



DIAGNOSING HEALTHCARE IN THE GCC

A preventative approach

Commissioned by



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ABOUT THE RESEARCH

Diagnosing healthcare in the GCC: A preventative approach is an Economist Intelligence Unit (EIU) report, sponsored by Abbott. It reviews the health challenges facing the population in the six Gulf Co-operation Council (GCC) states—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE—and highlights the need for early diagnosis and preventative healthcare strategies. The report investigates public health strategies and the delivery of healthcare in the Gulf to identify areas requiring improvement, with a focus on early diagnosis and preventative care.

In August-September 2016 the EIU conducted interviews with experts on healthcare in the Gulf region, including policymakers, academics and health practitioners. The insights from these in-depth interviews appear throughout the report. The EIU would like to thank the following experts (listed alphabetically) for sharing their insight and experience:

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- **Prof. Karol Sikora**, dean of medicine, University of Buckingham, UK; former head of WHO cancer programme
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The EIU bears sole responsibility for the content of this report. The findings and views expressed in the report do not necessarily reflect the views of the sponsor. Lois Rogers was the author of the report and Melanie Noronha was the editor.

EXECUTIVE SUMMARY

Vast oil wealth in the Gulf has led to lifestyle changes which, in turn, have given rise to increased incidence of non-communicable diseases (NCDs). Healthy traditional diets have been almost entirely replaced by a high-sugar, low-nutrient diet. Tobacco smoking has been taken up by men, women and children. An active lifestyle, which came naturally to the self-sufficient nomadic forebears of Gulf Arabs, has largely been replaced by desk-bound jobs. This has led to an evolution in the disease profile of the region from a preponderance of infectious diseases to chronic diseases spanning obesity, diabetes, heart disease and cancer.

The growing prevalence of these lifestyle-related diseases also has wider economic implications. It is therefore essential that these health issues are diagnosed and tackled before they progress and become chronic if the region is to develop a well-educated, skilled and diversified workforce and thereby achieve its economic potential. To do this, healthcare systems in the region need to adapt to changes in the disease profile. This paper examines the current state of healthcare delivery in the Gulf Co-operation Council (GCC), with a focus on the diagnostic process, and identifies strategies for the way forward.

Key findings:

Early diagnosis and better preventative healthcare will be essential for the future development of the GCC states. Dramatic economic growth fuelled by high oil prices since the early 2000s has brought rapid cultural change and resulted in a shift in lifestyle and dietary habits, leading to a rise in NCDs, particularly obesity and diabetes, in the region. In addition to the costs of managing these diseases, they will also have a debilitating effect on worker productivity and thus economic growth. Preventative healthcare and early diagnosis may curb the incidence of these lifestyle-related diseases, thereby helping GCC governments to achieve the goals set out in the economic visions for their countries.

Increased participation by the private sector is a key element to driving process efficiency across the healthcare system, including diagnostics. The dominant sentiment among regional healthcare experts is that healthcare delivery should be the mandate of the private sector, while the public sector should be responsible for planning, oversight and clinical governance. Improved efficiency—in terms of better utilisation of resources and improved patient turnaround times to achieve better clinical outcomes—will drive the system towards faster and more effective diagnosis, which will ultimately lower the cost of care and reduce the fiscal burden on GCC governments. Government oversight will be essential to ensure that the private sector is operating as it should.

Developing a centre of excellence for pathology will provide a benchmark for quality checks and testing procedures. Pathology results drive an estimated 70% of all healthcare decisions—particularly accurate diagnosis and the development of effective treatment plans—and thus have a knock-on impact on time to treatment, length of stay if a patient is hospitalised, readmission rates and associated health complications. While laboratories may be accredited, enforcement of protocols can be weak, leading to common errors in laboratory testing such as mislabelling or contamination of samples. Shaping a culture in which laboratories adhere to quality-assurance protocols will help. In particular, ongoing training for laboratory technicians, provided by local educational facilities, will help to standardise testing procedures across the region. This is especially necessary in the GCC, given that over three-quarters of the healthcare workforce consists of expatriates who have different training backgrounds.

Insurance schemes recently rolled out in the UAE and Saudi Arabia must cover basic screenings and additional layers of testing in order to facilitate early diagnosis and preventative healthcare. To comply with the law, many companies are offering their employees a basic insurance package, which according to experts does not provide sufficient coverage. In most cases, regular screenings are not covered, thus excluding many people from access to preventative healthcare. Given that sophisticated testing may not be covered by basic insurance plans, a framework must be developed to cover such tests if a genuine need can be identified. As things stand, low-income patients with basic insurance schemes are unable to access the tests needed to facilitate accurate and timely diagnoses and thus effective treatment.

Doctors should be incentivised on patient outcomes instead of tests administered. The proliferation of insurance coverage has led to egregious doctor-incentivisation practices, which have diluted the diagnostic process as unnecessary tests are conducted. This is mainly the case with high-income patients covered by enhanced insurance schemes. This has contributed to a poor public perception of healthcare in the Gulf, which in turn has resulted in fewer and delayed visits to primary-care facilities, resulting in delayed diagnosis. Enforcing regulation on incentivisation of medical professionals will improve transparency and patient trust in the Gulf. Increased data capture and record-keeping, through systems such as Dubai's "e-claim", will shed more light on such practices, identifying instances where unnecessary tests are performed.

Research databases must be developed to facilitate meaningful analysis of health challenges in the Gulf. Individual health records will be a valuable information resource, particularly for healthcare policy planners. Dubai's "e-claim" system (currently at a nascent stage), for example, and also disease-specific registries, will provide valuable data in the years to come on disease incidence and weaknesses in diagnosis and treatment. Individual health records will provide medical practitioners with detailed patient histories, which will lead to better diagnosis. As part of its Vision 2030, the

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government of Saudi Arabia aims for at least 70% of the population to have digital healthcare records by 2020.

Creating a conducive environment for greater digitisation and telehealth adoption can generate efficiencies in the market and address the shortage of healthcare professionals.

Remote diagnosis and treatment, particularly of chronic issues such as diabetes, will free up resources, allowing medical professionals to focus on more complex and costly cases. While there are examples of ongoing collaboration with international healthcare facilities, much more needs to be done to make the environment conducive to wider telehealth adoption for local consultations in the medium to long term. This will be part of the mandate of GCC governments in coming years.

Governments must develop a combined primary, secondary and tertiary prevention strategy to facilitate early diagnosis and preventative healthcare.

Governments across the GCC are engaged in public health education efforts (primary prevention), partnering with private players in many instances, to encourage healthy eating habits and exercise. They have also developed screening programmes (secondary/tertiary prevention) for many NCDs. A combined strategy will entail educating the public about the need for regular screenings while improving access to these programmes, to create a system in which early diagnosis is possible.

INTRODUCTION

The Gulf nations are currently in the grip of a healthcare crisis created, paradoxically, by the region's remarkable economic success. Oil has brought phenomenal wealth, but with it a range of diseases related to a shift in lifestyle that would have been hard to imagine when oil extraction began on a commercial scale after the second world war. The result has been an increasingly sedentary lifestyle combined with a Western-style diet laden with sugar, leading to a rise in chronic diseases.

In the case of many of these non-communicable diseases (NCDs)—particularly obesity, diabetes, heart disease and cancer—early diagnosis and preventative healthcare can have a large positive impact, either preventing diseases from occurring or effectively managing them once they have developed, to produce better patient outcomes and quality of life. With the growing prevalence of these diseases, the cost of treatment and the knock-on detrimental impact on economic growth potential have made NCDs a top concern.

Governments across the GCC have developed strategies under their long-term economic visions to tackle these diseases, shifting their approach from curative to preventative healthcare. The most robust of these strategies is Saudi Arabia's Vision 2030 and National Transformation Program (which specifies targets for 2020 across a range of key performance indicators (KPIs)). The UAE's Vision 2021 strategy contains a list of high-level KPIs, mirrored in emirate-level health strategies in Abu Dhabi and Dubai. To achieve these goals in the timeframes set out will require substantial improvements along the healthcare value chain.

