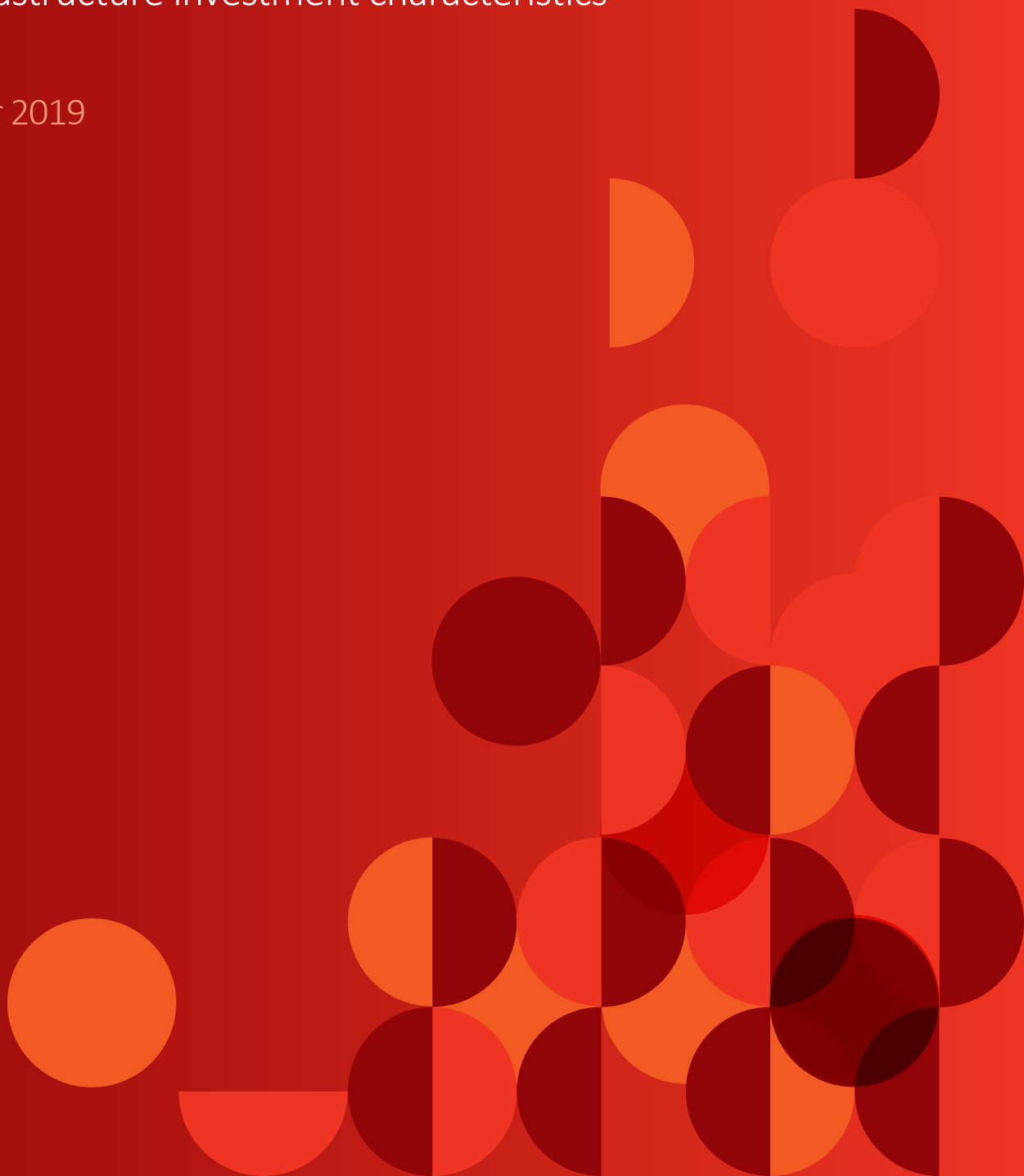


RED PAPER

Social infrastructure:

Identifying future healthcare requirements and
their infrastructure investment characteristics

December 2019



SUMMARY

Long term trends are driving robust growth in demand for healthcare services globally. Ageing demographics, the changing nature of disease, public funding pressures and technological change have converged to create a long term need for private sector investment in healthcare.

Infrastructure investors have long recognised the value that can be created through the provision of social infrastructure. However, due to the breadth of the healthcare sub-sector, careful consideration must be given to whether an investment in this space exhibits the characteristics of infrastructure investment.

In this paper, we outline our views on what investment characteristics define an infrastructure investment and assess a broad range of real assets within healthcare against these criteria.

While not all healthcare assets should be considered infrastructure, we believe there is a subset that do present attractive opportunities to invest in defensive, uncorrelated, essential social infrastructure, supported by multi-decade positive megatrends.

Specifically, opportunities in the Hospitals sub-sector, particularly with respect to decentralised outpatient day hospitals, are well-aligned with the investment objectives of infrastructure investors. We have included a brief summary of day and short stay hospitals in this paper.

Importantly, the right mindset is critical when making long-term investments in these healthcare sub-sectors. Due to the level of engagement required with other system participants and the potential social impacts and flow on reputational risks associated with poor service delivery, healthcare infrastructure must be delivered by active asset managers. We believe this active management must be undertaken with a customer-centric approach, focussing first and foremost on patient outcomes and quality of care. It is only with such an approach that investors can hope to retain a social license to operate and deliver sustainable long-term returns whilst also managing these reputational risks.

These prerequisites align well with QIC's philosophy in implementing our active asset management approach and our focus on environmental, social and governance principles as a long-term steward of infrastructure assets. In addition, we believe the healthcare industry will continue to seek patient long-term capital to meet the funding pressures which lie ahead. The stability this capital and the scope it offers to prioritise long-term initiatives has the potential to improve the quality of care received and enhance social outcomes.

1. INTRODUCTION

Social services like healthcare, education, law enforcement, housing, recreation and cultural assets underpin the building blocks of modern society and provide benefits to communities. Infrastructure investors have long recognised the value that can be created through the provision of social infrastructure. However, the potential breadth of social infrastructure means infrastructure investors must be clear about how the sub-sector is defined.

Intuitively, infrastructure assets are simply large, physical structures. However, from an investment perspective, the question of 'what is infrastructure?' takes on additional layers

of meaning. Are we truly providing an essential service? Is the business defensive with predictable long-term cashflows? What about the inflation protection and high operating margins that investors have grown accustomed to from the asset class?

For an infrastructure investor, our perceptions of what defines infrastructure are shaped, first and foremost, by the investment characteristics of the asset class, not by its physical characteristics. This goes to the heart of defining what is 'in' and 'out' of a social infrastructure sub-sector definition.

In this paper, we provide our perspectives on the investment characteristics that define infrastructure. We then carefully examine the healthcare sub-sectors within social infrastructure. Our aim is to identify the most attractive sub-sets that reflect the core tenets of infrastructure as an asset class.

But first, we start with the megatrends attracting long-term investors to the healthcare industry as a whole.

