

STRENGTHENING THE HEALTHCARE PYRAMID

How Qatar can make the next quantum leap in healthcare

Independent Study

Doha, November 2019



GS Health

Prologue:

Before you is the first GS study on healthcare in Qatar. Like all our studies, it is undertaken independently and critically. We believe both of these traits are important to objectively assess the state of healthcare and make meaningful recommendations.

We hope that the recommendations of this study shall help Qatar achieve what the Ministry of Public Health has as her Vision and Mission:

"We believe that Qatar has an opportunity to create a health care system that will provide the most effective and advanced health care to its people and to become a model for the world to follow. The heart of Qatar's strategic vision for the future is helping people achieve their full potential, thereby benefiting the individuals, their families, the community and the nation."

The Ministry goes on to elucidate how they propose achieving the above stated vision:

"Caring for the future means promoting public health, encouraging healthy lifestyles, providing community-based primary care, and ensuring that, when needed, some of the world's most advanced and highest quality care is available in tertiary (which is) medical facilities. These tertiary facilities will not only provide quality care but also are expected to be research leaders on the frontiers of science."

We couldn't agree more. Yet achieving these goals is not straightforward. Existing strengths everywhere, and in Qatar as well, create entrenched interests and biases. Redesigning and optimizing healthcare delivery is an arduous journey. We hope that this study will help the State of Qatar achieve their laudable goals in healthcare.

For this study, we relied exclusively on publicly available information on Qatar. Several key healthcare leaders in Qatar have been kind enough to review the earlier drafts and provide valuable encouragement and insights but we remain fully responsible for the analyses and conclusions. We are not looking to either praise or seek favor. But we are also not aiming to be unnecessarily acerbic for the sake of provoking. Through our studies we hope to illumine and inspire, like the Museum of Islamic Art does in Doha.

تمهيد:

نضع بين أيديكم أول بحث للدراسات العامة عن الرعاية الصحية في دولة قطر. تم إجراء هذه الدراسة بشكل مستقل وبعين ناقد على غرار جميع الدراسات التي نقوم بها في مؤسستنا، لما لهاتين السمتين من أهمية بالغة حينما يتعلق الأمر بإجراء تقييم موضوعي لحالة الرعاية الصحية في الدولة وتقديم توصيات هادفة في هذا الشأن.

ونأمل أن تساعد التوصيات المستخلصة من هذه الدراسة دولة قطر في تحقيق رؤيتها ورسالتها التي تحدثت عنها وزارة الصحة العامة قائلة:

"نرى أن دولة قطر لديها فرصة سانحة لإنشاء منظومة للرعاية الصحية تعمل على تقديم أكثر أساليب الرعاية الصحية فعالية وتقديمًا لشعبها، وهو ما يؤهلها لتصبح نموذجًا يحتذى به في كل دول العالم. كما تأتي مساعدة الأشخاص على تحقيق كامل إمكاناتهم في صميم الرؤية الاستراتيجية المستقبلية لقطر، الأمر الذي يعود بالنفع على الأفراد وعائلاتهم والمجتمع بأسره."

وتستطرد الوزارة في توضيحها بشأن الكيفية التي تنوي بها تحقيق رؤيتها المذكورة أعلاه قائلة:

"يقصد بالاهتمام بالمستقبل أن تقوم الدولة بتعزيز الصحة العامة والتشجيع على اتباع نمط حياة صحي وتوفير الرعاية الأولية القائمة على تلبية احتياجات المجتمع، بالإضافة إلى التأكد من توفر أساليب الرعاية الصحية الأكثر تطوراً والأعلى جودة في العالم في المنشآت الطبية التي تقدم الرعاية الثلاثية. لن توفر هذه المنشآت رعاية جيدة فحسب بل متوقع منها أن تصبح أيضاً رائدة في مجالات الأبحاث المتعلقة بمختلف آفاق العلوم."

وبالطبع نحن نتفق تماماً مع هذه الرؤية، إلا أن تحقيق هذه الأهداف ليس بالأمر الهين، فعادة ما تكون مواطن القوة – التي تتواجد في قطر مثلما تتواجد في كل مكان حول العالم – سلاخاً ذا حدين، ما يجعل إعادة هيكلة منظومة الرعاية الصحية وتحقيق الاستفادة القصوى منها عملاً شاقاً ومضنياً. ومن ثم نأمل أن تساعد هذه الدراسة دولة قطر على تحقيق أهدافها السامية في مجال الرعاية الصحية.

فنحن نعتمد في إعداد هذه الدراسة على المعلومات المتاحة للجميع للاطلاع عليها في قطر بصورة حصرية. كما تفضل العديد من رواد الرعاية الصحية الكبار داخل الدولة بمراجعة مسودة الدراسة الأولية وتقديم آرائهم السديدة لنا وتشجيعنا ودعمنا بصورة مفيدة، إلا أننا مازلنا نتحمل المسؤولية الكاملة عن التحليلات والاستنتاجات الواردة في هذه الدراسة، فنحن لا نقدم عبارات مدم أو تأييد في الدراسات التي نجريها، كما أننا لا نقدم كلمات لاذعة بلا مبرر من أجل الإثارة والاستفزاز فقط، وإنما نأمل أن تكون الدراسات الصادرة عن مؤسستنا مصدراً للتوعية والإلهام تماقاً مثلما هو الحال في متحف الفن الإسلامي في الدوحة.

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Executive Summary

Looking back: Qatar has achieved nearly world class healthcare outcomes, mainly driven by heavy investments in hospitals.

In the last decades Qatar has booked impressive gains in healthcare. While no single measure can capture entirely the complexity of excellence in healthcare, we have used a composite index of indexes to determine the state of healthcare in Qatar today¹. The composite index shows that today Qatar is amongst the best in the GCC but more importantly, it is one of the countries at the frontier of excellent healthcare worldwide – among the top 20% of all countries. To achieve this Qatar has invested heavily in a world-class secondary and tertiary care network. As would be expected, to achieve this performance Qatar spends a significant amount of money (measured per capita, corrected for age of population and buying power). Qatar has shown that, by investing in hospital care, it is possible to rapidly achieve world class healthcare in a country in a relatively short span of two to three decades.

Looking ahead: Qatar needs to strengthen the grassroots of healthcare: patient empowerment and primary care. The healthcare pyramid is top heavy and by investing in delivery capacity at the base, Qatar can achieve better outcomes at nearly the same spend while also better accommodating for demographic changes.

The core question we ask in this study is: What's next for Qatar's healthcare? What does Qatar need to do continue to make significant improvements in healthcare?

In order to make the next quantum leap, Qatar needs to significantly accelerate and deepen its investments in primary care, home and nursing care and patient empowered care. There is still room to improve in hospital care but given the excellent hospital infrastructure these incremental improvements are likely to happen already in secondary care. Integration of care and increased collaboration between providers working at different levels needs to be the new priority. To make a difference, to define the healthcare frontier of the future, Qatar needs to strengthen the base of its healthcare pyramid: the primary, home and self and family care and integrate care across the pyramid.

By strengthening and integrating the healthcare pyramid, Qatar can improve the outcomes significantly: 10 years higher life expectancy, 15% lower amenable mortality score, and up to 50% lower burden of disease. Importantly, these gains can be achieved at the current costs per capita, while improving access to care. This is possible because primary care and home care are relatively cost effective. In summary, while hospital capacity will continue to be needed as Qatar's population ages, strengthening and integrating the pyramid is the most effective route forward.

It is important to emphasize that these gains cannot be achieved at the cost of hospital care. In fact, an excellent secondary care infrastructure is a pre-requisite for the functioning of primary and home care. The current Qatar healthcare pyramid is top heavy – not because there is 'too much top' but because there is 'too little base'. We recommend that the base of this healthcare pyramid be significantly strengthened. The levels we recommend are much more significant than currently envisaged. We show that given the demographics (a young and aging population with high prevalence of chronic lifestyle related diseases) a major program of investment and build-up in primary and home care is needed, much like that was undertaken for secondary and tertiary care in the last decades.

Taking it forward: To make the healthcare 'journey in reverse', Qatar will need to do more than simply invest in primary care and home care capacity. It needs to actively integrate pathways across the layers of the pyramid. Furthermore, Qatar will need to develop trust in the value of utilizing care at the base of the healthcare pyramid. We elaborate on a possible mechanism, based on segmentation and service level differentiation, to develop this trust in primary care and self-care.

In most countries, healthcare, like sports, education or transport infrastructure, developed from the grassroots. In healthcare, nursing and family doctors came first and specialists and hospitals followed. In sports, village and city parks were the football fields before large world class stadiums were built. In transport, bicycles, public buses and trains came before cars. Qatar jump started this journey at the top of the pyramid. But in order to have a robust and effective society Qatar needs to also strengthen the grassroots, or the base of the pyramid. We call this the 'journey in reverse'.