This begins with early diagnosis and prevention. Timely and accurate diagnosis, which can be achieved through efficient processes, a skilled workforce and the adoption of technology, is the bedrock of effective and timely treatment plans that will improve patient outcomes. While preventative healthcare may not address the issue of those already living with these diseases, government budgets must be managed effectively to strike a balance between investing in treatment and investing in the future.

The next sections of this report map out the prevalence of NCDs in the GCC, making the case for early diagnosis, and outline the shift in government strategy towards preventative healthcare. Following this, the report reviews the healthcare system to identify areas that need to be improved to deliver early and more accurate diagnoses—a change that will be vital in order to reverse current health trends and achieve governments' goals.

CHAPTER 1: THE NEED FOR EARLY DIAGNOSIS AND PREVENTATIVE HEALTHCARE

The disease profile of the GCC countries is dominated by NCDs such as obesity, diabetes, cardiovascular disease and cancer. An important contributor to the prevalence of these diseases is the evolution in lifestyle that has resulted from rapidly rising per-capita incomes over the past few decades. “We used to be leaner and physically active before the oil wealth, but we have indulged too much since,” says Dr Khalid Al Shaibani, Saudi Arabia's deputy minister for planning and health economy. “We have taken up bad food habits and lack of physical activity”.

In the world league table for sales of sugar-sweetened beverages per head, the kingdom ranks fourth out of 80 countries, behind only Mexico, Chile and the US, with sales of 120 litres per capita in 2015. This compares with the UAE's 71 litres per capita. In addition, Saudi Arabia has seen the biggest increase in sales of such beverages per capita between 2010 and 2015—another indicator of the severity of the problem in the kingdom.¹ One of the factors driving increased consumption of sugar-sweetened food products across the Gulf region is a reliance on imports in the absence of suitable land and climatic conditions for local food production. Studies have shown that countries with the highest levels of imported food products tend to have the highest sugar intake, as imported foods tend to be heavily processed, sugar-rich and low in nutrition.²

This trend, in addition to an increasingly sedentary lifestyle, has contributed to high rates of obesity across the region, with around three-quarters of the adult population classed

as overweight or obese in places such as Kuwait³ and Qatar⁴. Several states in the region—most notably Saudi Arabia and Kuwait—lead the global diabetes league table, with around one in five adults suffering from the disease. Type 2 diabetes, which in the West is associated with ageing, is increasingly diagnosed in people in their thirties in GCC countries, with a comparatively greater problem of diabetes complications including fatty liver disease, liver failure, heart disease and blindness.

¹ <http://www.ehla-europe.eu/blog/2016/05/31/the-international-chair-on-cardiometabolic-risk-global-sugar-sweetened-beverage-sale-barometer/#prettyPhoto>

² [Nutritional determinants of worldwide diabetes: an econometric study of food markets and diabetes prevalence in 173 countries. <http://www.ncbi.nlm.nih.gov/pubmed/22691632>]; [A profile and approach to chronic disease in Abu Dhabi <https://globalizationandhealth.biomedcentral.com/articles/10.1186/1744-8603-8-18>]

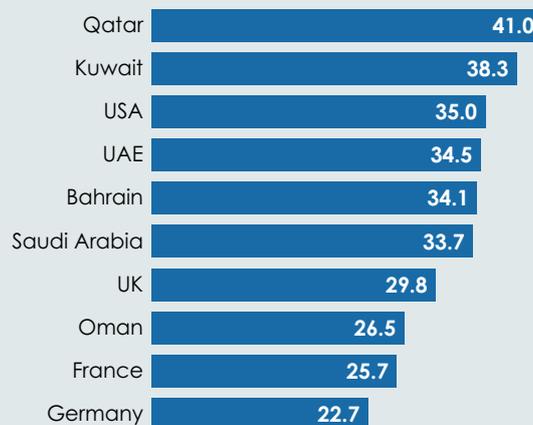
³ http://www.who.int/chp/steps/Kuwait_2006_STEPS_FactSheet.pdf

⁴ http://www.who.int/chp/steps/Qatar_FactSheet_2012.pdf

Figure 1

Prevalence of obesity in population aged 18+ years, 2014

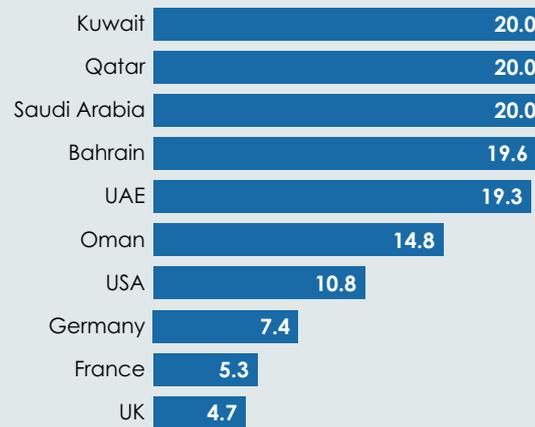
(%)



Source: World Health Organisation.

Figure 2

Prevalence of diabetes in population aged 20-70 years, 2015 (%)



Source: World Health Organisation.

Contributing to diabetes and heart disease is a culture of smoking. Smoking rates vary between 18% and 30% of men across the six GCC states.⁵ In fact, rates are likely to be higher in many places than official statistics suggest because of the use of *midwakh* (powdered tobacco) and the smoking of *shisha* (water pipes). *Shisha* pipes can give users the nicotine equivalent of 20 cigarettes in just one 45-minute session⁶, and are smoked by women and children of all ages as well as by men. “We don’t really know the full extent of this, but cancer and heart disease

linked to smoking are likely to cause worsening health problems,” says Dr Cother Hajat, associate professor at the Institute of Public Health, UAE University. “*Shisha* pipes or *midwakh* are used a lot by young people and school students. It is ubiquitous and very difficult to regulate.”

In addition to lifestyle factors, the population of the Gulf region is also affected by higher levels of genetic disease than other parts of the world, with accompanying costs of lifelong care. The high incidence of these conditions, which include thalassaemia or sickle cell anaemia (carried by one in every twelve people), is attributed to the tradition of marriage between cousins.⁷ Consanguineous marriage accounts for between 40% and 70% of all partnerships across the Gulf region and for 58% of marriages in the UAE, despite the availability of pre-marital screening programmes, according to Mahmoud Al Ali, director of the Arab Genomic Studies Centre in Dubai. There is also a tendency for women to continue bearing children until menopause, with the associated problem of greater risk of genetic disorders in babies of older mothers.

“Governments are now trying to come up with solutions to cope with this problem, but they’re not all at the stage where they should be,” Prof. Al Ali says. “Our database shows there are 290 types of genetic disease prevalent in the UAE and more than 1,000 across the whole of the Arab world. This is much higher than other countries—for example, there are only 70-80 [genetic] disorders listed in the equivalent Scandinavian database. It impacts the economy and is going to cost billions more if nothing is done about it.”

Cancer prevalence among GCC nationals is also high. It is estimated that in almost six out of ten breast cancer patients across the GCC region, the disease has already spread by the time it is identified.⁸ Karol Sikora, dean of medicine at the University of

⁵ <http://www.thelancet.com/action/showFullTableImage?tableId=tbl4&pii=S1470204515700343>

⁶ <http://tobaccocontrol.bmj.com/content/early/2015/02/09/tobaccocontrol-2014-051907.full#T1>

⁷ [BMJ Genetic Disorders in the Arab World <http://www.bmj.com/content/333/7573/831>]

⁸ [http://theLancet.com/journals/lanonc/article/PIIS1470-2045\(15\)70034-3/fulltext](http://theLancet.com/journals/lanonc/article/PIIS1470-2045(15)70034-3/fulltext)

Buckingham in the UK and former head of the World Health Organisation's cancer programme, also points out that in the Gulf region aggressive breast cancer occurs in women who are on average younger than breast cancer patients in the West. In the GCC, 26% of breast cancer cases occur in women below the age of 40, compared with fewer than 5% in other high-income countries.⁹ "We don't really know why this is, but it may be a consequence of lifestyle," he says. Proper analysis is hampered by the lack of accurate statistics on cancer incidence.