2. HEALTHCARE MEGATRENDS AND INVESTMENT DRIVERS

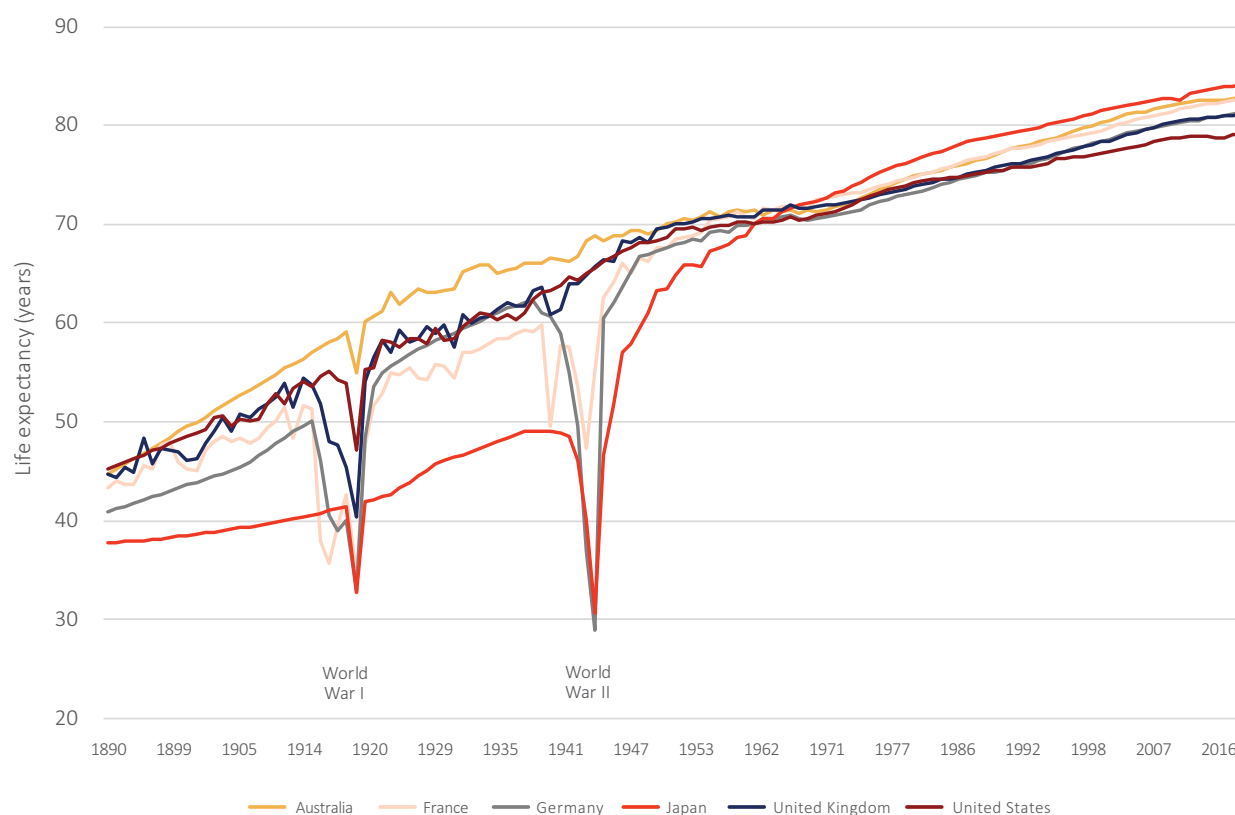
In this section, we examine the following key “megatrends” which will drive strong demand for healthcare services and shape the nature of healthcare systems over the coming decades:

1. Ageing demographics and increased life expectancy
2. The changing nature of disease
3. Public funding pressures
4. Technologies changing healthcare delivery
5. Decentralisation of healthcare services

2.1 AGEING DEMOGRAPHICS AND INCREASED LIFE EXPECTANCY

During the 17th century famine, war, plague and simple illness resulted in life expectancy at birth in the United Kingdom of a mere 36 years. After another century, life expectancy had improved only marginally, to just 39 years. A further two centuries on, life expectancy has more than doubled. The average life expectancy in the UK is 81 years, 79 years in the US, 83 years in Australia and almost 84 years in Japan.

Figure 1: Life expectancy has almost doubled in the past century



Source: GAPMINDER

Medical advancements have meant that we are living longer lives, marked not only by longer periods of healthiness but also the ability to live with illness for longer as we age.

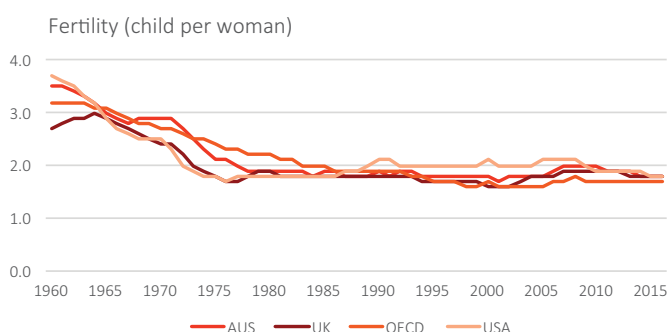
Although historically, life expectancies have tended to increase at a fairly steady rate, we expect this rate of increase to moderate across OECD nations with morbidity increasingly driven by ageing itself.

Even so, the proportion of those above 85 years will continue to grow (figure 2) with average life expectancy in OECD nations expected to reach 90.5 years for women and 87.8 years for men by 2060.

Increased life expectancy, together with universally declining fertility rates, have combined to dramatically change the age structure of populations in the OECD over time. With fertility rates in decline and increases in life expectancy the dominant source of population growth, the share of working age people is beginning to shrink (Figures 3 & 4).

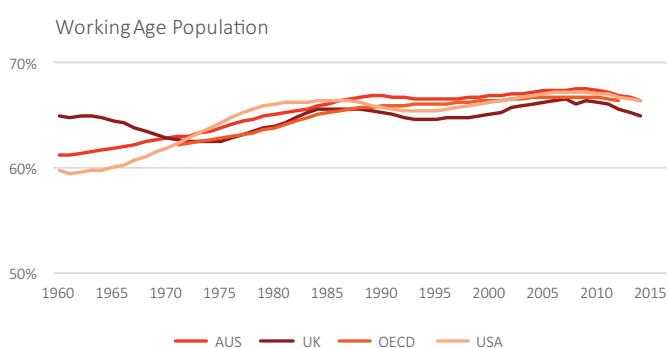
As is the case for increasing life expectancy, the trend of declining fertility is a long term one that is expected to continue for decades. The UN estimates that 69% of females will reproduce at below replacement rates of fertility (less than 2.1 births per woman) by 2045-50, up from 21% in 1975-80 and 46% in 2010-15.

