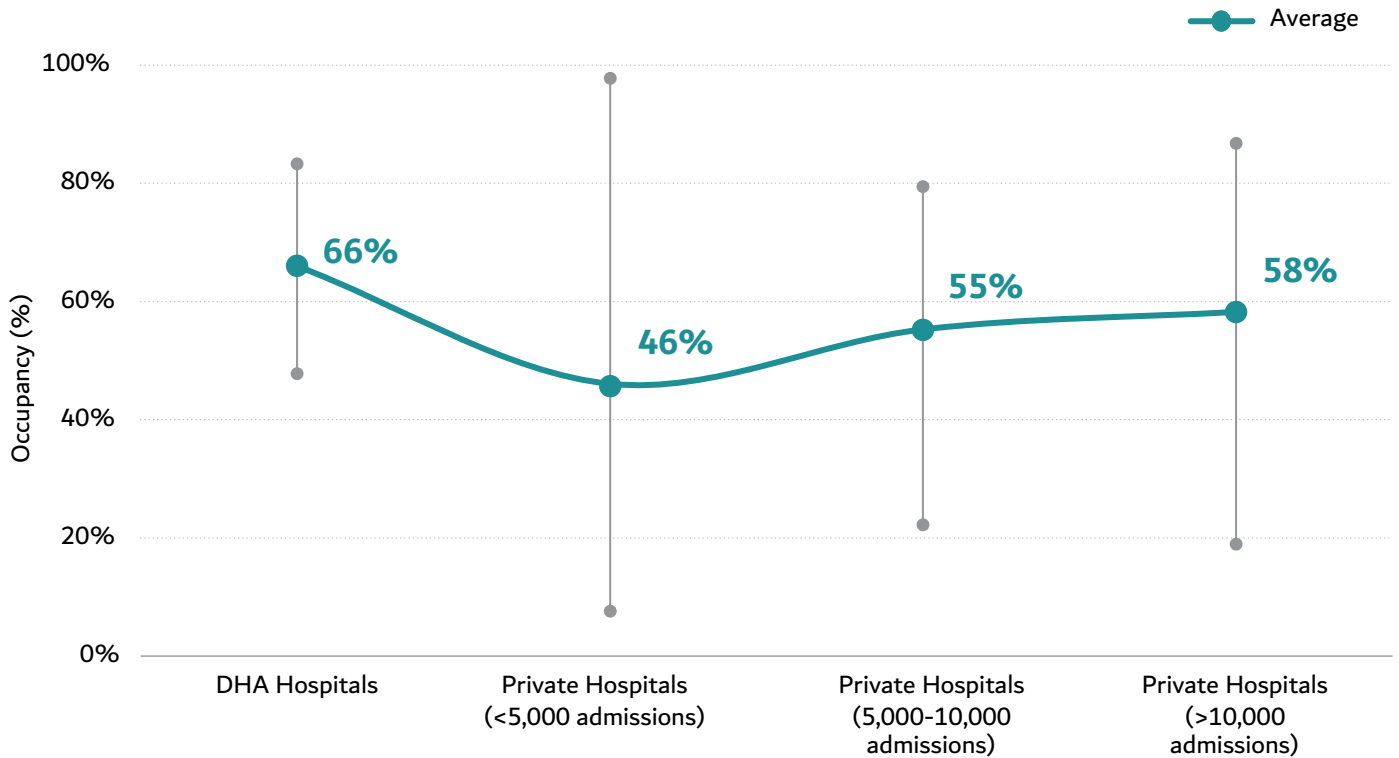
Figure 9: Proportion of Nationality Status Group per Facility Type



### 4.1.2 Hospital Length of stay and Occupancy

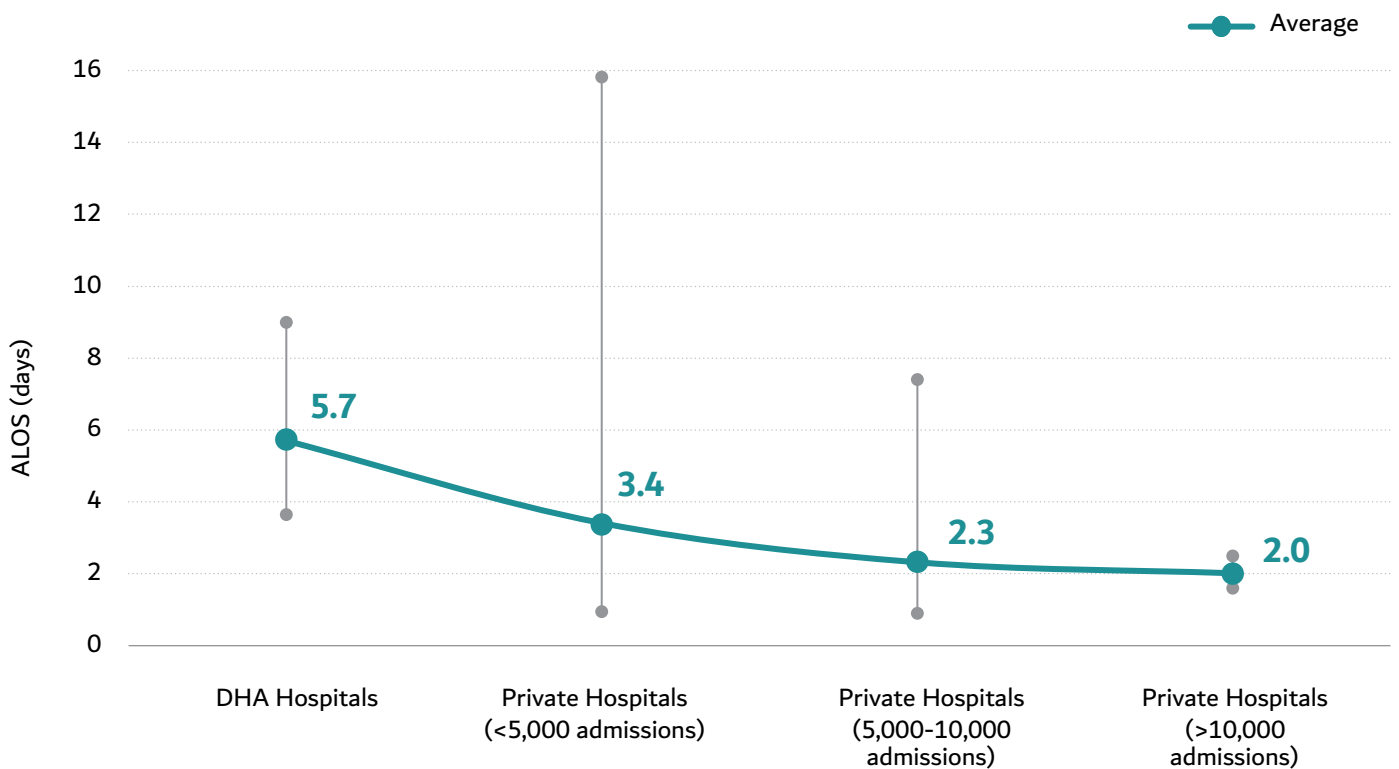
In the year 2017, the unweighted average bed occupancy rate was 73.3% for DHA hospitals and 47.6% for private sector hospitals. The distribution of hospital bed occupancy for both sectors is shown in the graph below.

Figure 10: Average hospital occupancy by facility ownership and number of admissions



Average length of stay, which includes same day admissions, for the private sector ranged from 1.0 to 15.9 days and had an unweighted average of 2.6 days between the years 2017 and 2018.

Figure 11: Average hospital length of stay (ALOS) by facility ownership and number of admissions



### 4.1.3 Clinical Service Infrastructure Supply

The capacity results of the Dubai Health Care Facility Survey are displayed below, after adjustment for the non-responders of the survey. This supply profile was then further validated with additional supply sources as discussed in the next section.

Table 9: Summary of current capacity captured by the survey

| Type                            | Sector       |            |              |            |            |            |          |           |          | Total        |
|---------------------------------|--------------|------------|--------------|------------|------------|------------|----------|-----------|----------|--------------|
|                                 | 1            | 2          | 3            | 4          | 5          | 6          | 7        | 8         | 9        |              |
| <b>Licensed acute beds</b>      | <b>1,111</b> | <b>509</b> | <b>3,417</b> | <b>0</b>   | <b>62</b>  | <b>0</b>   | <b>0</b> | <b>70</b> | <b>0</b> | <b>5,169</b> |
| Non-functional beds             | 214          | 9          | 429          | 0          | 17         | 0          | 0        | 2         | 0        | 671          |
| Total functional beds           | 897          | 500        | 2,988        | 0          | 45         | 0          | 0        | 68        | 0        | 4,498        |
| Functional acute overnight beds | 654          | 453        | 2,598        | 0          | 26         | 0          | 0        | 64        | 0        | 3,795        |
| Functional same day beds        | 243          | 47         | 390          | 0          | 19         | 0          | 0        | 4         | 0        | 703          |
| <b>Non-Acute beds</b>           | <b>13</b>    | <b>0</b>   | <b>122</b>   | <b>0</b>   | <b>0</b>   | <b>0</b>   | <b>0</b> | <b>0</b>  | <b>0</b> | <b>135</b>   |
| Rehabilitation                  | 13           | 0          | 58           | 0          | 0          | 0          | 0        | 0         | 0        | 71           |
| Other Non-Acute                 | 0            | 0          | 64           | 0          | 0          | 0          | 0        | 0         | 0        | 64           |
| <b>Outpatient rooms*</b>        | <b>1,115</b> | <b>880</b> | <b>6,226</b> | <b>107</b> | <b>238</b> | <b>397</b> | <b>6</b> | <b>24</b> | <b>2</b> | <b>8,979</b> |
| Hospital                        | 324          | 261        | 1,175        | 0          | 29         | 0          | 0        | 24        | 0        | 1,813        |
| Clinic and Centres              | 791          | 619        | 5,051        | 107        | 209        | 397        | 6        | 0         | 2        | 7,166        |
| <b>Critical Care</b>            | <b>111</b>   | <b>99</b>  | <b>590</b>   | <b>0</b>   | <b>12</b>  | <b>0</b>   | <b>0</b> | <b>12</b> | <b>0</b> | <b>824</b>   |
| ICU                             | 42           | 31         | 249          | 0          | 7          | 0          | 0        | 8         | 0        | 337          |
| NICU                            | 52           | 58         | 180          | 0          | 5          | 0          | 0        | 4         | 0        | 299          |
| PICU                            | 3            | 3          | 44           | 0          | 0          | 0          | 0        | 0         | 0        | 50           |
| Adult HDU                       | 13           | 7          | 91           | 0          | 0          | 0          | 0        | 0         | 0        | 111          |
| Paediatric HDU                  | 1            | 0          | 26           | 0          | 0          | 0          | 0        | 0         | 0        | 27           |
| <b>ED beds</b>                  | <b>101</b>   | <b>46</b>  | <b>282</b>   | <b>0</b>   | <b>10</b>  | <b>0</b>   | <b>0</b> | <b>17</b> | <b>0</b> | <b>456</b>   |
| Resuscitation bays              | 9            | 6          | 35           | 0          | 2          | 0          | 0        | 1         | 0        | 53           |
| High Acuity bays                | 27           | 15         | 129          | 0          | 2          | 0          | 0        | 3         | 0        | 176          |
| Low Acuity bays                 | 60           | 19         | 92           | 0          | 5          | 0          | 0        | 12        | 0        | 188          |
| Isolation rooms                 | 5            | 6          | 26           | 0          | 1          | 0          | 0        | 1         | 0        | 39           |
| <b>Operating Theatres</b>       | <b>26</b>    | <b>31</b>  | <b>157</b>   | <b>0</b>   | <b>6</b>   | <b>0</b>   | <b>0</b> | <b>4</b>  | <b>0</b> | <b>224</b>   |
| Elective                        | 23           | 21         | 139          | 0          | 3          | 0          | 0        | 3         | 0        | 189          |
| Emergency                       | 3            | 10         | 18           | 0          | 3          | 0          | 0        | 1         | 0        | 35           |
| <b>Dental Chairs</b>            | <b>262</b>   | <b>132</b> | <b>975</b>   | <b>16</b>  | <b>18</b>  | <b>53</b>  | <b>1</b> | <b>3</b>  | <b>0</b> | <b>1,460</b> |



| Type                   | Sector     |            |            |          |           |           |          |           |          | Total      |
|------------------------|------------|------------|------------|----------|-----------|-----------|----------|-----------|----------|------------|
|                        | 1          | 2          | 3          | 4        | 5         | 6         | 7        | 8         | 9        |            |
| <b>Procedural Care</b> | <b>138</b> | <b>114</b> | <b>626</b> | <b>4</b> | <b>34</b> | <b>22</b> | <b>0</b> | <b>13</b> | <b>0</b> | <b>951</b> |
| Angiography            | 3          | 4          | 13         | 0        | 0         | 1         | 0        | 0         | 0        | 21         |
| Computed Tomography    | 8          | 6          | 38         | 0        | 3         | 2         | 0        | 1         | 0        | 58         |
| Lithotripsy            | 16         | 8          | 17         | 0        | 0         | 0         | 0        | 0         | 0        | 41         |
| Magnetic Resonance     | 10         | 8          | 40         | 0        | 1         | 0         | 0        | 0         | 0        | 59         |
| Mammography            | 8          | 6          | 40         | 0        | 2         | 0         | 0        | 1         | 0        | 57         |
| PET                    | 1          | 0          | 1          | 0        | 1         | 0         | 0        | 0         | 0        | 3          |
| Linear Accelerators    | 0          | 0          | 2          | 0        | 0         | 0         | 0        | 0         | 0        | 2          |
| Ultrasound             | 48         | 50         | 250        | 2        | 12        | 9         | 0        | 5         | 0        | 376        |
| X-ray (fixed)          | 28         | 24         | 156        | 2        | 12        | 10        | 0        | 2         | 0        | 234        |
| X-ray (portable)       | 16         | 8          | 69         | 0        | 3         | 0         | 0        | 4         | 0        | 100        |
| X-ray (total)          | 44         | 32         | 225        | 2        | 15        | 10        | 0        | 6         | 0        | 334        |

\* This figure has been corrected for 20% non-respondents and does not exclude consultation rooms types that are not comparable to the demand profile. Comparable outpatient room supply figures are available in Chapter F – Gap Analysis.

An additional 742 beds by 2020 and 1,043 beds by 2025 are planned for development from a range of facilities that will be expanding in size and some that will be newly constructed. These figures have been derived from licensing data and reviewed by and Expert Panel with detailed local industry knowledge on likelihood of commissioning.

## 4.2 Supply Scenarios

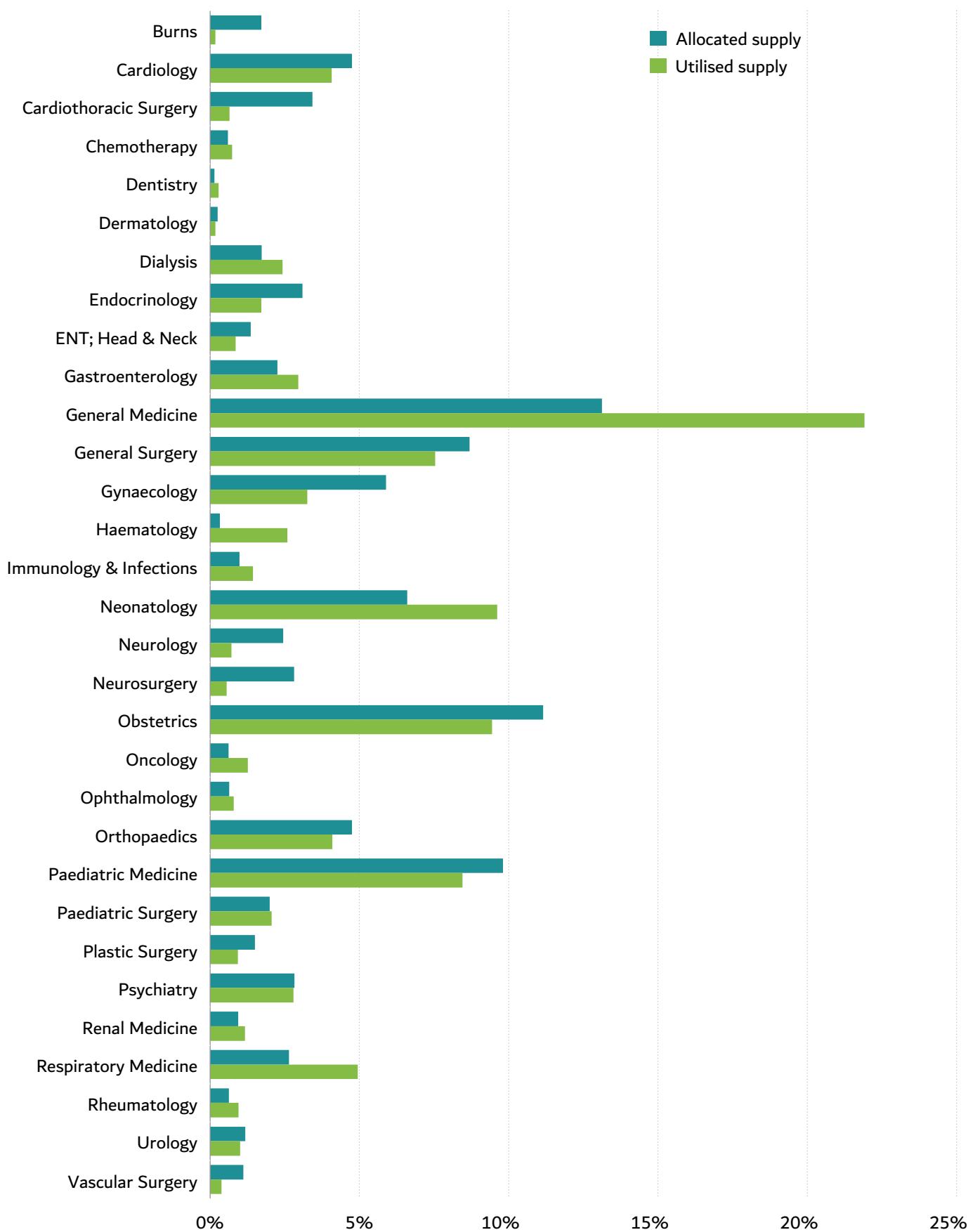
Two supply scenarios are studied to understand the current distribution of beds by specialty

1. **Supply scenario 1:** Capacity distributed by allocation or nomination to a specialty
2. **Supply scenario 2:** Capacity distributed by utilisation reported by Health Statistics 2017

The difference between the two scenarios highlights the misallocation of capacity by specialty, either caused by misreporting, limitations in coding practices or demand/supply mismatch of services. The implication of this misallocation is that the nominated resources, such as workforce, can often not be suited to the care provided out of this room. **For the gap analysis, Supply scenario 1 is used as the current supply capacity**

The table below demonstrates the differences between the distribution of capacity by specialty based on the two scenarios.

Figure 12: Supply scenario comparison, by proportion of total supply

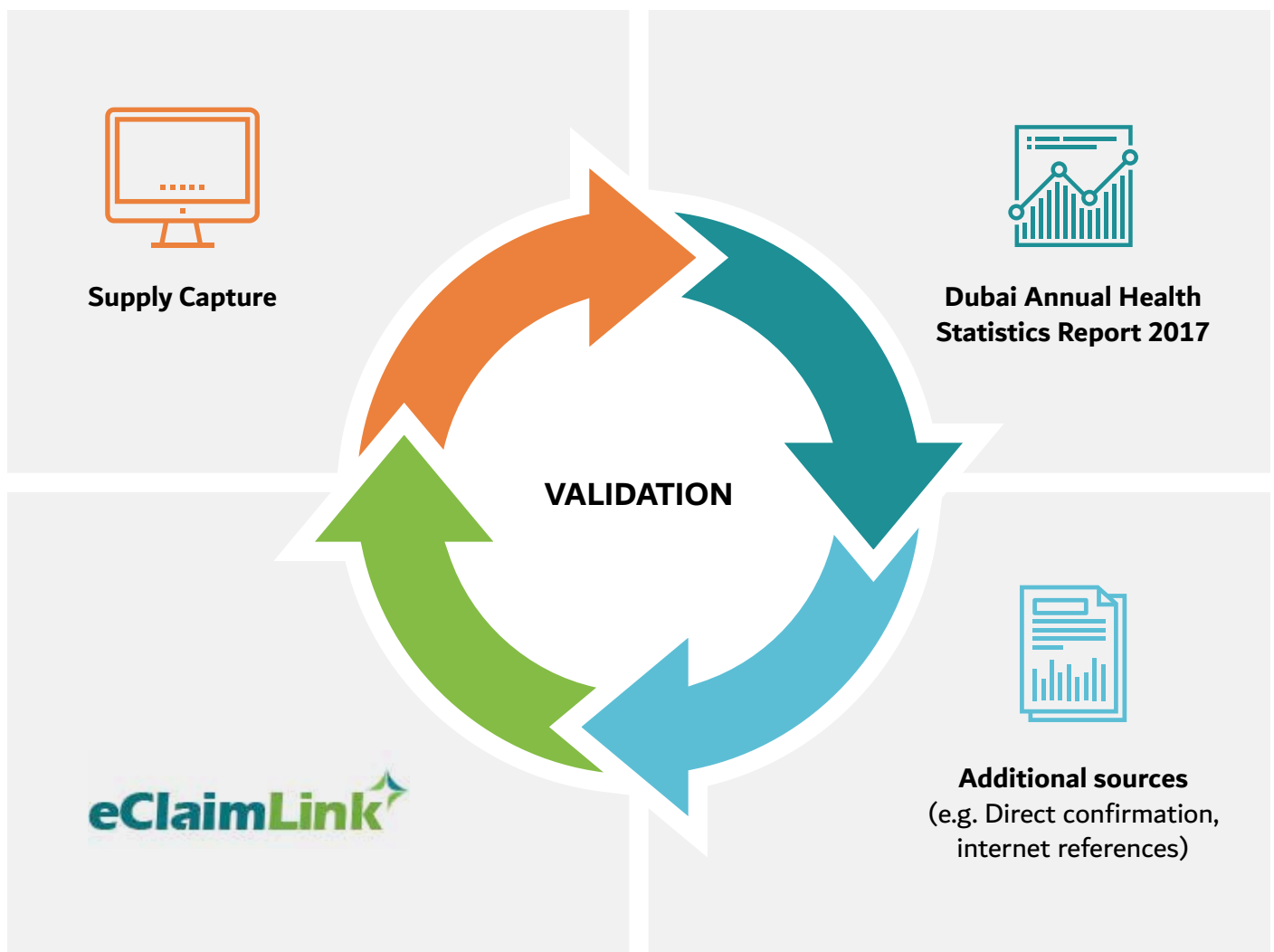


### 4.2.1 Supply validation

Supply validation processes were undertaken to ensure the validity of survey results regarding both capacity and activity. The purpose of the supply validation process was to assess the concordance between the survey responses and the Dubai Health Statistics 2017 report using DHA E-Claims records for the year 2017 as a secondary validation source to align the clinical specialities in the Health Statistics Report.