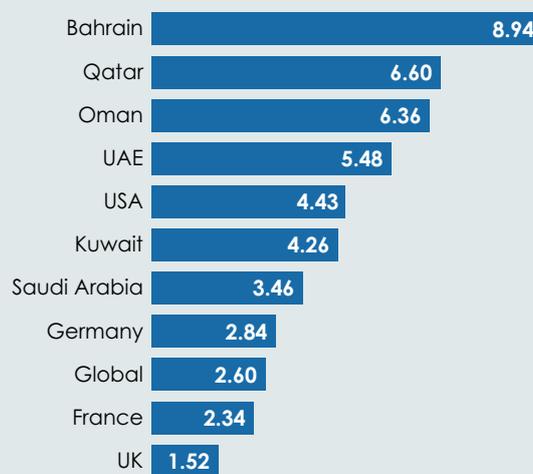
The economic burden

Shahrad Taheri, professor of Medicine at the Weill Cornell Medical Center in Qatar, explains that the prevalence of these NCDs has broader economic consequences: "With early obesity and early diabetes, people also get complications younger. There is an economic impact and an impact on educational development. We need people to be educated and well enough to work, otherwise the survival of the country is threatened."

One study estimates the direct annual cost of diabetes among Saudi nationals at SAR17bn (US\$4.5bn), representing 13.9% of total healthcare expenditure in the kingdom in 2014.¹⁰ Data compiled by the Global Health Data Exchange on disability-adjusted life years (DALYs—years of healthy life lost) illustrate the severity of the problem in the GCC. The percentage of DALYs on account of diabetes in the GCC states is far higher than the global average and the percentages in other developed countries such as the UK, France and Germany. This has a direct impact on worker productivity and economic growth in the region, and represents a call to look closely at what needs to be done to treat those living with the disease while simultaneously setting up a

system to curb current trends of rising prevalence of NCDs. This is especially important with regard to diseases, such as cancer, for which early diagnosis and prevention can have a dramatic impact on life expectancy and quality of life. Experts agree that 40% of all cancers are preventable, that another 40% are curable if diagnosed early and treated promptly, and that the remaining 20% can be treated with palliative therapy to reduce the disease burden.¹¹ This makes a strong case for strengthening the diagnostic process to facilitate early diagnosis.

Figure 3
Diabetes disability-adjusted life years
(% of years lost)



Source: Global Health Data Exchange, 2015.

⁹ [http://thelancet.com/journals/lanonc/article/PIIS1470-2045\(15\)70034-3/fulltext](http://thelancet.com/journals/lanonc/article/PIIS1470-2045(15)70034-3/fulltext)

¹⁰ <http://www.omicsonline.org/open-access/cost-of-diabetes-in-the-kingdom-of-saudi-arabia-2014-2155-6156-1000575.pdf>

¹¹ [Tackling cancer control in the Gulf Cooperation Council Countries <http://www.sciencedirect.com/science/article/pii/S1470204515700343>]

An increasingly expensive system

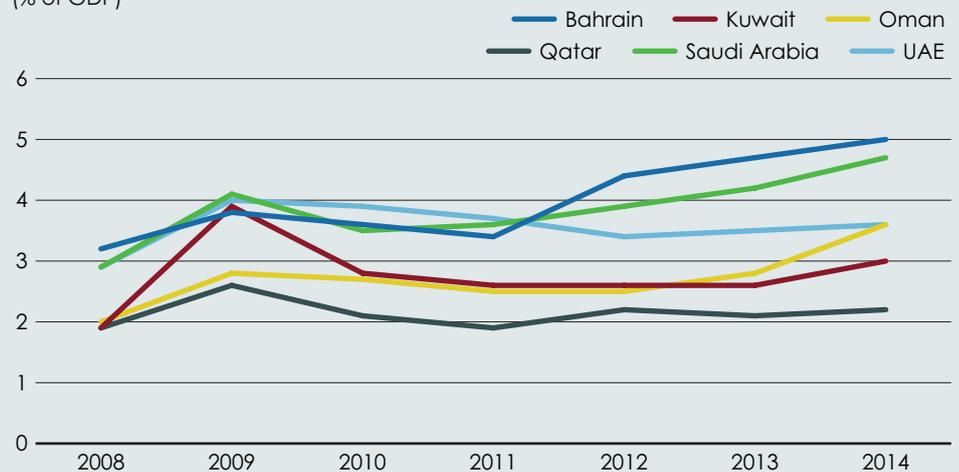
The healthcare system in the GCC, as it stands today, is largely financed by the public sector. Public spending accounts for over 70% of total healthcare spending in all GCC states with the exception of Bahrain. Governments generally fund all treatment for nationals of their countries at public-sector facilities, and this creates unsustainable costs for some, such as Saudi Arabia, where expatriates make up only one-third of the total population, compared with over 85% in Qatar and the UAE. Thus, the growing prevalence of chronic diseases exerts huge pressures not only on healthcare facilities but on governments as well. Under the current system, total annual healthcare costs could spiral from US\$36bn in 2013 to US\$68bn by 2022 unless the system is made more efficient,¹² for instance by improving the diagnostic process and taking a preventative approach to healthcare.

There will also be economic consequences as a result of changes in the region's demographics. Earlier this year Standard & Poor's, a credit-rating agency, pointed out that Saudi Arabia's population is forecast to expand from 32m in 2015 to 46m by 2050, with the percentage of dependent elderly people rising from 4% currently to 23%. Age-related government expenditure on pensions and healthcare could surge from 6% to 14% of GDP in the same timeframe.¹³ The need to limit the burden on the GCC's health system as the population ages is yet another argument in favour of preventative healthcare.

Figure 4

Healthcare expenditure as a percentage of GDP

(% of GDP)



Source: World Bank.

¹² [The 68\$ Challenge Strategy&, PwC's strategy consulting team http://www.strategyand.pwc.com/media/file/Strategyand_The-68-Billion-Dollar-Challenge.pdf]; [US Central Intelligence Agency World Factbook <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html>]; The curse of wealth – Middle Eastern countries need to address the rapidly rising burden of diabetes. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3992784/>

¹³ http://www.agefiactifs.com/sites/agefiactifs.com/files/fichiers/2016/05/global_aging_2016_-_58_shades_of_gray_28_apr_16.pdf

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Although the preceding analysis paints a grim picture, there is optimism about the region's ability to deliver the necessary transformation in healthcare. Experts believe that the healthcare system in the GCC has come a long way in a relatively short time—from little or no healthcare infrastructure or regulation to extensive facilities and a raft of regulations. The region's healthcare sector has been completely transformed in just a few decades, and there is every reason to believe that it can be transformed further. There are many initiatives under way to address the pressing need for better health education and disease prevention. However, a more holistic approach to early diagnosis and prevention is required before NCDs in patients become severe or irreversible.

CHAPTER 2: PUBLIC HEALTH STRATEGIES

The case for early diagnosis and preventative healthcare has led governments in the GCC to pay more attention to developing strategies to tackle the health issues facing the region. Preventative healthcare has become a core pillar of countries' strategies for realising their long-term economic visions. Saudi Arabia is determined to lead the way in the region's healthcare revolution with its recently launched Vision 2030, an ambitious US\$2trn government investment programme that aims to modernise the country and reduce its dependence on oil.¹⁴

Vision 2030 was released in April 2016, and was followed up in June by the 112-page National Transformation Program detailing the immediate strategies needed to realise the project's goals. Described as "Saudi Thatcherism" in reference to Margaret Thatcher, the British prime minister who pushed through the privatisation of much of the UK's infrastructure, the plan aims to create more than 1m private-sector jobs across sectors within five years and includes plans to develop and privatise five "medical cities". "There has never been anything like Vision 2030 before," says Dr Khalid Al Shaibani, Saudi Arabia's deputy minister for planning and health economy. "We know that implementing is very different from planning and strategising, but I am confident these goals can be achieved."

A VISION FOR HEALTHCARE

Saudi Arabia's Vision 2030 and National Transformation Program address the economic dangers of lifestyle-related diseases and include 16 new strategic objectives and targets and 17 key performance indicators for health improvement, including plans to boost the private sector's share of the kingdom's healthcare expenditure from 25% at present to 35% by 2020. Instead of being a healthcare provider, the ultimate aim is for the state to become the regulator of a privatised healthcare market.