Figure 3: Fertility rates in secular decline across the OECD



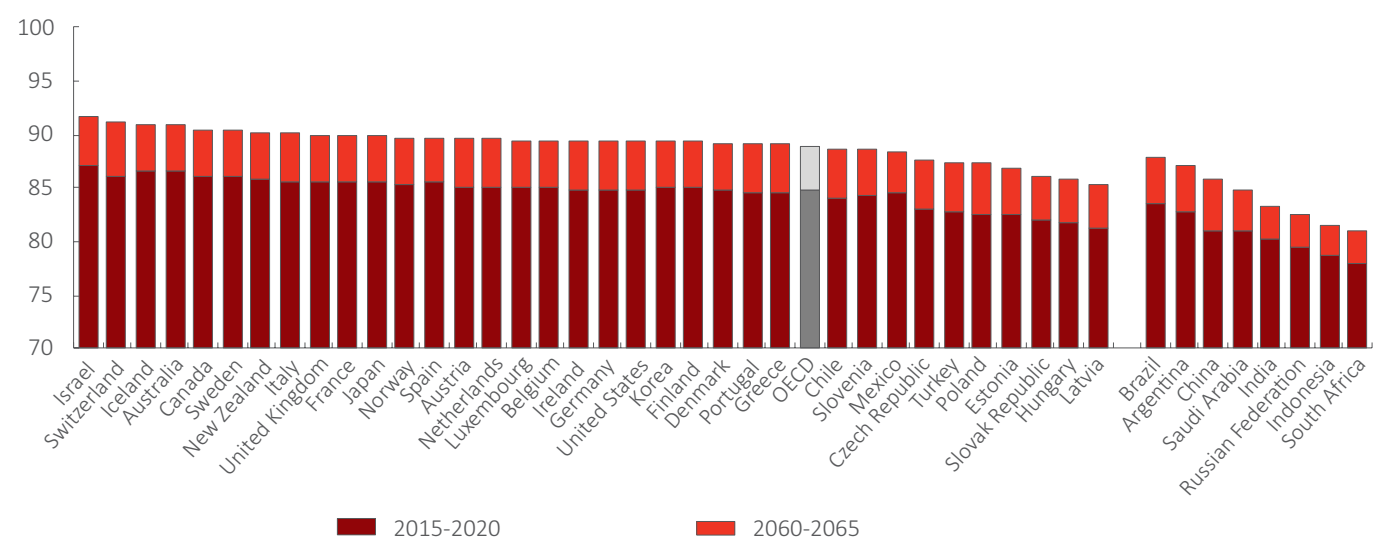
Source: OECD.

Figure 4: Working age population starting to shrink



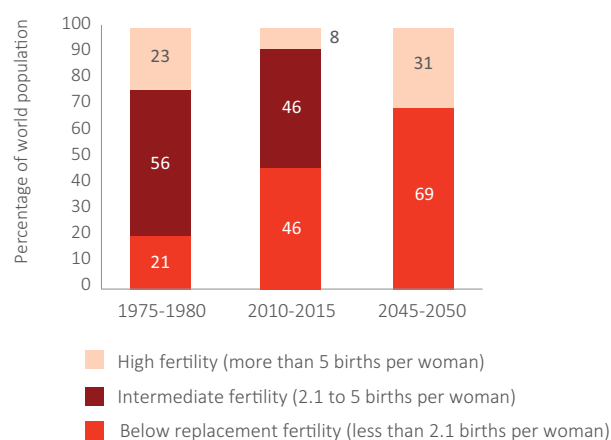
Source: OECD.

Figure 2: It is expected that life expectancy will continue to grow (life expectancy by country)



Source: United Nations, World Population Prospects – 2017 Revision, OECD.

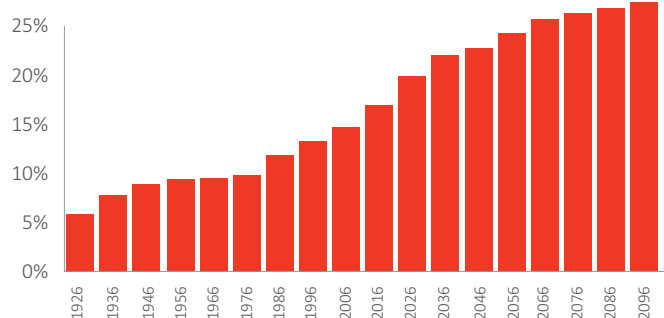
Figure 5: Distribution of the world's population by level of total fertility, 1975-1980, 2010-2015, and 2045-2050



Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). *World Population Prospects: The 2017 Revision*. New York: United Nations.

The combined impact of these megatrends will be a continuation of the demographic shifts experienced in OECD countries over the past decade. In Australia, the proportion of the population aged above 65 years is expected to increase continually over the coming century, reaching 25% of the population.

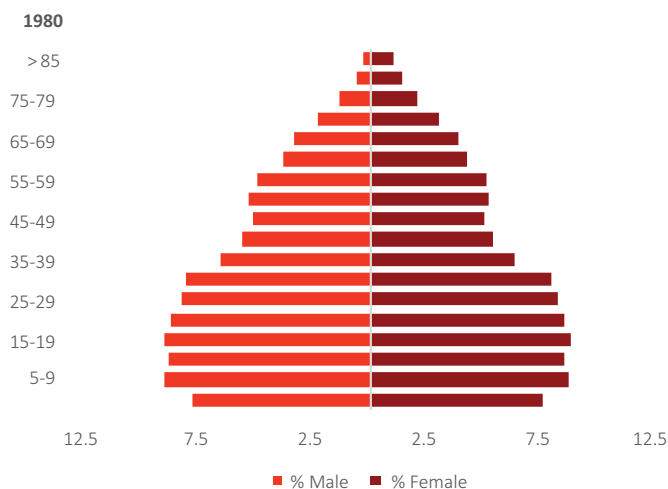
Figure 6: Proportion of Australian population aged above 65 years



Source: Australian Institute of Health and Wellness, *Older Australia at a glance*

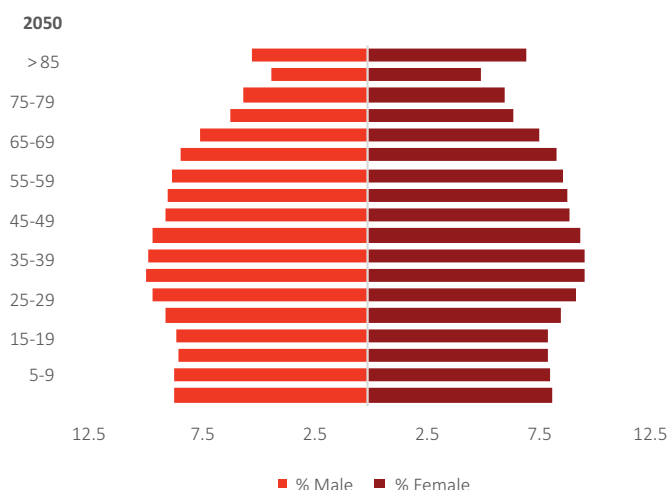
This will fundamentally change the structure of economies globally, driving shifts in demand for goods and services with particularly profound impacts in the healthcare industry.

Figure 7: Australian population pyramid, 1980



Source: ABS

Figure 8: Australian population pyramid, 2050



Source: ABS

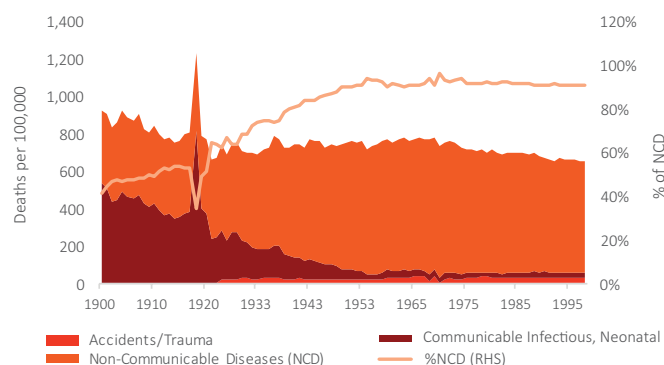
2.2 THE CHANGING NATURE OF DISEASE

As expected for an increase in life expectancy, the number of healthy years has increased, but so too have the number of years a person born today lives with illness. Historically, mortality tended to be relatively acute, driven by infectious diseases, malnutrition or external factors such as violence and war. Mortality in the 21st century, however, tends to be predominantly driven by diseases associated with lifestyle and ageing such as cancer and cardiovascular disease.

Accordingly, whereas contracting an infection could, in 16th century London, result in death in just days, Australians today are living with disease for an average of 11 years.

