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Healthcare and Medical Sector: Overview and Commercial Prospects in Saudi Arabia and the United States

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Executive Summary

The healthcare sector in Saudi Arabia is the largest in the Middle East, and both healthcare services and training have become top priorities for the Saudi Arabian Government, with 13.5 percent of the government's spending devoted to the sector. With increasing demand and increased yearly health care spending, the sector has emerged as an area of opportunity for economic growth in the Kingdom. We project that the contribution of health services to Saudi Arabia's GDP will increase by over 13 percent through 2025, with the Eastern Province, Al-Jouf, Riyadh, and Makkah experiencing the greatest near-term sector growth.

As our forecasts indicate, demand in the sector is growing at a compound annual growth rate (CAGR) of 2.3 percent while the CAGR of supply is 1.3 percent. As the gap in supply and demand for healthcare services continues to grow through 2030, so will opportunities for private health care providers.

Saudi Arabia is evaluating the current structure of its health care system in the context of issues such as a high prevalence of lifestyle diseases, preventative health initiatives, and innovative models of health care delivery. Obtaining human resources in terms of the trained healthcare professionals needed to meet rising demand will present a challenge. Both private sector and public sector providers have hired international staff, but developing the domestic capacity to meet these needs has become a priority. Labor productivity is expected to see continued growth, suggesting that national reforms have shown enough effectiveness to hire more Saudis in the private sector without diminishing productivity. Multinational corporations in medical products and services provide on-the-job training perspectives in highly skilled areas of work. A rising number of Saudi graduates from medical college programs, and training programs created through joint ventures will help to mitigate challenges in human capital.

Within the healthcare and medical industry, Saudi Arabia's privatization agenda as part of Vision 2030 will create new opportunities for foreign investors and foreign companies looking to gain or expand their presence in the Saudi market. The Saudi Government has underscored the importance of improving healthcare provisions through the modernization and expansion of state and privately run healthcare facilities. The private sector accounts for about 30 percent of the local healthcare market, though reform efforts underway by Saudi Arabia will bolster the private sector's position in the medium to long horizon. The Saudi Government's efforts towards openness in the

healthcare sector over the past couple of years strikes a notable contrast to past years. Among these efforts are transparency of the healthcare budget and spending, along with encouragement of private sector participation in healthcare, demonstrating commitment to attracting foreign investment. Opportunities for private-public coordination are expected to continue in areas such as specialized offerings in public hospitals, construction of new medical centers, long-term care services, e-health, pharmacy, laboratory, radiology, and hospital administration.

About one-third of the population in Saudi Arabia has health insurance. Changes to compulsory health insurance laws have expanded the medical insurance market, valued at \$6.7 billion (SR25 billion). The expansion of health insurance coverage may also influence pharmaceutical demand and prices as providers may prescribe generics treatments to minimize costs.

The pharmaceutical market in Saudi Arabia is the largest in the Gulf Cooperation Council (GCC), valued at over \$8.5 billion (SR32 billion), and segmented into prescription and over-the-counter products. While Saudis have traditionally preferred branded products, the market for generic products is expanding, though both branded and generics products are projected grow in the near term. Saudi Arabia also has a strong market for medical devices, particularly driven by an increasing need for diagnosis equipment and extended care.

As part of Vision 2030 and the National Transformation Program (NTP) 2020, the Saudi Government has set targets to boost local manufacturing of medical products and to develop an integrated pharmaceutical and medical device manufacturing cluster. In 2016, there were 16 licensed pharmaceutical factories planned with over \$400 million (SR1.5 billion) in financing, indicating early progress towards these goals. U.S. multinationals such as AbbVie, Cerner, GE Healthcare, Johnson & Johnson, Merck & Co, Pfizer, Welch Allyn, 3M, as well as small and medium enterprises (SMEs) have a growing presence in the Saudi Arabian healthcare sector. Partnerships with Saudi Arabia and U.S. firms such as Johnson & Johnson and AbbVie have focused on localizing production of key therapies needed by Saudis. Multinational manufacturers benefit from partnerships with local Saudi firms who distribute and promote their products.