Building a pyramid in reverse is not easy. There is no available script to follow, since most pyramids are built from the base up. Creating capacity and aligning the building blocks is unlikely to be sufficient since patient traffic and trust is already overwhelmingly focused on the top hospital care. This trust bias is often translated as a 'competitive' force: to strengthen the base, we must weaken the top. This is incorrect. We need both a strong top and a strong base. A strong top strengthens the base, a strong base strengthens the top. The base and the top are not interchangeable, they are complementary.

We believe that to achieve the healthcare gains we consider possible in Qatar concrete strategies are required on three dimensions:

- 1) System: Create capacity and resources at the bottom of the pyramid (in primary care and self and home care)
- 2) Processes: Leverage the current strengths of Qatari hospitals and medical specialists as well as the strengths of PHCC, Qatar Red Crescent and others to deliver integrated care
- 3) Trust: Design and deliver patient specific services to mold the behavior and expectation of patients, ensuring that the primary and self-care is equally effective and trusted by them as their current trust in hospitals and their physicians

Qatar has an enlightened policy of access to healthcare for all residents. We believe going forward, universal and mandated healthcare is important for the health of the nation. But Qatar is also a very diverse and dynamic society. By offering the same quality of care tailored to the needs and aspirations of different segments, Qatar can improve the healthcare experience of all, while creating trust and utilization at the grassroots level of the healthcare pyramid.

Looking back

Qatar has achieved nearly world class healthcare outcomes mainly through heavy investments in hospitals.

In this chapter we analyze the state of healthcare in Qatar. We consider healthcare outcomes, but also analyze costs to deliver as well as current delivery models and infrastructure.

While no single measure can capture the complexity of excellent healthcare entirely, we use a composite index of indexes² to determine the state of healthcare in Qatar today. The composite index we use consists of three publicly reported outcomes.

- 1) Life Expectancy
- 2) Amenable Mortality Index
- 3) Burden of Disease

The composite index shows that today Qatar is amongst the best in GCC, but more importantly that it is one of the countries at the frontier of excellent healthcare worldwide. Qatar is among the top 20% of all countries in Life Expectancy and Burden of Disease and among the top 15% countries on the Amenable Mortality Index (Figure 1).

Figure 1: Performance of Qatar healthcare compared to other countries and progression since 1990

On three different outcome measures...	serious improvements were made since '90...	...surpassing other GCC countries...	..and bringing Qatar to the top 20% in the world
<i>Qatar 2015 compared to:</i>	<i>Qatar 1990</i>	<i>Average of GCC 2015</i>	<i>World 2015</i>
 Life expectancy³	3 years life expectancy gained	1-4 years longer life expectancy than GCC	top 20%
 Amenable mortality⁴	20% higher performance on amenable mortality index	5-15% higher performance than GCC average	top 15%
 Burden of disease	68% more healthy life years	Up to 44% more healthy life years than GCC	top 20%

Since 1990 life expectancy has increased by three years. While life expectancy can still improve, Qatar sits comfortably in the cluster of developed western countries like Denmark, New Zealand and Singapore and scores significantly better than the GCC average (see Figure 2).

Figure 2: Gains in life expectancy for all countries between 1990-2015

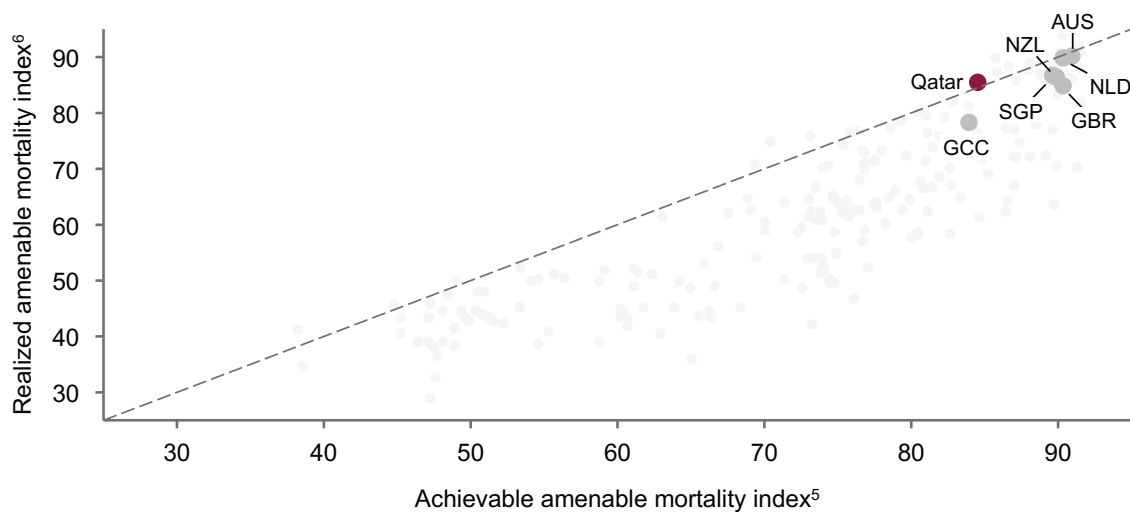
Life expectancy at birth increased by three years in Qatar bringing it amongst the best in the world but there are several countries with significantly more improvement [number of years, 1990 to 2015]



In Amenable Mortality, which is one of the most relevant overall measures of healthcare performance, Qatar has performed even better. Given the socio-economic profile of Qatar, its realized healthcare performance is what would be expected (Figure 3).

Figure 3: Realized amenable mortality compared to achievable based on the socio-demographic profile of countries

Quality of and access to healthcare in Qatar is excellent given its socio-economic profile; Amenable mortality index in Qatar is in line with what one would expect, but Qatar can improve further [2015]



Also, here there is room to improve further even though remarkable progress has been made in the period 1990-2015. In fact, no country has improved its Amenable Mortality Index more than Qatar since 1990.

Lastly Burden of Disease in Qatar has come down by 40% since 1990. The burden of communicable, cardiovascular and respiratory diseases has declined the most. The challenge for Qatar is non-communicable diseases, of which diabetes and kidney diseases have a disproportionately large burden (Figures 4 and 5).

Figure 4: Reduction in Burden of Disease for selected diseases⁷

Qatar has strongly reduced the burden of cardiovascular, respiratory and communicable diseases; further progress is required in non-communicable diseases like diabetes and mental disorders

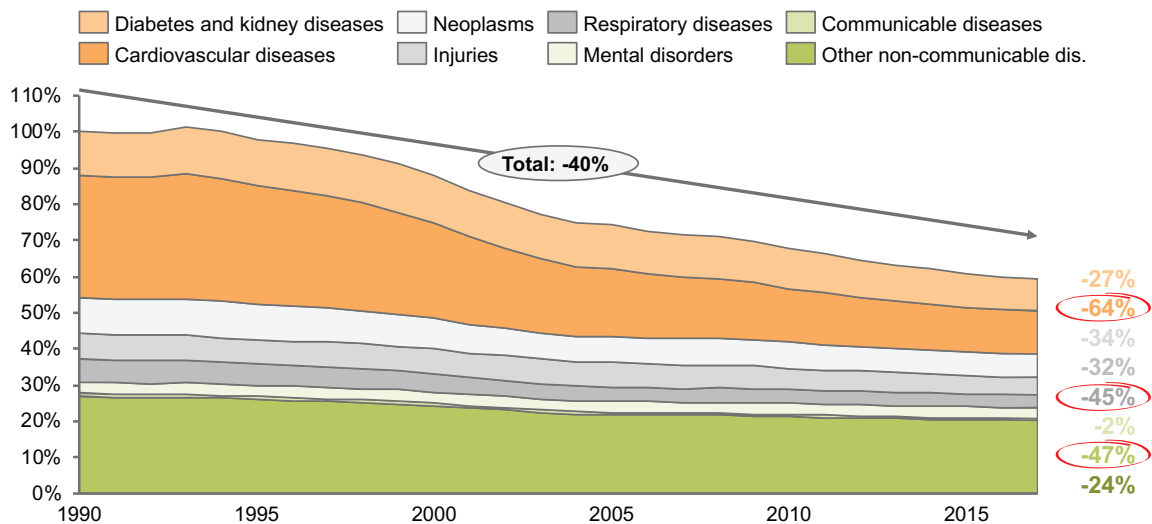
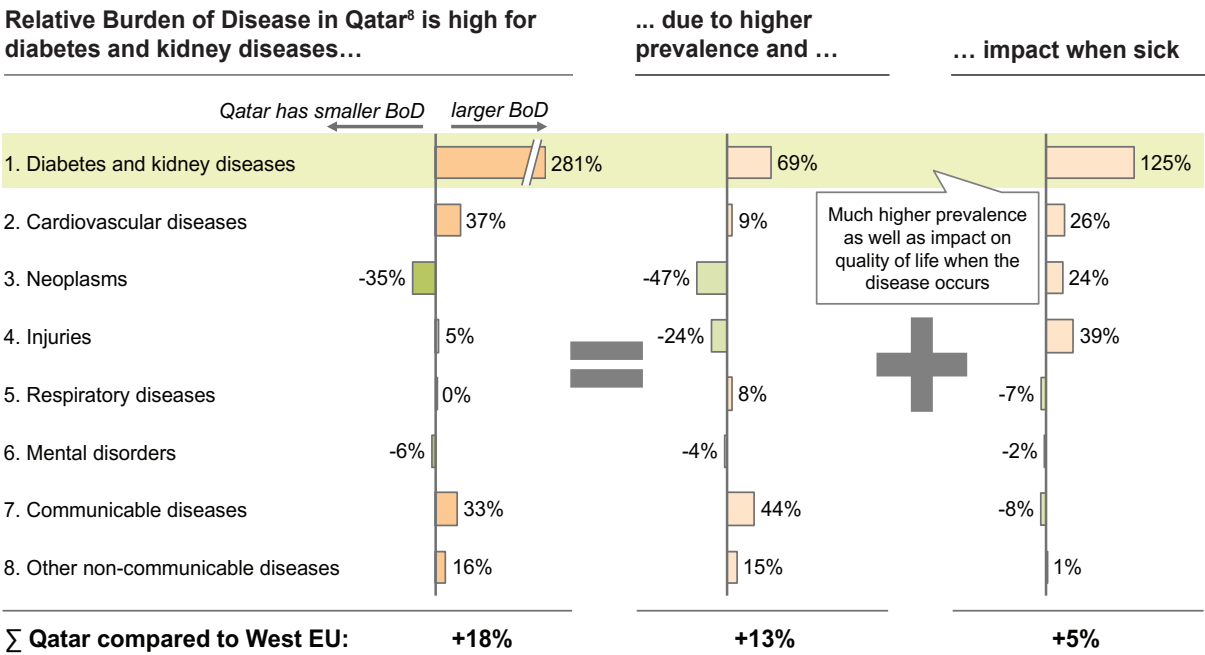