Where there were large variations in bed numbers, further validations were conducted using publicly accessible official data sources or by recontacting the facility to reconfirm results. The survey results were adjusted if the Health Statistics figures were found to be accurate in the additional validation checks.

For further reading on an in-depth methodology of supply validation, please see Chapter 8 – Appendix



### 4.2.2 Workforce Supply

Workforce supply has been derived from official workforce licensing data, by headcount, and cross validated with results from the survey, which quantifies a workforce profile by Full Time Equivalents (FTEs). An FTE is the number of working hours that represents one full-time employee during a fixed time period. FTE simplifies work measurement by converting work load hours into the number of full-time personnel required to complete that work.

Table 10: Summary of current license workforce by facility type and category, headcount

| Facility Type                      | Category     |                   |               |              |                     | Total         |
|------------------------------------|--------------|-------------------|---------------|--------------|---------------------|---------------|
|                                    | Medical      | Nurses & Midwives | Allied Health | Dentist      | Comp. Alt. Medicine |               |
| Hospital/DSC                       | 4,828        | 10,317            | 3,762         | 322          | 1                   | 19,230        |
| Outpatient Care Facility           | 2,951        | 5,361             | 2,253         | 1,798        | 196                 | 12,559        |
| Pharmaceutics                      |              |                   | 3,559         |              |                     | 3,559         |
| Others                             | 75           | 649               | 623           |              |                     | 1,347         |
| Diagnostic Centres                 | 102          | 24                | 546           |              |                     | 672           |
| <b>Total</b>                       | <b>7,956</b> | <b>16,351</b>     | <b>10,743</b> | <b>2,120</b> | <b>197</b>          | <b>37,367</b> |
| <b>DHA 2017 headcount subtotal</b> | <b>1,847</b> | <b>4,645</b>      | <b>N/A</b>    | <b>178</b>   | <b>N/A</b>          |               |

Only 3% of the entire licensed healthcare workforce are UAE Nationals, with the largest majority from India and Philippines which contribute nearly 70% of the workforce by headcount.

Table 11: Top 10 largest proportion of workforce, by nationality and category

| Nationality    | Category |                   |               |         |                     | Total |
|----------------|----------|-------------------|---------------|---------|---------------------|-------|
|                | Medical  | Nurses & Midwives | Allied Health | Dentist | Comp. Alt. Medicine |       |
| India          | 30%      | 50%               | 49%           | 32%     | 51%                 | 45%   |
| Philippines    | 1%       | 39%               | 18%           | 2%      | 0%                  | 23%   |
| Egypt          | 11%      | 1%                | 5%            | 6%      | 2%                  | 4%    |
| Pakistan       | 9%       | 1%                | 5%            | 2%      | 0%                  | 4%    |
| UAE            | 7%       | 0%                | 3%            | 5%      | 2%                  | 3%    |
| Syria          | 6%       | 0%                | 3%            | 10%     | 0%                  | 3%    |
| Jordan         | 2%       | 2%                | 3%            | 5%      | 1%                  | 2%    |
| Iran           | 3%       | 1%                | 1%            | 5%      | 1%                  | 2%    |
| United Kingdom | 4%       | 1%                | 1%            | 2%      | 7%                  | 2%    |
| Sudan          | 4%       | 0%                | 2%            | 1%      | 1%                  | 1%    |

Across all workforce categories, the Dubai healthcare workforce has an average age of 37 years and is made up of 62% of females. A breakdown of workforce categories is shown in the table below, highlighting the differences in each measure between each category.

Table 12: Workforce average age and proportion by gender and by category

| Measure      | Category |                   |               |         |                     | Total |
|--------------|----------|-------------------|---------------|---------|---------------------|-------|
|              | Medical  | Nurses & Midwives | Allied Health | Dentist | Comp. Alt. Medicine |       |
| Average age  | 45       | 34                | 35            | 40      | 43                  | 37    |
| Males        | 58%      | 15%               | 44%           | 51%     | 36%                 | 35%   |
| Females      | 40%      | 83%               | 50%           | 48%     | 57%                 | 62%   |
| Unidentified | 2%       | 2%                | 6%            | 2%      | 7%                  | 3%    |



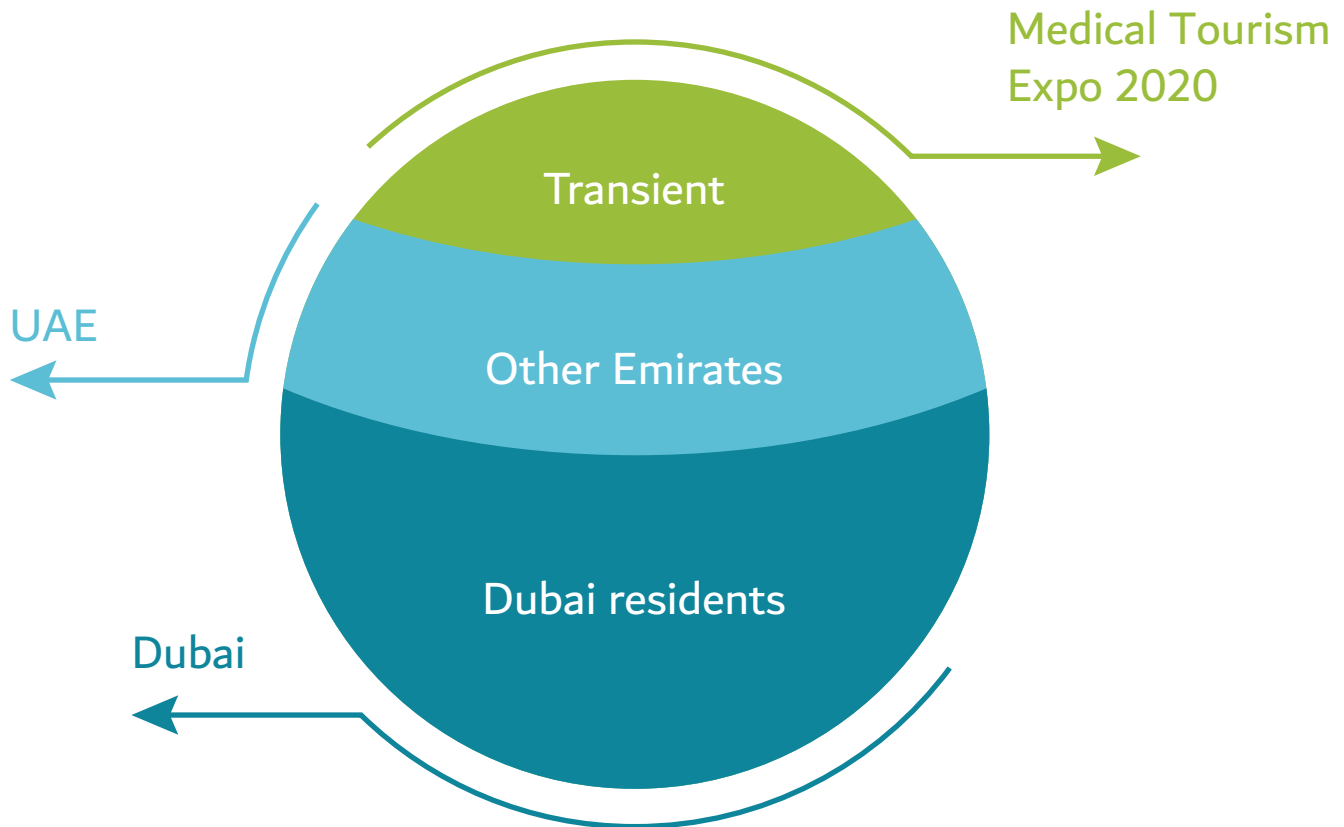
CHAPTER 5

# DEMAND ANALYSIS

This chapter contains the descriptions and implications of the Demand results as we as discussion on scenarios, assumptions and additional inflow and outflow of demand

## 5.1 Catchment and Assumptions

A catchment or population segment is defined as the utilization of services by a population and provided by a facility within an agreed geographic area. These segments allow flow patterns to be identified and analysed to demonstrate the impacts of both inflows (patients arriving) and outflows (patients departing). From these two flow directions of each segment, there are 6 flow categories which define the location of which the patient has arrived from or will depart to.



| Flows |                 |   |
|-------|-----------------|---|
| 1     | Dubai residents | <b>Dubai</b> inter-sector flow                    |
| 2     | Other Emirates  | <b>UAE</b> inflow and outflow                     |
| 3     | Transient       | <b>Medical Tourism</b> and <b>Expo 2020</b> flows |

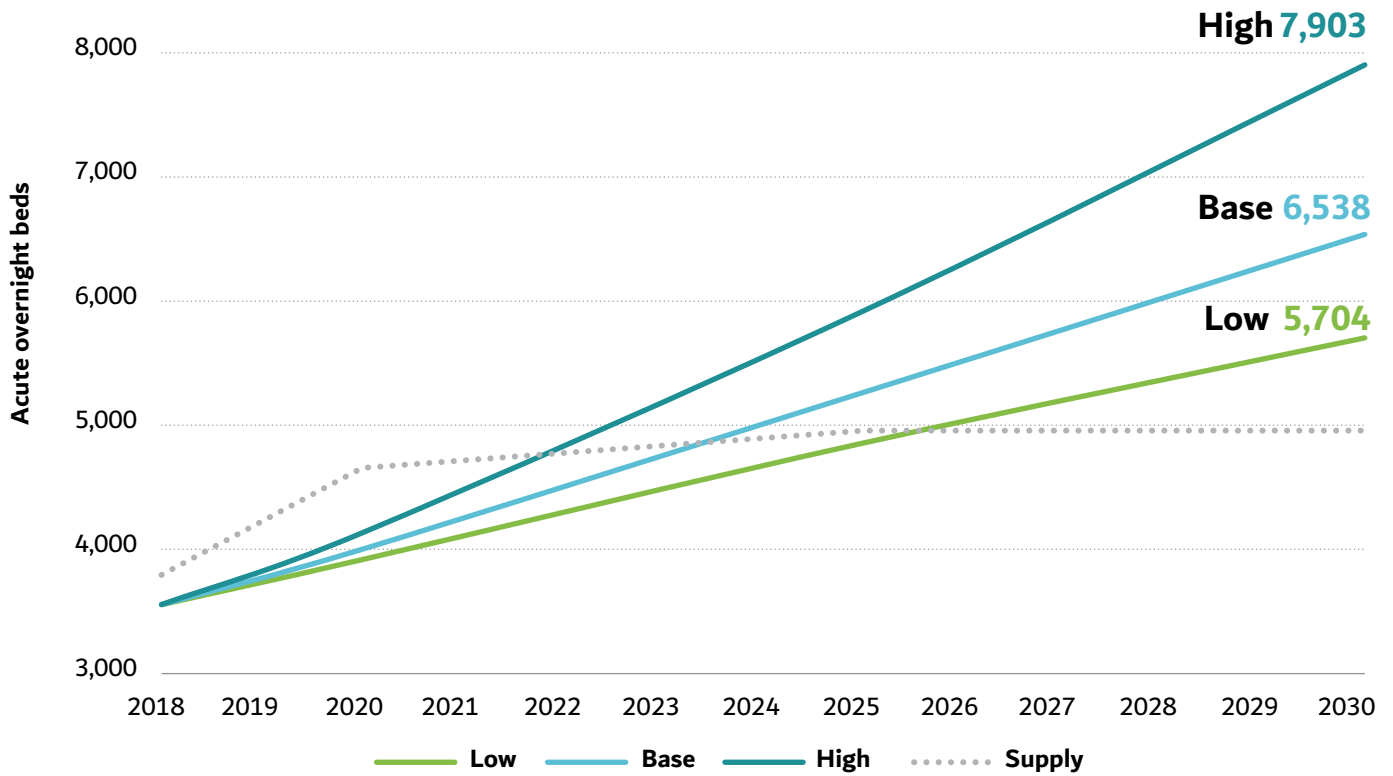
## 5.2 Demand scenarios

Three healthcare utilization scenarios were developed to identify Dubai’s demand for clinical capacity until 2030; namely Reference (High utilization), Relative Utilization (Low utilization) & Base scenarios. Each of these scenarios applied different utilization rates to demonstrate the impacts of policy change to the utilization of health care services.

The Base scenario accounts for local service utilization adjustments, models of care and current policy impacts on health care demand, whilst also allowing for capacity planning to move closer towards international standards by 2030. These demand utilization adjustment factors were discussed with an Expert Panel and analysed in conjunction with Health Statistics 2017 activity data with an additional sensitivity analysis to allow for benchmarking to local ratios.

For each service type, the Base scenario utilization rates is applied to the low, medium and high population growth profiles to generate the projected demand for that service type. As an example, the medium population profile demand scenario for acute overnight bed demand scenario modelling is shown below.

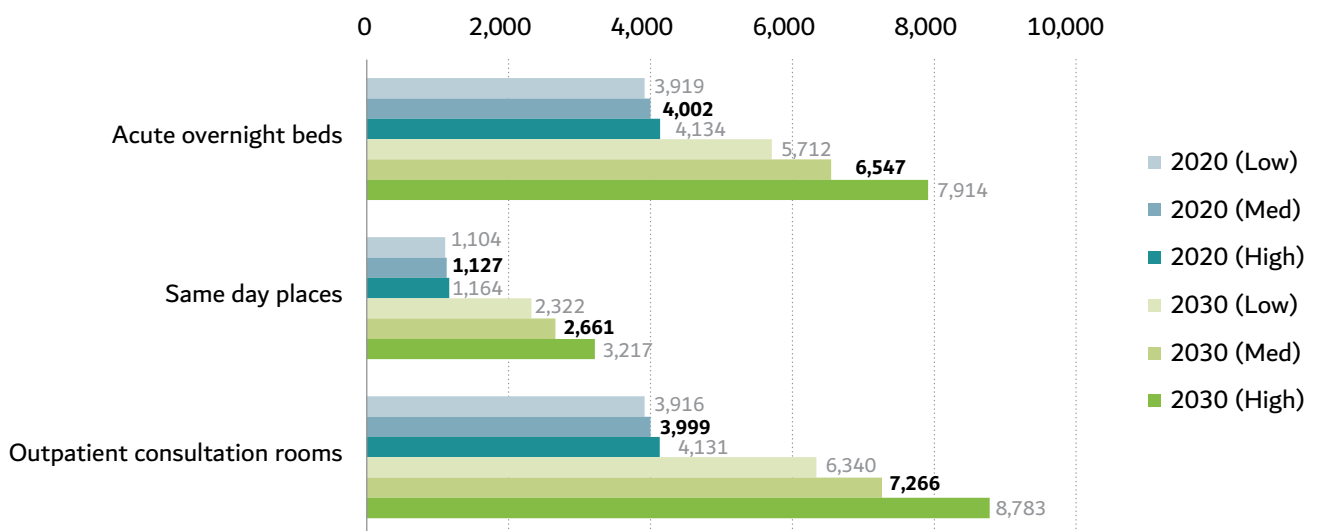
Figure 13: Demand scenarios for acute overnight beds

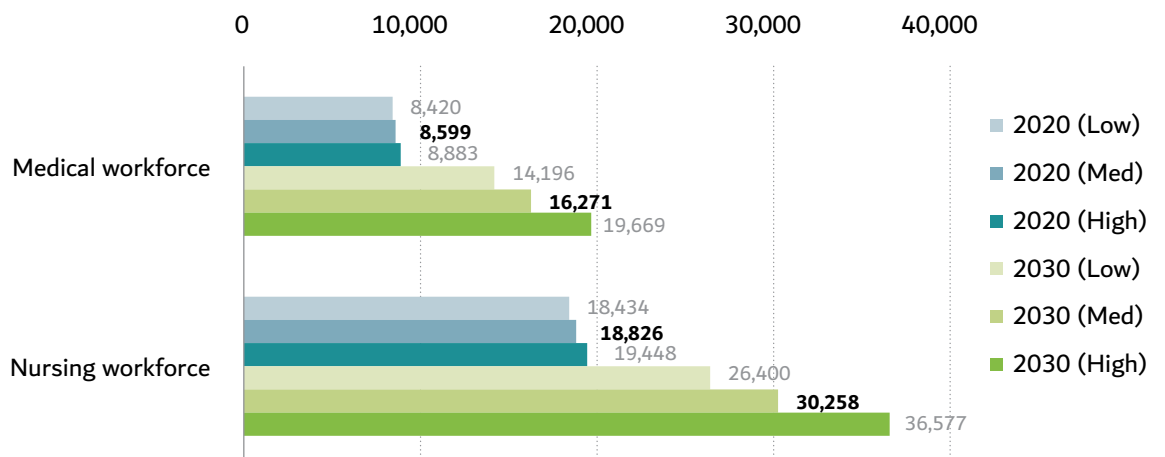
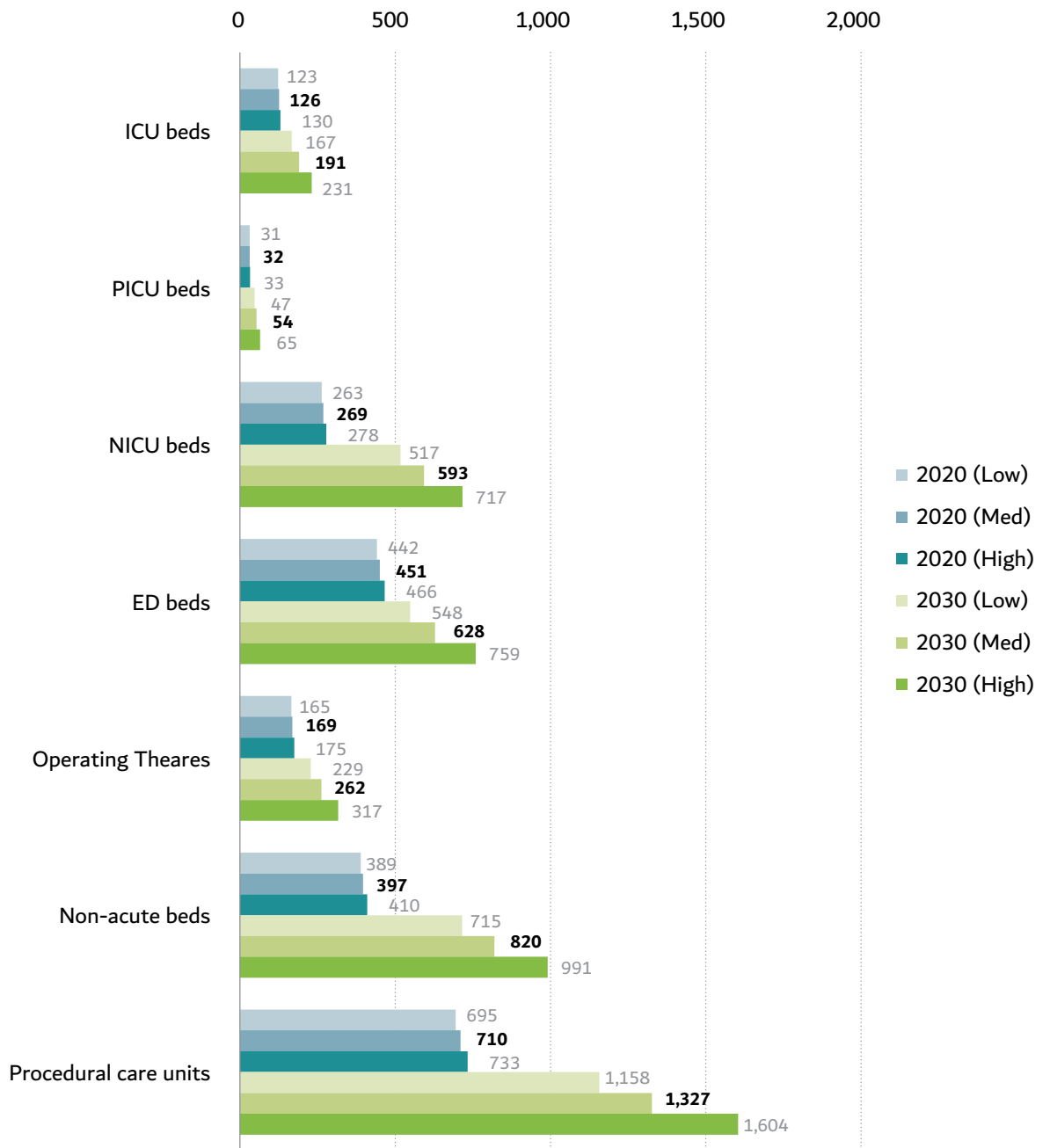


### 5.2.1 Population growth profile comparison

The Base scenario has been chosen as the analysed scenario, with low, medium and high population growth profiles being modelled to determine the range of capacity that is projected to be required.

Figure 14: Demand projections for each population series, by service type, 2020 and 2030







## 5.3 Additional demand

### Expo 2020

Dubai Expo 2020 will run between from 20th October 2020 to 10th April 2021 and impose an additional transient demand on the health care system. The 438-hectare site has a site capacity of 300,000 visitors and it is expected that over 70% of visitors will be international. Healthcare demand per day of clinic visits and episodes of care is estimated based on the number of domestic and international visitors coming to Dubai per day during the Expo and the likelihood of accessing specific types of healthcare. Demand modelling assumptions for Expo 2020 are outlined in detail in Chapter 8 – Appendix.

### Medical Tourism

Through local initiatives and the Dubai Health Experience (DXH), Dubai has developed into an emerging global health tourism destination. Medical tourism inflows present an additional scenario to health care demand for the Dubai health infrastructure as medical patients typically receive outpatient consultation(s) and depending on their purpose of travel may also include use of an operating theatre, inpatient bed or same day place.

Medical tourism inflow results have been driven by findings and assumptions in the DHA Health Tourism Strategy 2018-2021. Future demand figures have been derived from medical tourism targets, distributed across specialties by their current activity proportions.

Demand modelling assumptions for Medical Tourism are outlined in detail in Chapter 8 – Appendix.



## CHAPTER 6

# GAP ANALYSIS

This chapter describes the priorities that will need development within infrastructure and workforce to accommodate Dubai's health requirements to the year 2030. All gap figures displayed in this Chapter are based on the medium population series for the base scenario. Sensitivity analysis between population series is available in Chapter 8 – Appendix.