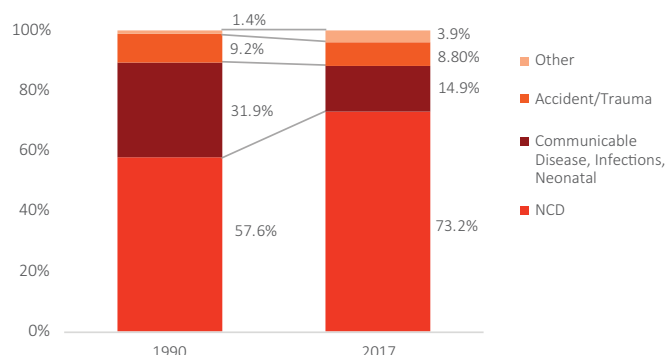
Changes in life expectancy have therefore been accompanied by significant changes in global morbidity – the causes of death. Consider, for example, that in the early 1900s, communicable and infectious diseases and neonatal deaths represented 59% of deaths in the United States. By 1998, deaths from those causes had declined to just 5%, with non-communicable disease (including cancer and cardiovascular disease) causing 91% of all deaths.

Figure 9: Causes of death in the US



Source: Max Roser, Life Expectancy (2018)

Figure 10: Global causes of death have shifted



Source: The Global Burden of Disease

Data from the Global Burden of Disease Study, a comprehensive global study of the causes of morbidity, indicated that six of the top 10 leading causes are predominantly driven by chronic diseases, accounting for 70% of all deaths in 2017. In 1990, when the study commenced, these six categories accounted for only 55% of deaths. Across the period 1990 to 2017, the two single largest causes of death, cardiovascular diseases and cancers, increased by c.11%.

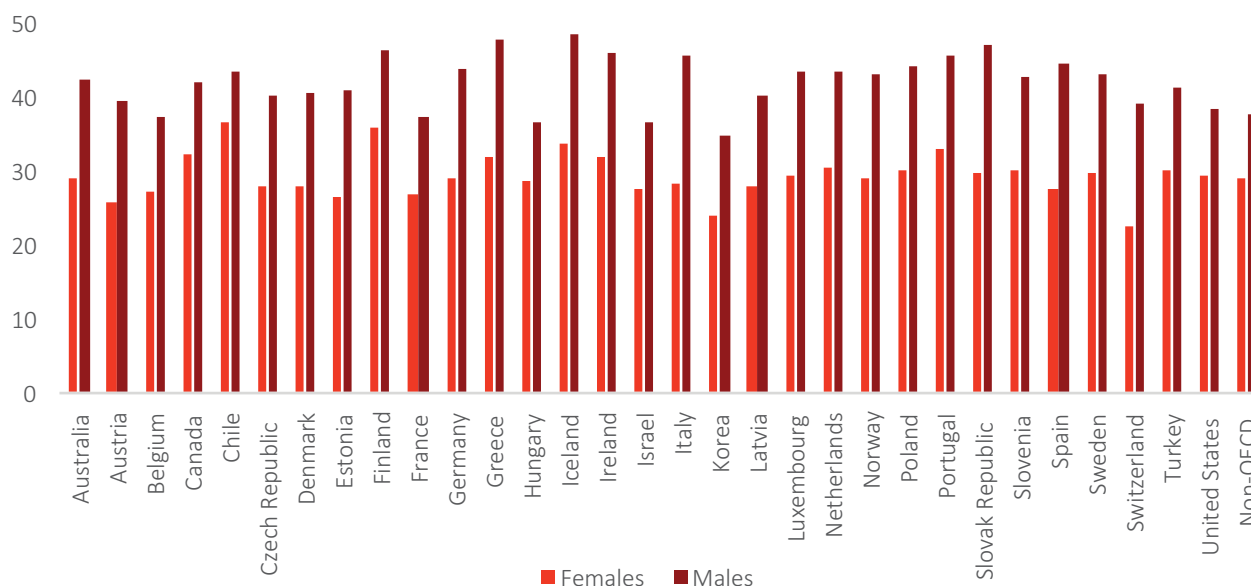
2.2.1 THE GROWING BURDEN OF OBESITY

The majority of the world's population now live in countries where diseases relating to excess weight are responsible for more deaths than diseases relating to malnutrition.

Within the OECD, it is estimated that nearly half of all adults and one in six children are overweight or obese, with the highest adult obesity rates in the US, Mexico, New Zealand and Hungary.

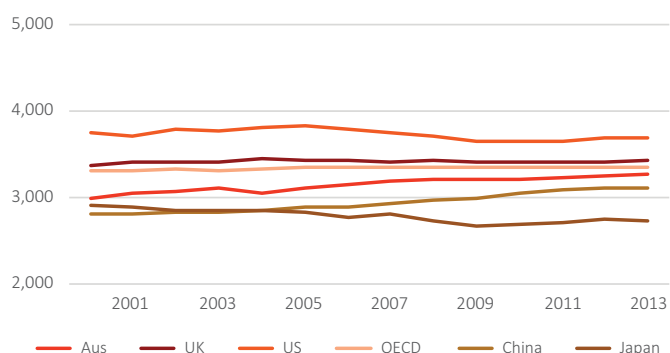
A recent study by the World Health Organisation estimated that world-wide obesity has tripled since 1975, amounting to more than two billion adults classified as overweight or obese.²

Figure 11: Percent of males and females overweight or obese by region



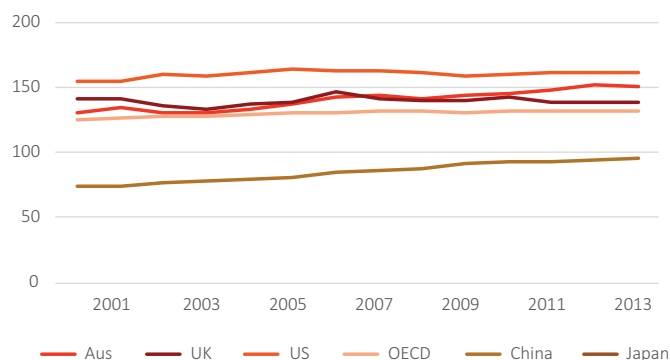
Source: World Health Organisation, 2017

Figure 12: Calorie intake consistently high across OECD excluding Japan



Source: Max Roser, Life Expectancy (2018)

Figure 13: Similar trends in fat consumption across OECD excluding Japan



Source: The Global Burden of Disease

Lifestyle factors such as diet and lack of exercise are the primary cause. Those in developed nations enjoy more sedentary lifestyles today, relative to 1975.

Although obesity itself is not typically a direct cause of death, being overweight or obese does materially increase the risk of a number of chronic diseases including diabetes, cardiovascular disease and cancers.

It is no surprise then that diseases typically related to lifestyle, such as Type 2 Diabetes, are increasingly common, affecting c.6.3% of the global population in 2017, a material increase from c.3.9% in 1990.³

In 2017, the World Obesity Foundation estimated that by 2025 the cost of medical care for the c.2.7 billion overweight and obese adults will amount to US\$1.2tn.