Figure 5: Burden of selected diseases in Qatar compared to Western European countries split in prevalence and impact when sick



We consider this specific challenge further in the next chapters where we make recommendations on how Qatar can make the next quantum leap in healthcare improvement.

To achieve its current health system performance, Qatar has invested heavily in a world-class secondary and tertiary care network. While as a share of its GDP Qatar spends significantly less than most western countries (only 4.7% after age correction), this is mainly a reflection of the wealth of Qatar and not a reflection of its healthcare spend. After correcting for age and price, Qatar spends 10-30% more than European nations per capita (Figure 6).

In healthcare, there appears to be a remarkably clear threshold for how much to spend before achieving a world-class life expectancy. Most poor countries cannot, or do not, spend enough on their healthcare. However, spending much more than the threshold is not necessarily beneficial either. The USA, where spend is much larger than the threshold without significant improvement in life expectancy, is a case in point. Qatar spend on healthcare is above the critical threshold. While Qatar obviously has financial room to further increase spend (Qatar spend as % of GDP is still low), further improvements to the health system do not necessarily require more spend.

To understand the effectiveness of healthcare spend in Qatar, we introduce the concept of the healthcare pyramid

Figure 6: Comparison of healthcare costs in Qatar with selected countries

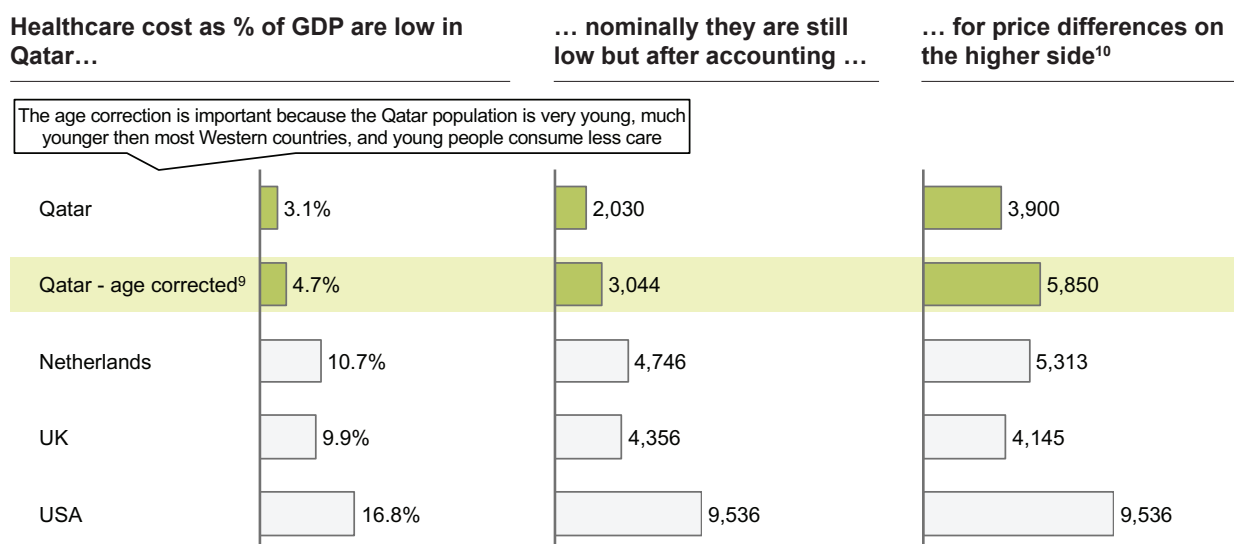


Figure 7: Schematic visualization of different healthcare delivery points as the 'Healthcare Pyramid' based on volume and unit price

**Higher in pyramid: lower volume and higher unit price.
Different services and expertise provided across the pyramid**

Secondary care contact points:

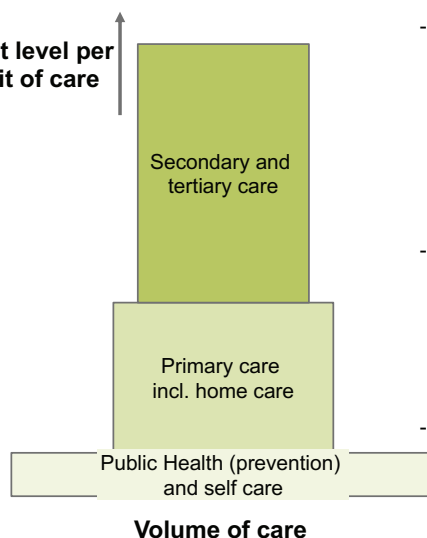
- Hospital (including academic)
- Specialized clinics
- Mental health care
- (Complex) diagnostics

Primary care contact points:

- Family physicians
- Paramedics
- Allied health professionals
- Dental care
- Pharmacies

- General prevention and public health activities
- Self-care without direct contact with healthcare professionals

Cost level per unit of care



**Example:
Obesity consult**

- Hospital consult with a surgeon or an internist once a year for QAR 500 per consult
- Once a month with a dietician, at a cost of QAR 100 per consult
- At home ongoing effort to change behavior at negligible costs (e.g. app)

**Example:
ECG test**

- At a hospital, an ECG costs QAR 200-400 and a patient is unlikely to have more than one a month
- At a primary care setting, an ECG costs QAR 50-200 and can happen every week if required
- At home on your watch, ECG is nearly free and many per day are possible

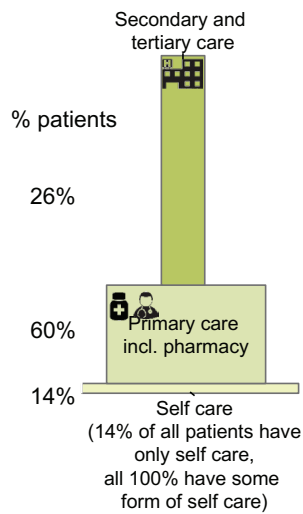
The three layers of the pyramid reflect 1) the volume of care 2) the unit cost and 3) the location where care is delivered. The volume of care can for example be the number of out-patient visits measured in minutes. The cost of care then is the cost per minute of an out-patient visit. That out-patient visit can take place at different locations in the delivery chain. A patient with fever, for example, can have a virtual chat with her nurse, visit her primary care physician, or visit the Emergency Department of the hospital. We use a three-tier pyramid for simplicity, though the richness of delivery models may justify further differentiation.

The lowest tier with the lowest unit cost is self-care. Therefore, ideally this tier when medically justified, is the one with the highest volume of care. This could for example be an app that allows for e-health diagnostics (like ECG on a watch; see Figure 7).

The second tier in the pyramid is primary care including primary care physicians and their assistants, home nurses, physiotherapists, dentists, pharmacists etc. The top tier is hospital care, which includes general and specialist, secondary and tertiary care. The concept of the pyramid applies at the health system level, but also at the level of specific diseases, as Figure 8 illustrates for diabetes (and Figure 13 for Alzheimer patients).