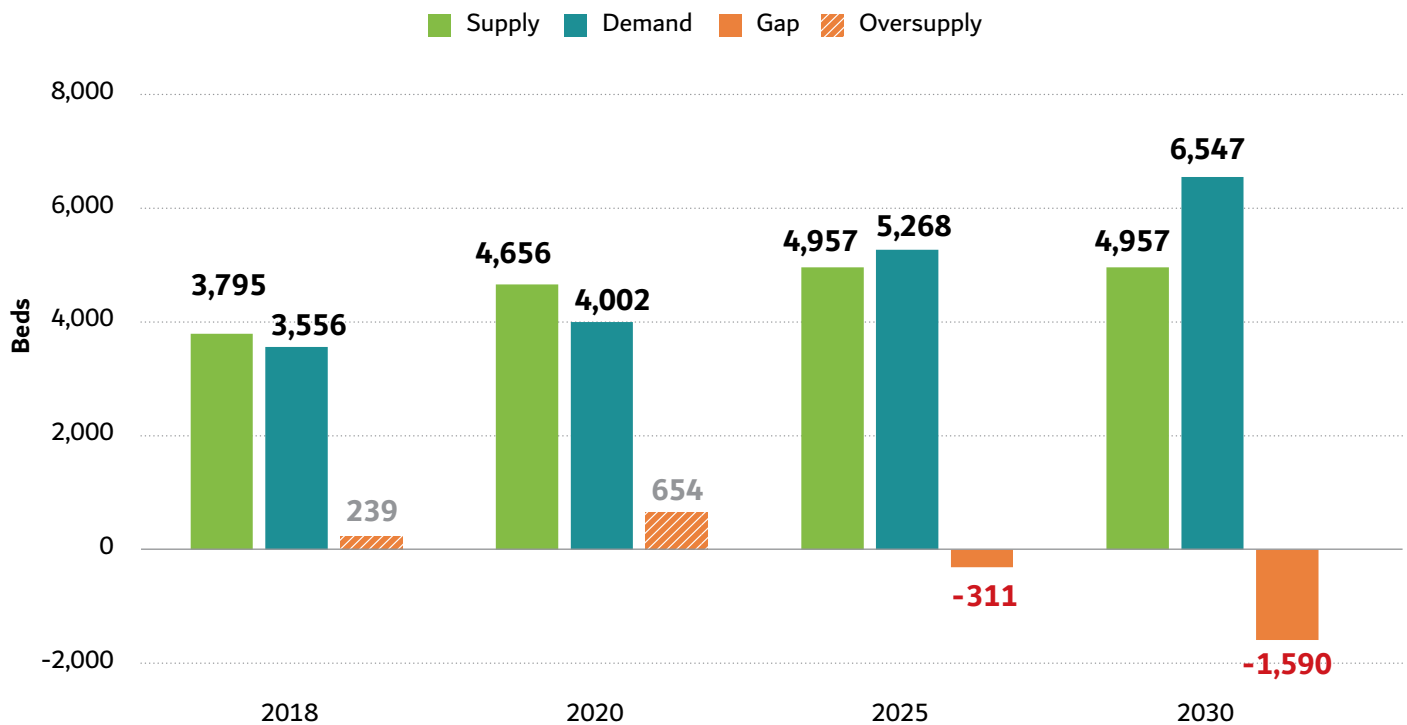
## 6.1 Acute Inpatient care (Overnight)

Of the 5,169 licensed beds in Dubai, 671 are non-functional and 703 are allocated beds to same day care, which results in a supply of 3,795 functional acute overnight beds. Based on licensing applications and Expert Panel discussion, planned supply is expected to add an additional 861 beds by 2020 and a total of 1,162 beds by 2025.

| Bed status                             | Number       |
|--|--------------|
| <b>Licensed beds</b>                   | <b>5,169</b> |
| - Non-functional beds                  | 671          |
| <b>Functional beds</b>                 | <b>4,498</b> |
| - Same day beds                        | 703          |
| <b>Acute overnight functional beds</b> | <b>3,795</b> |

Gap analysis shows that by 2025 there will be a gap of **311** acute overnight beds, which is projected to increase to **1,590** by 2030.

Figure 15: Acute overnight bed gap, 2018 to 2030



The gap in 2025 can be addressed by utilising the non-functional beds currently built to address the requirements by specialty as shown below. Planned supply has been distributed by the proportion of gap for each specialty, assuming that future supply will likely address the service lines with the greatest requirements.

Table 13: Acute overnight bed gap by specialty, 2018 to 2030, sorted by 2030 gap

| Specialty |                             | Supply |      | Demand |      |      | Gap  |      |      |
|-----------|-----------------------------|--------|------|--------|------|------|------|------|------|
|           |                             | 2018   | 2025 | 2020   | 2025 | 2030 | 2020 | 2025 | 2030 |
| 1         | Orthopaedics & Rheumatology | 158    | 253  | 213    | 349  | 513  | -1   | -96  | -241 |
| 2         | Respiratory Medicine        | 48     | 166  | 253    | 334  | 386  | -108 | -167 | -237 |
| 3         | Paediatric Medicine         | 355    | 445  | 429    | 534  | 682  | -5   | -89  | -227 |
| 4         | Obstetrics                  | 371    | 494  | 414    | 584  | 727  | 23   | -90  | -225 |
| 5         | Gastroenterology            | 68     | 125  | 102    | 202  | 335  | -10  | -77  | -189 |
| 6         | Psychiatry                  | 160    | 259  | 338    | 367  | 403  | -78  | -108 | -163 |
| 7         | Cardiology & Cardiothoracic | 285    | 389  | 318    | 444  | 539  | 40   | -55  | -153 |
| 8         | General Surgery             | 314    | 415  | 361    | 458  | 554  | 27   | -43  | -142 |
| 9         | Oncology & Haematology      | 31     | 80   | 116    | 147  | 178  | -43  | -67  | -103 |
| 10        | Renal Medicine              | 23     | 53   | 48     | 93   | 155  | -10  | -41  | -93  |
| 11        | Paediatric Surgery          | 60     | 90   | 85     | 127  | 174  | -3   | -37  | -81  |
| 12        | Urology                     | 39     | 58   | 39     | 76   | 134  | 7    | -18  | -65  |
| 13        | Immunology & Infections     | 28     | 50   | 64     | 75   | 85   | -16  | -25  | -39  |
| 14        | Neonatology & NICU          | 614    | 691  | 592    | 658  | 709  | 100  | 33   | -33  |
| 15        | Rheumatology                | 13     | 25   | 6      | 9    | 13   | -7   | -15  | -29  |
| 16        | Transplantation             | 0      | 4    | 2      | 3    | 10   | -3   | -5   | -9   |
| 17        | ENT; Head & Neck            | 46     | 54   | 36     | 48   | 56   | 16   | 6    | -2   |
| 18        | Vascular Surgery            | 40     | 50   | 22     | 35   | 50   | 25   | 15   | 0    |
| 19        | Dentistry                   | 4      | 5    | 4      | 5    | 5    | 0    | 0    | 0    |
| 20        | Dermatology                 | 9      | 10   | 4      | 6    | 7    | 6    | 4    | 3    |
| 21        | Ophthalmology               | 23     | 25   | 9      | 12   | 14   | 15   | 13   | 10   |
| 22        | Neurology                   | 88     | 106  | 51     | 74   | 88   | 51   | 32   | 16   |
| 23        | Plastic Surgery             | 56     | 64   | 28     | 34   | 32   | 35   | 30   | 29   |
| 24        | Burns                       | 62     | 64   | 7      | 10   | 12   | 57   | 54   | 52   |
| 25        | Endocrinology               | 112    | 125  | 53     | 62   | 68   | 72   | 64   | 55   |
| 26        | Neurosurgery                | 104    | 113  | 32     | 38   | 43   | 81   | 75   | 69   |
| 27        | General Medicine            | 485    | 546  | 329    | 398  | 452  | 208  | 148  | 85   |
| 28        | Gynaecology                 | 213    | 221  | 49     | 86   | 123  | 169  | 135  | 99   |

## RECOMMENDATIONS

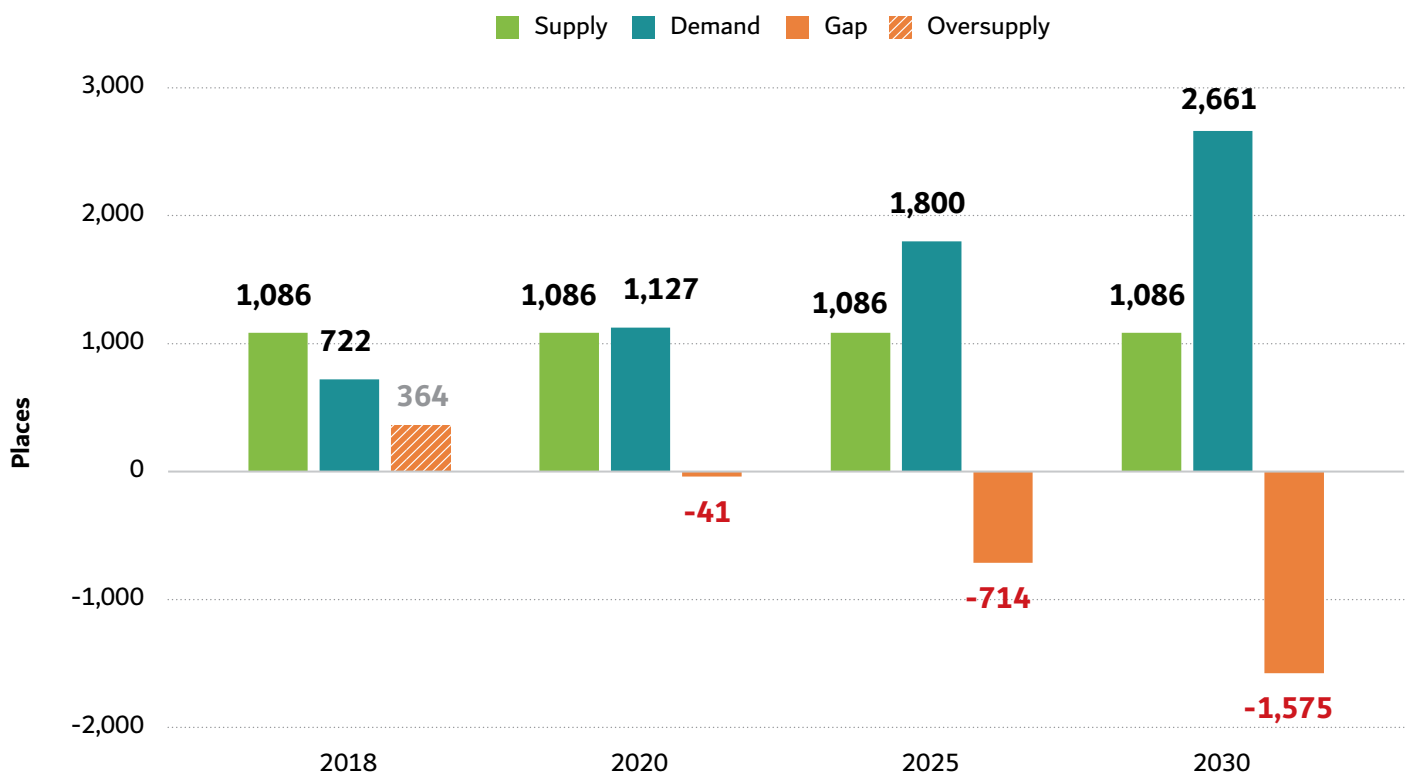
- **Distribution of capacity:** Aggregate capacity has kept up with local demand however significant gaps are prevalent in select service lines. A redistribution of beds is required to ensure that there is a better match between allocated and utilised capacity. Improved allocation of capacity will allow for higher quality of service provision as both the asset and workforce will be better placed to provide specialised care. Suboptimal occupancy rates in the private sector may be reflective of the mismatch in distribution of capacity.
- **Role delineation and referral networks.** There needs to be clearer role delineations of hospitals to create an efficient referral network between private and public sector hospitals. This delineation allows for a more efficient use of infrastructure and workforce resources through better utilisation of under-occupied facilities, economies of scale and improved quality of care.
- **Definitions and frameworks:** A clearly defined framework for defining a hospital bed and the standardised reporting of capacity is required. There needs to be a greater understanding of the difference between built capacity, licensed beds and functional beds to allow for better strategic planning and visualization of capacity buffers.
- **Census reporting.** Reporting of hospital occupancy and activity by inpatient unit through a regular census will provide a more transparent system-wide picture of utilised capacity and assist in spare capacity forecasting to assist in operational planning and disaster management.
- **Improved collection and reporting of admitted patient health statistics:** the accurate coding, collection and reporting of the summative admitted patient record is crucial to understanding the utilisation of Dubai's hospitals. The further development of a standard data dictionary; mandatory reporting requirements, standards and timeframes; and coding quality reviews for both public and private hospital will significantly improve the reliability and usefulness of these data for performance and capacity management.
- **Future planned supply:** Implement Certificate of Need policies to ensure that capacity of planned facilities is linked to gaps and investment opportunities, and addresses health system needs to optimize demand and supply and sustain and equilibrium state
- **Hub-and-spoke models:** Establishing a structured network of linked facilities will allow care to be provided closer to the patient's place of residence where gaps in supply indicate. Decentralising capacity growth from sector 3 and establishing supply in growth sectors when demand exceeds the capacity of sector 3 facilities should be considered. Hospitals in growth sectors should focus on spoke facility role. Spoke facilities will generally have a primary and secondary care focus and refer to tertiary hub facilities when required.
- **Demand reduction strategies:** Offsetting acute overnight admissions through increased utilisation of same day and outpatient care should be further investigated. Demand mitigation can be achieved through strengthening the primary and community care network and improving its ability to case manage patients in the ambulatory setting for conditions where evidence shows that hospital admission can be avoided.
- **Reducing overnight length of stay:** Implement systematic discharge planning and DRG performance review as a way of reducing overnight length of stay of admissions, especially within the public system. This in conjunction with use of same day or short stay care units in hospitals, such as Medical Assessment Units, allows for multi-disciplinary input and case management to patients presenting with acutely exacerbated chronic medical conditions, needing short term stabilisation, or those requiring development of care plans prior to discharge and referral to community-based care.
- **Mental health policy:** Policy review is required to improve utilisation for both nationals and non-nationals to address the unmet demand of mental health illness. Mental health demand projections have been reduced due to historically low relative utilisation of the service in Dubai. This policy review should examine patients being assessed and treated in different settings based on their needs; remote telehealth and community care for those that require ongoing care; and specialised mental health acute facilities for those requiring high complexity mental health care. A multi-disciplinary service model that supports community-based care should be explored to reduce the pressure on scarce inpatient mental health facilities.

## 6.2 Acute Inpatient care (Same Day)

The acute same day place supply of 1,086 places consists of all designated medical and surgical same day beds as well as treatment chairs for chemotherapy, infusions and renal dialysis. The distribution of this supply to specialties is based on acute overnight bed as reported by the survey and adjusted for local utilisation figures calculated from HS17 activity data.

The gap analysis shows that Dubai has an undersupply of **41** acute same day places in 2020, which will increase to **1,575** places by 2030.

Figure 16: Acute same day place gap, 2018 to 2030



The gap analysis for each specialty shows that the top 5 specialties in requirement by 2030 will be Dialysis, Paediatric Medicine, Gastroenterology, Orthopaedics & Rheumatology and General Medicine.

Table 14: Acute same day place gap by specialty, 2018 to 2030

| Specialty |                             | Supply | Demand |      |      | Gap  |      |      |
|-----------|-----------------------------|--------|--------|------|------|------|------|------|
|           |                             | 2018   | 2020   | 2025 | 2030 | 2020 | 2025 | 2030 |
| 1         | Dialysis                    | 123    | 162    | 298  | 493  | -39  | -175 | -370 |
| 2         | Paediatric Medicine         | 105    | 120    | 177  | 264  | -15  | -71  | -159 |
| 3         | Gastroenterology            | 27     | 49     | 102  | 181  | -22  | -75  | -155 |
| 4         | Orthopaedics & Rheumatology | 43     | 65     | 118  | 188  | -21  | -75  | -144 |
| 5         | General Medicine            | 167    | 191    | 248  | 296  | -24  | -81  | -129 |
| 6         | General Surgery             | 92     | 117    | 152  | 190  | -25  | -60  | -98  |
| 7         | Haematology & Oncology      | 9      | 53     | 75   | 103  | -44  | -65  | -94  |
| 8         | Cardiology & Cardiothoracic | 23     | 49     | 84   | 136  | 4    | -31  | -83  |
| 9         | Paediatric Surgery          | 8      | 41     | 65   | 97   | -18  | -42  | -74  |
| 10        | Renal Medicine              | 53     | 16     | 37   | 73   | -8   | -29  | -65  |
| 11        | Chemotherapy                | 7      | 21     | 41   | 68   | 10   | -10  | -37  |
| 12        | Urology                     | 38     | 11     | 26   | 48   | 1    | -14  | -37  |
| 13        | Obstetrics                  | 12     | 27     | 50   | 73   | 11   | -12  | -35  |
| 14        | Gynaecology                 | 31     | 61     | 117  | 165  | 71   | 15   | -34  |
| 15        | Ophthalmology               | 131    | 20     | 32   | 45   | -4   | -16  | -29  |
| 16        | Dentistry                   | 16     | 18     | 21   | 22   | -15  | -18  | -19  |
| 17        | Respiratory Medicine        | 3      | 12     | 23   | 35   | 4    | -6   | -19  |
| 18        | Psychiatry                  | 16     | 17     | 21   | 25   | -6   | -9   | -14  |
| 19        | ENT; Head & Neck            | 11     | 11     | 19   | 28   | 4    | -4   | -13  |
| 20        | Neurology                   | 16     | 14     | 26   | 40   | 17   | 5    | -9   |
| 21        | Immunology & Infections     | 3      | 6      | 8    | 11   | -2   | -4   | -7   |
| 22        | Vascular Surgery            | 31     | 3      | 6    | 9    | 4    | 1    | -2   |
| 23        | Dermatology                 | 7      | 2      | 3    | 4    | 1    | 0    | -1   |
| 24        | Neonatology & NICU          | 5      | 4      | 4    | 4    | 1    | 1    | 1    |
| 25        | Endocrinology               | 9      | 16     | 22   | 30   | 19   | 12   | 5    |
| 26        | Burns                       | 34     | 1      | 1    | 2    | 8    | 8    | 7    |
| 27        | Neurosurgery                | 25     | 7      | 10   | 13   | 18   | 16   | 12   |
| 28        | Plastic Surgery             | 43     | 12     | 17   | 16   | 31   | 26   | 27   |

## RECOMMENDATIONS

- Increasing same day utilisation:** A growing proportion of inpatient services can be effectively treated in a same day setting. It is recommended that there be clear guideline be established on diagnosis group, procedures and operations that are suited to same day service delivery to inform funders of this strongly emerging opportunity. Establishing guidelines for same day model of cares will assist Dubai cater for a growing number of high volume and low complexity hospital episodes suited to same day care and would help mitigate demand for overnight inpatient wards, particularly in the public sector. With appropriate redesign, same day models allow increased activity within existing resources without compromising patient safety or quality of care. Patients are provided essential inpatient management, however, are case managed in the outpatient setting.
- Definitions and coding practices:** To further assist the implementation of DRGs in Dubai, establish clear definitions of acute service types to help distinguish between overnight, same day and outpatient care. Inconsistencies in classifications and coding practices between facilities compromises ability to clearly analyse activity and plan future capacity. An example of this exists in the variability of coding practices and lack of clarity of chemotherapy, renal dialysis and admitted emergency presentations.
- Growing demand:** Renal dialysis is demonstrating rapidly increasing requirements for acute same day services until 2030. It is noted that two additional dialysis centres are expected to be commissioned within the next two to three years. This, however, may be insufficient to accommodate the projected gaps in supply by 2030. An Emirate-wide systematic review of renal dialysis care is recommended to ensure that the population is readily able to access care in settings suitable to their needs. Education and preventative strategies to reduce the prevalence of renal failure should be a priority for policy. However, alternative treatment modalities, such as home dialysis and increased used of peritoneal dialysis should be explored as part of the review to determine their viability as alternative treatment options.

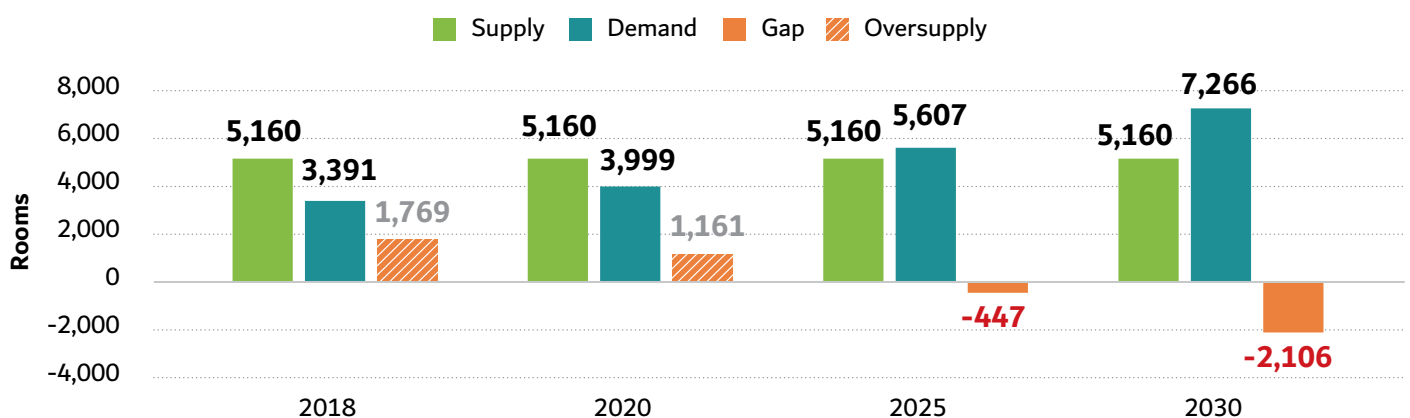
### 6.3 Outpatient care (Consultation rooms)

There are a reported 5,160 outpatient consultation rooms in Dubai across the facility settings of hospitals, clinics and centres. The vast majority (70%) of these rooms are in Sector 3, with Sector 1 and 2 contributing 13% and 10% respectively.

The demand profile for outpatient care has been adjusted for local utilisation factors as derived from Health Statistics 2017 activity data, which gives a locally sensitive gap result based on current practices and models of care.

The gap analysis shows that Dubai is currently well served with outpatient consultation rooms with a requirement for an additional **447** rooms by 2025, increasing to **2,106** rooms by 2030.