The centrepiece of the proposals is a plan to develop and privatise five large healthcare complexes: King Fahad Medical City in Riyadh, King Abdullah

Medical City in Makkah, King Faisal Medical City for the Southern region, Prince Muhammad Bin Abdulaziz Bin Abdulrahman Al Saud Medical City for the Northern region and King Khalid Medical City in the Eastern region.

These megaprojects are intended to transform access to high-quality healthcare and medical innovation and will each cost up to US\$5.5bn to build. The developments will include residential buildings, hotels for patients' relatives, commercial complexes, educational facilities and medical research centres, as well as recreational facilities to make each city a self-sustaining health-service community.

¹⁴ [http://vision2030.gov.sa/sites/default/files/NTP_En.pdf]

continued...

Other key targets for 2020 include:

- Provide 70% of the population with a unified medical health record
- Increase the number of resident Saudi physicians who are enrolled in training programmes from 2,200 to 4,000
- Increase the nursing and healthcare-support workforce from 70.2 to 150 per 100,000 population
- Increase from 40% to 70% the percentage of patients who receive emergency or urgent care with medical decision made (admission/transfer/discharge) in less than four hours in key hospitals
- Increase the percentage of appointments received in specialised medical disciplines within four weeks (average for all specialties in key hospitals) from below 40% to 70%
- Increase the percentage of healthcare facilities reporting comprehensive performance and quality measures from 40% to 100%
- Increase the annual number of primary-healthcare visits per capita from two to four
- Increase life expectancy from 74 years to 80 years

Similarly, the UAE's Vision 2021 strategy aims to develop "world-class healthcare" and includes ten high-level key performance indicators. These include reductions in the number of deaths from cardiovascular diseases and cancer, the prevalence of diabetes, obesity among children and smoking rates. Separate plans have been developed at emirate level, including the Abu Dhabi Healthcare Strategic Plan and the Dubai Health Strategy 2016-21, which mirror components of Vision 2021.

Qatar also has its own National Vision 2030, which will set new healthcare standards. A national screening programme to test everyone for high-priority diseases such as diabetes, heart disease and breast cancer is in the pipeline¹⁵, as is a plan to create an enhanced service to prevent and treat diabetes and its associated complications (which include limb amputation and eye disease). There are also plans to produce better public information about diet, exercise and the benefits of a healthy lifestyle. Bahrain's Health Improvement Strategy (2015-2018) outlines a similar health agenda for the kingdom.

¹⁵ <http://www.nhsq.info>

A shifting mindset: From cure to prevention

Across the region, policy experts, clinicians and government officials concur that to truly move the needle and achieve some of the goals set out by regional governments, the focus needs to shift from treatment to preventative healthcare. This will entail a multi-pronged approach encompassing primary, secondary and tertiary preventative strategies.

Primary prevention: Aims to prevent disease or injury before it occurs

Primary prevention consists of activities to prevent exposure to factors that cause disease, altering unhealthy behaviour and increasing resistance to disease should exposure to such factors occur. Such activities include legislation and enforcement to ban or control the use of hazardous products; public health education; screening; and immunisation against infectious diseases.¹⁶

While immunisation programmes are well established in the GCC, recent primary prevention efforts have focused on public health education, encouraging healthy eating habits and exercise to lower the prevalence of obesity and diabetes. Policymakers acknowledge that the region's high temperatures will continue to pose a problem for exercise programmes, and thus many planners are developing proposals to use school buildings as community gyms after teaching hours to provide an indoor space to exercise.

Qatar has already set up the Aspire Zone, created for the 2006 Asian games, which has 13 playing fields and is the world's largest indoor multipurpose sports hall. It has also created Aspire Active, a programme to nurture Qatari sporting talent and to inspire fitness through participation in training modules, although it is not clear whether the programme has had an impact at the macro level. Meanwhile, shopping centres in Kuwait are being encouraged to offer organised mall walking or running groups to give people a chance to exercise away from the searing heat.¹⁷

There is also increasing collaboration with private-sector organisations. UAE-based Landmark Group, a leading retail and hospitality conglomerate, has partnered with Dubai Health Authority and Emirates Diabetes Society, among others, to host the Beat Diabetes Walk. Now in its eighth year, the event entails a full day of community-centric fitness and educational activities around managing and preventing diabetes for participants. Landmark Group estimates that it has engaged with over 35,000 people through the walk.

On the legislative front, plans are being developed to institute a tax on sugar-sweetened and tobacco products. Dr Al Shaibani says that his ministry has recommended the introduction of a sugar tax in Saudi Arabia. "We are looking at a tax on sugary drinks and fast food, but it will take us a year to study what different countries are doing and come to a decision," says the minister. "Singapore has embarked on a 'war on fat and sugar'.

¹⁶ <https://www.iwh.on.ca/wrmb/primary-secondary-and-tertiary-prevention>

¹⁷ <http://news.kuwaittimes.net/jogging-malls-popular-sports-ramadan/>

We are looking at their experience." Many of the specialists consulted for this report see such taxes as a logical step. Dr Cother Hajat, associate professor at the Institute of Public Health, UAE University, suggests that a concerted effort across the GCC may be the answer. "Together, the GCC countries could have a significant impact on obesity with a sugar and fat tax, strict regulations on food imports, better food labelling, and regulation of the size of soda drinks," she says.

Secondary prevention: Aims to reduce the impact of a disease or injury that has already occurred

Secondary prevention entails detecting and treating a disease or injury as early as possible to halt or slow its progress, and refers mainly to screening programmes and ongoing diet-control and exercise.¹⁸ These measures are required alongside disease management at the primary-care level, with people taking charge of monitoring their own symptoms rather than simply being passive recipients of hospital care.

Screening programmes to check blood pressure, blood sugar levels and lung function as markers of diabetes and heart disease have been implemented in the GCC. One example is the UAE's innovative Weqaya prevention programme to screen people for diabetes, heart and respiratory diseases and cancer.¹⁹ "One of the Weqaya success stories is that the UAE had the world's second-highest prevalence of diabetes but has now fallen out of the top ten because of our initiatives," Dr Hajat says. The UAE has also made progress in reducing death rates by introducing breast screening, but Dr Hajat says that "there are many more things we need to do to understand rates of disease and measure changes, including better registries and better data."

Experts encourage a one-off comprehensive screening programme to identify high-risk factors for each individual. In this way, people can reduce their regular screenings to those for the factors that pose the greatest risk for them, thereby avoiding spending time and money on screening for factors that do not present a high risk.

To tackle genetic risk factors, premarital genetic screening is now compulsory in many parts of the Gulf region, although it does not prohibit couples from marrying. Early warning can also be offered by prenatal foetal testing, but access to the service remains patchy. Mr Al Ali says that a network of screening centres equipped to provide screening, counselling and family education is needed across the Gulf region to make people more aware of the consequences of marriage between first cousins. "We can't stop consanguineous marriages—it is part of our culture and identity—but we can make people aware of [the risks]" he says.

Other measures include new guidelines developed in Saudi Arabia providing advice on identifying obesity in children and managing their health to halt weight gain, and lifestyle modification programmes for adults.

¹⁸ <https://www.iwh.on.ca/wrmb/primary-secondary-and-tertiary-prevention>

¹⁹ [Weqaya: A population-wide cardiovascular screening program in Abu Dhabi, UAE <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3483896/>]

Tertiary prevention: Aims to soften the impact of an ongoing illness or injury that has lasting effects

Tertiary prevention entails helping people to manage long-term, often complex health problems and injuries in order to improve as much as possible their quality of life and prevent recurrence. Tertiary prevention is often difficult to separate from treatment, as some of their goals overlap.²⁰

Tertiary prevention includes rehabilitation programmes to minimise impairment and disability, such as physical therapy after a stroke. The Saudi-based Sultan Bin Abdulaziz Humanitarian City is among the largest rehabilitation centres in the Middle East. Amana Healthcare, which opened an 80-bed facility in 2013, was the first specialised in-patient facility for advanced medical rehabilitation in the UAE, and for many patients has reduced the need to travel abroad for specialist treatment.

Tertiary prevention can also refer to screening programmes for complications of chronic diseases, such as eye and kidney abnormalities for diabetic patients. It extends to public health education targeted at patients and their families to raise awareness of potential complications. The Dubai Health Authority has plans to launch a diabetes app to educate diabetics about better management of the disease. Other public education efforts to encourage exercise and healthy eating habits, specifically around glucose and salt intake, overlap with those discussed under primary prevention.