Figure 8: Example of the healthcare pyramid of diabetes (The Netherlands)

Pyramid of diabetes care based on integral costs and volume at each delivery point



Care is a continuum with patients using care at more than one point in any given year and across all points in the pyramid during the lifetime

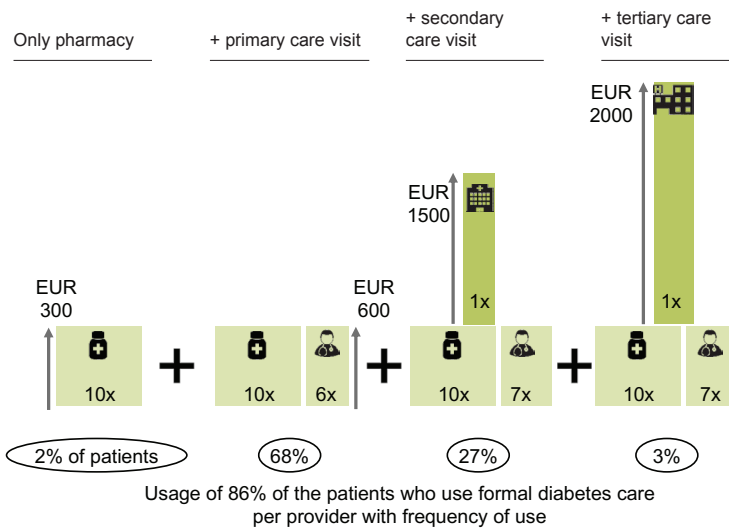
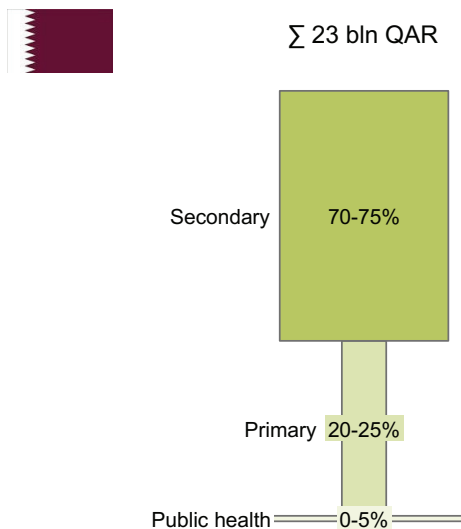
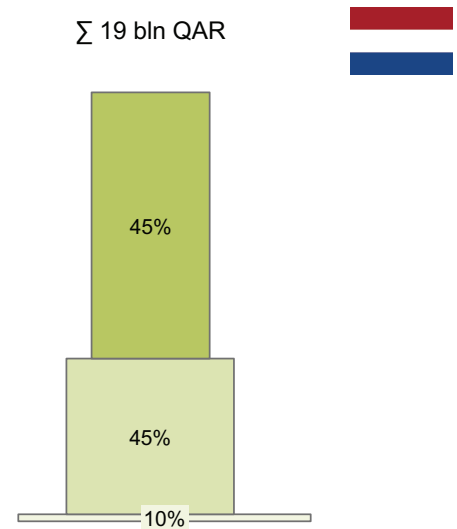


Figure 9: Qatar healthcare pyramid compared to Dutch pyramid

In Qatar hospital care is highly developed, the bottom of the pyramid is in development¹²



In the Netherlands, bottom of the pyramid is strong; continued efforts directed at further strengthening



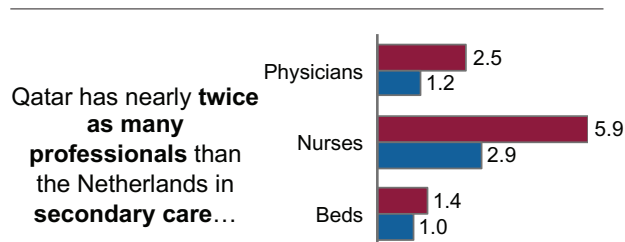
While this is clearly a simplification, the pyramid does help us understand the strengths and weaknesses, and the threats and opportunities of the current care in different countries. A comparison of the Qatari pyramid with that of the Netherlands is shown in Figure 9.

Qatar spends roughly 70-75% of its budget of 23 billion QAR on secondary hospital care and only 20-25% on primary care and 0-5% on system or self-care. In comparison, in the Netherlands the spend ratio is 45% secondary care, 45% primary care and 10% self-care or system care. We have corrected here for age differences between the two countries.

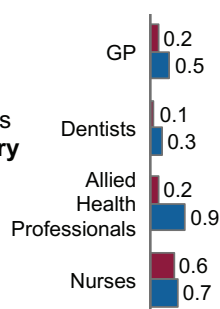
Qatar has achieved its excellent healthcare system by investing in hospital care. We estimate that Qatar has nearly twice the number of medical specialists and less than half the number of primary care physicians per capita than the Netherlands after age correction (Table 1).

Table 1: Resources and usage in Qatar and the Netherlands

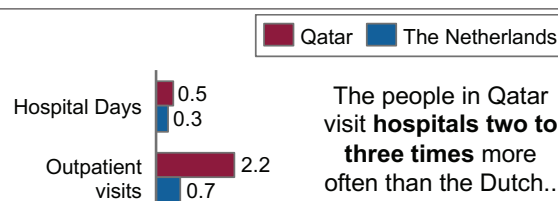
Resources in secondary (top) and primary care (bottom) per 1000 inhabitants



... and only **half as many** in the **primary care settings**



Usage in secondary (top) and primary care (bottom) per capita



...but they visit the **primary care practice** much less often than Dutch



No complete and accurate data could be found on Qatar, as data for the Qatar Red Crescent wasn't available. Hence, it is an estimate based on PHCC data and local knowledge.

Analysis of delivered care volumes confirms that Qatar relies heavily on hospital care. Qatar not only has more admissions per capita but also longer average length of stay and more out-patient visits in hospitals than primary care settings. Cumulative hospital days in Qatar are nearly 40% higher than in the Netherlands. Outpatient visits are even more reliant on hospitals, three times more visits in hospitals and three times less in primary care, even after accounting for age differences between the two countries¹³.

Qatar has shown that by investing in hospital care it is possible to rapidly achieve best in the world healthcare in a country in a relatively short span of two-three decades. Indeed, we may rightly call this extraordinary achievement a 'quantum leap'. In the media, newly rich countries are sometimes criticized for their priorities. Derogatory terms like 'art-washing' and 'sports-washing', which reflect investments in art and sports are used as a slur. Qatar's achievements in healthcare show that this is neither a fair nor a complete picture. Healthcare, like education and infrastructure, is one of the pillars of any society. By providing a world-class healthcare system to all its residents, irrespective of nationality, Qatar demonstrates its profound commitment to building a healthy society.

The frontier of excellent healthcare, however, is not static. All the healthcare measures we have analyzed continue to improve further – on average healthcare worldwide is an amazing and unending success story. The improvement is not just the average, which is determined by the laggard countries mostly, but there is also significant improvement in best practices. We believe that current Qatar healthcare system is robust enough to improve with the frontier as it evolves.

The question we pose in the next chapter is how Qatar can make the next quantum leap. We explore not only incremental improvements in line with the current frontier improvements, but a major improvement that defines the frontier of the future. We have already provided a glimpse of what that answer is – a better balanced healthcare pyramid is not only cost effective but most importantly, delivers better results, especially in a country like Qatar where the biggest burden of disease is in non-communicable diseases.

Looking ahead

Qatar needs to strengthen the grassroots of healthcare: patient empowerment and primary care going forward. The current healthcare pyramid is top heavy therefore by investing in delivery capacity at the base and integrating across the pyramid, Qatar can achieve better outcomes for the aging population at nearly the same spend.

The socio-economic development of most societies has been a gradual process over a century or more. Complexity building on simplicity, as technological advances made the unthinkable possible. Qatar emerged much later and, in some ways, has skipped the first steps and relied on the latest and the most developed solutions.

In order to understand the Qatari healthcare pyramid, and the next steps, it is useful to consider other sectors. In Figure 10, we provide the two examples of mobility and sports, though other examples, such as education, also apply.

Figure 10: The mobility and sports pyramids in Qatar: a schematic view

Mobility

Cars



Public transport



Foot / bicycle

- The mechanized mobility has progressed from bicycles and public transport to cars and planes in most countries
- Qatar has an excellent infrastructure for cars and a world-class airline; investments in metro are being made now

Sports

World class
high-tech stadiums



Local stadiums



Parks and fields

- Normally, the football pyramid (or any other sports) starts with neighborhood fields and parks
- Sports is a key sector in the Qatar vision for the future. It has invested in world-class stadium and in developing talent (Aspire Academy).

The Qatar development curve differs from other countries: wealth and population growth has come later and in a huge quantum leap in Qatar. Qatar has built a world-class infrastructure at the top. The challenge now is to ensure that the pyramid next to a strong top also has a strong bottom

Let's consider the example of sports. Qatar has some of the most advanced sports stadiums in the world. The football pyramid in most countries starts with a grass field in a village or the park of a local football club. It is followed by 'simple' stadiums with larger catchment areas. World class football stadiums that can host top international matches came much later in the football pyramid. Qatar already has more world-class stadiums per capita than most countries. Qatar recognized early in 2004 that to encourage wider society broad sports participation, sports also needs to be embedded at grassroots level. The Qatar Aspire Academy is an excellent example of strengthening the sports pyramid at the base.