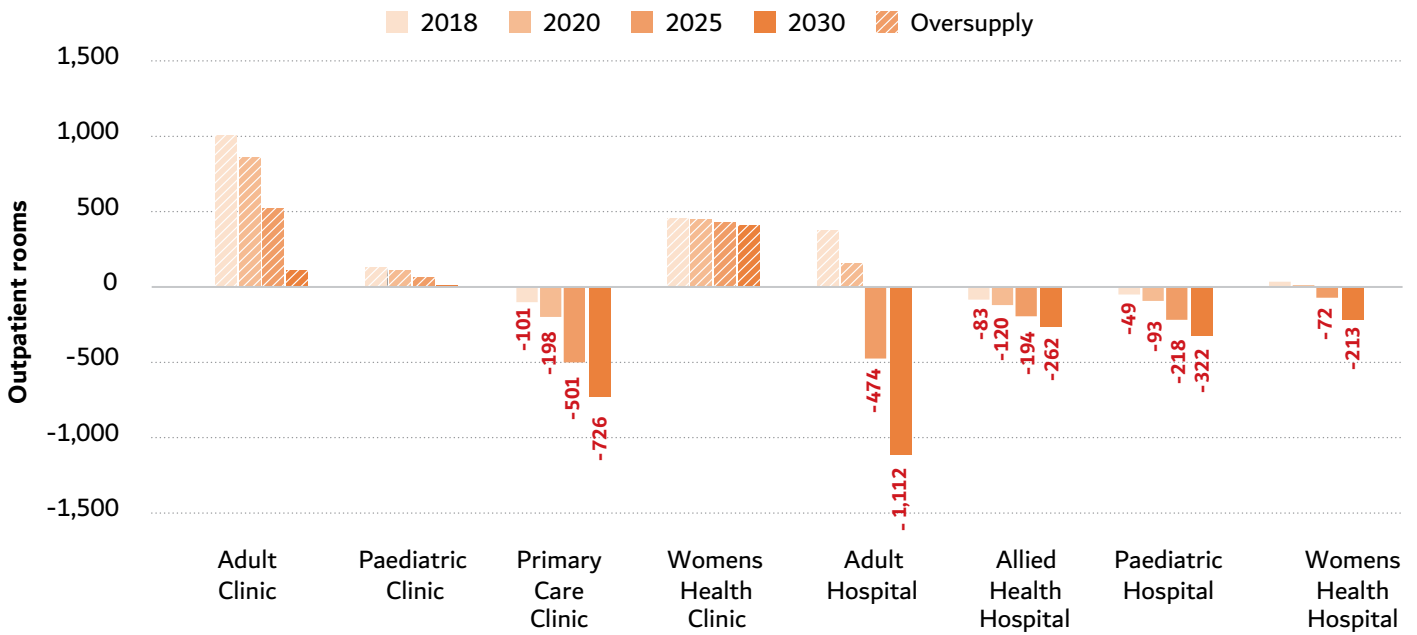
Figure 17: Outpatient room gap, 2018 to 2030





The largest contributor to the gap in outpatient consultation rooms occurs in both the primary care and adult hospital outpatient service modes, with most clinic-based rooms being in oversupply up to 2030.

Figure 18: Outpatient room gap by service mode, 2018 to 2030



When viewing the gap by geographical sector, the large concentration of supply in Sector 3 results in no requirement of consultation rooms up to 2025, with an additional 105 rooms required by 2030. The majority of gap will occur in Sectors 1, 2, 4, 5 and 6, highlighting the current patient flow trends and historical focal capacity allocation in Sector 3. The geographic distribution of primary care may emerge as a significant concern with the increasing density of Dubai’s population and the associated increased travel times.

Figure 19: Outpatient room gap by sector, 2018 to 2030

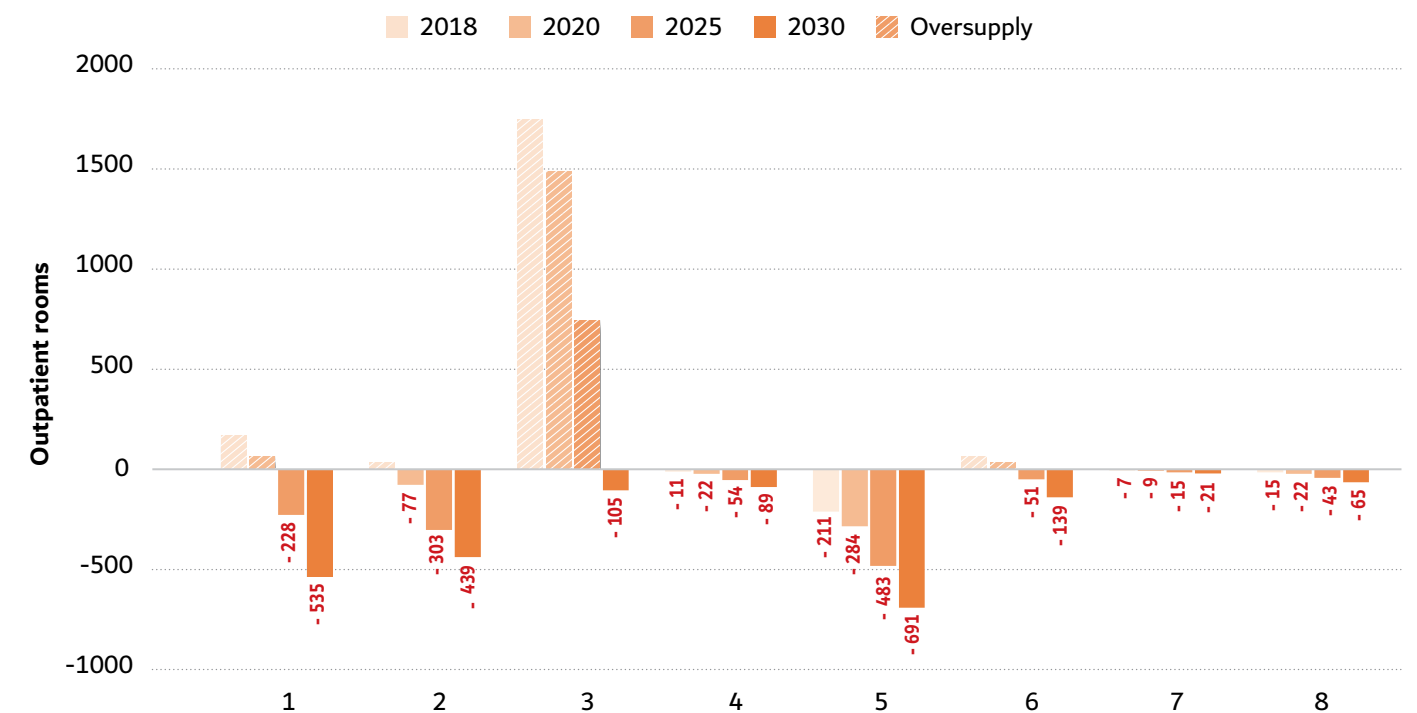


Table 15: Outpatient room gap by specialty, 2018 to 2030, sorted by largest 2030 gap

| Specialty |                             | Supply | Demand |       |       | Gap  |      |      |
|-----------|-----------------------------|--------|--------|-------|-------|------|------|------|
|           |                             | 2018   | 2020   | 2025  | 2030  | 2020 | 2025 | 2030 |
| 1         | Primary Care                | 677    | 875    | 1,178 | 1,403 | -198 | -501 | -726 |
| 2         | Allied Health               | 101    | 221    | 295   | 363   | -120 | -194 | -262 |
| 3         | Paediatrics                 | 423    | 363    | 499   | 651   | 60   | -76  | -228 |
| 4         | General Medicine            | 657    | 381    | 596   | 870   | 276  | 61   | -213 |
| 5         | Respiratory Medicine        | 36     | 136    | 181   | 245   | -100 | -145 | -209 |
| 6         | Endocrinology               | 97     | 143    | 207   | 286   | -46  | -110 | -189 |
| 7         | Neurology                   | 75     | 150    | 191   | 232   | -75  | -116 | -157 |
| 8         | Gastroenterology            | 105    | 113    | 172   | 256   | -8   | -67  | -151 |
| 9         | Oncology & Haematology      | 37     | 72     | 100   | 136   | -35  | -63  | -99  |
| 10        | Orthopaedics & Rheumatology | 349    | 236    | 315   | 419   | 113  | 34   | -70  |
| 11        | Immunology & Infections     | 20     | 40     | 52    | 65    | -20  | -32  | -45  |
| 12        | Urology                     | 118    | 79     | 113   | 158   | 39   | 5    | -40  |
| 13        | Trauma and Injury           | 8      | 28     | 36    | 42    | -20  | -28  | -34  |
| 14        | Renal Medicine              | 26     | 29     | 38    | 53    | -3   | -12  | -27  |
| 15        | Dentistry                   | 55     | 40     | 57    | 80    | 15   | -2   | -25  |
| 16        | Vascular Surgery            | 17     | 19     | 26    | 34    | -2   | -9   | -17  |
| 17        | Neonatology                 | 2      | 6      | 8     | 10    | -4   | -6   | -8   |
| 18        | Psychiatry                  | 140    | 83     | 111   | 138   | 57   | 29   | 2    |
| 19        | Neurosurgery                | 42     | 12     | 16    | 20    | 30   | 26   | 22   |
| 20        | ENT; Head & Neck            | 183    | 90     | 116   | 149   | 93   | 67   | 34   |
| 21        | Obstetrics                  | 307    | 143    | 179   | 262   | 164  | 128  | 45   |
| 22        | General Surgery             | 181    | 66     | 91    | 122   | 115  | 90   | 59   |
| 23        | Cardiology & Cardiothoracic | 193    | 61     | 91    | 131   | 132  | 102  | 62   |
| 24        | Ophthalmology               | 218    | 62     | 90    | 140   | 156  | 128  | 78   |
| 25        | Plastic Surgery             | 205    | 24     | 31    | 37    | 181  | 174  | 168  |
| 26        | Gynaecology                 | 515    | 114    | 170   | 247   | 401  | 345  | 268  |
| 27        | Dermatology                 | 373    | 69     | 81    | 93    | 304  | 292  | 280  |

## RECOMMENDATIONS

- Primary Care priority:** An enhanced system-wide co-ordinated approach to improve primary care is recommended. This is to be supported by local service delivery, clearly defined referral service delivery networks. Further work is need on the differentiation the roles of primary, secondary and tertiary care providers in this network. Enhancing a gatekeeper model and promoting primary care as entry point into Dubai’s healthcare network will assist in effective referrals for elective and urgent care. Promoting primary care providers as a patient’s entry point will facilitate more effective screening and has the potential to reduce unnecessary and expensive treatments.
- Overcapacity:** Clinic-based consultation rooms, especially those located in Sector 3, display a large oversupply. This creates a highly concentrated ambulatory care structure, which may resist primary care and patient focus initiatives. Strategies need to be put in place to enhance local primary care and to provide remote care through the aid of telemedicine solutions where feasible.
- Multi-disciplinary team:** Allied health and nurse practitioners provided cost effective alternatives to standardised, non-complex care and free up scarce medical practitioner resources for the management of higher complexity cases. Ambulatory multi-disciplinary models focusing on preventative and supportive functional care in the outpatient setting improves patient outcomes, quality of care and reduces unnecessary costs.
- Capacity:** Perform a detailed utilization-based review of functional and non-functional capacity of consultation rooms to better understand utilized capacity and occupancy. This framework would assist in reducing duplication of consultation rooms for the same service.



“In line with the 50 year charter and direction for a Doctor for Every Citizen we will continue to develop infrastructure in Dubai to ensure that the fifth article acts as a performance indicator for DHA to measure efficiency of hospitals, primary care centers specialized centers and clinics across Dubai”

**Humaid Al Qutami**  
Director General, Dubai Health Authority

## 6.4 Emergency Department

Across Dubai, there are 501 Emergency bays of which 229 are allocated to Life Threatening care and 272 are allocated to Urgent Care. Most of these bays are in Sector 3 (61%), followed by Sector 1 (22%) and Sector 2 (10%).

The gap analysis indicates that Dubai is well served by total emergency bays currently and will require **35** bays by 2025, increasing to **107** bays by 2030. When the gap is analysed by type of bay, it shows an immediate requirement for Life Threatening bays, increasing from **26** bays currently to **211** bays by 2030. This presents an opportunity to repurpose existing capacity to meet this current and emerging requirement.

Figure 20: Supply, demand and gap for ED bays, 2018 to 2030

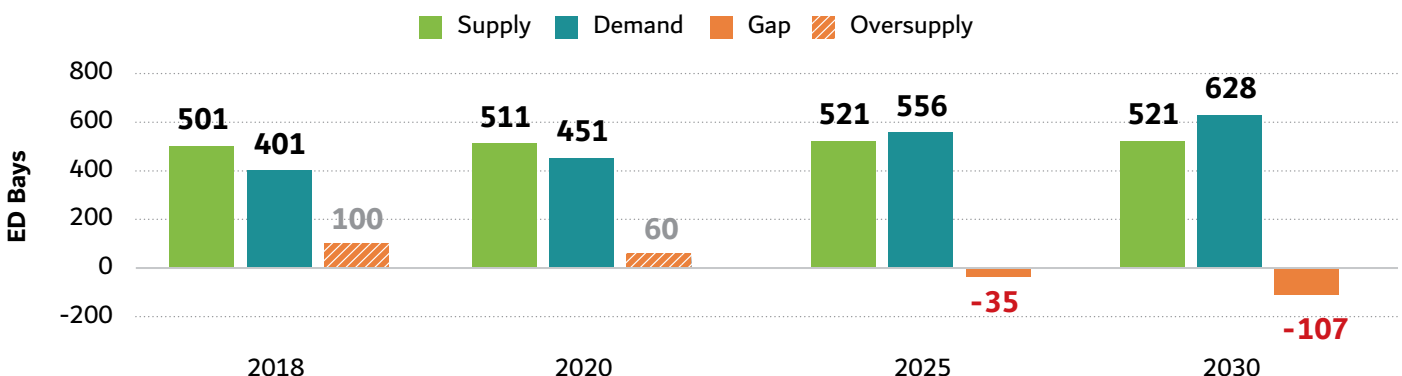
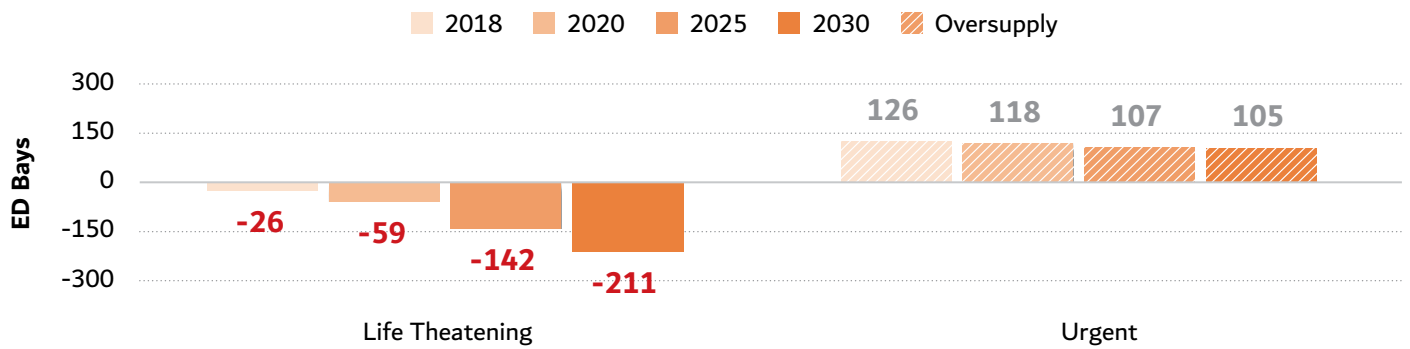


Figure 21: Gap by type, 2018 to 2030



## RECOMMENDATIONS

- Life threatening emergency bays:** Additional life-threatening emergency bays are an immediate need and will remain a requirement up to 2030, reinforced by the high levels of emergency department activity at public hospitals where most life-threatening care is provided in Dubai. It is recommended that life-threatening capacity is increased in facilities where patients are presenting. This additional capacity should be resourced to rapidly respond and effectively identify and treat patients who are at a high probability of dying.
- Walk-in urgent care clinics:** Appropriately staffed walk-in urgent care clinics be established to cater for urgent non-life-threatening patients and reduce pressure on existing emergency departments that are facing pressure from high volumes of life-threatening presentations. These urgent care centres are to be established in smaller generalist hospitals with underutilised capacity because higher acuity patients are being diverted to the larger specialist hospitals of Dubai. This model will be assisted by telehealth applications to allow patients to have access to specialists when required and be triaged to a higher acuity facility and transferred when necessary.
- Workforce:** Consistent with international trends in Emergency Care, larger facilities should be encouraged to employ emergency medicine-trained practitioners instead of internal medicine generalists to improved practice quality and reduce hospital emergency department-based morbidity and mortality.
- Planning requirements:** It is recommended that facility licensing policies be reviewed to limit the development of low-quality and poorly utilised emergency bays in small and inappropriately staffed hospitals where utilisation and quality care cannot be assured.

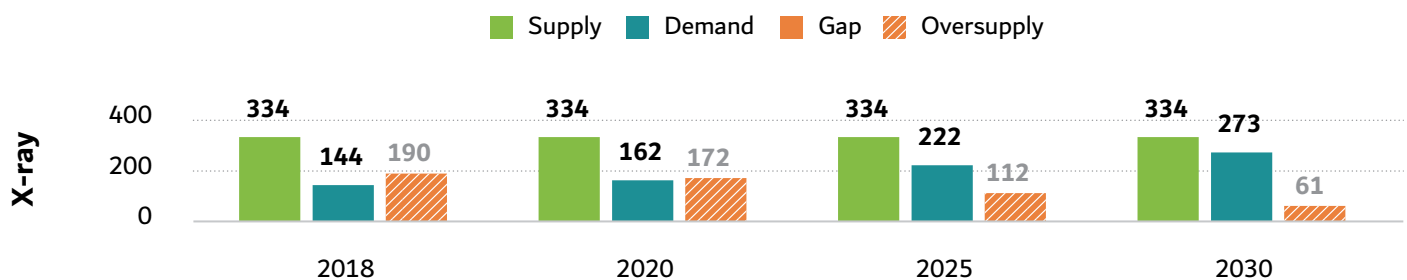
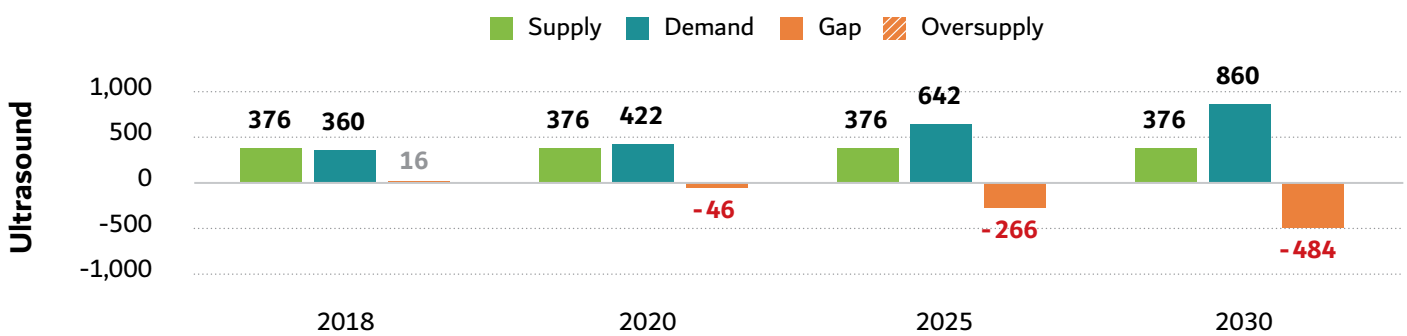
## 6.5 Procedural Care / Medical Imaging

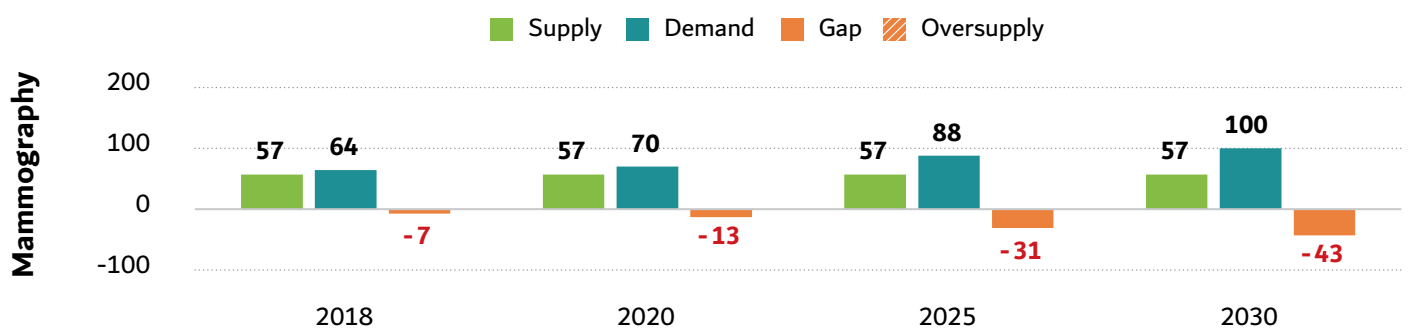
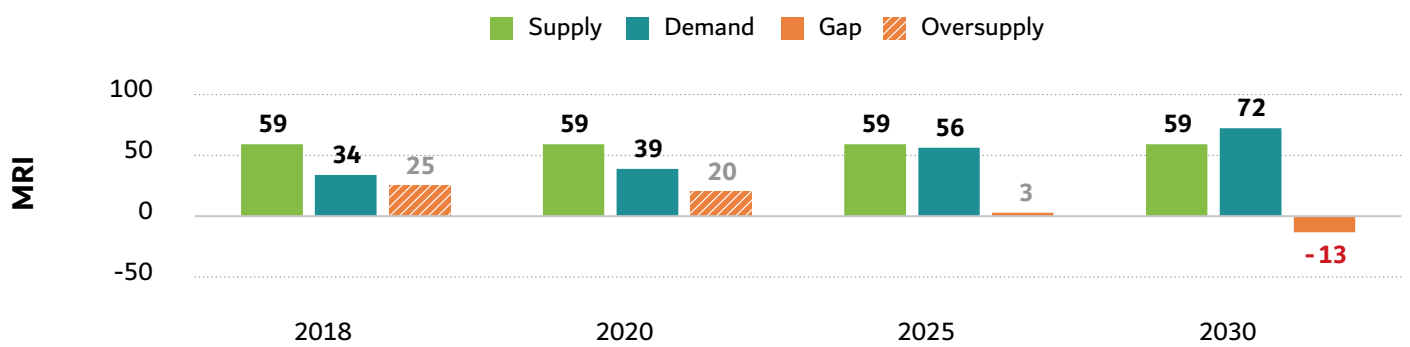
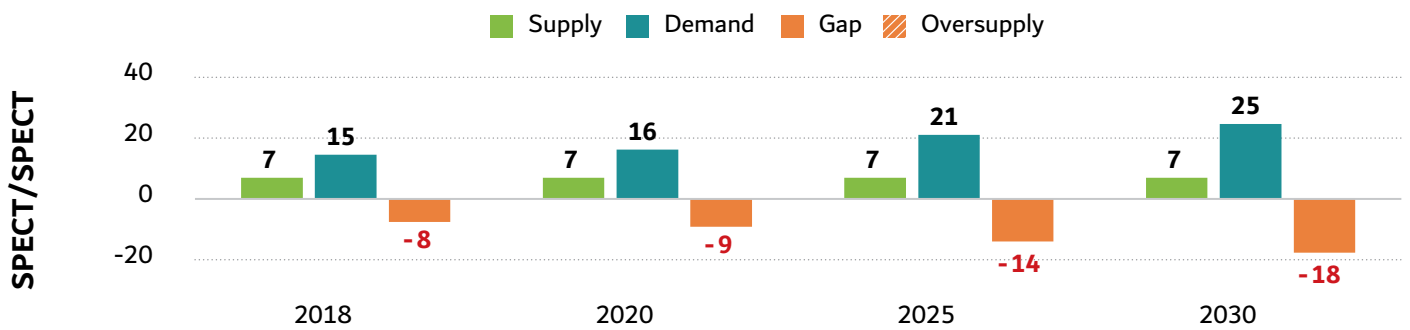
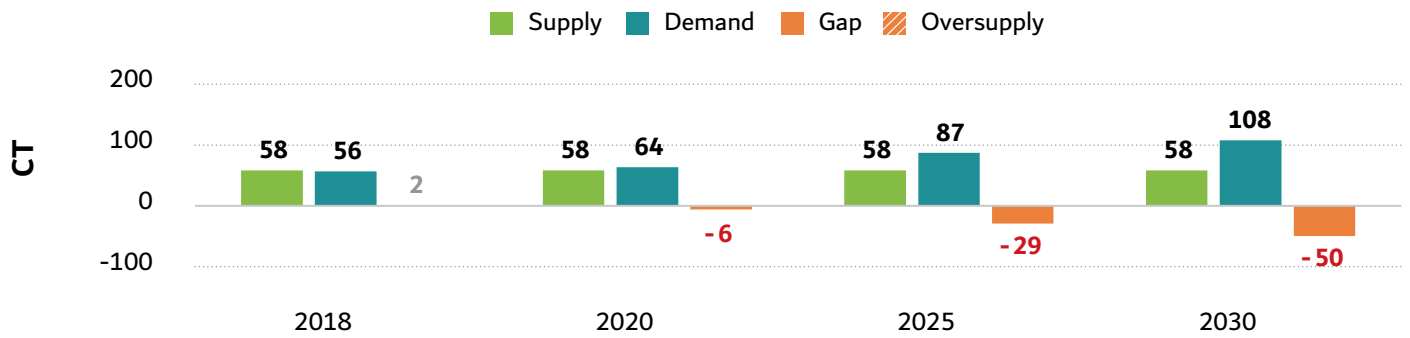
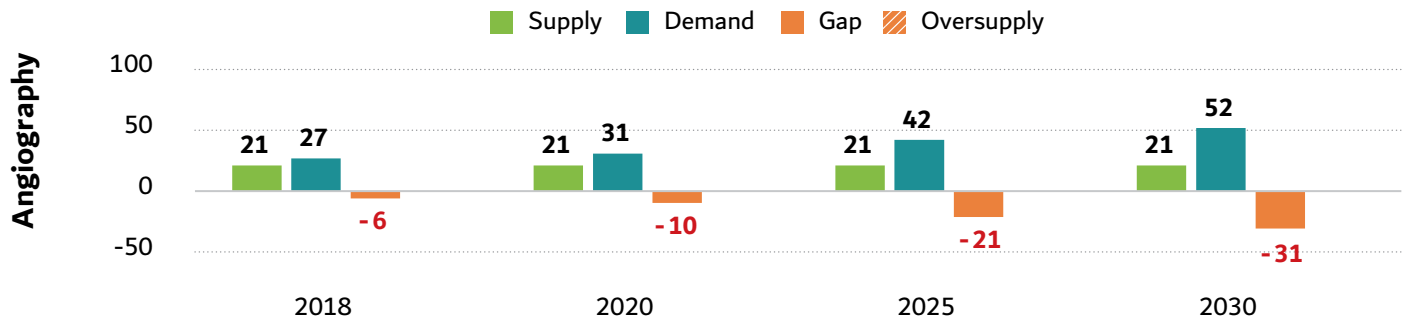
The distribution of procedural care, or medical imaging, units amongst the Emirate is heavily focused in Sector 3 (65%), Sector 1 (14%) and Sector 2 (12%). The demand profile estimates for each procedural care unit type has local relative utilisation rates applied where indicated after Expert Panel discussion; this was most pronounced for SPECT/SPECT-CT, PET and Radiation therapy.