2.2.2 GROWTH IN CHRONIC AND DEBILITATING DISEASES

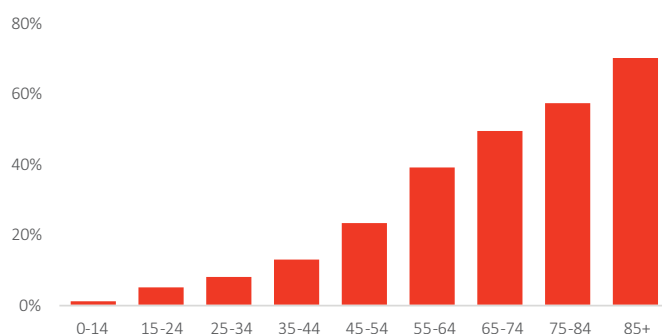
The common product of changes in demographics, morbidity and lifestyle is growth in chronic and debilitating diseases. Medical advancements have meant that we are living longer, despite deteriorating lifestyles, but they have also enabled us to live with a large number of chronic diseases (Figures 14 & 15).

These trends mean that each patient is progressively more difficult and thus expensive to treat, not only because of the chronic nature of their underlying diseases and the interactions between each disease, but increasingly to ensure that side-effects of different medications or treatments are properly managed.

For example, it is not uncommon for a modern patient to have diabetes, cardiovascular disease, high blood pressure, hypertension and chronic pain. These are all long-term conditions, requiring a carefully constructed combination of specialist treatments and medications.

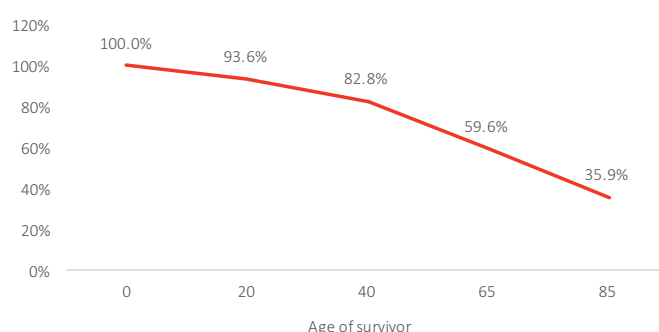
Studies relating to healthcare expenditure have shown that a person surviving to 40 years of age has approximately 82.8% of their total lifetime health care expenditure still ahead of them. For a person who is 85 years old, there remains still an incredible 35.9% of their expected total lifetime costs yet to be spent.⁴ This reflects the material increase in complexity in treatment and the multitude of diseases frequently present for those in that age bracket.

Figure 14: Percent of patients with five or more long-term conditions by age bracket



Source: APRA.

Figure 15: Percent of relative lifetime expenditure by age



Source: The Lifetime Distribution of Health Care Costs

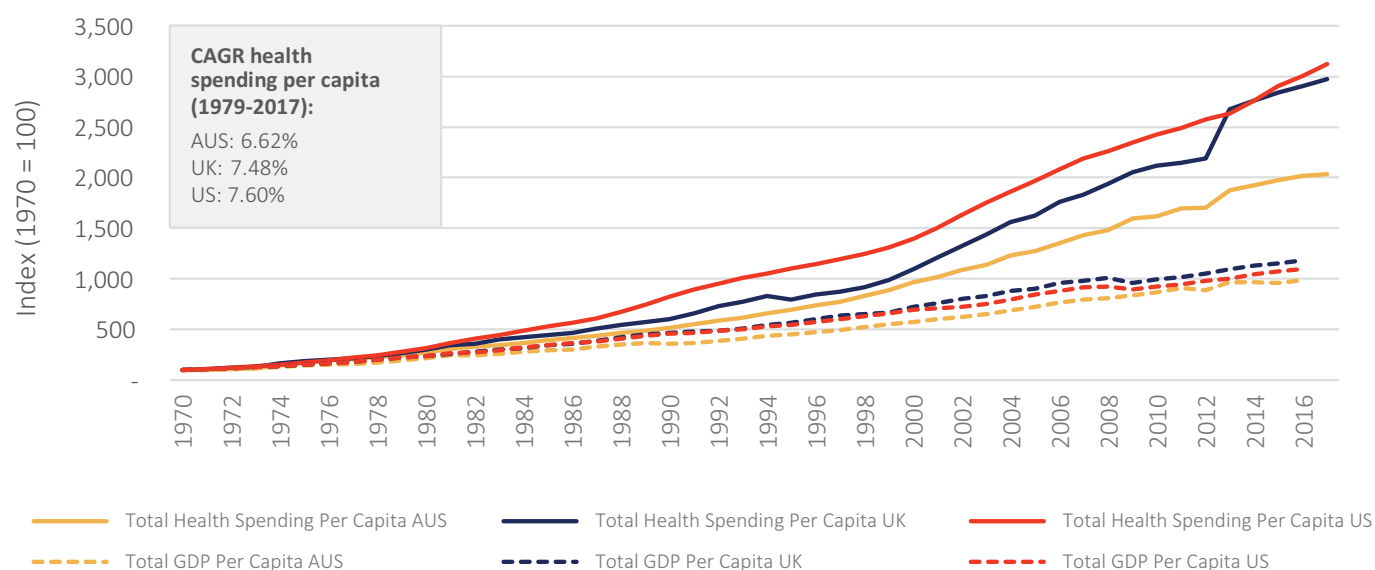
2.3 PUBLIC FUNDING PRESSURES

Continued increases in life expectancy, changes in global morbidity and growth in chronic diseases mean that healthcare systems face a continued increase in the demand for long-term and increasingly complex care. Due to the role of ageing in the occurrence of chronic diseases, people over the age of 75 incur per capita health expenditures that are five times higher than people aged 25 to 34.

These ongoing structural changes are expected to significantly increase the amount of funding the healthcare system will require and drive material changes to the nature of healthcare services sought and delivered. While private healthcare funding is prevalent in developed markets, the majority of total healthcare expenditure is funded by the public sector. In Australia, the proportion of total healthcare expenditure funded by the government has been stable at between 67-70% over the last decade.⁵

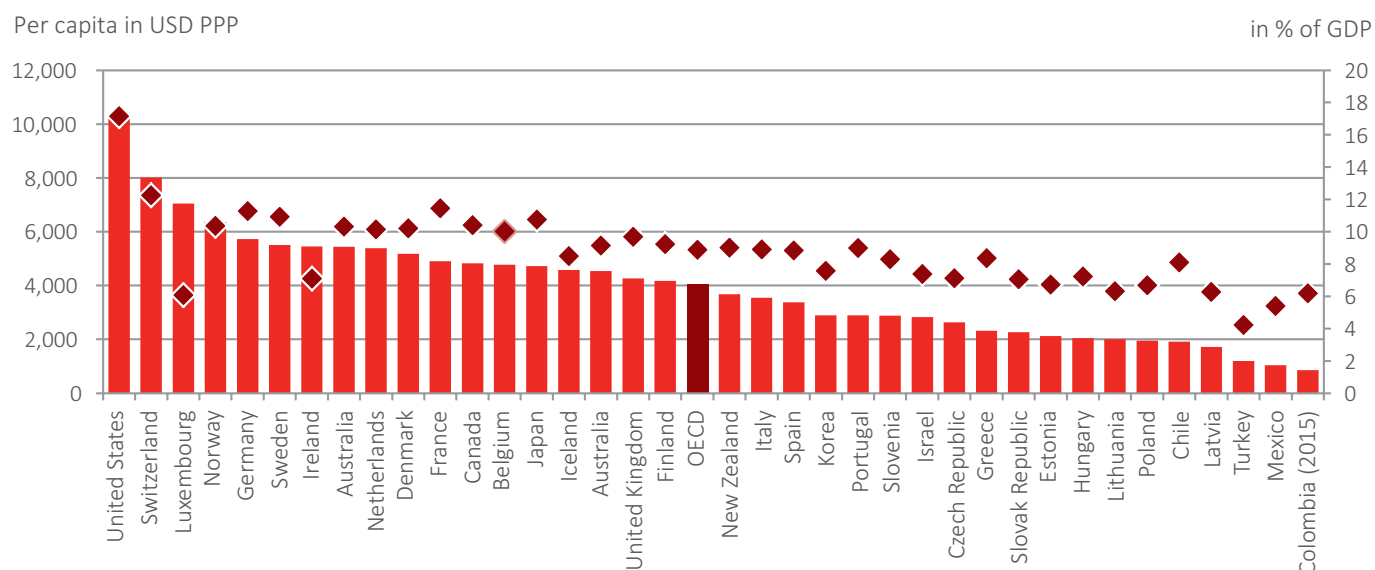
When considered alongside the decline in working age populations, it's understandable that many governments globally are concerned about the rising costs of healthcare, which has historically outpaced GDP growth on a per capita basis in the US, UK and Australia (Figure 16).