This analogy helps to understand the healthcare pyramid in Qatar. Qatar has invested in excellent hospital care. Hamad Medical Center has many world class specialist hospitals, for example for cardiology. Sidra is probably one of the best Mother and Child hospitals in the world. These hospitals deliver some of the best hospital care in the world, just like its world-class stadiums host world cup athletics and football championships. Clearly, Qatar does not need more Sidra hospitals or Khalifa stadiums. We believe the focus of investment and growth needs to shift to the base of the pyramid. To the grassroots of better health and more sports. In this chapter, we analyze different scenarios for what this might look like.

Scenarios for healthcare improvement in Qatar

To understand how healthcare can be improved in Qatar we considered three scenarios:

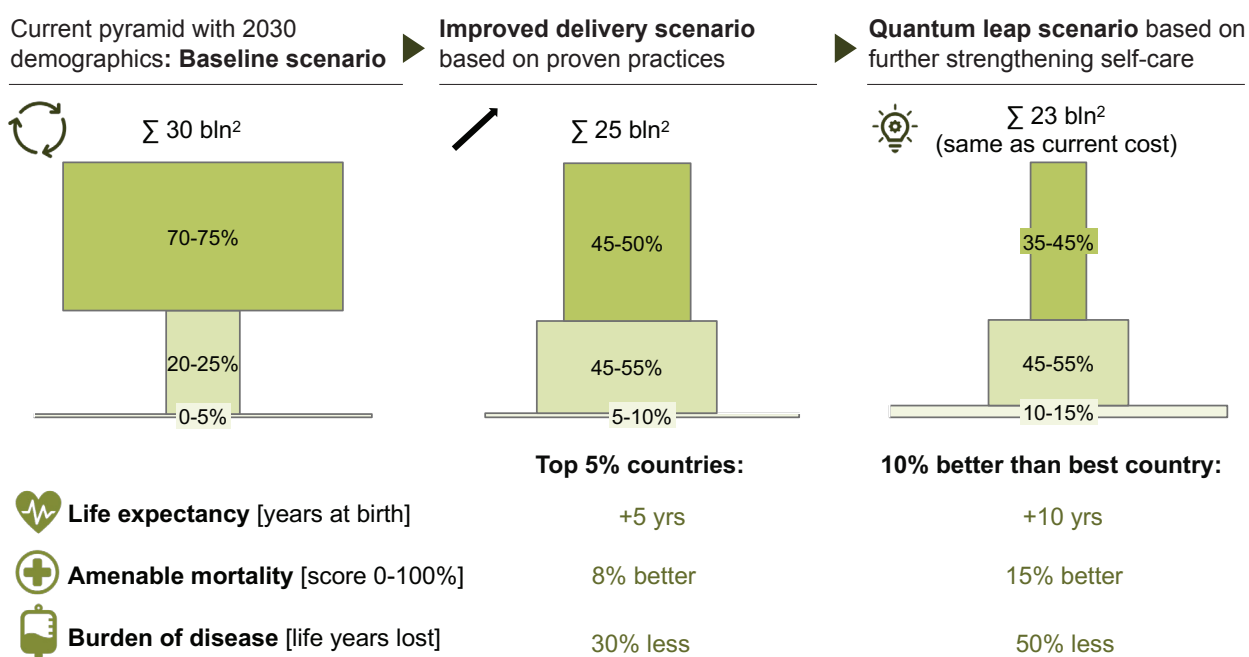
- The Baseline scenario is based on the current healthcare pyramid and considers only demographic changes in Qatar (aging of population).
- The Improved Delivery scenario incorporates proven practices from around the world. Based on the Dutch or EU healthcare pyramid 'Improved Delivery' scenario reflects the current proven best practices.

But EU countries are not standing still. Further investments in primary care and self-care are clearly the route to follow also in the Netherlands and other countries. The relative share of spend in hospital care in the Netherlands can be lower, while the outcomes can be better by investing further at the base of the pyramid.

- Finally, we also analyze a Quantum Leap scenario. In this scenario, we go beyond the current best practices and incorporate the effect of future best practices. Qatar has the momentum and the capabilities for going beyond current best practices (Improved Delivery) to defining the future best practices (Quantum Leap).

For each of the three scenarios we calculated the impact on health outcomes, the health infrastructure and resources, and the healthcare costs (Figure 11).

Figure 11: Three scenarios for healthcare pyramid in Qatar in 2030 with associated potential costs and gains in health outcomes¹⁴



Baseline scenario

UN projects the population of Qatar in 2030 to be 3.3 million with 0.4 million people between 0-14 years, 2.7 million between 15-64 and 0.2 million 65+. We constructed age, gender and nationality-based profiles of the population and used profile specific prevalence to calculate future demand. We project that changes in demographics alone in the baseline scenario would require a 30% increase in capacity by 2030. If the pyramid structure was the same in 2030 as in 2015 this would translate to 1,300 extra beds at hospitals additional spend of 7 billion QAR.

Improved Delivery scenario

Based on results already achieved in other countries, Qatar can improve significantly on the health of its residents: we estimate that relative to the baseline scenario, a 5-year gain in life expectancy, an 8% reduction in amenable mortality and a 30% reduction in Burden of Disease is possible in this scenario. These gains are driven by stronger primary care while accounting for the demographic changes as in the Baseline scenario. We estimate that additional 2 billion QAR spend is sufficient in this scenario.

Quantum Leap scenario

The most gains require the Quantum Leap scenario, which strengthens the system, self-care and primary care blocks of the pyramid beyond current best practices in the world. We estimate that relative to the baseline scenario, a 10-year gain in life expectancy, a 15% reduction in amenable mortality and a 50% reduction in Burden of Disease is possible in this scenario.

Encouragingly, a stronger base of pyramid delivers gains in health outcomes at lower costs. This is to be expected since care can be delivered at the base of the pyramid at a lower unit cost than at the top. By strengthening the pyramid, a 'spend neutral' design is possible. In the Quantum Leap scenario this would mean QAR 9 billion extra spend in primary care settings and 2 billion QAR extra in self or home-care settings. Hospital capacity and spend is already more than adequate in Qatar for the 2030 needs, provided stronger primary care delivery is put in place.

To be successful in Improved Delivery and Quantum Leap scenario the pyramid must be strengthened but it must also be integrated. Not all hospital care can or should be delivered by primary care physicians. A deep-dive into a large and relevant disease group, diabetes, illustrates this.

Deepdive: Strengthening the pyramid of diabetes care

Since the biggest disease burden is in non-communicable diseases like diabetes, it not surprising that the biggest gains can be made here. Nor should it be surprising that primary care or more self-care (since these diseases are often life-style diseases) is the most effective channel to achieve these gains. But diabetes is a complex disease with a complex pathology. No two diabetes patients are the same nonetheless the progression of the disease will always require integrated care across the entire pyramid.

Stable diabetic patients with limited morbidity can diagnose, monitor and adopt lifestyle changes entirely by themselves in this disease phase. Interventions, like automatic adjustment of insulin doses based on actual sugar levels recorded by the patient, can be almost entirely delegated to the patient and their family. It requires apps and tools to record glucose levels and post measurements to analyze these to determine the most suitable course. This could mean in the simplest cases to adjust medication, which a device could do reliably at home. In intermediate cases, primary care physicians could be the ideal provider. Even better, many studies show that nurse physicians or specialized diabetic nurses are better at delivering care to these types of patients. Not all diabetes patients can however be solely treated by their primary care physicians or can be responsibly supervised at home at all times. Diabetes patients with multi-morbidity and with secondary complications in fact need very specialized care, usually only possible at specialized centers under internist supervision.

Since stability and instability in diabetes can change over the course of the disease it is apparent that an integrated chain or pyramid, in which care is coordinated across all levels of the pyramid, is critical.

Strengthening the diabetes pyramid is not about taking care away from hospitals. It is about delivering the right diabetes care at the right place and the right time. It is not about the setting or organization. It could be that Hamad Medical Center has a team of diabetic nurses that deliver primary care within its existing infrastructure. It could also be that the Primary Healthcare Corporation delivers increasingly complex diabetes care within their existing infrastructure. The gains are not in infrastructure costs (only about 10%) or even in overall costs (primary care physicians are not necessarily less expensive). The gains are predominantly in care protocols and outcomes. In diabetes, as we learned from one of the most inspiring physicians in the Netherlands, perhaps the most effective intervention is providing a dog to each patient. Be it a new organization, PHCC or HMC, who runs the 'Adopt a Dog' program is not the point; the dog is the point.

Achieving the 'Quantum leap' scenario

To achieve these goals, the delivery system must be improved: new capacity needs to be created and the healthcare pyramid reengineered. But capacity itself is not enough. One also needs to account for the reality of care delivery in Qatar today to make the pyramid functional. This requires leveraging the excellent hospital network with world-class hospitals and medical doctors in Qatar. A well-functioning, balanced pyramid requires tightly integrated processes across the different levels. Finally, the population must develop a deeply engrained trust in their hospital and primary care physicians and in themselves, so that they make the right choice for the right care at the right time and place.