²⁰ <http://www.emro.who.int/emhj-volume-3-1997/volume-3-issue-1/article2.html>

²¹ <http://www.emro.who.int/emhj-volume-3-1997/volume-3-issue-1/article2.html>

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While primary prevention is considered to make the greatest contribution to the wellbeing of the population as a whole²¹, to be truly effective a strong collaborative effort is required to ensure that primary, secondary and tertiary prevention strategies are developed simultaneously. For instance, educating the public about the need for regular screenings while improving access to these programmes will create a system in which early diagnosis is possible. Education about possible complications of chronic diseases goes hand in hand with the provision of access to regular screening for such complications. This preventative approach should also extend to the delivery of healthcare, which is explored in greater depth in the next section of this report.

CHAPTER 3: DELIVERY OF HEALTHCARE

To address the health challenges prevalent in the GCC due to the proliferation of chronic diseases and the ageing of the population, it is essential to take a closer look at the beginning of a patient's journey, to understand the failure to diagnose these diseases early. Diagnostic error is defined as (a) the failure to establish an accurate and timely explanation of the patient's health problem or (b) communicate that explanation to the patient.²² Figure 6 emphasises the role information plays in minimising or preventing diagnostic error, which has a knock-on impact on the rest of the patient journey. Various factors contribute to the quality of the information generated in the diagnostic process including health care systems and processes, skills of medical professionals, technology used, among others. In this chapter, we take a closer look at these factors in the context of the GCC.

In general, experts indicate that in the GCC, primary healthcare is relatively underdeveloped. "There is no well-functioning referral system. [The GCC is] using processes set up to fight infection when now they need help with lifestyle diseases," says Sameen Siddiqi, former World Health Organisation (WHO) director of health systems development in the region.

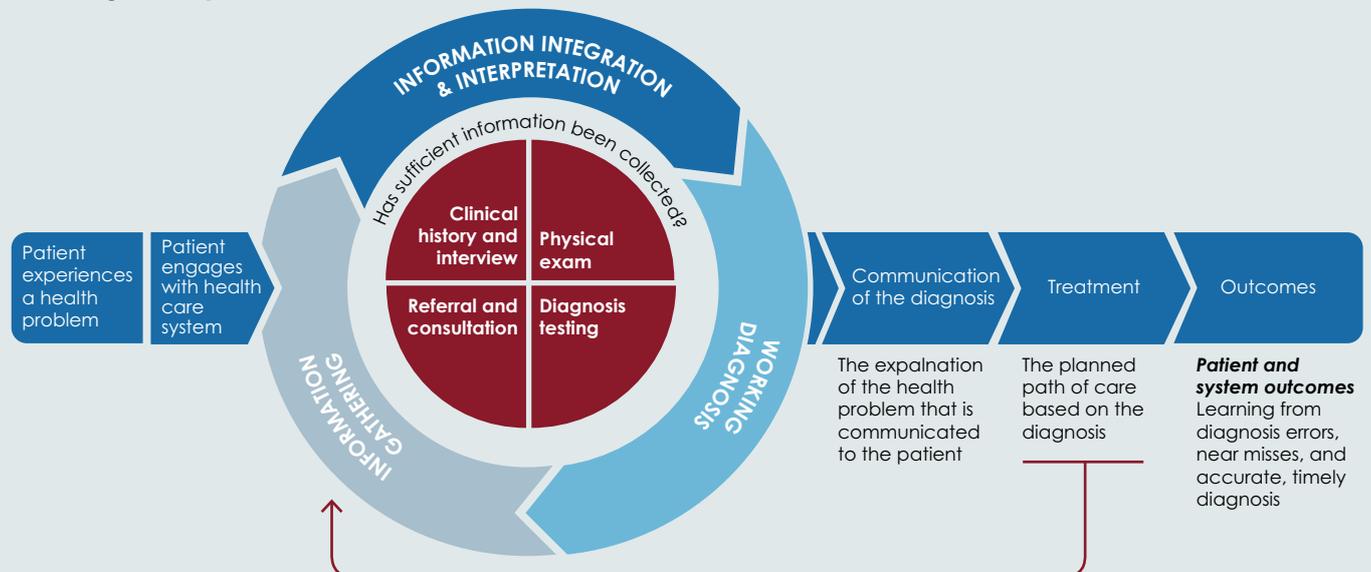
²² Balogh, E., Miller, B. and Ball, J. (ed.s), Improving Diagnosis in Health Care, Washington D.C., The National Academies Press, 2015.

²³ Balogh, E., Miller, B. and Ball, J. (ed.s), Improving Diagnosis in Health Care, Washington D.C., The National Academies Press, 2015.

The complexity of organisational structures in some places contributes to the weakness of primary healthcare. The UAE, with its population of just 9m, has four health regulators: the federal health ministry, the Health Authority-Abu Dhabi (HAAD), the Dubai Health

Figure 6

The diagnostic process



Source: Improving Diagnosis in Healthcare²³



If they want to provide good-quality healthcare to the people efficiently, they need to move towards a more privatised model.

David Hadley, chief executive of the Dubai-based Mediclinic Middle East hospital group

Authority (DHA) and the Dubai Healthcare City (DHCC) free zone. Each authority has its own jurisdiction and is responsible for facilities, market regulation, and licensing of doctors and nurses within it. Measures of healthcare-provider quality are neither transparent nor standardised, and thus are not understood by patients. The lack of standardised key performance indicators and statistics makes it difficult to judge accurately the quality of healthcare facilities, such that the best providers often struggle to distinguish themselves in the market.

As a result, at the heart of the structural change required, according to regional experts, is the need to enhance efficiency, which includes improved utilisation of resources with the right skills and faster patient turnaround times to ensure more accurate and early diagnosis. In turn, this will lead to a more seamless patient journey involving implementing the right treatment quickly and enabling patients to recover faster. This can be brought about by addressing three key pillars: processes, people and technology.

Processes

To improve diagnostic processes, medical experts are calling for a transfer of primary care to the private sector—including allowing insurers to create a market—while keeping planning, oversight and clinical governance under the control of public-sector authorities. “It is a proven fact that the private [sector] delivers healthcare more efficiently than the government does,” explains David Hadley, chief executive of the Dubai-based Mediclinic Middle East hospital group. “If they want to provide good-quality healthcare to the people efficiently, they need to move towards a more privatised model.” Efficiency is born out of increased competition, and private players are quick to respond to changes in the healthcare market. Mr Hadley cites the Dubai model: “Here, it’s very competitive. Each provider elevates the next, and each medical insurance company keeps the providers in check because they’re competing. So it’s a very good market.” Government oversight is essential to promote “value-based” principles and ensure that private players follow standardised processes and procedures as well as adhere to quality and performance standards. .

While privatisation addresses system-wide inefficiencies, there is an increasing recognition that accurate diagnosis specifically is fundamental to good healthcare provision.²⁴ A study of National Health Service pathology services in the UK estimates that pathology is an integral component of an estimated 70% of clinical interventions²⁵, which include diagnosis and choice of treatment. For cancer in particular, early and accurate diagnosis is key, and pathology can provide vital information—such as how aggressive or invasive the disease is—that determines treatment choices and patient outcomes.

But even in the best systems around the world, the latest evidence shows that specialist blood and tissue analysis by pathologists and haematologists may be inaccurate.²⁶ Mousa Al Abbadi, a consultant pathologist at Sheikh Khalifa Medical City in Abu Dhabi, which is managed by the Cleveland Clinic, says that similar laboratory errors occur in

²⁴ [<http://www.pubpdf.com/pub/26942417/The-Value-of-In-Vitro-Diagnostic-Testing-in-Medical-Practice-A-Status-Report>]

²⁵ http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_091984.pdf

²⁶ [Medical error – the third leading cause of death in the US <http://www.bmj.com/content/353/bmj.i2139>]

the Gulf region. Typical mistakes in pathology include the mislabelling of specimens, issues with transportation and the chain of command, improper sealing of containers and contamination between specimens. While no laboratory is immune to mistakes, close adherence to protocols outlined by an accreditation programme can help to minimise them. Dr Al Abbadi believes that it should be mandatory for all laboratories to be accredited by the College of American Pathologists or an equivalent body.²⁷

Even when laboratories are accredited, enforcement of protocols may be weak in some cases, once again leading to common errors in pathology. "There is a need to change the culture in laboratories to drive home the need to follow quality assurance protocols," Dr Al Abbadi says. Establishing a centre of excellence for pathology would also help in monitoring and improving standards and practices in pathology, providing pathologists and lab technicians with a benchmark for quality checks and testing procedures.