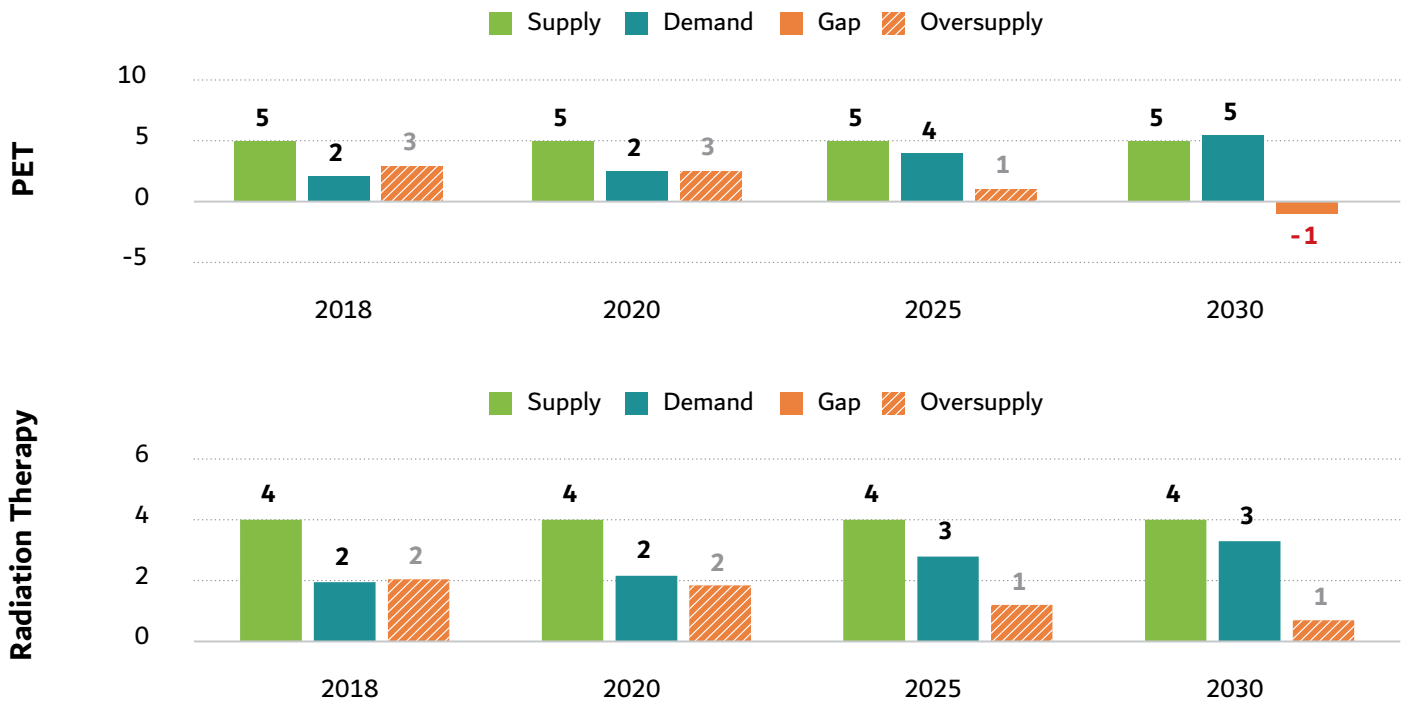
The gap analysis for procedural care units is summarised in the table below, followed by accompanying supply, demand and gap figures for each unit type.

Table 16: Procedural care unit gap by type, 2018 to 2030

| Specialty |                              | Supply | Demand |      |      | Gap  |      |      |
|-----------|------------------------------|--------|--------|------|------|------|------|------|
|           |                              | 2018   | 2020   | 2025 | 2030 | 2020 | 2025 | 2030 |
| 1         | Ultrasound                   | 376    | 422    | 642  | 860  | -46  | -266 | -484 |
| 2         | Computed Tomography          | 58     | 64     | 87   | 108  | -6   | -29  | -50  |
| 3         | Mammography                  | 57     | 70     | 88   | 100  | -13  | -31  | -43  |
| 4         | Angiography                  | 21     | 31     | 42   | 52   | -10  | -21  | -31  |
| 5         | SPECT/SPECT-CT               | 7      | 16     | 21   | 25   | -9   | -14  | -18  |
| 6         | Magnetic Resonance           | 59     | 39     | 56   | 72   | 20   | 3    | -13  |
| 7         | Positron Emission Tomography | 5      | 2      | 4    | 5    | 2    | 1    | -1   |
| 8         | Radiation Therapy            | 4      | 2      | 3    | 3    | 2    | 1    | 1    |
| 9         | X Ray                        | 334    | 162    | 222  | 273  | 172  | 112  | 62   |







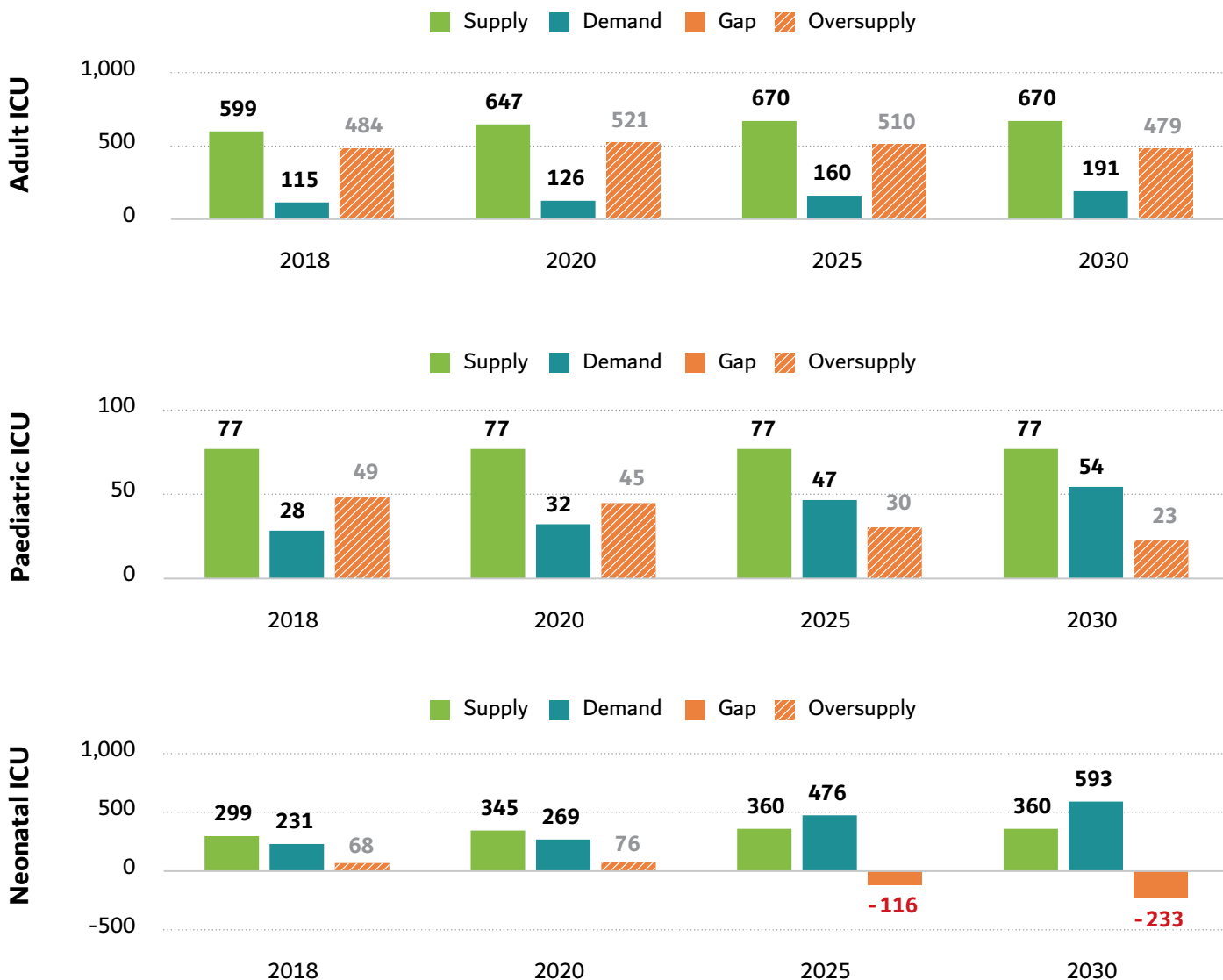
## RECOMMENDATIONS

- **Planning requirements:** Review policies and license requirements for medical imaging equipment at the facility planning stage to reduce unnecessary allocation of expensive and underutilised machines
- **Diagnostic centres:** Standalone diagnostic centres are recommended to reduce duplication of services and improve workforce utilisation. Rationalising medical imaging for smaller clinics in highly concentrated areas helps to reduce infrastructure and workforce capacity duplication
- **Teleradiology:** Review of policies and requirements to encourage uptake of teleradiology that will allow the review of digital radiological images by expert radiologists regardless of a diagnostic centre's location
- **Shared Diagnostic platform:** Enabling diagnostic results to be shared amongst facilities through a cross-platform solution will improve efficiency and safety of care for the patient. This will also allow capacity to be used by multiple facilities instead of being siloed into individual units.
- **Reducing outflow:** Reducing outflow to outside Dubai for specialist procedural care, such as radiation therapy, will increase utilisation by improving self-sufficiency. It is recommended that radiology centres of excellence be established in high outflow specialities where there is a projected gap in supply.

## 6.6 Critical Care beds

There are currently 902 critical care beds in Dubai (526 Adult, 299 Neonatal and 77 Paediatric), with an additional planned supply of 144 adult ICU and 61 NICU beds expected to be commissioned by 2025.

The gap analysis indicates that critical care beds will remain oversupplied up to 2030, however when displayed by type of bed, there is an undersupply of **116** Neonatal ICU beds by 2025 which increases to **233** by 2030.



### RECOMMENDATIONS

- Long-term care:** Improving LTC capacity and its model of care will reduce intensive care bed utilisation of patients requiring long term airways assistance, one of Dubai’s largest contributors to the oversupply of adult ICU beds.
- NICU capacity:** Addressing the growing demand and gap in NICU beds through allocation of additional licences and funding. This growth is largely due to increased neonatal survival rates from technological advancements and the delay of childbirth by families to older ages in women increasing the number of high-risk births.
- Planning requirements:** Review policies and requirements for minimum critical care beds at facility planning stage to ensure that beds are approved to meet expected demand and to meet international bed planning benchmarks

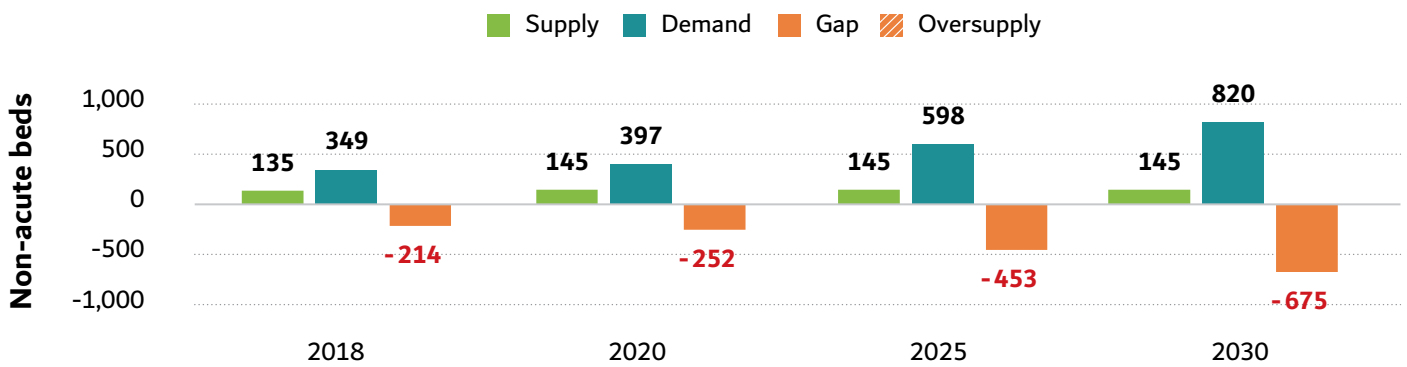


## 6.7 Non-Acute Care and Long-Term Care beds

The current supply of non-acute care beds is made up of 64 long term care beds and 71 rehabilitation beds, with a further 30 rehabilitation beds planned by 2020. The demand profile for non-acute care has been adjusted for local utilisation factors, with only 10% of non-national population demand being considered needed.

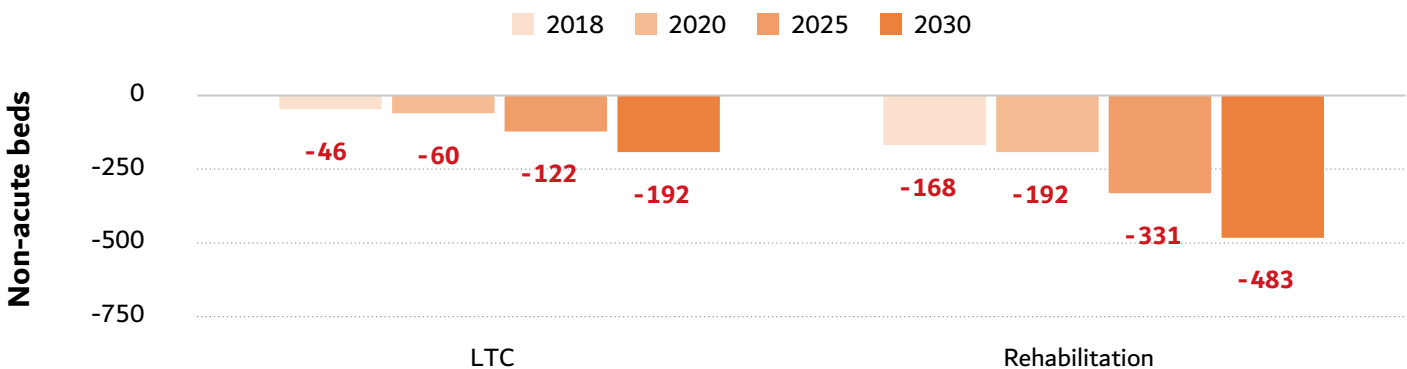
The gap analysis indicates that non-acute care beds are currently in undersupply and their future requirements will continue to grow, increasing from **214** beds in 2018 to **675** beds by 2030.

Figure 22: Supply, demand and gap for Non-acute care beds, 2018 to 2030



When analysed by type of bed, the largest contributor to non-acute care bed gap is Rehabilitation, which currently requires 168 beds and will increase to 483 beds by 2030.

Figure 23: Figure 23 Gap by bed type, 2018 to 2030



Several medical conditions and disorders treated under the service lines of Orthopaedics, Neurology, Respiratory, Cardiology, and Oncology require extended rehabilitation. The growth in Acute Orthopaedics and Rheumatology are estimated to require a significant bed demand by 2025, which is a major contributor to demand for physical therapy and musculoskeletal rehabilitation

The greater survival of patients with moderate to profound functional impairment coupled with a general population aging is placing additional demands on social and health care systems for the provision of longer-term care systems and facilities to accommodate these emerging needs.

## RECOMMENDATIONS

- Increasing capacity:** There is an existing and growing requirement in non-acute and long-term care capacity which need supporting with appropriate licence and funding incentives to improve investment in rehabilitation, transitional and long-term care facilities. Public and private and partnership opportunities should be explored for the funding, development and operation long term care systems and facilities.
- Model of care:** Exploration and development of rehabilitation, post-acute and long-term care service delivery models of care to address insufficient supply and growing demand. These models of care should address therapy requirements in all care settings along the patient journey including the management of patients requiring continuous airways management support and those requiring ongoing support with activities of daily living.
- Improving access:** A clearly defined insurance reimbursement framework and process for rehabilitation and long-term care is required to improve service availability in response to increasing demand, especially for non-nationals.
- Reducing demand:** Explore options for community-based and outreach non-acute care to mitigate facility capacity gaps. A large component of rehabilitation and long-term care can be cost effectively delivered through community and home care systems. These systems can be managed and monitored via centralised expert systems and care planning managed through the aid of telemedicine solutions
- Policy driven demand:** Planning for the impact on demand as a result of financing initiatives currently under way, such as implementation of DRGs in 2019, that will increase the demand for step down and long-term care facilities due to payment and length of stay caps on acute care.

“The DHA works to ensure all insurers have adequate providers, both in terms of geographic coverage and medical competence, regardless of the level of plan. We want to move into the preventive medicine instead of curative because it reduces the costs.”



**Mr. Saleh Al Hashimi**

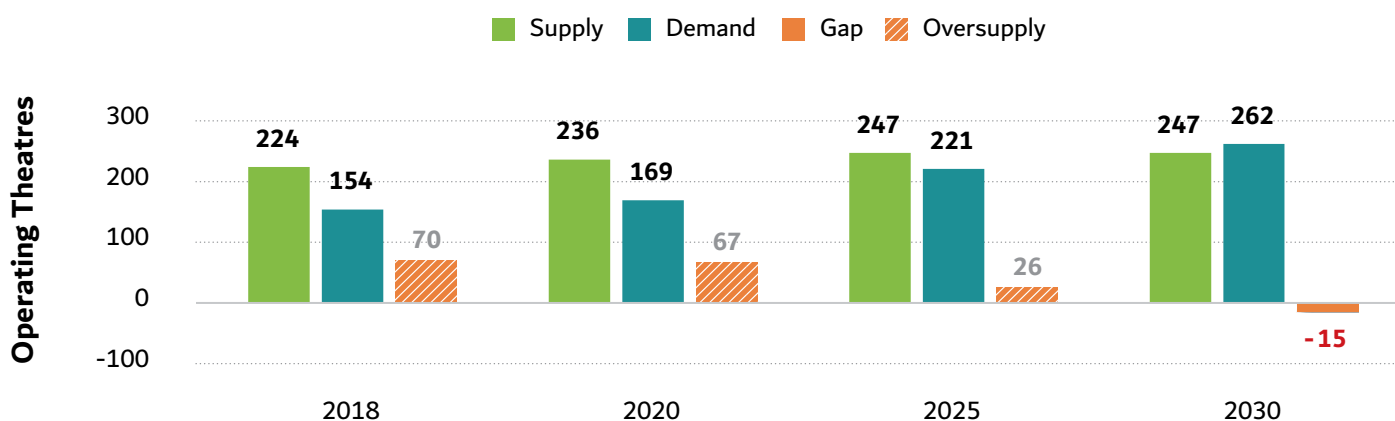
Advisor, Dubai Health Insurance Corporation, DHA

## 6.8 Operating Theatres

There are currently 224 operating theatres within Dubai, of which 189 are used for elective surgeries and 35 for emergency surgeries. Based on planned facility licensing, an additional 23 operating theatres are expected by 2025.