Figure 16: Index of healthcare spending per capita vs GDP per capita⁶



Source: The Lifetime Distribution of Health Care Costs

Figure 17: Health spending per capita and as share of GDP, 2017



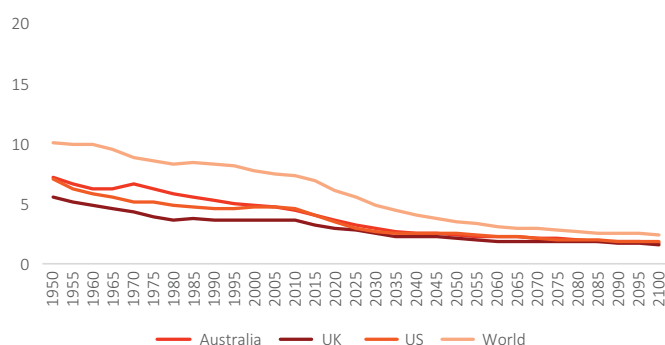
Source: OECD Health Statistics 2018

This trend has been consistent across developed markets despite the diversity of approaches to public healthcare funding such as capitation funding (per person), activity based funding (fee for service), outcomes based funding, bundled payments or alliance contracting. Many countries deploy a range of funding models, each of which have their strengths and weaknesses, but none of which have been able to slow the growth in total public healthcare spending over time.

As healthcare spending has continued to grow at a faster rate than GDP, healthcare spending as a share of GDP has increased to approximately 9% for the OECD on average, between 9-10% in the UK and Australia and approximately 17% in the US.

Adding to this pressure, the decline in working age populations is expected to continue, increasing the fiscal constraints facing governments. Globally, 'support ratios' (the ratio of working-age population relative to those in retirement age) are expected to decline from 8.4 in 1980 to 3.5 by 2050. That is, the financial support a pensioner draws from the healthcare system will be shared across less than half the number of people in 2050 than in the 1980s, driving an increase in healthcare costs per working age population.

Figure 18: Global support ratios expected to decline materially



Source: UN.

These factors are combining to challenge the fiscal sustainability of health care arrangements. However, there are expectations from the community that governments will continue to ensure access to affordable, high-quality health care. In Australia, society's priorities and expectations are best evidenced by the fact that health (A\$81.8b) and pension-related expenditures (A\$70.2b) represent two of the largest items of government spending.⁷

In the UK, given the pressure on the National Health Service (NHS), the private sector (including not for profit organisations) is now responsible for the delivery of a significant proportion of the care needed to look after the elderly population as well as people of all ages with long term health conditions. For example, 80% of adult social care services are provided by the private sector, with 13% provided by volunteers and only 7% by the public sector.⁸

Unfortunately, contrary to the trend in many industries, technological innovation in healthcare is not expected to be a panacea for costs. Historically, technology has been a contributing factor to increasing healthcare costs due to the continued adoption of more effective treatments and higher quality care. We next explore some leading examples of healthcare technology and the ways in which they will shape the future of healthcare by driving increases in decentralised delivery models such as community-based care.

2.4 TECHNOLOGIES CHANGING HEALTHCARE DELIVERY

It is a common refrain that advances in medical technology and their diffusion across health systems is the principal driver for increasing expenditures. The evidence suggests that between 25-75% of the overall health care cost increase is due to new medical technologies.⁹

In many industries (such as IT, Moore's Law) the perennial gale of creative destruction through innovation of technologies drives prices down. Yet this is not the case with healthcare technology. In healthcare, new technology often results in more expensive substitutes for an existing service; provides new treatments for previously untreatable conditions; expands indications (an indication is a condition which makes a particular treatment or procedure advisable) or intensifies the level of use of a technology.

There are historical, structural and political differences within and between countries health systems that influence the adoption and diffusion of new technologies. The roll out and provision of particle beam therapy is an example where the Japanese government decided to facilitate access to this technology, leading to much faster diffusion and adoption.

We view technology with an optimistic lens, it provides life extending and quality of life enhancing benefits. New technology delivers value despite increasing costs and whilst cost is more easily measured it is only one side of the cost- benefit equation, it is value with respect to clinical and societal benefit that is just as important. For example, some new technologies may be cheaper and cause less complications, leading to increased provision of those healthcare procedures. When the cost savings per case are offset by the increased number of procedures, costs in the aggregate increase, but will also increase the total benefits from the care provided.

Below, we focus specifically on technologies that are facilitating decentralised delivery models for healthcare, as this is an area that we expect will be highly relevant for infrastructure investors in the future.

2.4.1 DECENTRALISATION OF HEALTHCARE SERVICES

There are clear structural drivers supporting greater disaggregation and decentralisation in the delivery of health care, particularly in the context of receiving non-acute, elective and long-term care. Technology is a key enabler of this trend.

Technology can improve the efficiency and effectiveness of community care and have a dramatic impact on quality of life of people in care settings with a wide variety of needs. Some new technology and their application in decentralised models of healthcare include:

- **Telecare** includes personal alarms that people wear or put in their home. They call for urgent help when activated. Sensors can track activity and identify risks where a person lives. They call for help if the person falls or there is a lack of movement for some time. They can also identify when a person is moving around less than usual, or if their habits change. For example, they might be using the bathroom more or sleeping less at night. Sensors can also pick up risks like fire, gas leaks, floods or significant temperature changes. Memory aids help people remember when or how to do something, like taking medicine or eating a meal. These include talking alarm clocks or watches, which can assist people with dementia.
- **Telemonitoring** includes implants under the skin, or equipment in people's home to monitor their health. Examples include monitors for: blood sugar, blood pressure, temperature, heart rate or breathing. Telemonitoring devices can help a person to manage their own health condition. Their care provider can use the information recorded to spot early signs of changes in their condition.
- **Telehealth or Telemedicine** is phone or video contact between people and health and social care professionals. It enables people to have contact with the professional in real time when the option of a face to face meeting is not available or it isn't needed to agree the best treatment. For example, it could be used to connect a number of professionals involved in someone's care or in smaller hospitals to link with centres of excellence.
- **Digital records** which support more effective quality assurance through more effective communication, information sharing and improved data analysis. People who use services and their families can use online platforms to access and contribute to the information that is important to them. They can also communicate with those involved in their care and treatment. Records can be written, stored and shared digitally rather than on paper. Digital care records can make information easier to access and quicker to share. This reduces the number of times people who use services have to give information or repeat themselves. Electronic medication management (eMar) systems can help staff to record the medicines given to people in their care, minimise mistakes or incomplete records. Typical digital records now include: care plans, medical/clinical records, medication systems (eMar) staff employment records, including recruitment and training records, staff management records, including rotas.
- **mHealth** (or mobile health) refers to apps for smartphones or tablets, online patient communities offering information and support, wearable technology to help people stay fit and healthy, to communicate with friends and family and to carry out everyday tasks. This does not need to be prescribed as part of medical treatment e.g. fitness tracker. Communication aids (such as tablet-based apps) can be tailored to an individual's needs, preferences and activities. For example, they can be regularly updated with words and expressions that are important to the person using them. Voice recognition software can help to make adjustments for sensory disabilities. Or a computer-based app can be also used to deliver tailor made treatment/recovery plans for people e.g. some exercises that a patient can do at home to help rehabilitation.