People

An efficient diagnostic process requires a skilled workforce, and this has been among the top healthcare challenges for the GCC. Laila Al Jassmi, chief executive of Dubai-based consultancy Health Beyond Borders, points out that the GCC is suffering along with other world regions as a result of the growing global shortage of healthcare professionals. Within the Gulf region, Saudi Arabia is at the bottom of the human resources league tables for provision of doctors, nurses, pharmacists and dentists. Whereas Qatar had more than 27 doctors per 10,000 population in 2012, Saudi Arabia had just nine²⁸. Similarly, the kingdom had just 21 nurses and midwives per 10,000 population, compared with 45 per 10,000 in Kuwait and Oman and 74 per 10,000 in Qatar. Saudi Arabia had just two dentists per 10,000 people, compared with between four and six per 10,000 in the UAE and Qatar. Shortages in the workforce lead to longer waiting times for patients and lower-quality care as resources are spread thin.

The situation is exacerbated by the fact that primary care in the region is heavily reliant on an expatriate workforce, with expats accounting for 75% of physicians and 79% of nurses in the GCC.²⁹ Dr Siddiqi explains that "they come from different countries with different training and speak different languages. They need a strong induction programme and they don't necessarily get it. There is a high turnover of people, which doesn't support continuity of care." Ms Al Jassmi echoes this sentiment, saying that although attracting skilled workers from abroad will continue to be necessary, providing continuous training and education for medical professionals is also vital. There are plans to open a new 300-bed teaching hospital in Ajman as part of the expansion of the Gulf Medical University in the UAE.

Skill shortages in pathology in particular place a substantial burden on the diagnostic process. The Gulf region faces a shortage of well-trained pathologists, and particularly of those with more sub-specialised training in various areas of histopathology. The fact

²⁷ These may be ISO-15189, Clinical Pathology Accreditation of United Kingdom (CPA-UK), Joint Commission International Agency (JCIA)

²⁸ http://www.who.int/gho/publications/world_health_statistics/EN_WHS2013_Part3.pdf?ua=1

²⁹ <http://middleeasthospital.com/GCC%20HEALTHCARE%20CHALLENGE.pdf>

that there are few relevant education programmes available in the region means that specialisation in the field receives little encouragement. Dr Al Abbadi explains: “The UAE has no postgraduate training programme in pathology, but Saudi Arabia does. A lot of pathologists in the region go to Saudi Arabia for training. There are plans to provide resources and establish pathology training programmes in the UAE—a direction that is welcomed by all healthcare providers.” The shortage may stem from the fact that there is only limited exposure to pathology at undergraduate level. Dr Al Abbadi says: “In a typical six-year programme, [students] are exposed to pathology in their second or third year. In general, pathology accounts for less than 10% of the total training.” Given that pathology drives a significant proportion of the decisions made by medical practitioners, it would seem to be underrepresented in medical training programmes overall, and this could have consequences for physicians' ability to order the right tests and interpret the results correctly.

The culture in which medical professionals are trained also has an impact on the choices they make during the diagnostic process. Experts indicate that two major schools of thought exist in the region. Under British training, patients are considered a cost to the system and professionals take a more practical approach to tests and treatment. American-trained doctors, by contrast, practise more defensive medicine, conducting a broader array of tests to “cover their backs”, as they are used to operating in a more litigious society in the US. Experts opine that the American culture is dominant in the Gulf. Although society in the GCC is not litigious, “the consequence of doing something wrong here is that they take your passport away, so [doctors] definitely practise very defensive medicine,” explains Mr Hadley. Efforts to change this culture to bring down the costs to the healthcare system and reduce the amount of time spent on diagnosis fall squarely within the mandate of healthcare authorities in the region.

Technology

Widespread use of sophisticated technology can facilitate data capture and health record-keeping. Given the importance of quality information in the diagnostic process, illustrated in Figure 6, digitised medical information integrated well into the health care system has the ability to provide medical practitioners and health policymakers not just with hindsight but predictive analysis as well, which will facilitate preventative healthcare.

Dubai's “e-claim” system captures key data points such as diagnosis, medication prescribed and treatment. Mr Hadley explains that “if they don't match each other, then there are question-marks. Normally it's because we haven't coded correctly, as a lot of it's still manual. But it could be that people are charging for things when they shouldn't be or are doing [procedures] when they shouldn't.” Khalid Al Shaibani, Saudi Arabia's deputy minister for planning and health economy, echoes this sentiment: “At the moment we have different government and private providers using different electronic medical records (EMR) that are not talking to each other. People have repeated

investigations, blood tests and so on, for heart disease and conditions such as diabetes. There is wasteful shopping around for treatment and costly second opinions." This leads to delays in diagnosis and increased costs to patients, insurers and governments. Digitising individual records will improve transparency and can also facilitate an "e-referral" system to expedite a patient's transition from primary to secondary and then tertiary care.

Maintaining high-quality health records is also vital for effective prevention. Data on diagnoses, treatment and medication collected over a number of years will be useful in identifying instances of inaccurate diagnosis and inappropriate treatment, highlighting deficiencies in the diagnostic process. This will arm government officials and policymakers with the necessary information to make effective changes to the system. Saudi Arabia has ambitious plans to provide health records for its entire population, with a target of 70% coverage by 2020.

The need for data records extends to disease-specific registries. Cancer registration, in particular, is essential to accurately identify opportunities for early detection by making appropriate screening programmes available for the most common malignancies at national and regional levels. Each of the six GCC countries has a national cancer registry, and while these do include some expatriate cancer cases, coverage of expatriates is weak. Timely data on cancer incidence is not made available, hampering essential medical research into causes and trends. The adoption of more sophisticated technology and digitisation of health records should facilitate real-time data capture, and this information, if collated in disease-specific registries, can be utilised to strengthen early diagnosis and prevention strategies.

The advent of telehealth is also set to transform the healthcare landscape in the region in the medium to long term. "[Technological] advances have given us the ability to transmit high-quality images quickly and easily across the world for diagnostic purposes. We could never have done this ten years ago," says Karol Sikora, dean of medicine at the University of Buckingham in the UK and former head of the WHO's cancer programme. "There will always be a problem with getting sufficient numbers of oncologists in the Gulf, but partnerships between providers mean diagnosis and consultation can be done remotely with specialists from elsewhere in the world."

A consultation model that relies exclusively on remote medical input is also being developed by the Mayo Clinic Healthcare Network, a subscription operation that recently set up a collaboration with the American Hospital in Dubai. "It is a unique way of providing healthcare," says Aaron Han, acting chief medical officer at the American Hospital. "We can ask Mayo experts to give information on best practice on just about any condition and we can conduct doctor-to-doctor consultations on different cases, managed over the internet or via a portal." This kind of approach will address some of the inefficiencies that exist in the diagnostic process in the Gulf, allowing better access to skilled practitioners in other parts of the world and lowering costs by reducing the need for patients to travel abroad to receive medical advice.



At one end of the insurance and income spectrum, insufficient tests are being conducted to facilitate diagnosis. At the other end of the spectrum, occupied by high-income patients with enhanced insurance schemes, there is a culture of performing unnecessary tests

In time, this approach could be expanded to provide remote access to local practitioners as well. Dr Siddiqi highlights the fact that in the GCC “there is limited community disease management of long-term conditions such as heart disease and diabetes. People can access hospitals straight away, so they go to emergency rooms for things like blood pressure checks. It is expensive and wasteful.” Providing remote access to medical practitioners through telehealth technologies for routine check-ups—particularly for diabetes and cardiovascular diseases—will reduce these “emergency” visits, freeing doctors up to focus on more complex cases. In addition, patients in remote areas would be able to access the expertise of leading medical professionals in the region. For instance, a patient in a remote part of Saudi Arabia, through telehealth technologies, may be able to leverage the medical expertise of a specialist in Riyadh. Creating an environment conducive to telehealth adoption will require, among other things, strong primary-care service provision, an integrated healthcare system and interoperable information technology systems.