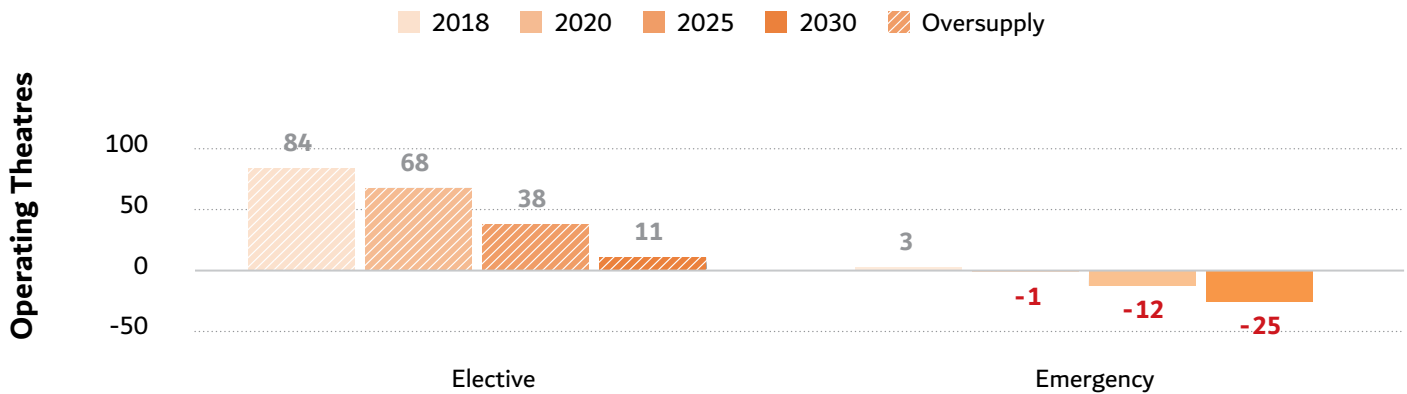
Gap analysis of operating theatres indicates that there is an oversupply of operating theatres in Dubai which becomes an undersupply of 15 theatres in 2030.

Figure 24: Supply, demand and gap for Operating Theatres, 2018 to 2030



This is as a result of the oversupply of elective theatres, which does not reach a requirement for additional capacity in the next 12 years. Whereas, additional emergency theatres are required by 2020 and is expected to increase to 25 theatres by 2030.

Figure 25: Gap by theatre type, 2018 to 2030



This analysis takes into consideration non-national outflow and national inflow from other Emirates of the UAE. There may be additional demand for elective theatres and recovery bays when further taking into consideration the net flows of medical tourism inflow and outflow expected beyond 2020.

## RECOMMENDATIONS

- **Medical Tourism:** Better capture of Medical Tourism activity by mandatory reporting of Dubai visitor clinical referrals and hospital admissions, including diagnostic, procedural and location of residence information, to assist in capacity planning and coordination of resources for elective operations or procedures.
- **Occupancy rates:** Undertake a review of operating theatre utilisation to better understand of occupancy rates and functional capacity to allow for improved capacity planning and disaster management.
- **Planning requirements:** Review policies and requirements for minimum operating theatre rooms at facility planning stage based on international benchmarks to reduce oversupply of elective theatres.
- **Procedural rooms:** Utilising facility planning guideline definitions to encourage use of procedural rooms instead of operating theatres where clinically appropriate.



“To meet the developments and growing private sector investment in the Dubai healthcare sector, the DHA is developing its regulatory standards to ensure the delivery of high medical standards that exceed expectations, and to provide the Emirate with skilled and highly qualified health professionals. Incorporating smart technologies in healthcare is an important priority as it enhances patient care, ensures better follow-up and empowers patients”

**Dr. Marwan Al Mulla**

CEO, Health Regulation Sector, DHA

## 6.9 Human Resources

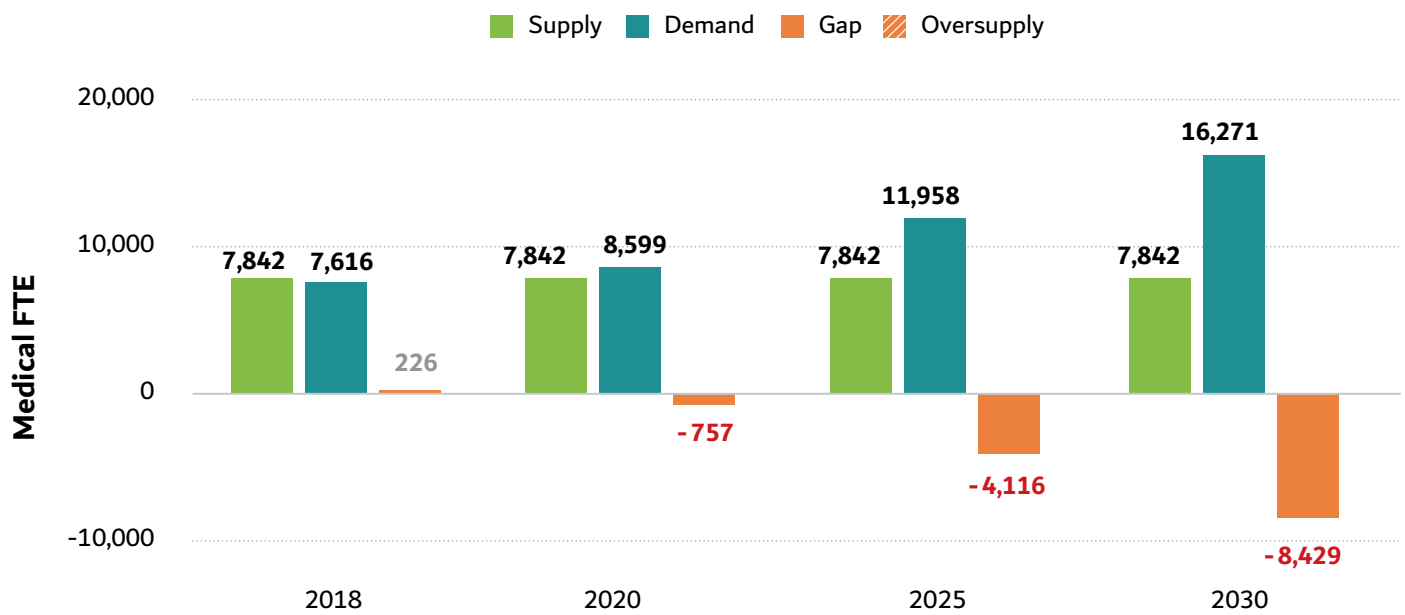
The workforce profile in Dubai in November 2018 has been derived from licensed professionals and its conversion to full-time equivalents (FTEs) based on nationality. This figure has been cross-validated with FTEs reported in the survey by each facility.

FTEs is a measure that represents the number of working hours one full-time employee works during a standardised time-period regardless of the specific number of hours worked by individual workers. FTE simplifies work measurement by converting work load hours into the number of full-time workers required to complete that work.

The demand profile for workforce within the catchment is based on activity levels for inpatients, outpatients and community care with adjustments made for burden of disease and relative utilisation factors linked to patient episode activity

The licensed medical workforce in Dubai is comprised of 7,616 FTE across both the public and private sector, which is expected to be in undersupply before 2020. By 2030, the Dubai health system will need to double its medical workforce to accommodate the medium scenario population demand requirements and meet contemporary healthcare standards.

Figure 26: Medical workforce gap by FTE, 2018 to 2030



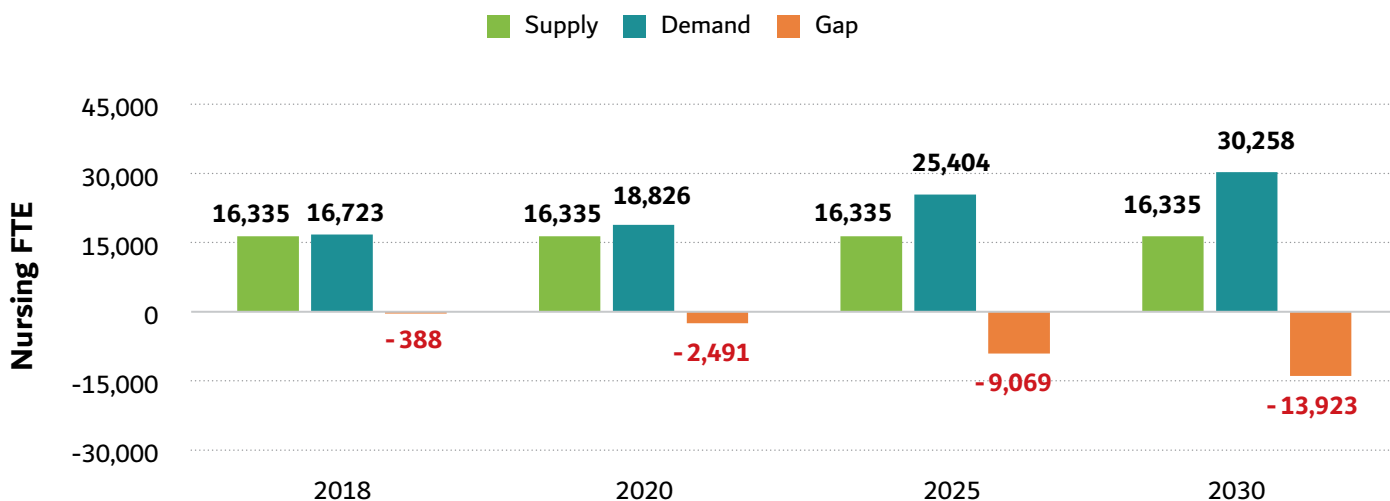
Medical workforce requirements by specialty are shown below and have been derived from demand growth in inpatient and outpatient activity for each specialty.

Figure 27: Medical specialty workforce gap analysis, 2020 to 2030

| 2020                         |        |        | 2030                         |        |        |
|------------------------------|--------|--------|------------------------------|--------|--------|
| Medical specialty            | Supply | Gap    | Medical specialty            | Supply | Gap    |
| General Medicine and Surgery | 1,624  | -1,034 | General Medicine and Surgery | 1,624  | -4,184 |
| Paediatrics                  | 635    | -726   | Paediatrics                  | 635    | -2,144 |
| Anaesthetics                 | 353    | -166   | General Medical Practice     | 1,687  | -472   |
| Endocrinology                | 70     | -62    | Anaesthetics                 | 353    | -455   |
| Psychiatry                   | 75     | -59    | Obstetrics                   | 574    | -227   |
| Haematology                  | 11     | -58    | Endocrinology                | 70     | -213   |
| Rehabilitation               | 25     | -45    | Cardiology                   | 130    | -189   |
| Immunology & Infections      | 17     | -40    | Renal Medicine               | 43     | -142   |
| Dentistry                    | 25     | -32    | Respiratory Medicine         | 51     | -127   |
| Respiratory Medicine         | 51     | -30    | Critical Care Medicine       | 78     | -127   |
| Cardiology                   | 130    | -21    | Neurology                    | 87     | -103   |
| Renal Medicine               | 43     | -20    | Orthopaedics                 | 388    | -102   |
| Neurology                    | 87     | -19    | Psychiatry                   | 75     | -90    |
| Critical Care Medicine       | 78     | -17    | Immunology & Infections      | 17     | -87    |
| Clinical Genetics            | 3      | -14    | Haematology                  | 11     | -87    |
| Audiological Medicine        | 3      | -11    | Rehabilitation               | 25     | -85    |
| Nuclear Medicine             | 8      | -10    | Dentistry                    | 25     | -77    |
| Oncology                     | 24     | -6     | Ophthalmology                | 217    | -62    |
| Cardiothoracic Surgery       | 32     | -1     | Oncology                     | 24     | -61    |
|                              |        |        | Radiology                    | 258    | -57    |
|                              |        |        | Audiological Medicine        | 3      | -29    |
|                              |        |        | Neonatology                  | 43     | -28    |
|                              |        |        | Cardiothoracic Surgery       | 32     | -27    |
|                              |        |        | Clinical Genetics            | 3      | -26    |
|                              |        |        | Interventional Cardiology    | 52     | -23    |
|                              |        |        | Nuclear Medicine             | 8      | -16    |
|                              |        |        | Radiation Oncology           | 17     | -15    |
|                              |        |        | Rheumatology                 | 25     | -5     |

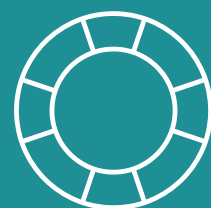
There are currently 16,335 FTE nurses licensed in Dubai, with a current shortfall of 388 FTEs, increasing to nearly 14,000 by 2030. The growth in nurse demand is in keeping with the activity growth in overnight, same day and ambulatory health care services within the Emirate.

Figure 28: Nursing workforce gap by FTE



## RECOMMENDATIONS

- **Full-Time Equivalents:** Workforce licensing to capture practitioner working hours in conjunction with headcount to allow FTE estimates and improved workforce planning.
- **Workforce forecasting methods:** Long-term workforce planning recruitment strategies should be tied to both ‘top-down’ activity modelling and ‘bottom-up’ benchmarking exercises. This will assure that international benchmarks are validated against contemporary Dubai workforce conventions.
- **Distribution:** Ensure that the allocated and utilised distribution of workforce capacity reflects skill set capacity requirements. Scarce specialist professionals should be allocated to areas of demand and basic care provided by appropriately credentialed generalists, allied health or nurse practitioners.
- **Increasing Nationals in the Healthcare Workforce:** Develop and implement strategies to recruit, retain and train National health professionals considering Nationals make up only 3% of total workforce yet 10% of Dubai’s population. This should be done in conjunction with review and enhancement of teaching hospitals, training programs, allocation of training places and post-graduate training incentives.
- **Medical tourism:** Better capture of Medical Tourism activity to assist in workforce planning and coordination of human resources. Medical tourists will generally have a higher staff to patient ratios and numbers of clinical and non-clinical interactions.
- **Occupancy rates:** Low occupancy rates create inefficiencies in the utilisation of both infrastructure capacity and workforce capacity. Restructuring of current facilities to improve occupancy and patient throughput will increase the efficient utilisation of the scarce health workforce.
- **Advanced practice nurses:** Improving the primary care model by empowering appropriately post-graduate qualified nurses to provide diagnosis, care planning and treatment for simple conditions under the guidance of a managing physical. A ‘Nurse practitioner’ role can help increase access to services in community primary care specialist and continuing care settings.



CHAPTER 7

# DISCUSSION

This chapter summarises the results and implications on future developments in infrastructure and workforce for the Dubai health sector. It further outlines the recommended actions to be undertaken to meet projected demands in an efficient and effective manner

## 7.1 Summary

Dubai's population is experiencing continuing significant growth at rate that is 3.9 percentage points greater than the world's current growth of 1.1% per annum. This growth and a progressive shift to its age, gender and nationality structure are all impacting utilization patterns of health care services. Health care requirements are thereby increasing at faster rates requiring more efficient utilization of existing infrastructure and further planning and investment in additional capacity to address projected shortfalls.

Systematic capacity planning ensures not only that total capacity continues to keep up with the demands on the health system, but that appropriate new capacity is distributed to the sectors experiencing growth and that existing infrastructure is adapted to accommodate emerging roles, technologies and systems whilst more efficiently addressing demand growth. Since the last DSCSP, there has been significant growth in hospital, centre and outpatient capacity. However, because of the unprecedented population growth there remain significant short falls in certain service lines, highlighted by the gap between allocated and utilised distribution of capacity.

The results of the 2018-2030 DCSCP KPU gap analysis is shown in the table below, highlighting current supply and the projected gaps moving towards 2030.

Table 17: Summary of gaps by KPU, 2018 to 2030

| Key Planning Unit              | Supply | Demand |        |        | Gap    |        |         |
|--------------------------------|--------|--------|--------|--------|--------|--------|---------|
|                                | 2018   | 2020   | 2025   | 2030   | 2020   | 2025   | 2030    |
| Acute overnight beds           | 3,795  | 4,002  | 5,268  | 6,547  | 654    | -311   | -1,590  |
| Acute same day beds            | 1,086  | 1,127  | 1,800  | 2,661  | -41    | -714   | -1,575  |
| Outpatient consultation rooms  | 5,160  | 3,999  | 5,607  | 7,266  | 1,161  | -447   | -2,106  |
| Non-Acute overnight beds       | 135    | 397    | 598    | 820    | -252   | -453   | -675    |
| Emergency department bays      | 501    | 451    | 556    | 628    | 60     | -35    | -107    |
| CC – Adult ICU                 | 599    | 126    | 160    | 191    | 521    | 510    | 479     |
| CC – Paediatric ICU            | 77     | 32     | 47     | 54     | 45     | 30     | 23      |
| CC – Neonatal ICU              | 299    | 269    | 476    | 593    | 76     | -116   | -233    |
| Operating Theatres (Elective)  | 189    | 133    | 174    | 201    | 68     | 38     | 11      |
| Operating Theatres (Emergency) | 35     | 36     | 47     | 60     | -1     | -12    | -25     |
| Human Resources - Medical      | 7,842  | 8,599  | 11,958 | 16,271 | -465   | -4,053 | -7,067  |
| Human Resources - Nursing      | 16,335 | 18,826 | 25,404 | 30,258 | -2,491 | -9,069 | -13,923 |
| Ultrasound                     | 376    | 372    | 572    | 765    | -46    | -266   | -484    |
| Computed Tomography            | 58     | 56     | 77     | 95     | -6     | -29    | -50     |
| Mammography                    | 57     | 59     | 76     | 86     | -13    | -31    | -43     |
| Angiography                    | 21     | 29     | 41     | 50     | -10    | -21    | -31     |
| SPECT/SPECT-CT                 | 7      | 15     | 20     | 23     | -9     | -14    | -18     |
| Magnetic Resonance             | 59     | 36     | 52     | 67     | 20     | 3      | -13     |
| Positron Emission Tomography   | 5      | 2      | 3      | 5      | 2      | 1      | -1      |
| Radiation Therapy              | 4      | 2      | 2      | 3      | 2      | 1      | 1       |
| X Ray                          | 334    | 138    | 191    | 234    | 172    | 112    | 62      |





Note: Gap numbers highlighted in red colour with a –ve sign represents an undersupply



## 7.2 Service specialty priorities

A “traffic light” assessment is presented for inpatient and outpatient service specialties based on capacity with the greatest growth in demand and gaps in supply. The assessment dashboard is presented in the figure below for each scenario and 2020 and 2030 based on the following evaluation criteria.

Table 18: “Traffic light” assessment for supply gaps

| Gap/Supply  | Priority      | Description                        |
|---|---------------|------------------------------------|
|  >50%    | <b>High</b>   | > 50% deficit in total supply gap  |
|  25-50%  | <b>Medium</b> | 25-50% deficit in total supply gap |
|  0-25% | <b>Low</b>    | 0-25% deficit in total supply gap  |
|  <0%   | <b>No</b>     | No deficit in total supply gap     |

The priority table highlights both the gap as a proportion of current supply and the actual gap for each specialty by key planning unit for 2020 and 2030, indicating the priority of planning and investment actions for each service specialty.



“The DCSCP comprehensively outlines new and existing capacity distributed across the nine sectors in Dubai. Through this assessment, it is important that the priority gap areas are addressed by engaging and supporting investments that will address these health service gaps to ensure we meet the future healthcare demand across the Emirate of Dubai.”

**Dr. Nahed Monsef**

Director, Strategy and Governance Department, DHA

Table 19: Acute overnight priorities by specialty, shown by gap percentage and number, 2020-30

| Acute overnight beds |      |                             |       |      |                             |
|----------------------|------|-----------------------------|-------|------|-----------------------------|
| 2020                 |      |                             | 2030  |      |                             |
| %                    | No.  | Specialty                   | %     | No.  | Specialty                   |
| -74%                 | -108 | Respiratory Medicine        | >100% | -237 | Respiratory Medicine        |
| -59%                 | -43  | Haematology & Oncology      | >100% | -93  | Renal Medicine              |
| -33%                 | -16  | Immunology & Infections     | >100% | -103 | Haematology & Oncology      |
| -30%                 | -78  | Psychiatry                  | >100% | -189 | Gastroenterology            |
| -27%                 | -10  | Renal Medicine              | -95%  | -65  | Urology                     |
| -11%                 | -10  | Gastroenterology            | -88%  | -240 | Orthopaedics & Rheumatology |
| -3%                  | -3   | Paediatric Surgery          | -86%  | -81  | Paediatric Surgery          |
| -1%                  | -5   | Paediatric Medicine         | -82%  | -39  | Immunology & Infections     |
| -1%                  | -1   | Orthopaedics & Rheumatology | -68%  | -163 | Psychiatry                  |
| 5%                   | 23   | Obstetrics                  | -50%  | -227 | Paediatric Medicine         |
| 7%                   | 27   | General Surgery             | -45%  | -225 | Obstetrics                  |
| 11%                  | 40   | Cardiology & Cardiothoracic | -40%  | -153 | Cardiology & Cardiothoracic |
| 14%                  | 100  | Neonatology & NICU          | -34%  | -142 | General Surgery             |
| 15%                  | 7    | Urology                     | -5%   | -33  | Neonatology & NICU          |
| 18%                  | 1    | Dentistry                   | -4%   | -2   | ENT; Head & Neck            |
| 31%                  | 16   | ENT; Head & Neck            | 0%    | 0    | Vascular Surgery            |
| 39%                  | 208  | General Medicine            | 0%    | 0    | Dentistry                   |
| 50%                  | 51   | Neurology                   | 15%   | 16   | Neurology                   |
| 53%                  | 25   | Vascular Surgery            | 16%   | 85   | General Medicine            |
| 55%                  | 35   | Plastic Surgery             | 27%   | 3    | Dermatology                 |
| 57%                  | 72   | Endocrinology               | 41%   | 10   | Ophthalmology               |
| 59%                  | 6    | Dermatology                 | 45%   | 55   | Endocrinology               |
| 63%                  | 15   | Ophthalmology               | 45%   | 99   | Gynaecology                 |
| 71%                  | 81   | Neurosurgery                | 47%   | 29   | Plastic Surgery             |
| 78%                  | 169  | Gynaecology                 | 62%   | 69   | Neurosurgery                |
| 90%                  | 57   | Burns                       | 82%   | 52   | Burns                       |

Table 20: Acute same day priorities by specialty, shown by gap percentage and number, 2020-30

| Acute same day beds |     |                             |       |      |                             |
|---------------------|-----|-----------------------------|-------|------|-----------------------------|
| 2020                |     |                             | 2030  |      |                             |
| %                   | No. | Specialty                   | %     | No.  | Specialty                   |
| >100%               | -44 | Haematology & Oncology      | >100% | -370 | Dialysis                    |
| >100%               | -15 | Dentistry                   | >100% | -159 | Paediatric Medicine         |
| -98%                | -8  | Renal Medicine              | >100% | -155 | Gastroenterology            |
| -84%                | -22 | Gastroenterology            | >100% | -144 | Orthopaedics & Rheumatology |
| -78%                | -18 | Paediatric Surgery          | >100% | -98  | General Surgery             |
| -59%                | -2  | Immunology & Infections     | >100% | -94  | Haematology & Oncology      |
| -53%                | -6  | Psychiatry                  | >100% | -83  | Cardiology & Cardiothoracic |
| -49%                | -21 | Orthopaedics & Rheumatology | >100% | -74  | Paediatric Surgery          |
| -32%                | -39 | Dialysis                    | >100% | -65  | Renal Medicine              |
| -27%                | -25 | General Surgery             | >100% | -37  | Urology                     |
| -25%                | -4  | Ophthalmology               | >100% | -37  | Chemotherapy                |
| -15%                | -24 | General Medicine            | >100% | -29  | Ophthalmology               |
| -14%                | -15 | Paediatric Medicine         | >100% | -19  | Dentistry                   |
| 6%                  | 1   | Urology                     | >100% | -19  | Respiratory Medicine        |
| 7%                  | 4   | Cardiology & Cardiothoracic | >100% | -14  | Psychiatry                  |
| 19%                 | 1   | Dermatology                 | >100% | -7   | Immunology & Infections     |
| 21%                 | 1   | Neonatology & NICU          | -94%  | -35  | Obstetrics                  |
| 25%                 | 4   | Respiratory Medicine        | -81%  | -13  | ENT; Head & Neck            |
| 29%                 | 4   | ENT; Head & Neck            | -77%  | -129 | General Medicine            |
| 29%                 | 11  | Obstetrics                  | -31%  | -1   | Dermatology                 |
| 31%                 | 10  | Chemotherapy                | -30%  | -2   | Vascular Surgery            |
| 54%                 | 71  | Gynaecology                 | -29%  | -9   | Neurology                   |
| 54%                 | 19  | Endocrinology               | -26%  | -34  | Gynaecology                 |
| 55%                 | 17  | Neurology                   | 14%   | 5    | Endocrinology               |
| 57%                 | 4   | Vascular Surgery            | 19%   | 1    | Neonatology & NICU          |
| 71%                 | 31  | Plastic Surgery             | 49%   | 12   | Neurosurgery                |
| 73%                 | 18  | Neurosurgery                | 63%   | 27   | Plastic Surgery             |
| 93%                 | 8   | Burns                       | 74%   | 7    | Burns                       |