The Ministry of Health (MOH) has undertaken initiatives aimed to grow the local pharmaceutical industry, privatize hospitals, and remake primary healthcare

centers. Overall, the Ministry is addressing a need to consolidate services and boost efficiency. Near term transformation progress, however, depends on targeting the easily obtained gains in the healthcare system and the trade off in terms of the country's comfort with the current system with potential long-term individual and economic benefits.

In 2017, the United States healthcare sector has been one of the best performers in terms of investment, with a particularly strong biotechnology subsector. Demand in the U.S. healthcare sector continues to be robust, partially driven by an aging population. In the near term, California, Florida, Illinois, New York, Ohio, Pennsylvania, and Texas are among the top regional marketplaces for both ambulatory and nursing care services. Over the past years, the U.S. healthcare market has seen a trend of consolidation and has become more consumer-driven and value-based. Innovative technologies and business models continue to

emerge, disrupt, and to some extent, limit rising costs.

The U.S.'s premier academic institutions, pharmaceutical manufacturers, and healthcare providers continue to occupy key positions within Saudi Arabia's healthcare sector. As a valuable trading and investment partner, the United States plays a substantial role in the Saudi Government's ongoing sector transformation and privatization plans. Promising commercial prospects exist across various medical services, medical devices, hospital management and joint ventures, training of medical staff, pharmaceutical manufacturing and distribution, information technology and data management. These prospects are in digitization of records and patient billing, provision of health insurance, and local development of bioequivalence centers and clinical research organizations in the Kingdom. Continued bilateral cooperation will be instrumental in long-horizon advancement of the Saudi healthcare sector.

Key Healthcare Sector Trends

- Saudi Arabian Government-initiated economic reforms to the healthcare sector as outlined in Vision 2030 and the National Transformation Program.
- A growing gap in the supply and demand for Saudi Arabian healthcare services through 2030.
- An increased role of the Saudi private sector and emerging opportunities for public-private partnerships.
- Increased foreign investment in the Saudi healthcare sector, especially in areas such as long-term care.
- A larger Saudi Government budget appropriation to healthcare and development services.
- An increased capacity of privately-managed facilities in Saudi Arabia.
- Underutilization of Ministry of Health Primary Health Care centers.
- Pilot projects initiated by the Ministry of Health with focus areas such as primary health.
- Localization of pharmaceuticals manufacturing in Saudi Arabia.
- Expanding markets in Saudi Arabia for both branded and generic products.
- A rise in labor productivity in the Saudi healthcare sector.
- Increased opportunities for foreign participation in professional development and training in the Saudi healthcare sector.
- Rising wages and a growing number of Saudis working in pharmaceuticals manufacturing.
- More Saudis enrolling and graduating from medical programs.
- Increased opportunities for foreign investors in Saudi Health IT.
- Growing medical insurance coverage in Saudi Arabia.
- Consolidation in the global medical device industry.
- The economy in the U.S. healthcare sector becoming more consumer-driven and value-based.
- Increasing U.S. demand for hospital and ambulatory services.
- Technological innovations, especially with medical devices, placing downward movement on costs in U.S. healthcare sector.
- Eased U.S. FDA therapy approval procedures.

Saudi Arabia – Increased Demand and Privatization of Healthcare

The demand for healthcare services continues to increase in Saudi Arabia with a 36.3 percent projected increase in demand by 2030. We project a 2.3 percent compound annual growth rate (CAGR), presenting growing opportunity for investment. Between 2017 and 2020, we project that national demand for healthcare will increase by 7.9 percent. The demand growth in the Eastern Province steadily outpaces other areas of the country on a yearly basis. Through 2020, the Eastern Province, Makkah, and Riyadh have the greatest projected expansion. However, projections through 2030 show that longer-term demand growth will be greatest in the Eastern Province, Makkah, Madinah, and Al-Jouf. The country’s changing demographics is one of largest factors that will drive growth of Saudi Arabia’s health care sector in coming years. The trend of increasing demand correlates with a growing Saudi population, increasing proportion of elderly Saudis, and a rising occurrence of lifestyle-related and chronic diseases. The percentage of the population age 65 years and older, those with the greatest healthcare requirements, is projected to increase from 3.6 percent to 7.7 percent of the total population between 2017 and 2030. The 65 years and older population segment will account for a larger share of the population as life expectancy increases.