We address the system, processes and trust requirements in the final chapter and make concrete recommendations on potential next steps.

Taking it forward

To make the healthcare 'journey in reverse', Qatar will need to do more than simply invest in primary care and self-care capacity. It needs to actively integrate pathways across the layers of the pyramid. Furthermore, Qatar will need to develop trust in the value of utilizing care at the base of the healthcare pyramid. We elaborate on a possible mechanism, based on segmentation and service level differentiation, to develop this trust in primary care and self-care.

In most western countries, healthcare, like sports, education or transport infrastructure, developed from the grassroots. In healthcare, nursing and family doctors came first and specialists and hospitals followed. In sports, village and city parks were the football fields before large world class stadiums were built. In transport, bicycles, public buses and trains came before cars. Qatar jump started this journey at the top of the pyramid. But in order to have a robust and effective society Qatar needs to also strengthen the grassroots, or the base of the pyramid. We call this the 'journey in reverse'.

Building a pyramid in reverse is not easy. There is no available script to follow, since most pyramids are built from the base up. Creating capacity and aligning the building blocks is unlikely to be sufficient since patient traffic and trust is already overwhelmingly focused on the top hospital care. This trust bias is often translated as a 'competitive' force: to strengthen the base, we must weaken the top. This is incorrect. We need both a strong top and a strong base. A strong top strengthens the base, a strong base strengthens the top. The base and the top are not interchangeable, they are complementary.

To understand why we emphasize more than just capacity building let's briefly return to the sports sector.

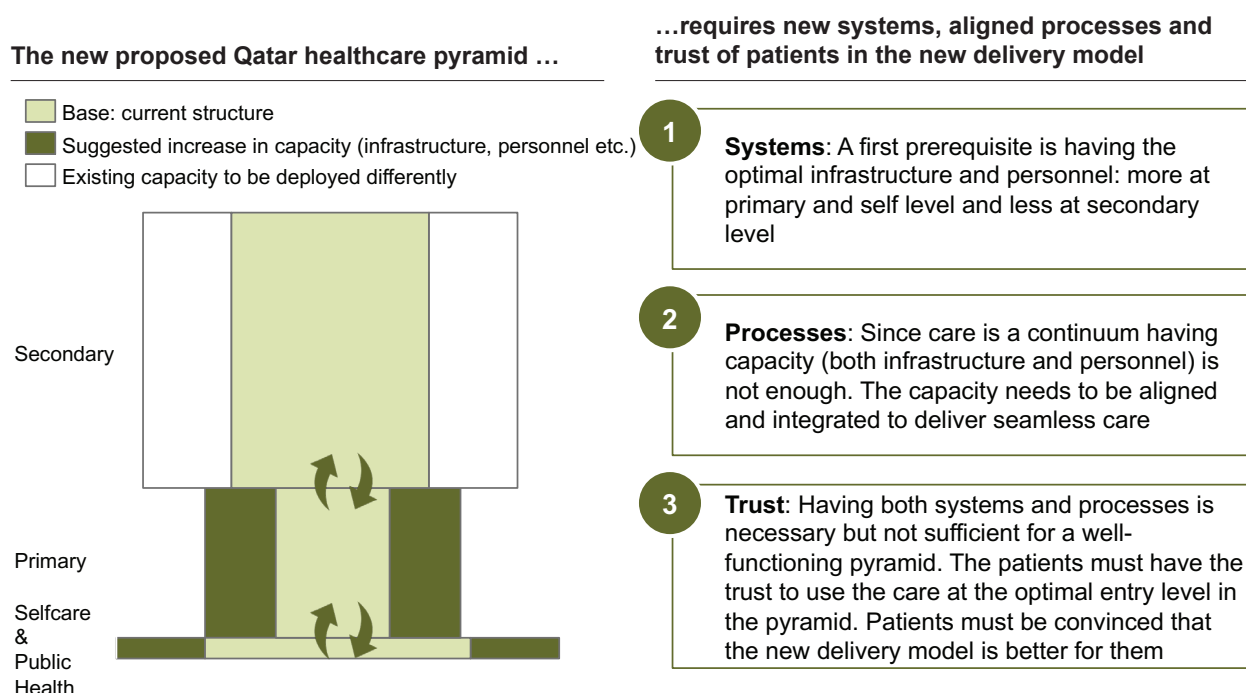
With stadiums like Khalifa stadium, Qatar has a world-class top of the sports pyramid, where the best athletes in the world can train and compete. The pinnacle is important, but it is hardly sufficient to ensure that the children of the nation also grow up playing football and participating in sports, for sports sake alone. For the children to train and compete at least twice a week they need local sports fields, with coaches and referees that have experience and affinity with training young children. As some of them mature and show talent the next level of resources will be required, such as talent spotters, youth coaches and appropriate sports facilities. Only for the very best and few the opportunities may arise to play under national coaches and with a whole support staff in Khalifa stadium. For the pyramid to work, an adequate **system** of capacity (fields) and resources (local coaches and referees with interest in football for children) is required.

For a nation to develop a successful sports culture, it is crucial to have both the amateur and professional levels in the sports pyramid. **Processes** within the sports value chain should be tightly integrated across the layers of the sports pyramid, in which all parties are bound together in a cooperative, codependent model. Khalifa does not compete with the local football fields in the community. Nor do the national coaches and support staff compete with the local coaches and referees. Without well-functioning amateur football, there cannot be professional football. Khalifa and the national football team is important. It is the pinnacle to which children aspire. But Khalifa does not just need to be there, it needs to be intimately aligned and bond with the grassroots of football.

The existence of local facilities and resources might not be enough, even if they are well integrated, if the children believe that only playing at Khalifa is worthwhile. The top of the pyramid is not just a symbol of success; it is success itself, since it has all the world-class resources available that are desired, which the bottom of the pyramid clearly does not. Despite the presence of local capacity and resources, the children and their parents may not trust the capacity and resources available at the bottom of the pyramid. The top has world-class gym and cooled fields, it has physiotherapists and sports trainers, it has a team of coaches. The bottom has open fields that are not the regulation size, the local coach is one of the fathers and the referee is his neighbor. It is the difference between a professional and an amateur. Celebrating amateurism is just as important in sports as winning the gold medal to have a deeply rooted sports culture.

Applying the analogy of sports to healthcare, we believe that to achieve the healthcare gains possible in Qatar concrete strategies are required on three dimensions (Figure 12):

Figure 12: Redesign of the healthcare pyramid in Qatar



- 1) System:** Create capacity and resources at the bottom of the pyramid (in primary care and self and homecare)
- 2) Processes:** Leverage the current strengths of Qatari hospitals and medical specialists as well as the strengths of PHCC, Qatar Red Crescent and others to integrate care
- 3) Trust:** Design and deliver patient specific services to mold the behavior and expectation of patients, ensuring that the primary and self-care is equally effective and trusted by them as their current trust in hospitals and their physicians

System: Create capacity and resources at the bottom of the pyramid

Redesign of the healthcare pyramid starts with creating new capacity at the bottom of the pyramid and refocusing current secondary care capacity to primary care.

The reengineering required is significant. Even after accounting for the extra capacity needed in secondary care due to demographics in 2030, still around 12,000 full time equivalents (FTE) currently delivering secondary care will need to be realigned to deliver primary care and homecare. We estimate that additional 5,000 FTE will be needed to integrate care and navigate patients. The magnitude of this reengineering is a serious challenge, but Qatar has shown through its rapid investments in the past in hospital care, that it is capable of undertaking this challenge.

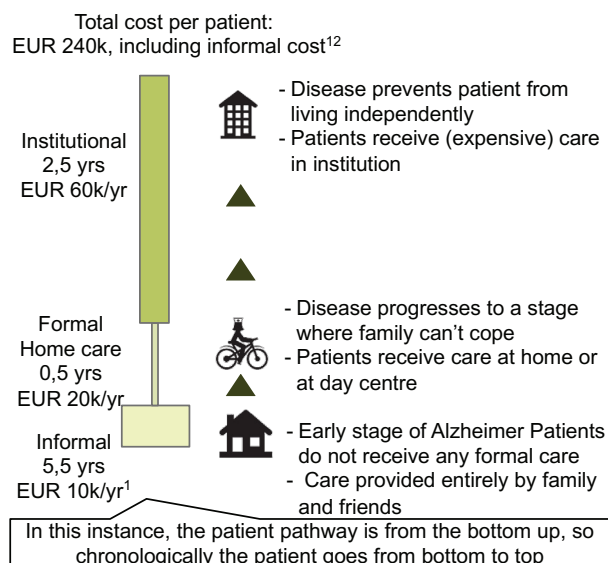
Note that when we speak of primary care, we do not necessarily imply where it is provided or that it is provided entirely within PHCC. Primary care could very well also be provided under a hospital umbrella, depending on the disease and corresponding blueprint for integrated care pathways. The personnel and the physical infrastructure of hospitals may be utilized to provide integrated care.