The role of insurance

While nationals in the GCC receive healthcare coverage from the government, the lack of universal healthcare coverage for expatriates, who make up the majority of the population in most GCC states, has discouraged frequent primary-care visits on account of the large out-of-pocket expenses that these would incur. This is among the reasons for delays in diagnosis for diabetes, cardiovascular diseases and cancer in the region.³⁰

While health insurance has yet to get off the ground in many places, the UAE and Saudi Arabia now have a legal requirement that employers provide comprehensive cover for all employees. Abu Dhabi is the first place where insurance has been fully rolled out: it has been provided by the government for nationals through a single-payer scheme known as Thiqa (administered by the national health insurance company, Daman), and by employers for expatriates (administered by private insurance companies).³¹ Dubai is in the final stage of its insurance roll-out, and Saudi Arabia plans to complete its roll-out by April 2017. A US government report³² says that there are 8.5m people with health insurance in Saudi Arabia. In addition, 6m civil servants and their dependents will soon be brought into the insurance pool, meaning that around one-half of the population will be covered.

However, while this will lighten the cost burden to a certain extent and may encourage primary-care visits, complexities exist around co-payments and tests covered that are not fully understood by patients. To comply with the new law in Saudi Arabia and the UAE, many companies offer their employees—and in particular low-paid workers—only the basic insurance scheme, which according to experts does not offer sufficient coverage. Under the basic scheme, regular screenings are not included and many insurers often refuse to pay for additional layers of testing that may be required to arrive at better diagnoses. Unless coverage is broadened to include the screenings and tests

³⁰ <http://gulfnews.com/news/uae/health/88-of-uae-people-don-t-go-for-cancer-screening-1.1607871>

³¹ Hamidi and Akinic (2015), ‘Examining the health care payment reforms in Abu Dhabi’, *The International Journal of Health Planning and Management* <http://onlinelibrary.wiley.com/doi/10.1002/hpm.2276/epdf>

³² http://trade.gov/topmarkets/pdf/Medical_Devices_Top_Markets_Report.pdf

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that are needed to enable accurate diagnoses, the insurance roll-out across the GCC will not facilitate early diagnosis and prevention. While sophisticated testing may not be included in basic insurance schemes, a framework must be developed to cover such tests if a genuine need can be identified.

Thus, at one end of the insurance and income spectrum, insufficient tests are being conducted to facilitate diagnosis. At the other end of the spectrum, occupied by high-income patients with enhanced insurance schemes, there is a culture of performing unnecessary tests. The proliferation of insurance has created egregious doctor-incentivisation practices in hospitals: instead of focusing on patient outcomes, physicians are rewarded based on the number of tests that they perform. Market players indicate that laws are in place to address incentivisation practices that lead to unnecessary tests being carried out, and that it is simply a matter of enforcing them. Governments are wary, Mr Hadley explains, as the problem is so rife that they fear facilities would be forced to shut down if these laws were enforced. But enforcement would bring efficiency and necessary transparency to the sector, and this would improve public perceptions of healthcare in the Gulf. Enhancing patients' trust in the system is vital in order to increase the frequency of visits to primary healthcare facilities and thus assist early diagnosis. Mr Hadley says that noticeboards placed around his hospital group's facilities describing their incentivisation policies assure patients that doctors are not paid per treatment. Basmah Al Buhairan, managing director of healthcare and life sciences at the Saudi Arabian General Investment Authority, says that in Saudi Arabia plans to provide private insurance for everyone are being rolled out with the aim of promoting "value-based" systems that reward doctors and healthcare providers according to outcomes and quality of care, rather than paying them per treatment.

CONCLUSION

There are no illusions about the scale of the healthcare problems confronting the GCC. A failure to address the prevalence of chronic diseases—specifically obesity, diabetes, cardiovascular diseases and cancer—will reduce the productive capabilities of the working population, with a consequent detrimental impact on the region's ability to fulfil its economic potential.

The rapid transformation of the Gulf states in recent decades indicates a strong capacity for change. Until now, healthcare has focused on treating rather than preventing problems, but there is no reason to believe that the region's capacity for change cannot be positively channelled towards transforming the healthcare sector.

To overcome the health challenges prevalent in the region and bring about meaningful change, a system-wide adoption of value-based healthcare principles is required. To achieve this, and thus to reach the goals set out in national programmes in the GCC countries, there must be a coherent programme to improve core components of the diagnostic process, which not only marks the start of a patient's journey but also plays a vital role in ongoing care and prevention. The direct impact of improving the diagnostic process will be timely and accurate diagnoses, which in turn will reduce time to treatment, recovery times, length of stay if a patient is hospitalised, readmission rates and associated health complications.

Strengthening diagnostics will help to shift the approach in healthcare from curative to preventative. This does not discount the need for treatment for those living with chronic diseases, but places the focus on prevention in order to curb current health trends and the consequent economic burden.

This will require a holistic approach spanning system-wide changes, improvements in pathology and preventative healthcare strategies. Our report has identified key action points under each of these categories to improve the diagnostic process, which will help achieve goals set out in Saudi Arabia's National Transformation Program (NTP):

System-wide changes

- **Increase private-sector participation**

While the government will remain a key player in the healthcare system, there will be a greater role for private-sector players—from providers to insurers—to generate the necessary efficiencies, including better utilisation of resources (medical professionals and equipment) and faster patient turnaround times. This will lead to quicker and more accurate diagnoses. The most relevant NTP goals that this will help achieve include increasing the private-sector's share of total healthcare spending from 25% to 35%, maintaining annual operating costs per person at US\$8,800 and reducing time to treatment for emergency and specialised care. Government oversight and

regulation is vital to ensure that complexities arising from increased private-sector participation, such as the provision of unnecessary tests to increase revenue, are managed.

- **Monitor and correct doctor-incentivisation practices**

Implementation of laws around doctor incentivisation—to prohibit financial incentives for medical tests and referrals—will go a long way towards reducing time and money spent on costly second opinions and unnecessary tests, thus reducing lead times from diagnosis to treatment. This will have a broader positive impact on patient trust in the regional healthcare system, and is likely to encourage patients to visit primary healthcare facilities more often for regular check-ups. This will help achieve the NTP goal of increasing primary healthcare visits per capita from two to four, as well as managing operating costs per patient.

- **Develop an environment conducive to greater adoption of sophisticated technologies, including telehealth**

In the medium to long term, increased use of e-health and telehealth technologies will facilitate remote diagnosis, which is useful in managing chronic diseases such as diabetes and heart disease. This will free up medical professionals to spend more time on complex cases, improving resource-use efficiency and thus resulting in lower operating costs per patient. It will also help to achieve the NTP goals of increasing primary healthcare visits per capita and managing operating costs per patient.

- **Widen health record collection and develop robust health databases**

Collection of patient information is a vital component of the diagnostic process, and adoption of sophisticated technologies will facilitate this across the healthcare value chain—diagnosis, prescription of medication, and treatment. This will provide detailed medical histories, leading to faster and more accurate diagnoses, and will help to identify instances where unnecessary tests are performed. It will also reduce lead times to tertiary care—especially beneficial in aggressive cancer cases—helping to achieve the NTP goal of increasing the percentage of appointments received in specialised medical disciplines within four weeks from under 40% to 70%. Over the years, these databases will be a rich source of information on disease incidence that will help policymakers to develop more robust healthcare strategies. Cancer registries, for instance, can help to identify common malignancies for which regular screening programmes can then be developed.

Pathology

- **Increase laboratory accreditation and enforce protocols**

Given the importance of pathology in the diagnostic process, laws in the GCC should mandate that all laboratories achieve the highest levels of accreditation, such as College of American Pathologists accreditation or equivalent. This will help to achieve the NTP goal of increasing the percentage of healthcare facilities reporting

comprehensive performance and quality measures from 40% to 100%. Furthermore, establishing a centre of excellence for pathology will provide a local benchmark for quality-assurance protocols in laboratories. This will help to minimise errors in pathology, which in turn will have a significant impact on diagnosis and choice of treatment, helping to achieve NTP goals related to reducing time to treatment for emergency and specialised care.