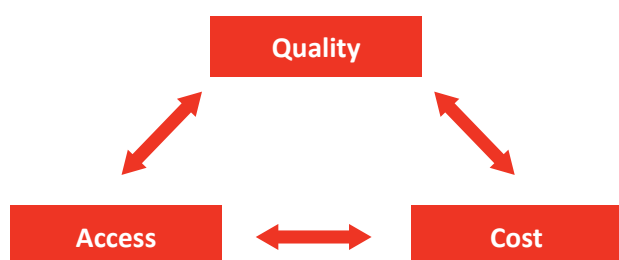
3 DEFINING HEALTHCARE INFRASTRUCTURE INVESTMENTS

3.1 HEALTHCARE REQUIRES RESPONSIBLE, ACTIVE LONG-TERM ASSET MANAGERS

An overarching prerequisite for investing in healthcare is that it is done with an active, responsible approach, prioritising patient outcomes and quality of care.

In the healthcare industry, poor corporate governance can result in significant impacts on patient outcomes. All healthcare system participants must carefully balance three competing priorities to ensure good patient outcomes: cost, quality and access. Healthcare providers must ensure that the right procedure is done on the right patient, the right way and at the right cost by balancing these priorities.

Figure 19: Healthcare investors must balance competing priorities



A change that has an effect in one element of the cost, quality and access triangle will typically have an impact on one of the other elements. If you lower costs, you adversely impact quality or access. Conversely, if you improve quality then often costs may increase.

We operate in an environment where investors are increasingly conscious of the social impacts of their investments, and monopolistic businesses are increasingly being challenged to justify their social license to operate. In this context, QIC's philosophy toward investing and asset management has always been that taking a customer-centric approach to the provision of essential services is the only way to ensure that an investment will retain a social license and deliver sustainable returns.

Due to the heightened consequences of service provision within the healthcare sub-sector, we believe this philosophy should be a prerequisite for all long-term investors seeking to enter this sector and its constituent sub sectors.

Further, healthcare investors must also be active with respect to engaging with other system participants to ensure appropriate patient outcomes. At a high level, there are five participants in global healthcare systems- patients, providers, payers, purchasers and policy makers – that need to be actively managed.

Figure 20: Healthcare system participants



The role of an infrastructure investor within healthcare is that of a provider, and there are inherent limits to the level of influence a provider has over the cost, quality and access to healthcare provided to patients. For investors with a desire to ensure positive patient outcomes, this highlights the need for ongoing engagement and collaboration with other system participants. This is not a task that can be done passively without increasing risks for both patients and investors.

In particular, changes in policy and regulatory settings can have profound impacts on patient outcomes as well as the sustainability of economic returns. This is because these settings can redirect public healthcare resources to influence the behaviour and responsibilities for all the other healthcare participants (patients, providers, payers, purchasers). As a result, segments of the healthcare sector are likely to benefit from an increase in the kind of responsible, active, long-term ownership that is synonymous with other infrastructure.

A longer-term investment horizon of 15+ years would enable investment decisions to prioritise patient outcomes and quality of care, over short-term earnings or cost minimization imperatives. A longer-term approach also has the potential to generate more sustainable returns, as consistently delivering positive patient outcomes results in lower reputational risks.

In the following section, we seek to narrow the sub-sectors of healthcare which are most appropriate for infrastructure investor participation.

3.2 SOCIAL INFRASTRUCTURE: IDENTIFYING THE HEALTHCARE SUB-SECTOR

In the table below, we provide our perspectives on the key investment characteristics that have traditionally defined infrastructure as an asset class. In the following section, we assess the universe of potential healthcare investments against each of these characteristics.

Infrastructure assets have also traditionally been pursued as a source of returns that are uncorrelated to short term business cycles and the returns of listed equities.

To assess the healthcare sub-sector against the characteristics outlined above, we have first separated the spectrum of healthcare investments into three broad categories:

1. Pharmaceuticals - Businesses primarily involved in the research, development, production and marketing of pharmaceuticals.

2. Medical Technologies - Businesses primarily involved in the research, development, production and marketing of biotechnology products, healthcare equipment and supplies.

3. Services - Businesses that provide healthcare services, or own and operate health care facilities which are used for the provision of healthcare services.

At first glance, many businesses within the healthcare spectrum may appear to exhibit infrastructure investment characteristics. They are often providing essential services after all, often underpinned by governmental-backed revenues. Barriers to entry are also quite common due to the highly regulated nature of the industry, which includes regulatory accreditation requirements for any new entrants.

It is only when investors peel back the layers of value drivers and risks that it becomes clear which healthcare assets are characterised by truly defensive and predictable long-term cashflows.

Specifically, we have identified day and short stay hospitals as assets capable of exhibiting strong infrastructure investment characteristics.

Figure 21: Infrastructure assets that QIC targets should demonstrate the below characteristics

Infrastructure asset class description	Characteristics for healthcare assessment
Predictable long-term cash flows Cash flow stability may stem from low volatility in demand (as a result of providing an essential service), stable operating costs (from low risk operations) and certainty of revenue from either contracts or prices set by a regulator under predictable frameworks.	<ul style="list-style-type: none"> • Essential service provision (generally applicable to all healthcare activities) • Volume predictability • Contracted revenue or government backed regulatory price setting • Robust operating margins and cashflow
Hedge against inflation A hedge against inflation can be provided by operating under a pricing regime that allows price raises in line with inflation or being provided a regulated return linked to inflation.	<ul style="list-style-type: none"> • Regulated or inflation linked pricing
Defensive characteristics Assets that exhibit defensive characteristics from year to year as a consequence of high barriers to entry, stable predictable cash flows and limited exposure to revenue risks.	<ul style="list-style-type: none"> • High barriers to entry • Customer stickiness / diverse customer base

Figure 22: Infrastructure investments should be confined to a subset of healthcare services, such as day and short stay hospitals