Table 21: Outpatient priorities by specialty, shown by gap percentage and number, 2020-30

| Outpatient consultation rooms |      |                             |       |      |                             |
|-------------------------------|------|-----------------------------|-------|------|-----------------------------|
| 2020                          |      |                             | 2030  |      |                             |
| %                             | No.  | Specialty                   | %     | No.  | Specialty                   |
| >100%                         | -100 | Respiratory Medicine        | >100% | -209 | Respiratory Medicine        |
| >100%                         | -20  | Trauma and Injury           | >100% | -34  | Trauma and Injury           |
| >100%                         | -4   | Neonatology                 | >100% | -8   | Neonatology                 |
| >100%                         | -120 | Allied Health               | >100% | -99  | Oncology & Haematology      |
| >100%                         | -75  | Neurology                   | >100% | -262 | Allied Health               |
| -98%                          | -20  | Immunology & Infections     | >100% | -45  | Immunology & Infections     |
| -93%                          | -35  | Oncology & Haematology      | >100% | -157 | Neurology                   |
| -47%                          | -46  | Endocrinology               | >100% | -189 | Endocrinology               |
| -29%                          | -198 | Primary Care                | >100% | -151 | Gastroenterology            |
| -13%                          | -2   | Vascular Surgery            | >100% | -726 | Primary Care                |
| -12%                          | -3   | Renal Medicine              | >100% | -27  | Renal Medicine              |
| -8%                           | -8   | Gastroenterology            | -97%  | -17  | Vascular Surgery            |
| 14%                           | 60   | Paediatrics                 | -54%  | -228 | Paediatrics                 |
| 27%                           | 15   | Dentistry                   | -46%  | -25  | Dentistry                   |
| 33%                           | 113  | Orthopaedics & Rheumatology | -34%  | -40  | Urology                     |
| 33%                           | 39   | Urology                     | -32%  | -213 | General Medicine            |
| 41%                           | 57   | Psychiatry                  | -20%  | -70  | Orthopaedics & Rheumatology |
| 42%                           | 276  | General Medicine            | 1%    | 2    | Psychiatry                  |
| 51%                           | 93   | ENT; Head & Neck            | 15%   | 45   | Obstetrics                  |
| 53%                           | 164  | Obstetrics                  | 18%   | 34   | ENT; Head & Neck            |
| 63%                           | 115  | General Surgery             | 32%   | 62   | Cardiology & Cardiothoracic |
| 69%                           | 132  | Cardiology & Cardiothoracic | 33%   | 59   | General Surgery             |
| 71%                           | 30   | Neurosurgery                | 36%   | 78   | Ophthalmology               |
| 72%                           | 156  | Ophthalmology               | 51%   | 22   | Neurosurgery                |
| 78%                           | 401  | Gynaecology                 | 52%   | 268  | Gynaecology                 |
| 81%                           | 304  | Dermatology                 | 75%   | 280  | Dermatology                 |
| 88%                           | 181  | Plastic Surgery             | 82%   | 168  | Plastic Surgery             |

## 7.3 Contemporary Models of Care

The use of evidence-based models of care and service delivery frameworks will continue to reduce inappropriate clinical variation, support better utilization of hospitals, and improve the patient journey. Enhancements to new and existing models being considered in the development of clinical services include:



**Emergency Department** – Rapid triage and patient streaming into Observation/ Fast Track/Acute Care zones; Short Stay Units to manage short stay patients who would otherwise be admitted to inpatient care; restricted access to areas that care for paediatric patients; and urgent care centres to support the diversion of low acuity cases away from the management of life-threatening conditions.



**Surgery** – Short stay surgery and day of admission models for low complexity and high-volume surgical case types; separation of emergency and elective surgical streams; and post-acute care in the ambulatory setting rather than as an overnight inpatient



**Medicine** – emphasis on managing chronic disease in ambulatory setting rather than crisis management hospital setting. Advent of Emergency Short Stay Medical Units for the admission of patients presenting to emergency departments, and to relieve the Emergency Department's access blockage. The increased use of same day and outpatient care models for the delivery of standardise care packages, such as intravenous antibiotics and wound management.



**Rehabilitation services** – increasing multidisciplinary care teams across a range of settings including acute settings, ambulatory, or home-based. The use of community care packages to support patients with ongoing functional disabilities who need support for activities of daily living.



**Paediatric services** - delivered through Centre of Excellence model with collocated inpatient and outpatient services. These services are supported by generalist paediatricians distributed throughout the community and provision of short stay general paediatric services at community hospitals.



**Maternity** – midwifery-led care for mothers with normal risk pregnancies, antenatal care in community settings, early discharge from hospital-based birthing and community based antenatal care following discharge.



**Dialysis** – continued shift toward home or self-dialysis delivered through satellite facilities and from ongoing strategic relationships with non-government providers. These facilities are supported by centralised training hubs for the training and management of patients and staff in satellite or home care facilities.



**Ambulatory and Outpatient services** – increasing service provision and range of procedure and treatment services offered to reduce the need for inpatient admission.



**Primary Health** – greater use of hub-and-spoke service delivery and operational mechanisms to support appropriate referral pathways. The establishment of one-stop primary centres that support access to the range of screening, diagnostic and treatment services necessary for the management of common condition amenable to relatively simple interventions.

## 7.4 Service Delivery Trends

Health services and systems continue to evolve as a result of new technologies and therapies, better diagnostic capabilities, new clinical techniques, and ongoing improvements in service provision. Key service delivery trends and approaches that have been adopted by contemporary health systems and have been considered in the development of the 2018 Dubai Clinical Services Capacity Plan include:



**Clear role delineation framework** to differentiate facilities to be provided as close to where patients live, usually primary and generalist secondary services; and those that benefit from scale, due to low demand volumes, and the availability of scarce clinical expertise (specialist secondary, tertiary and quaternary services) that are provided in centralised locations.



Continuing emphasis on **patient safety, quality, and risk management** to inform service networking, facility role definition and credentialing. Patients and providers are expecting that healthcare outcomes will be positive leading to a reduction in disease, disability or death. Standards for the licensing and credentialing of facilities and personnel are becoming increasingly stringent in response to these changing expectations.



Increasing focus on **patient-centred care** and patient satisfaction. Health consumers are increasingly informed about care quality and outcomes. Intolerance of poor outcomes is increasing due to more pervasive knowledge about clinical processes and practices. Providers motivated to deliver the best available care and to have satisfied patients are becoming more quality focused. This cycle of improvement is promoting more sensitive resource allocation and clinical practice standards to ensure quality care.



Increasing adoption of **multidisciplinary care teams** across a range of service settings. The mix and qualifications of healthcare is becoming increasingly diverse as more people achieve tertiary qualifications and technological advances promote a shift from agrarian and industrial work to one based on service delivery. A multidisciplinary healthcare approach allows for standard care to be delivered by less skilled workers, while freeing up more skilled workers to focus on advanced care and more complex case types. Multidisciplinary care also enables teams to focus on group problem solving thereby increasing the chances of improved patient outcomes.



New and **advancing technologies** and their impact on services, providing alternatives to current practices such as increased use of personalised and minimally invasive therapies as an alternative to traditional treatment and invasive surgery. Advances in personalised healthcare interventions supported by automated digital systems are reducing the error and invasiveness of treatment and providing a safer care environment for patients. Artificial intelligence supported by biometric computing are increasing the precision of diagnosis and treatment leading to reduced errors and better outcomes.



Ongoing reductions and continued efforts to **manage length of stay** for acute inpatient admissions. Use of case management and care coordination as tools to focus on early discharge planning processes to reduce bed-blockages in inpatient beds. Globally, hospital bed supply rates continue to decrease due higher occupancy rates and reduced length of stay. More care is being delivered in the short stay, home care and outpatient settings with overnight length of stay either plateauing or declining.



Increased use of ambulatory and/or **short stay models** of care, hospital in the home and community-based models of care, with potential to stem the growth in demand for avoidable hospital services.



Ongoing **uptake and expansion of e-Health** and tele-based services to support remote services, mobile and community-based care and networking of facilities and care providers



Greater **clinician communication** and patient transition between community-based services and hospital services to target adverse health behaviours within the community to improve personal wellbeing, reduce the incidence of chronic diseases, and as a means of managing demand for hospital services.



**Community health and outpatient services** supported by safer and less invasive treatments playing an increasingly important role in hospital demand management and in delivery of chronic, complex, and continuing care in the community to facilitate the shift in the setting of care.



**Partnerships with non-government organisations** to identify synergies and opportunities in service provision.



An ongoing **focus on aged care service provision**, including provision of assessments and supporting delivery partners to manage increases in demand for healthcare, community and residential support s due to an aging population.



## 7.5 Setting the Direction for Clinical Service Capacity in Dubai

The analysis presented in this report highlight that an incremental shift is required in the Dubai health system from the current delivery model to a more contemporary specialist model that is supported by appropriate clinical governance policies. The establishment of clinical peer review panels to accredit specialist and consultant practitioners will provide an improved framework for the leadership of healthcare in Dubai, one of the world’s most dynamic and fastest growing cities.

Importantly, if Dubai is to maintain its international exemplar status, its healthcare capacity framework must be at the cutting edge of biomedical and innovative technology systems for excellence in clinical service delivery. The following table summarises the recommendation arising out of the 2018-2030 Clinical Service Capacity Planning exercise.









“The growing demand for medical care in the region is a key driver of growth in the healthcare sector. Therefore, it is important for the future of health care to shift towards adopting innovative smart technologies in order to improve various aspects of patient care, a focus on preventative care and ensure that there we maintain an optimal balance of supply and demand of healthcare services in Dubai”




**Dr. Nahed Monsef**

Director, Strategy and Governance Department, DHA

**Table 22: Summary of Capacity Planning Recommendations for each Service Type**

|  <b>Acute Overnight Care</b>   |  <b>Acute Same Day care</b>   |
|---|--|
| <ul style="list-style-type: none"> <li>• Distribution of capacity to meet clinical services with significant gaps and to improve hospital occupancy.</li> <li>• Role delineation and referral networks to improve referral patterns and efficient use of infrastructure.</li> <li>• Definitions and frameworks for the better definition and understanding of bed capacity.</li> <li>• Improved bed census reporting to improve capacity and performance management.</li> <li>• Improved collection, coding and reporting of admitted patient health statistics.</li> <li>• Link of future planned supply to clinical service capacity requirements.</li> <li>• Promote hub-and-spoke networks to improve general capacity in high growth Sectors and tertiary centres of excellence</li> <li>• Demand reduction strategies that foster improved prevention, primary care and ambulatory care.</li> <li>• Reduce overnight length of stay through improved discharge management and the adoption of short stay models of care.</li> </ul> | <ul style="list-style-type: none"> <li>• Increasing same day utilization through funding and reimbursement incentive to meet projected demand and address gaps</li> <li>• Develop of guidelines for medical and surgical short stay models of care to encourage more same day service provision.</li> <li>• Promote expansion of short stay surgical units to address growth and supply gaps.</li> <li>• Improve coding standards for definitions to enable clearer reporting and monitoring of different care types</li> <li>• Review growing demand and supply for renal dialysis to ensure that growth can be addressed by the most efficient service delivery</li> </ul> |

|  |   |
|--|---|
|  <h3>Outpatient care</h3>   |  <h3>Emergency department care</h3>  |
| <ul style="list-style-type: none"> <li>• An enhanced system-wide co-ordinated approach to improve primary care is required.</li> <li>• Empowering the patient to make better access choices through information (DHA Public Map) on outpatient service availability.</li> <li>• Review licencing and land allocation strategies to address overcapacity of clinics based in Sector 3.</li> <li>• Encourage establishment of Multi-disciplinary teams to support more efficient delivery of ambulatory and outpatient care.</li> <li>• Conduct a utilization review of functional and non-functional capacity of consultation rooms to promote improved occupancy.</li> </ul> | <ul style="list-style-type: none"> <li>• Increase the capacity of high acuity bays in Dubai public hospital emergency departments.</li> <li>• Promote walk-in urgent care clinics for non-life threatening patients in smaller hospitals to reduce pressure on larger hospitals.</li> <li>• Emergency care at specialist referral facilities should be strongly encouraged to provide care by emergency qualified practitioners.</li> <li>• Facility licensing policies be reviewed to limit the development of low-quality and poorly utilised emergency bays in smaller hospitals.</li> </ul> |
|  <h3>Operating theatres</h3>  |  <h3>Critical care</h3>  |
| <ul style="list-style-type: none"> <li>• Better capture of Medical Tourism activity to assist in planning and coordination of resources for elective procedures.</li> <li>• Improve understanding of operating theatre occupancy rates and functional capacity to improved capacity for emergency surgery</li> <li>• Review policies for minimum operating theatre rooms a planning stage to reduce unnecessary licensing of elective theatres.</li> <li>• Utilise facility guideline definitions to encourage clinically appropriate use of procedural rooms instead of operating theatres</li> </ul>   | <ul style="list-style-type: none"> <li>• Improve long term care capacity and its model of care to reduce unnecessary adult intensive care bed utilization.</li> <li>• Address the growing demand and gap in NICU beds through allocation of additional licences or funding.</li> <li>• Review facility planning guideline and licensing policies for the clearer approval of critical care beds at planning approval stage.</li> </ul>  |

|  <b>Non-acute and Long-term care</b>  |  <b>Procedural care</b>   |
|--|--|
| <ul style="list-style-type: none"> <li>• Support licence and funding incentives to improve investment in rehabilitation, transitional and long-term care facilities.</li> <li>• Explore public private partnership opportunities for the funding, development of long-term care systems and facilities.</li> <li>• Development of rehabilitation, post-acute and long-term care service delivery models of care to address insufficient supply.</li> <li>• Establish a clearly defined insurance reimbursement framework and process for rehabilitation and long-term care</li> <li>• Explore options for community -based and outreach care to mitigate facility capacity gaps.</li> <li>• Plan for the impact on demand as a result of implementation of DRGs in 2019 on long term care facilities due to payment caps.</li> </ul>   | <ul style="list-style-type: none"> <li>• Review planning and licensing requirements to ensure that only necessary capacity is approved at the planning stage.</li> <li>• Establish comprehensive diagnostic centres to reduce unnecessary duplication of services.</li> <li>• Review of policies and requirements to encourage uptake of teleradiology and develop cost-effectiveness incentives.</li> <li>• Enabling diagnostic results to be shared among facilities through a cross-platform solutions to improve efficiency of patient care.</li> <li>• Establishment of specialist Centre of Excellence to reduce outflow for specialist procedural care, such as radiation therapy.</li> </ul> |
|  <b>Workforce</b>   |  |
| <ul style="list-style-type: none"> <li>• Workforce licensing to capture working hours status in conjunction with headcount to better represent workforce estimates.</li> <li>• Long-term workforce recruitment strategies should be tied to both activity projection modelling and local benchmarking exercises.</li> <li>• Ensure allocated and utilised distribution of workforce capacity reflects skill set capacity.</li> <li>• Develop and implement strategies to recruit, retain and train National health professionals.</li> <li>• Better capture of Medical Tourism activity to assist in workforce planning and coordination of human resource allocation.</li> <li>• Restructuring of current facilities to improve occupancy and patient throughput to assist with better workforce utilization.</li> <li>• Enabling appropriately qualified nurses to provide independent care under the guidance of a managing physician.</li> </ul> |  |



## CHAPTER 8

# APPENDIX

This chapter describes in further detail the technical aspects of the project and its modelling methodology. It outlines the comprehensive modelling performed on population projections, health care capacity supply and demand, as well as a sensitivity analysis to test different scenarios.

## 8.1 Technical documents

### 8.1.1 Population modelling

The DCSCP has developed a series of population projections based on probability model from historical estimates for 5-year age and gender groups for a relatively stable but growing number of persons for the year 2010-2016. In addition, the DCSCP has collected from DSC publications the sector estimates for the same period, these were projected using the same probabilistic model. This projection series show a population in 2030 that is smaller than the projection series estimated by official government statistics released by the Dubai Statistic Centre (DSC) and provided in February 2018.

Population projections were conducted separately for each of the nine sectors using best fit probabilistic modelling from historical trends with 2006 as the base year - using sectorial population data provided from the previous version of DCSCP. Holding capacity for each sector was used to determine the capacity for growth in each sector and allow for distribution amongst adjacent sectors if reached in future years.

The proportions of Nationals and Non-Nationals in each of the sectors were weighted for each projection year by the differential proportions for Nationals specified in the previous DCSCP.

The population projections were then scaled back based on the population estimates for Nationals and Non-Nationals provided by an Expert Panel from the DHA for the projection years. Furthermore, the populations of nationals and non-nationals in each sector were then split into gender and age groups based on the proportions also provided by this panel.

**Table 23: Medical specialty workforce gap analysis, 2020 to 2030**

| Scenario | 2030 population | Average annual growth rate | Compound annual growth rate |
|----------|-----------------|----------------------------|-----------------------------|
| Low      | 4,042,944       | 2.5%                       | 2.2%                        |
| Medium   | 4,633,793       | 4.1%                       | 3.4%                        |
| High     | 5,601,526       | 6.7%                       | 5.1%                        |

### 8.1.2 Relative utilisation

Relative utilisation adjustments were performed to ensure that reference files were adapted to local service utilisation rates and trends. This process ensures that both over- and under-utilisation of specific services are captured in both the national and non-national cohorts. It also allows for a regression of utilisation rates over and agreed period to reach closer to international benchmarks in planning for a more efficient and equitable health care service.

This process was performed by analysing Health Statistics 2017 bed days per capita rates by specialty and nationality and then comparing these to the international reference benchmarks. The aggregate effect of this utilisation adjustment can be seen in the second demand scenario 'RU', which adjusts the demand profile to maintain an In-Status Quo situation where future planning is based on the current coverage, utilisation and flow parameters.

After extensive workshop discussions with an Expert Panel, a utilisation adjustment profile was created for each service line that was specific to nationality and year up to 2030. This profile allowed for demand to be adjusted towards local trends in immediate years whilst allowing for a regression closer towards international benchmarks by 2030. This regression was based on discussions of current policies and likelihood of policy change as well as strategic plans set in place by the DHA that could impact service provision and reduction of outflows

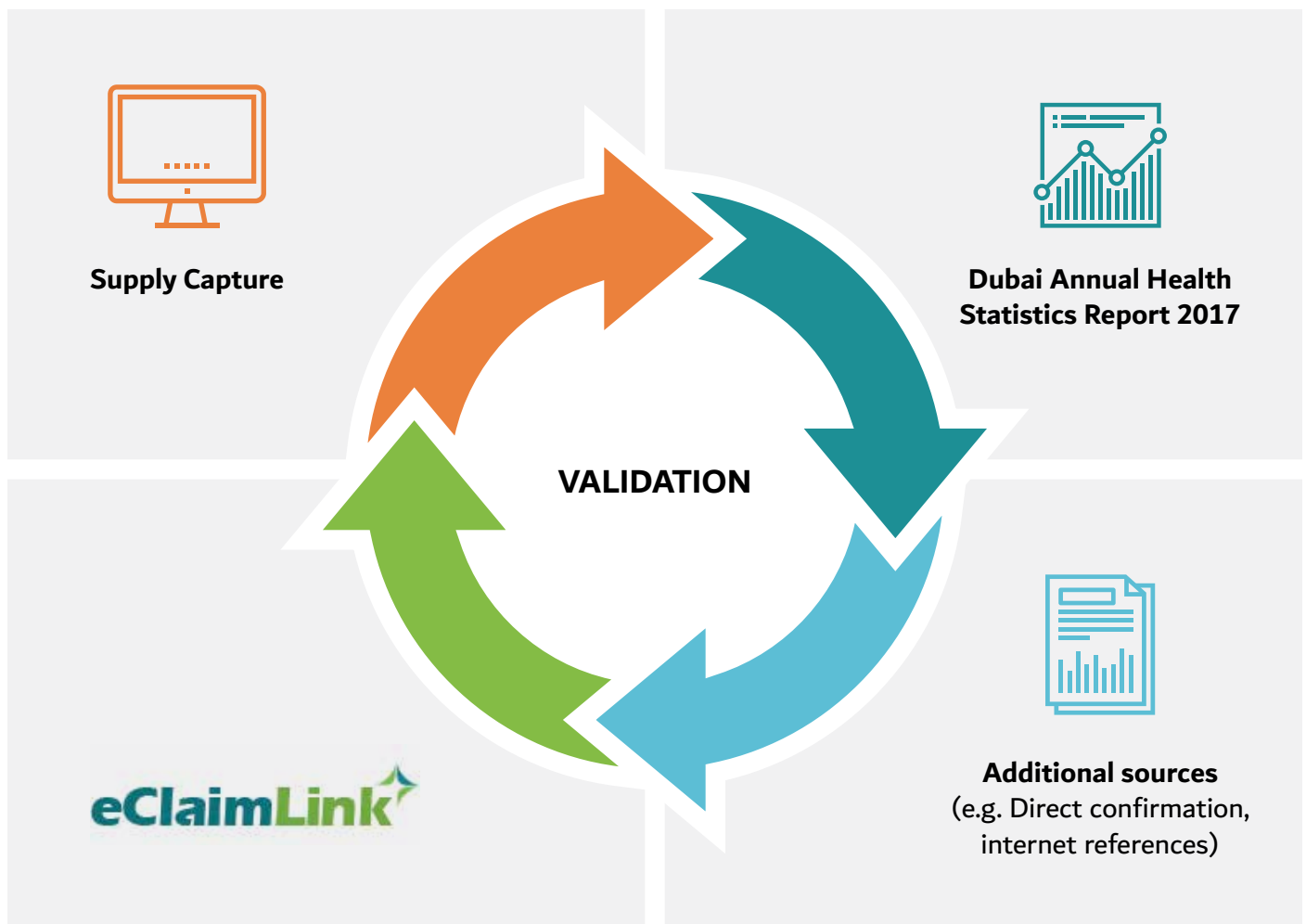
### 8.1.3 Supply validation

An extensive supply validation was performed to create a comprehensive supply capture of the historical capacity, activity and utilisation levels of the Dubai health care market.