A growing gap between the demand and available services has emerged, especially for rehabilitation and

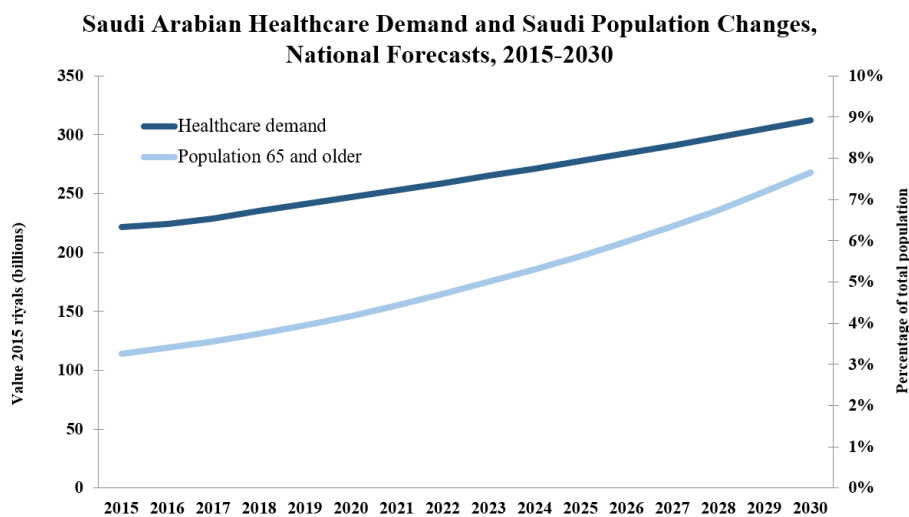
long-term care, that makes the area a key focus for private sector involvement. With an increasing number of elders requiring care and restructuring of how care is delivered, the demand for home health care is rapidly increasing in a previously inexistent area of services. Saudi Arabia’s healthcare market is one of the most advanced in the GCC, yet a limited number of long-term care operators exist with respect to the size of the population.

Forecasts indicate that by next year, Saudi Arabia will account for nearly 60 percent of the total healthcare market in the GCC overall. A clear supply and demand gap will continue to widen with the current trajectory of the sector. The CAGR of national supply is 1.3 percent, and the compound annual growth rate of national demand is 2.3 percent, suggesting more opportunities for service providers.

The Saudi Arabian Government has continually emphasized the increased role of the private sector through privatization and financing of activities related to job creation and investment. The healthcare sector has been opened to global healthcare companies and Saudi citizens, likely promoting increased competition. High-level officials involved in the sector have indicated part of a strategy to change regulations, thus encouraging private sector involvement. In 2016, H.R.H. Deputy Crown Prince Mohammed bin Salman told Bloomberg:

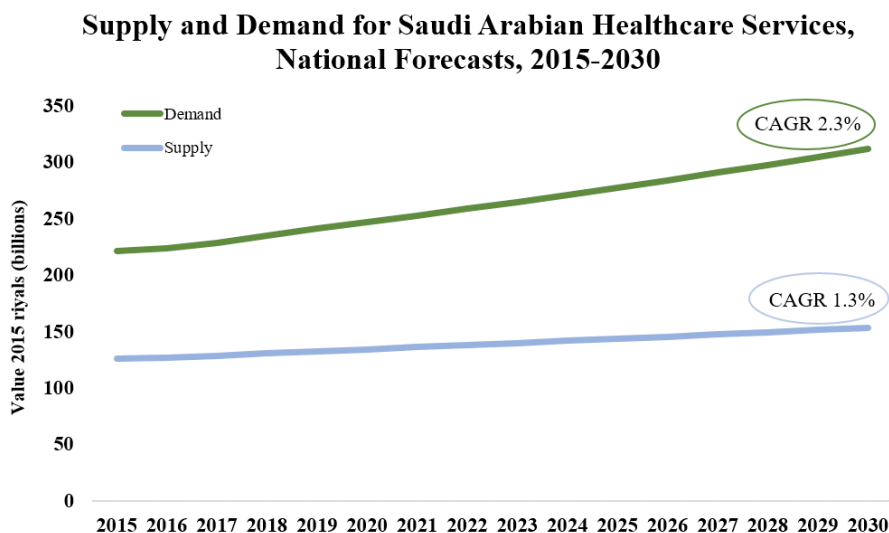
“The most important sectors are the healthcare and services sectors. In healthcare, we are trying to get rid of all the assets owned by the government and transfer