If the personnel and physical infrastructure are the same, one may wonder: what is different? The difference is in the delivery model. Everything in the care pathway is less medicalized: in a heavy clinical setting, patients are admitted more easily, an extra MRI is more quickly performed, some extra lab tests are more readily done. In a non-clinical setting, the focus gravitates more naturally to secondary prevention (education), simple diagnoses, day care, routine nursing tasks etc.

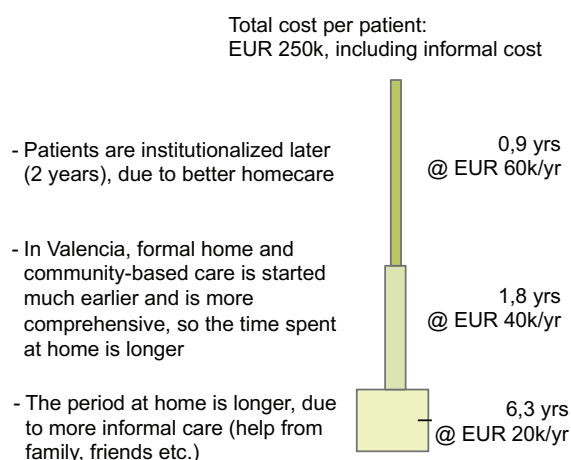
To make these concept concrete, let's explore what the system change would look for Alzheimer patients (Figure 13).

Figure 13: Strengthening the Alzheimer care pyramid: comparative example from two care pathways¹²

In most countries the focus is on institutional care at the end-of-life stage...



... in Valencia, Spain focus on formal homecare improves the quality of patient life



The average duration of Alzheimer's disease is 9 years, of which the last three are in institutional care – in nursing homes when possible, otherwise episodically hospital care. The first six years are mainly informal care, by family members and friends. Here, creating capacity for homecare during the informal phase is a key intervention. Homecare is more than nursing: it could involve activity support like music or art-therapy, physical exercise, occasional guided trips including overnight stays, etc. Studies from programs that have created such capacity show that they prolong the life of the patients (though marginally) but also, very importantly, improve the quality of life of both the patients and their loved ones. For Alzheimer's alone we estimate that an additional 500 FTE nursing capacity will be required, and on top of that an additional 100 FTE for day care activities¹⁵.

Processes: Leverage the strengths of all healthcare providers

In strengthening the pyramid, hospitals need to play a vital role. To illustrate, let's reconsider the example of diabetes. Diabetic care is a continuum. About 15% of the patients in any given year need no formal care at all and can manage by themselves. For nearly 70% of the 85% who do need formal care, primary care and pharmaceutical care is sufficient. Only about a quarter of all diabetes patients in a year need hospital care and only about 2% need tertiary care. Over a lifetime however, nearly all will need some hospital care.

There is well documented medical evidence that nurse specialists are better than internists at controlling disease progression in the diabetes population¹⁵. The underlying mechanism is mainly adherence to protocols and availability of time between the caregiver and the patient. Thus, creating capacity of nurse specialists and delegating regular diabetes care to them improves the quality of life, reduces complications and prolongs life. Moreover, it frees up valuable internist capacity to address more complex patients. The location and the organization that delivers care is not the point: the hospital could be the best location and organization to deliver diabetes care to patients. The point is the type of care and the resources ideally suited to deliver the best care. Translating this into concrete actions, we estimate that around 600 FTE physician assistants are needed for twice yearly medical check-ups of the retina, foot, HBA1C etc. On top of that, continuous support should be considered to enable low-threshold advice and even pro-active lifestyle advice.

For diabetes patients, the role of hospitals is crucial, though for most patients, if their diabetes is well managed, hospitals will hopefully have no role at all, except at end-of-life care. In the Netherlands, the diabetes care pyramid is extremely well balanced, stable at the bottom and integrated. To ensure compliance with extensive medical evidence that primary and self-care is best for diabetes disease control, financial incentives have been long aligned to ensure that the diabetes care is concentrated at the bottom of the pyramid (for example diabetes payment is based on an integrated model under supervision of the primary care physician and not the hospital).

We believe that a cooperative model is required that balances the two apparently conflicting needs. The primary care physician is not a replacement for the internist nor is a PHCC center a replacement for HMC. They are a continuation of each other, fully aligned and informed and working in tandem. For a patient, the care must feel as a continuum in which, whether administering insulin at home, undergoing a routine annual check-up at PHCC, or an eye exam at HMC, the care is coordinated seamlessly. The boundaries of the organizations should be invisible to the patient.

Trust: Use service-level differentiation to help all types of patients trust the new strengthened pyramid

Even after building an adequate system at the base of the pyramid and ensuring that providers and processes are aligned in seamless, integrated pathways, patients must also make use of the new care pathways. Conceptually, various approaches could be chosen to make this happen, for example:

- **Wait-and-see approach:** One might argue that once the capacity is built and aligned, patients will find their way to it. This would be analogous to the common mantra in hospital care, 'a bed built is a bed filled! We do not, however, consider this a viable strategy. In the United States, Preferred Provider Organization (PPO) health plans are considerably more expensive precisely because patients gravitate towards the top of the care pyramid, not the bottom. A wait-and-see approach without choices and active 'nudging' of patients towards the bottom of the pyramid would likely result in a top-heavy pyramid regardless of the capacity built.
- **Gatekeeper approach:** In the Netherlands and other countries, primary care physicians function as gatekeepers: to see a hospital physician a referral from a primary care doctor is required. This functions well because the system has a long history of functioning well and people have grown to trust it, even though like all systems it has its negatives. A mandatory gatekeeper role may work for Qatar but will require judicious implementation choices. Importantly timely access to required medical care at all times and situations must be realized. If a mandatory gatekeeper role is introduced to the system at a later stage, there is a risk that it will be perceived as a step back that ration's care. Consider, for example, the bad reputation of Health Management Organization (HMO) insurance plans in the United States: according to the New York Times their "reputation for skimping on care has so tainted the plans that the insurers and companies resurrecting them have gone through innumerable steps to try to avoid using the term H.M.O." For gatekeeper role to work patients must grow to trust it in Qatar. We now look at trust-building.
- **Trust-building approach:** We believe that the most feasible way forward is actively building trust amongst patients in a balanced and integrated pyramid. The benefits of the primary and home care offerings must be actively promoted and adapted to the service level needs of the individual patient. The goal is that patients feel comfortable in making the switch from the top of the pyramid to the bottom when possible, knowing that the top is always accessible when needed. When this is achieved the gatekeeper role is even more effective: since the patient becomes the gatekeeper.

We see the trust-building approach as the way forward for Qatar. Building this kind of trust is not easy in any part of the world. And Qatar is an extraordinarily diverse and dynamic society. The backgrounds and expectations of its denizens are very different. In order to develop the trust of all its population segments in primary and selfcare we propose that Qatar develop a service level differentiation strategy based on a well-founded segmentation of its population.

What do we mean by service levels? The example of air travel illustrates this nicely. Let's consider a full flight from Amsterdam to Doha. There are about 350 people on the plane, and they all get the same high-quality functional service: a smooth transit from one capital to the other. However, each of the passengers consumes the service according to their own needs and aspirations. For example:

- One passenger is on holiday trip. She has booked the trip very early, on a travel website as a special combination package that includes a hotel booking. She has no need for luxury seating or fast airport check-in, and so travels economy. She travels with 2 large suitcases. She has a slight fear of flying and notifies the cabin crew prior to sitting down. Building on their experience with similar passengers, they are able to help her have a calm and relaxed flight.
- Another passenger booked the flight yesterday through her corporate travel agent. She was able to squeeze two early morning meetings before her flight and planned to do computer work during the flight. In Doha, she has business meetings that same night, and she will travel onwards to Johannesburg the next day, although that might change to a day later if she is able to secure another meeting with an important client in Doha on that day. She always travels with a light carry-on suitcase.
- A third passenger is a 12-year old boy. His parents booked him a flight to go and visit his uncle, aunt and 11-year old cousin who have recently moved to Doha as expats. His parents are not able to join yet, they will fly into Doha a few days later. As an unaccompanied minor, he requires supervised guidance through the departure and arrival airports. On board the plane he is checked on periodically by the cabin crew.