		Pharmaceuticals			Medical Tech			Services				
		Biotech Pharma	Specialty Pharma	Generic Pharma	Diagnostics	Devices	Industrial	Wholesaling	Contract Manufacturing	Care Facilities	Hospitals	Diagnostic Labs
Description		Early stage development of pharmaceuticals prior to commercialisation	Revenue generating patent protected pharmaceuticals	Revenue generating non-patent protected pharmaceuticals	Diagnose and monitor medical conditions	Range of products including hearing aids and voice prostheses	Manufactured goods such as reading glasses, wheelchairs and orthopaedics	Intermediaries between manufactures and customers	Manufactures pharma products or medical devices for third parties	Care for those with special needs or chronic conditions	Day and short stay hospitals providing the medical infrastructure and equipment to facilitate specialist procedures	Services to diagnose various conditions
Infrastructure Characteristics	Volume Predictability	✗ ✗ ✗	✓ ✓	✓	✓ ✓	✓ ✓	✗	✓	✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓
	Regulated / Inflation linked pricing	✗ ✗ ✗	✓ ✓	✗	✓	✗	✗	✓	✓	✓ ✓ ✓	✓ ✓	✓ ✓
	Customer Stickiness	✗ ✗ ✗	✓ ✓	✓	✓ ✓	✓ ✓ ✓	✓	✓ ✓	✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓
	No Manufacturing	✗	✗	✗	✗	✗	✗	✓ ✓	✗	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
	Mid / Long Term Contracts	✗ ✗ ✗	✗	✓	✓	✓	✓ ✓	✓	✓ ✓ ✓	✓ ✓	✓	✓
	Robust Margin and Cash Flow	✗ ✗ ✗	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓	✓ ✓	✓ ✓	✓ ✓ ✓	✓ ✓
	Diverse Customer Base	✗ ✗ ✗	✓	✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓	✓ ✓	✓ ✓	✓ ✓ ✓
	Barriers to Entry	✗	✓ ✓ ✓	✗	✓ ✓	✓ ✓	✓	✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓

In the following section, we provide a brief overview of day and short stay hospitals.

4 SPOTLIGHT ON DAY AND SHORT STAY HOSPITALS

Hospitals, in their various forms, make up the core of healthcare infrastructure. In Australia, it is estimated that by 2050, as the numbers of elderly patients continues to rise, a 62% increase in hospital beds will be required to meet expected hospital demand. To put this in context, this growth would come at a cost of almost 10% of Australia's total GDP.¹⁰

This demand growth is strongly linked to ageing demographics and increased life expectancy, as those aged 65 years and above attend hospitals at 5 times the average rate of those aged 64 years and under.

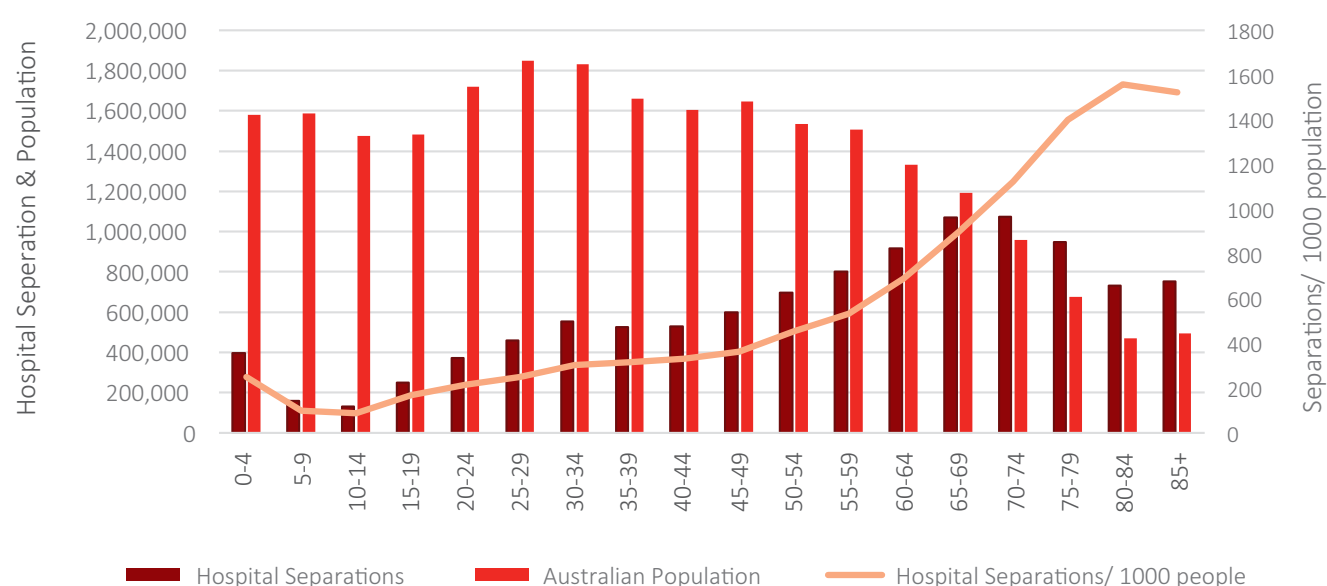
While traditional large inpatient hospitals will likely continue to see strong demand amidst this growth profile, our assessment has identified that decentralised outpatient day and short stay hospitals will exhibit robust long term demand growth. In particular, we find that day hospitals underpinned by non-elective surgeries have the potential to provide stable and highly visible core volumes. Combined with the high barriers to entry created by regulation and the upfront costs of real assets (including facilities and equipment), this results in the potential for strong, stable margins and highly defensive cashflows. In other words, an attractive infrastructure asset.

Day hospitals are also poised to benefit from the increasing focus on improving patient outcomes at a lower cost to government. Multiple studies have shown that the use of day surgeries for non-critical care can result in improved patient outcomes at lower costs relative to traditional large hospitals. In 2017, Private Health Insurers in Australia paid inpatient hospitals 32% more than they paid outpatient day hospitals for the top nine most common same day procedures.¹¹ Further, the day hospital model of getting patients back into their homes for the majority of their rehabilitation period has been shown to increase the extent and pace of recoveries. Accordingly, we believe both public policy and private health insurers will play a key role in driving continued growth in the utilisation of day hospitals and clinics within the broader healthcare system.

Volume growth for day hospitals is also supported by technological advancements. Technology is not only facilitating a more decentralised healthcare system, but also constantly expanding the scope of surgeries that can be performed on the same day. In Australia the volume growth in day hospitals has averaged a CAGR of 6.0%.

Pricing of services within day hospitals is typically driven by a combination of private health insurance arrangements and direct government funding, with the exact model varying by country.

Figure 23: Population and hospital separations (i.e. visits) by age¹²



5 KEY FINDINGS FOR INFRASTRUCTURE INVESTORS

Only a narrow subset of healthcare assets qualify when assessed against our criteria for infrastructure investments. Positively, the assets that do qualify offer attractive opportunities to invest in defensive, uncorrelated, essential social infrastructure assets, supported by multi-decade positive megatrends.

Specifically, we identified opportunities in the Hospitals sub-sector, particularly with respect to decentralised outpatient day and short stay hospitals focussing on non-elective procedures.

As the industry continues to evolve, this sector will continue to benefit from a sharper focus on providing outcome-driven, value-based purchasing of healthcare. Numerous studies have shown that increased reliance on high quality day surgeries for non-emergency procedures would result in better medical outcomes for patients at a lower total cost of provision.

It is also worth re-emphasising that the healthcare industry is not a suitable space for passive investors, due to the level

of engagement required with other system participants and the potential social impacts of poor service delivery. Both of these drive different reputational risks for owners. Indeed, healthcare infrastructure must be delivered with a customer-centric approach, focussing first and foremost on patient outcomes and quality of care. This requires a different workforce and operating model than more mainstream infrastructure. It is only with such an approach that investors can hope to retain a social license to operate and deliver sustainable long-term returns by managing reputational risks.

These prerequisites align well with QIC's traditional approach to asset ownership, given our history as a long-term steward of infrastructure. In turn, we believe the industry itself would welcome an increase in patient long-term capital, given the stability it can provide and the scope to prioritise long-term initiatives. These features can help improve the quality of care, with less pressure on short-term earnings or cost minimization while meeting many institutional investors desire to effect change in the provision of social infrastructure.

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