- **Expand local laboratory skills**

As pathology is estimated to drive 70% of clinical interventions, it is a critical component in delivering accurate diagnosis and effective treatment. Providing local educational programmes to encourage specialisation in pathology will supply the local healthcare system with the necessary skills to improve the effectiveness of laboratories, helping to achieve the NTP goal of increasing the number of resident Saudi physicians who are enrolled in training programmes from 2,200 to 4,000. Ongoing training programmes for lab technicians can also be provided by local institutions to help standardise the way that quality procedures and laboratory tests are conducted across the region.

Preventative strategies

- **Ongoing public health education**

Although programmes are under way to educate the public about the causes of obesity and diabetes, these efforts must be expanded to further engage private-sector companies and the broader public. Ongoing efforts to inform the public about the adverse effects of unhealthy diets and smoking and the importance of regular screenings and exercise are necessary to achieve the NTP goals of reducing the prevalence of obesity and diabetes.

- **Improve access to screening**

Combined with public health education, screening facilities (particularly for breast cancer and diabetes) must be made more widely available. This will help to achieve the NTP goal of increasing the number of primary healthcare visits per capita. Early detection, particularly for diseases such as cancer and diabetes, can have a significant impact on treatment options and quality of life. The insurance market can play a substantive role in achieving this aim by offering health insurance products which, even at the basic level, include screening programmes. Experts encourage a one-off comprehensive screening to identify high-risk factors, which can help in developing a more targeted, and hence more efficient, screening programme for each individual.

- **Apply taxes on sugar and tobacco products**

Taxes on sugar-sweetened and tobacco products will increase their cost to the consumer and can be a strong deterrent to excessive consumption of these products. This will contribute to reducing the prevalence of obesity and diabetes over time—key NTP goals.

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Table 1: Key action points to improve the diagnostic process and the government KPIs these will help achieve

Help to achieve	Strategy	Saudi Arabia National Transformation Program 2020 targets	UAE Vision 2021 targets
System-wide changes	Increase private-sector participation 	<ul style="list-style-type: none"> ✓ Increase private-sector contribution in total healthcare spend from 25% to 35% ✓ Operating cost per person should remain unchanged at SAR 33,000 (US\$8,800) ✓ Increase percentage of patients who receive emergency or urgent care with medical decision made (admission/ transfer/discharge) in less than four hours in key hospitals from 40% to 70% ✓ Increase percentage of appointments received in specialised medical disciplines within four weeks (average for all specialties in key hospitals) from <40% to 70% 	<ul style="list-style-type: none"> ✓ Increase percentage of accredited health facilities from 54.7% to 100%
	Monitor and correct doctor incentivisation practices 	<ul style="list-style-type: none"> ✓ Operating cost per person should remain unchanged at SAR 33,000 (US\$8,800) ✓ Increase percentage of patients who received emergency or urgent care with medical decision made (admission/ transfer/discharge) in less than 4 hours in key hospitals from 40% to 70% ✓ Increase number of primary healthcare visits per capita from 2 to 4 	
	Develop an environment conducive for greater adoption of sophisticated technologies, including telehealth 	<ul style="list-style-type: none"> ✓ Operating cost per person should remain unchanged at SAR 33,000 (US\$8,800) ✓ Increase number of primary healthcare visits per capita from 2 to 4 	
	Widen health record collection and develop robust health databases 	<ul style="list-style-type: none"> ✓ Increase the percentage of Saudi citizens who have a unified digital medical record from 0% to 70% ✓ Operating cost per person should remain unchanged at SAR 33,000 (US\$8,800) 	<ul style="list-style-type: none"> ✓ Reduce number of deaths from cancer per 100,000 population from 99 to 64.2

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Help to achieve	Strategy	Saudi Arabia National Transformation Program 2020 targets	UAE Vision 2021 targets
		<ul style="list-style-type: none"> ✓ Increase percentage of patients who received emergency or urgent care with medical decision made (admission/ transfer/discharge) in less than four hours in key hospitals from 40% to 70% ✓ Increase percentage of appointments received in specialised medical disciplines within four weeks (average for all specialties in key hospitals) from <40% to 70% ✓ Increase percentage of healthcare facilities reporting comprehensive performance and quality measures from 40% to 100% 	<ul style="list-style-type: none"> ✓ Increase percentage of accredited health facilities from 54.7% to 100%
Pathology	<p>Increase laboratory accreditation and enforce protocols</p> 	<ul style="list-style-type: none"> ✓ Increase the percentage of patients who received emergency or urgent care with medical decision made (admission/ transfer/discharge) in less than four hours in key hospitals from 40% to 70% ✓ Increase percentage of appointments received in specialised medical disciplines within 4 weeks (average for all specialties in key hospitals) from <40% to 70% ✓ Increase percentage of healthcare facilities reporting comprehensive performance and quality measures from 40% to 100% 	<ul style="list-style-type: none"> ✓ Reduce number of deaths from cancer per 100,000 population from 99 to 64.2 ✓ Increase percentage of accredited health facilities from 54.7% to 100%
	<p>Expand local laboratory skills</p> 	<ul style="list-style-type: none"> ✓ Increase the number of resident Saudi physicians who are enrolled in training programmes from 2,200 to 4,000 ✓ Increase percentage of appointments received in specialised medical disciplines within four weeks (average for all specialties in key hospitals) from <40% to 70% 	<ul style="list-style-type: none"> ✓ Reduce number of deaths from cancer per 100,000 population from 99 to 64.2
	<p>On-going public health education</p> 	<ul style="list-style-type: none"> ✓ Increase the number of primary healthcare visits per capita from 2 to 4 ✓ Reduce percentage of smoking incidence by 2 percentage points from baseline 	<ul style="list-style-type: none"> ✓ Reduce number of deaths from cardiovascular diseases per 100,000 population from 297.6 to 158.2;

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Help to achieve	Strategy	Saudi Arabia National Transformation Program 2020 targets	UAE Vision 2021 targets
Preventative strategies		<ul style="list-style-type: none"> ✓ Reduce percentage of obesity incidence by 1 percentage points from baseline ✓ Operating cost per person should remain unchanged at SAR 33,000 	<ul style="list-style-type: none"> ✓ Reduce prevalence of smoking any tobacco product from 21.6% among men and 1.9% among women to 15.7% among men and 1.66% among women ✓ Reduce prevalence of diabetes from 19.3% in 2015 to 16.28% ✓ Reduce prevalence of obesity among children ✓ Increase average healthy life expectancy from 67.9 years to 73 years
	Improve accessibility to screenings 	<ul style="list-style-type: none"> ✓ Increase number of primary healthcare visits per capita from 2 to 4 ✓ Increase percentage of appointments received in specialised medical disciplines within four weeks (average for all specialties in key hospitals) from <40% to 70% ✓ Reduce percentage of obesity incidence by 1% from baseline ✓ Operating cost per person should remain unchanged at SAR 33,000 (US\$8,800) 	<ul style="list-style-type: none"> ✓ Reduce number of deaths from cancer per 100,000 population from 99 to 64.2 ✓ Reduce number of deaths from cancer per 100,000 population from 99 to 64.2 ✓ Reduce number of deaths from cardiovascular diseases per 100,000 Population from 297.6 to 158.2 ✓ Increase average healthy life expectancy from 67.9 years to 73 years
	Apply taxes on sugar and tobacco products 	<ul style="list-style-type: none"> ✓ Reduce percentage of smoking incidence by 2 percentage points from baseline ✓ Reduce percentage of obesity incidence by 1 percentage points from baseline ✓ Operating cost per person should remain unchanged at SAR 33,000 (US\$8,800) 	<ul style="list-style-type: none"> ✓ Reduce number of deaths from cardiovascular diseases per 100,000 Population from 297.6 to 158.2; ✓ Reduce prevalence of smoking any tobacco product from 21.6% among men and 1.9% among women to 15.7% among men and 1.66% among women ✓ Reduce prevalence of diabetes from 19.3% in 2015 to 16.28% ✓ Reduce prevalence of obesity amongst children ✓ Increase average healthy life expectancy from 67.9 years to 73 years

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