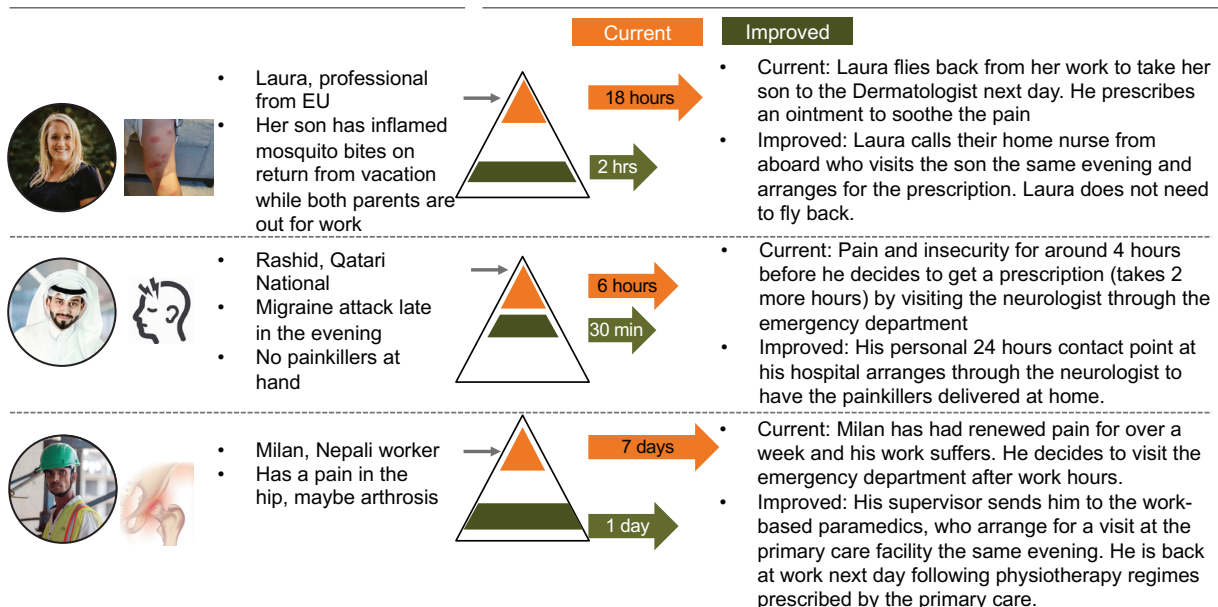
While each passenger achieves the same goal: fly to Doha from Amsterdam, the service level they seek and receive differs greatly. We argue that a similar concept of segmentation and service level adaptation is needed to optimize usage of the Qatar health system. It is commendable that a local born Qatari, a professional from EU, or a cabdriver from Sri Lanka all have access to good hospital care. But their requirements, likes and desires around how and when they access this core function will vary. Understanding and addressing these differences, while keeping the core medical delivery the same, will help navigate the patients and develop their trust in the new strengthened and aligned healthcare pyramid.

In Figure 14, we illustrate this using three cases. In each case the patient is drawn to the top of the pyramid for different reasons: Laura and Rashid, because both believe that they have the right to the best care and that is what hospital care is; and Milan because he cannot access primary care. Yet for all three, a better solution exists, which is not only medically equal perhaps even better, but also provides a better service:

Figure 14: On how comprehensive understanding of the needs and aspirations helps create a well functioning pyramid: three examples

Different segments of the population have different needs and aspirations..

... the new pyramid must deliver care that is better than current through better match with their individual needs and aspirations



- For Laura, a home nurse could visit her son at home while she is travelling, and prescribe the ointment required which the driver can then pick-up. The son gets the same treatment he would have gotten next day when Laura would have flown back in panic and taken him to the dermatologist. The nurse can of course always consult the dermatologist directly if she was unsure of the ailment, with a video consult or possibly a physical visit being arranged the same evening, should it be needed.
- For Rashid, medication can be prescribed without having to visit the hospital. A neurologist can call him directly or, if required, arrange a video consult. The medication can be prescribed and delivered directly to him at home. The speed of this care, combined with the service level – direct access to his neurologist, means that he gets medical aid faster than he would have in the hospital, and in the comfort of his own home.
- For Milan, his supervisor could send him to the work-based paramedics, who arrange for a visit at the primary care facility the same evening if needed. He can be back at work the next day following physiotherapy regimes prescribed by the primary care, avoiding capacity pressure at the Emergency care and loss of work for him.

The better solution, which involves using other medical channels, may feel as either denial or delay of coverage. And in some cases, indeed some delay may be the case. However, in most cases there is no impact of the delay and there might even be a medical benefit in terms of avoiding over treatment and risk of complications. The idea in service level segmentation and differentiation of offerings is that these are sufficiently attractive to the user to help them make the intended choice thus building their trust in the system.

We believe that to ensure a well-functioning and well-balanced pyramid, Qatar needs to adopt a service-level design, in which service levels are tailored to the needs and aspirations of specific segments amongst its denizens. The three examples in figure 14 illustrate what this might look like. The purpose and justification of it is in ensuring that the perceived needs of the residents, to directly seek the most complex care at the top of the pyramid when care at the bottom is more appropriate, is addressed. Targeted awareness and activation programs should complement these service levels to ensure that Laura, Rashid and Milan know what to do and where to go when they find themselves in these situations.

Qatar has an enlightened policy of access to healthcare for all residents. We believe going forward, universal and mandated healthcare is important for the health of the nation. But Qatar is also a very diverse and dynamic society. By offering the same quality of care tailored to the needs and aspirations of different segments, Qatar can improve the healthcare experience of all, while creating trust and utilization at the grassroots level of the healthcare pyramid.

Footnotes

1. The measures we use are Life Expectancy, Risk Corrected Amenable Mortality and Burden of Disease.
2. It makes sense to use them together since none of them reflect individually the overall performance. Life expectancy could be low, or burden of disease high given externalities and other society-based issues, like violence or eating habits, irrespective of the quality of healthcare delivery. Amenable mortality reflects performance on those conditions which are amenable to treatment with current medical technology but is limited to only 32 diseases.
3. Source: life expectancy database of The World Bank, accessed on 10/07/2019. Available at <https://data.worldbank.org/indicator/sp.dyn.le00.in>
4. Amenable mortality stands for specific disease-related deaths that were preventable with timely medical intervention Amenable mortality is corrected for risk-factors such as demography and environment. Burden of disease is corrected for demography. Source: The World Bank (2019), Healthcare Access and Quality Index Lancet (2015), Global Burden of Disease (2017).
5. Achievable reflects a 'best practice' or 'frontier' determined for every country, given the socio-demographic profile of that country. The socio-demographic profile incorporates factors such as income, education and fertility. Higher achievable than realized indicates gaps in performance of healthcare system.
6. Amenable mortality of 32 therapeutic areas, risk-standardized for cause-specific mortality rates for each geography-year by removing the joint effects of local environmental and behavioral risks, and adding back the global levels of risk exposure as estimated for GBD 2015. Source: Healthcare Access and Quality Index Lancet, 2015.
7. Indexed BoD per year with uniform population distribution; Qatar 1990 = 100%. Source: Global burden of disease, 2017. Available from <http://ghdx.healthdata.org/gbd-results-tool>.
8. Corrected for age and gender differences per country, 2017. Source: Global burden of disease, 2017. Available from <http://ghdx.healthdata.org/gbd-results-tool>.
9. Age corrected to make it comparable to the population of other countries.
10. Corrected to account for the purchasing power disparity in different countries in dollar terms, 2017. For Qatar this means that USD 2030 can actually buy USD 3900 worth of healthcare at the USA price level (therefore the correction is 1:1 for the USA) Source: WHO, Gupta Strategists analysis.
11. Informal cost is not taken into account in other pyramids, because the opportunity cost is unknown. In this example, we have actually computed the cost of informal care and included in the analysis. Source: Kosten van Ziekten, Nationaal Kompas Volksgezondheid, CIZ, A. Corudas et al. 2010 J Alz Dis, J. Rivera et al. 2008 Int J Geriatr Psychiatry, Alzheimer Nederland, Alzheimer-Europe, Gupta Strategists.
12. Secondary care includes both attending physicians and residents. Primary care includes homecare, based on PHCC data. Qatar Red Crescent not included due to unavailable data. Width is based on consultations, as a main driver for volume, and extrapolated to the whole pyramid. For system it is wider, as a proxy the number of questions asked to family members. The nominal cost in the Netherlands is EUR 75 bln and corresponds to WHO data. The total cost above the Dutch pyramid is based on Dutch pyramid applied to Qatar demand and demographics. Source: National Health Accounts (2012), PHCC annual report (2016), Nivel (2016).
13. We have analyzed several other European countries and while the proportions are slightly different the general picture is the same as in the Netherlands and Qatar comparison.
14. Costs are based on current prevalence and costs in Qatar extrapolated to 2030 (30% extra costs). Outcomes are estimates based on reported results in best practice countries, expectations of gains possible extrapolated from different publications and field studies and ongoing initiatives.
15. Qatar already has some similar initiatives in place like Ehsan Center for Empowerment and Elderly Care and the 'Family Caregiver's Group'. However, we did not find any evidence that such care emphasis is present at a sizeable scale.
16. See for example the PhD dissertation of Sebastiaan T. Howeling: task delegation between primary and secondary care for diabetes (2005) Source: Kosten van Ziekten, Nationaal Kompas Volksgezondheid, CIZ, A. Corudas et al. 2010 J Alz Dis, J. Rivera et al. 2008 Int J Geriatr Psychiatry, Alzheimer Nederland, Alzheimer-Europe, Gupta Strategists.

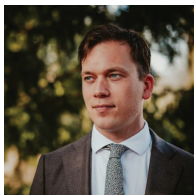
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