The purpose of the supply validation process was to assess the concordance between the survey responses and the Dubai Health Statistics 2017 report using DHA E-Claims records for the year 2017 as a secondary validation source to align the clinical specialities in the Health Statistics Report.

Initially, the total number of beds, the calculated average length of stay and the number of inpatient and outpatient episodes for each hospital from the Health Statistics Report was compared to the figures provided in the survey. The variance was calculated at an aggregate level for the public and private sector hospitals and separately for each of the hospitals. Where there were large variations in bed numbers, further validations were conducted using publicly accessible official data sources or by recontacting the facility in coordination with the DHA. The survey results were adjusted if the Health Statistics figures were found to be accurate in the additional validation checks.

The validation study also utilised the unit level Health Statistics and E-Claims datasets for the year 2017 to align the DHA allocated specialities to ICD and IRDRG codes-based service lines., however clinical specialties of the service provider were not available in the private sector Health Statistics data. Initially, a mapping reference was developed from the E-Claims and public sector Health Statistics data to proportionally allocate the principal ICD codes in the private sector Health Statistics dataset to each clinical service line. This comparison was done to highlight the discrepancies between the two supply scenarios (allocated and utilised distribution) and compare the magnitude of difference for each specialty.



## 8.1.4 Sensitivity analysis

A three-phase approach was conducted to assess the sensitivity of the capacity planning findings.

- A population-based analysis is presented to assess the impact of different age distribution on the potential demand for services
- A 70% occupancy rate is applied to the aggregate bed demand for both scenarios. The gaps in supply at 60% occupancy and the 80% occupancy, used for the capacity planning, are contrasted to illustrate the differences for these occupancy assumptions
- The crude per capita rates were calculated and contrasted against other countries in the Western Asia region and the selected high-income regions.

Table 24: Medical specialty workforce gap analysis, 2020 to 2030

| KPU Categories          | Supply per 10,000 Dubai population | Demand per 10,000 Dubai Population |       |
|-------------------------|------------------------------------|------------------------------------|-------|
|                         | 2018                               | 2018                               | 2030  |
| Acute beds (licensed)   | 16.67                              | 14.59                              | 20.02 |
| Acute beds (functional) | 14.51                              |                                    |       |
| ICU beds                | 1.09                               | 0.37                               | 0.41  |
| NICU beds               | 0.96                               | 0.75                               | 1.28  |
| PICU beds               | 0.16                               | 0.09                               | 0.12  |
| ED bays                 | 1.47                               | 1.29                               | 1.36  |
| OT rooms                | 0.72                               | 0.50                               | 0.57  |
| Outpatient rooms*       | 16.65                              | 9.01                               | 13.53 |
| Medical FTE's           | 25.30                              | 23.64                              | 32.17 |
| Nurses FTE's            | 52.69                              | 53.95                              | 65.30 |

\* Only includes outpatient room categories used in demand modelling

Table 25: Occupancy rate sensitivity analysis, 2018 to 2030

| Overnight Beds        | 2018  | 2020  | 2025   | 2030   |
|-----------------------|-------|-------|--------|--------|
| <b>Demand profile</b> |       |       |        |        |
| 80% occupancy         | 3,112 | 3,502 | 4,610  | 5,729  |
| 70% occupancy         | 3,557 | 4,002 | 5,268  | 6,547  |
| 60% occupancy         | 4,150 | 4,669 | 6,146  | 7,638  |
| <b>Gap analysis</b>   |       |       |        |        |
| 80% occupancy         | 683   | 1,155 | 348    | -771   |
| 70% occupancy         | 239   | 654   | -311   | -1,590 |
| 60% occupancy         | -354  | -13   | -1,189 | -2,681 |

Table 26: Gap analysis for low, medium and high population series

| Key Planning Unit | Low   |        |         | Medium |        |         | High   |        |         |
|-------------------|-------|--------|---------|--------|--------|---------|--------|--------|---------|
|                   | 2020  | 2025   | 2030    | 2020   | 2025   | 2030    | 2020   | 2025   | 2030    |
| Overnight beds    | 1,466 | 361    | -755    | 955    | -311   | -1,590  | 823    | -485   | -1,806  |
| Same day places   | 103   | -484   | -1,235  | -41    | -714   | -1,575  | -78    | -773   | -1,662  |
| Outpatient rooms  | 1,671 | 268    | -1,179  | 1,161  | -447   | -2,106  | 1,029  | -632   | -2,346  |
| Non-acute beds    | -201  | -377   | -570    | -252   | -453   | -675    | -265   | -473   | -702    |
| ICU beds          | 537   | 530    | 503     | 521    | 510    | 479     | 517    | 505    | 473     |
| PICU beds         | 49    | 36     | 30      | 45     | 30     | 23      | 44     | 28     | 21      |
| NICU beds         | 110   | -55    | -157    | 76     | -116   | -233    | 67     | -132   | -253    |
| ED beds           | 118   | 36     | -27     | 60     | -35    | -107    | 45     | -53    | -128    |
| Operating room    | 89    | 54     | 18      | 67     | 26     | -15     | 61     | 19     | -24     |
| Procedural care   | 302   | 19     | -237    | 211    | -113   | -406    | 188    | -147   | -450    |
| Medical FTE       | 339   | -2,591 | -6,354  | -757   | -4,116 | -8,429  | -1,041 | -4,511 | -8,966  |
| Nursing FTE       | -90   | -5,830 | -10,065 | -2,491 | -9,069 | -13,923 | -3,113 | -9,908 | -14,922 |

Note: Gap numbers highlighted in red color with a –ve sign represents an undersupply



### 8.1.5 Definitions and assumptions used in the calculation of key planning units

Each service type has a service definition framework which categorises service lines based on a list of relevant DRG codes, the framework for acute inpatient care used for this report is shown in the table below.

Table 27: Service definition mapping for acute inpatient care

| Service line                                   | DRG   |
|--|---|
| <b>Burns</b>                                   | Burns<br>Skin Graft with Burns  |
| <b>Cardiology &amp; Cardiothoracic Surgery</b> | Acute Myocardial Infarction<br>Acute & Subacute Endocarditis<br>Heart Failure<br>Atherosclerosis<br>Cardiac Congenital & Valvular Disorders<br>Cardiac Arrhythmia & Conduction Disorders<br>Angina Pectoris & Chest Pain<br>Syncope & Collapse<br>Other Circulatory System Diagnoses<br>Cardiac Valve Procedures with Cardiac Catheterization<br>Cardiac Valve Procedures without Cardiac Catheterization<br>Coronary Bypass with Cardiac Catheterization<br>Coronary Bypass without Cardiac Catheterization<br>Complex Thoracic Vascular Procedures<br>Cardiac Defibrillator & Heart Assist System Insertion<br>Permanent Cardiac Pacemaker Insertion<br>Cardiac Catheterization<br>Cardiac Catheterization with AMI<br>Percutaneous Cardiovascular Procedures |
| <b>Chemotherapy</b>                            | Chemotherapy  |
| <b>Dentistry</b>                               | Dental & Oral Disease<br>Dental Procedures  |
| <b>Dermatology</b>                             | Major Skin Disorders<br>Other Skin & Breast Disorders<br>Skin Ulcers  |
| <b>Dialysis</b>                                | Renal Dialysis  |
| <b>Endocrinology</b>                           | Diabetes & Nutritional & Misc. Metabolic Disorders<br>Inborn Errors of Metabolism<br>Other Endocrine Disorders  |

| Service line                | DRG   |
|-----------------------------|---|
| <b>ENT; Head &amp; Neck</b> | Epistaxis<br>Epiglottitis-Otitis Media-Upper Respiratory Tract Infection & Laryngotracheitis<br>Other Ear-Nose-Mouth & Throat Diagnoses<br>Other Complex Head & Neck Procedures<br>Sinus & Mastoid Procedures<br>Salivary Gland Procedures<br>Tonsil & Adenoid Procedures<br>Other Ear-Nose-Mouth & Throat Procedures<br>Cochlear Implant<br>Nasal Procedures<br>Myringotomy with Tube Insertion<br>Mouth Procedures<br>Thyroid-Parathyroid & Thyroglossal Duct Procedures  |
| <b>Gastroenterology</b>     | Diverticulitis-Diverticulosis & Inflammatory Bowel Disease<br>Gastrointestinal Obstruction<br>Other Gastroenteritis & Abdominal Pain<br>Other Digestive System Diagnoses<br>Cirrhosis & Alcoholic Hepatitis<br>Pancreas Disorders except Malignancy<br>Liver Disorders except Malignancy-Cirrhosis Or Alcoholic Hepatitis<br>Other Biliary Tract Disorders<br>Non-Complex Small & Large Bowel Procedures<br>Complex Small & Large Bowel Procedures<br>Rectal Resection<br>Complex Upper Gastrointestinal Endoscopy<br>Noncomplex Upper Gastrointestinal Endoscopy<br>Pancreas & Liver Procedures<br>Complex Biliary Tract Procedures<br>Other Hepatobiliary & Pancreas Procedures |
| <b>Gynaecology</b>          | Pelvic Evisceration-Radical Hysterectomy & Radical Vulvectomy<br>Abortion Procedures<br>Dilation & Curettage-Intrauterine & Cervical Procedures<br>Tubal Interruption or Removal of Ovaries<br>Uterine & Adnexal Procedures<br>Vagina-Cervix & Vulva Procedures<br>Laparoscopic & Endoscopic Gynaecologic Procedures<br>Other Gynaecologic Procedures<br>Female Reproductive System Infections<br>Menstrual & Other Female Reproductive System Disorders  |

| Service line                       | DRG  |
|------------------------------------|--|
| <b>Haematology &amp; Oncology</b>  | Coagulation Disorders<br>Blood & Blood Forming Organs Disorders<br>Red Blood Cell Disorders including Sickle Cell Anaemia<br>Other Procedures Of Blood & Blood Forming Organs<br>Nervous System Malignancy & Degenerative Disorders<br>Ear-Nose-Mouth & Throat Malignancy<br>Respiratory Malignancy<br>Digestive Malignancy<br>Malignancy Of Hepatobiliary System & Pancreas<br>Musculoskeletal & Connective Tissue Malignancy & Pathological Fractures<br>Malignant Breast Disorders<br>Kidney & Urinary Tract Malignancy & Renal Failure<br>Male Reproductive System Malignancy<br>Female Reproductive System Malignancy<br>Acute Leukemia<br>Lymphoma & Non-Acute Leukemia<br>Radiotherapy<br>Other Myeloproliferative Disorders & Poorly Differentiated Neoplasm Diagnosis<br>Lymphoma & Leukemia With OR Procedure<br>Bone Marrow Transplantation<br>Bone Marrow Transplantation Autologous |
| <b>Immunology &amp; Infections</b> | Simple Pneumonia & Whooping Cough<br>Septicaemia<br>Post-Operative & Post-Traumatic Infections<br>Fever<br>Non-Bacterial Infections<br>Other Bacterial & Parasitic Diseases<br>Human Immunodeficiency Virus Infection<br>Allergic Reactions  |
| <b>Neurology</b>                   | Multiple Sclerosis & Cerebellar Ataxia<br>Non-Specific CVA & Pre-Cerebral Occlusion Without Infarct<br>Viral Meningitis<br>Non-Traumatic Stupor & Coma<br>Seizure<br>Migraine & Other Headaches<br>Concussion<br>Other Nervous System Disorders<br>Disequilibrium  |

| Service line                           | DRG   |
|--|---|
| <b>Neurosurgery</b>                    | Head Trauma<br>Craniotomy<br>Cranial & Peripheral Nerve Procedures<br>Pituitary & Pineal Procedures   |
| <b>Obstetrics</b>                      | Abortion<br>Antepartum Disorders<br>Postpartum Disorders<br>Caesarean Delivery<br>Vaginal Delivery with Procedure<br>Vaginal Delivery   |
| <b>Ophthalmology</b>                   | Acute Major Eye Infections<br>Neurological Eye Disorders<br>Other Eye Disorders<br>Orbital & Extraocular Procedures<br>Intraocular & Lens Procedures  |
| <b>Orthopaedics &amp; Rheumatology</b> | Fractures of Femur<br>Fracture of Pelvis Or Dislocation Of Hip<br>Osteomyelitis<br>Medical Back Problems<br>Other Bone & Joint Diseases<br>Injuries to Unspecified or Multiple Sites<br>Carpal Tunnel Release<br>Spine Procedures<br>Bilateral & Multiple Major Lower Extremity Joint Procedures<br>Amputation<br>Major Lower Extremity Joint & Limb Reattachment Procedures<br>Major Upper Extremity Joint & Limb Reattachment Procedures<br>Spinal Fusion Procedures for Curvature of the Spine<br>Spinal Fusion Procedures except for Curvature of the Spine<br>Hip & Femur Procedures except Major Joint<br>Foot Procedures<br>Local Excision & Removal of Internal Fixation Device<br>Soft Tissue Procedures<br>Other Musculoskeletal System & Connective Tissue Procedures<br>Knee & Lower Leg Procedures except Foot<br>Upper Extremity Procedures<br>Arthroscopy<br>Septic Arthritis<br>Connective Tissue Disorders<br>Musculoskeletal Signs-Symptoms-Sprains & Minor Inflammations<br>Other Musculoskeletal System & Connective Tissue Diagnoses |

| Service line           | DRG   |
|------------------------|---|
| <b>Neonatology</b>     | Respiratory System Problems Arising in Neonatal Period<br>Neonate Birthwt <X000 Grams with Major Procedure<br>Neonate Birthwt 1000-1499 Grams with Major Procedure<br>Neonate Birthwt 1500-1999 Grams with Major Procedure<br>Neonate Birthwt 2000-2499 Grams with Major Procedure<br>Neonate Birthwt >2499 Grams with Major Procedure<br>Neonate Died or Transferred to Another Acute Care Facility<br>Neonate Birthwt 1000-1499 Grams without Major Procedure<br>Neonate Birthwt 1500-1999 Grams without Major Procedure<br>Neonate Birthwt 2000-2499 Grams without Major Procedure<br>Neonate Birthwt >2499 Grams without Major Procedure<br>Mechanical Ventilation with/without Tracheostomy (Neonatal) |
| <b>Plastic Surgery</b> | Cleft Lip & Palate Repair<br>Cranial & Facial Bone Reconstructive Procedures<br>Skin Graft without Burns<br>Skin Graft without Burns Excluding Hand<br>Skin Graft without Burns to Hands<br>Other Skin-Subcutaneous Tissue & Breast Procedures<br>Breast Procedures   |
| <b>Psychiatry</b>      | Organic Disturbances & Mental Retardation<br>Schizophrenia<br>Major Depression<br>Personality & Impulse Control Disorders<br>Depression<br>Neuroses except Depression<br>Childhood Mental Disorders<br>Compulsive Nutrition Disorders<br>Other Mental Disorders<br>Other Mental Disorders with ECT<br>Alcohol & Drug Rehab &/Or Detox Therapy<br>Drug Rehab &/Or Detox Therapy  |
| <b>Rehabilitation</b>  | Rehabilitation  |

| Service line                | DRG  |
|-----------------------------|--|
| <b>Renal Medicine</b>       | Hypertension<br>Kidney & Urinary Tract Infections<br>Urinary Stones<br>Kidney & Urinary Tract Signs & Symptoms<br>Other Kidney & Urinary Tract Diagnoses   |
| <b>Respiratory Medicine</b> | Respiratory Failure<br>Pulmonary Embolism<br>Major Chest Trauma<br>Respiratory Infections & Inflammations<br>Chronic Obstructive Pulmonary Disease<br>Asthma & Bronchiolitis<br>Interstitial Lung Disease<br>Pneumothorax & Pleural Effusion<br>Respiratory System Signs-Symptoms & Other Diagnoses<br>Mechanical Ventilation with/without Tracheostomy<br>Mechanical Ventilation with/without Tracheostomy for Nervous System Disorder<br>Mechanical Ventilation with/without Tracheostomy for Respiratory System Disorder<br>Mechanical Ventilation with/without tracheostomy for Circulatory Systems Disorder<br>Mechanical Ventilation with/without Tracheostomy for Infectious and Parasitic Disorder<br>Mechanical Ventilation with/without Tracheostomy For Trauma Poisoning or Toxic Effects<br>Complex Respiratory System Procedures<br>Non-Complex Respiratory System Procedures<br>Bronchoscopy |
| <b>Transplantation</b>      | Heart &/or Lung Transplantation<br>Liver Transplantation<br>Kidney Transplantation   |
| <b>General Medicine</b>     | Deep Vein Thrombophlebitis<br>Cellulitis<br>Complications of Treatment<br>Other Injury-Poisoning & Toxic Effect Diagnoses<br>Signs & Symptoms<br>Other Factors Influencing Health Status<br>Poisoning & Toxic Effects of Drugs<br>Trauma to The Skin-Subcutaneous Tissue & Breast  |

| Service line            | DRG  |
|-------------------------|--|
| <b>General Surgery</b>  | Peritoneal Adhesiolysis<br>Hernia Procedures except Inguinal & Femoral<br>Appendiceal Procedures<br>Non-Complex Stomach-Oesophageal & Duodenal Procedures<br>Other Digestive System Procedures<br>Anal Procedures<br>Colonoscopy<br>Cholecystectomy except Laparoscopic<br>Laparoscopic Cholecystectomy<br>Lower Limb Procedure with Ulcer/Cellulitis<br>Lower Limb Procedure without Ulcer/Cellulitis<br>Adrenal Procedures<br>Other Endocrine Metabolic And Nutritional Procedure<br>Obesity Procedure<br>Endoscopic and Investigation Procedures for Metabolic Disorder<br>Circumcision<br>Male Sterilization Procedures<br>Spleen Procedures<br>OR Procedures for Infectious and Parasitic Diseases<br>OR Procedures Injuries to Unspecified or Multiple Sites<br>OR Procedures Injuries to Hand<br>Or Procedures Injuries to Lower Limb |
| <b>Urology</b>          | Male Reproductive System Diagnoses except Malignancy<br>Complex Bladder Procedures<br>Upper Urinary Tract Procedures<br>Bladder & Lower Urinary Tract Procedures<br>Urethral & Transurethral Procedures<br>Extracorporeal Shockwave Lithotripsy<br>Cystoscopy & Urinary Tract Endoscopy<br>Penis Procedures<br>Non-Complex Prostate & Scrotal Contents Procedures<br>Transurethral Prostatectomy<br>Other Male Genital Procedures  |
| <b>Vascular Surgery</b> | Extracranial Vascular Procedures<br>Vein Ligation & Stripping<br>Other Circulatory System Procedures<br>Amputation for Circulatory System Disorder<br>Create-Revise-Remove Dialysis Device<br>Extracranial Haematological Procedures   |

## 8.1.6 Expo 2020



**إكسبو 2020**  
دبي، الإمارات العربية المتحدة  
DUBAI, UNITED ARAB EMIRATES

Health service demand projections are estimated for domestic visitors from UAE (excluding Dubai residents) and International visitors from the regions of Africa, America, Australasia, Eastern Europe, South Asia, South-East Asia, Western Asia, Western Europe. Demand projections for Dubai residents are excluded from all the healthcare services in this analysis to remove a double count. Medium scenario modelling assumptions include:

- 3 Expo visits and 5 stay days per international visitor assuming 100% of international visitors will stay overnight in Dubai during Expo
- 4 Expo visits and 2 stay days per domestic visitor assuming 50% of domestic visitors will stay overnight in Dubai during Expo

Table 28: Projected Expo 2020 peak demand requirements

| Peak demand (2021)          |               | Capacity demand |
|-----------------------------|---------------|-----------------|
| Visitor demand per day      | Domestic      | 6,052 / day     |
|                             | International | 27,260 / day    |
| Overnight Beds              | Domestic      | 155 beds        |
|                             | International | 800 beds        |
| Same Day Places             | Domestic      | 29 places       |
|                             | International | 167 places      |
| Outpatient Rooms            | Domestic      | 7 rooms         |
|                             | International | 55 rooms        |
| Procedural Rooms            | Domestic      | 29 rooms        |
|                             | International | 159 rooms       |
| ICU beds                    | Domestic      | 25 beds         |
|                             | International | 89 beds         |
| ED places                   | Domestic      | 34 places       |
|                             | International | 151 places      |
| Emergency Operating Theatre | Domestic      | 6 theatres      |
|                             | International | 30 theatres     |



## 8.1.7 Medical Tourism



Through local initiatives and the Dubai Health Experience (DXH), Dubai has developed into an emerging global health tourism destination. Medical and wellness tourism is a growing phenomenon which sees patients travelling outside their local area of residence to receive healthcare services that are more readily available, less expensive or of higher quality than local options. Medical tourism is focused on the medical treatment of pre-existing conditions whereas wellness tourism is a holistic, preventative service looking to maintain or improve overall health. This spectrum of care places cosmetic and dental surgery for aesthetic reasons, weight-loss management and other holistic-styled clinic treatment between wellness and medical tourism

The global medical tourism market is driven by affordability and accessibility of good quality healthcare services along with assistance from tourism departments and local governments. In addition, availability of latest medical technologies in medical tourism hubs, throughout the world, is expected to fuel the market growth.

Medical tourism inflows present an additional scenario to health care demand for the Dubai health infrastructure, medical patients typically receive outpatient consultation(s) and depending on their purpose of travel may also include use of an operating theatre, inpatient bed or same day place.

Medical tourism inflow results have been driven by findings and assumptions in the DHA Health Tourism Strategy 2018-2021. Future demand figures have been derived from medical tourism targets, distributed across specialties by their current activity proportions. It is reported currently that roughly 50% of all health tourists arriving in Dubai seek medical care, split amongst the specialties of Orthopaedics, Gynaecology, Neurology & Neurosurgery, Cardiology, Fertility, Ophthalmology, Oncology, Dentistry & Plastic Surgery

The medical tourism requirements are outlined below, generated by the following assumptions:

- All medical patients will require 2 outpatient consultations
- A small proportion (10-30%) of patients will require overnight care (at specialty specific length of stay periods), with the remainder requiring the use of a same day place

Table 29: Medical Tourism requirements, 2018 to 2030

|                         | 2018    | 2020    | 2025    | 2030    |
|-------------------------|---------|---------|---------|---------|
| <b>Medical Tourists</b> | 134,500 | 250,000 | 375,000 | 500,000 |
| <b>Overnight Beds</b>   | 395     | 734     | 1,101   | 1,468   |
| <b>Same Day Places</b>  | 299     | 556     | 835     | 1,113   |
| <b>Outpatient Rooms</b> | 77      | 143     | 214     | 285     |

## 8.2 Acknowledgements

The DCSCP and its results have been tested with in depth stakeholder consultations and collaboration across various departments and sectors. Sincere gratitude and appreciation go to the public and private facilities and other stakeholders for their cooperation in providing information to the surveyors, filling out the survey forms and actively participating and providing feedback during the consultation workshops and the initial presentation of the results.

The authors of this report recommend its adoption as a fundamental basis for health sector strategy and its implementation. It is also recommended that this document be regarded as live, subject to updates every three years to align with prevailing conditions, changes to the healthcare industry, technology and Government policy



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