FIGURE 1: Saudi Arabian Healthcare Demand and Aging Saudi Population National Forecast, 2015-2030



Source: REMI, USSABC

FIGURE 2: Supply and Demand for Saudi Arabian Healthcare Services
National Forecast, 2015-2030



Source: REMI, USSABC

them into a holding company. We are trying to push for more health insurance by convincing the citizens that services provided through health insurance are better than the free healthcare services, and faster for them. We will also transfer our health treatment programs abroad to domestic programs and we will also incentivize our partners abroad to invest in healthcare locally. Regarding the services sector, we have a number of entities that have privatized a lot of their services such as the interior ministry. We are trying to encourage the rest of the services ministries to follow in their footsteps. I believe we have the knowledge and the know-how.”

Saudi Arabia established the National Center for Privatization near the end of 2016, a center that will oversee national privatization policies and programs, and will facilitate public-private partnerships, including healthcare.

The private sector currently accounts for about 30 percent of the local health care market. In 2016, SAGIA said that it plans to present near-term investment opportunities to the private sector valued at \$10.7 million (SR40 million).

Processes for international investors have eased in recent years. Non-Saudis may now own and operate hospitals in Saudi Arabia. In an effort to allow companies to attract qualified health professionals, experienced workers may now move among institutions without restriction.

Total inpatients to private sector hospitals in Saudi Arabia reached 1.2 million in 2015, 42 percent growth from 2011. The growing demand for private sector hospitals

exceeds the rate of growth of inpatient visits across all hospitals, with an increase of 10.6 percent over the five-year period. Private sector outpatient visits have also increased by 18.1 percent from 2011 to 2015, reaching 50.5 million, and exceeding total outpatient growth of 5.1 percent.

We project a 7.3 percent compound annual growth rate in the private sector health care market through 2020.

Economic Reform

Vision 2030

Saudi Arabia has laid out larger goals to create a diversified economy and limit dependence on the public sector in its Vision 2030 strategy document. Healthcare sector reforms will complement these goals. The Vision 2030 strategy aims to increase private sector participation in healthcare, and as outlined in the document, the Ministry of Health intends to limit its role to regulatory and supervisory work. According to Vision 2030, *“The public sector will focus on promoting preventative care, on reducing infectious diseases and encouraging citizens to make use of primary care... The public sector will focus on its planning, regulatory and supervisory roles... We intend to provide our health care through public corporations both to enhance its quality and to prepare for the benefits of privatization in the longer term. We will work towards developing private medical insurance to improve access to medical services and reduce waiting times... doctors will be given better training to improve treatments for chronic diseases.”*

Economic reforms outlined in the National Transformation Program (NTP), released in June 2016 under the supervision of H.R.H. Deputy Crown Prince Mohammed bin Salman Al-Saud, includes a strategic target to raise total private expenditure. In the NTP, the Ministry of Health aims to increase private sector contribution to total health care from 25 percent to 35 percent by 2020. Additionally, the NTP calls for 70 percent of Saudi citizens to have unified digital medical records by 2020.

In addition to changing how the health sector operates in order to foster excellence in healthcare delivery, the reforms ultimately aim to increase the health of citizens. Saudi Arabia intends to rise in its global rank in Social Capital Index from 26th to tenth through increased preventative healthcare services, medical technology, private sector integration, and increased competition. Under the NTP, the Ministry of Health will oversee a plan to enhance training for health professionals for the treatment of chronic diseases. These plans also direct the Ministry of Health to optimize and better utilize the capabilities of public hospitals and healthcare centers.

Additional healthcare sector aims include the following:

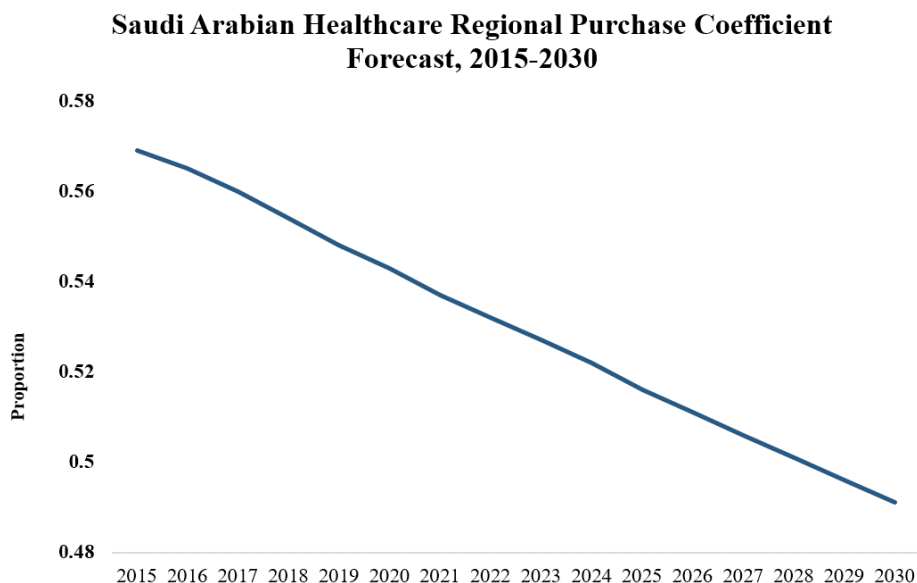
- As part of the NTP, the Ministry of Energy, Industry, and Natural Resources has set a goal of increasing the contribution of local pharmaceuticals manufacturing to total market value from 20 percent to 40 percent by 2020.

- Vision 2030 sets out to increase Saudi Arabian life expectancy from 74 to 80 by 2030.
- Vision 2030 calls for Government and private sector coordination to create initiatives which will allow Saudi Arabian citizens and residents to engage in sports and leisure activities to increase physical fitness. In tandem, the NTP calls for a one percent reduction in Saudi obesity rates by 2020.
- To raise the number of licensed medical facilities to 100 from 40 by 2020.
- Double the number of qualified nurses by 2020.
- Develop private medical insurance to improve access to medical services.

Increasing Reliance on Foreign Investment

In coming years, the proportion of goods and services purchased from domestic producers, the regional purchase coefficient, is projected to decline [see figure 3]. This decline suggests that Saudi Arabia will increasingly rely on imports across the sector, presenting an expanding market opportunity for health-related investment.

FIGURE 3: Saudi Arabian Healthcare Regional Purchase Coefficient Forecast, 2015-2030



Source: REMI, USSABC

Entering the Market

Reforms allow 100 percent foreign ownership in the sector, however, foreign companies tend to coordinate with local representatives when conducting business in Saudi Arabia, including local agents or legal counsel. Foreign companies in Saudi Arabia also tend to work with local distribution firms, and given the nature of a close business community, companies may wish to spend time finding a Saudi business partner since dissolving a relationship with a Saudi distributor may require compensation. While not a strict requirement, some distributors or agents may prefer exclusive contracts. A five percent customs duty is typically charged on medical device imports, though some equipment can be exempted when sent to a government project or organization.

Pilot Programs

The Ministry of Health has identified opportunities for public-private partnerships in areas that can be outsourced – such as laboratory, pharmacy, and radiology — within large hospitals, primary health care centers, and extended care facilities. The ministry has also targeted primary health care centers, rehabilitation, medical cities, long-term care, and home care for private healthcare delivery. The Ministry of Health has begun assessment of pilot projects in the first quarter of 2017, and in the second and third quarters will go through prequalification and request for proposal issuance with investors.

Implementation of the pilot projects will occur beginning in 2017 through 2022. For each private sector participation (PSP) initiative, the Ministry is establishing a business unit to head request for proposals, to coordinate with private partners, and to oversee funds. Organizations responsible for service delivery, such as primary health care centers, will form special purpose vehicles (SPVs), such that shareholders will consist of a group of private companies in Saudi Arabia's Public Investment Fund.

Measures taken to boost competition and transparency will allow the Government to shift its role to a more limited one in the long-term. The public-private partnership model will establish a greater sense of stability among private Saudi healthcare workers in terms of job stability. The Saudi Ministry of Health has set the goal to privatize 295 hospitals and 2,259 health centers by 2030. The next step is to shift management of public hospitals to corporate entities.

Private Sector Investments

Based on data from Thomson Reuters, there have been some major private investments from foreign companies. The following are examples of this activity.

- Amanat's acquisition of a 33.2 percent stake in the Saudi long-term care provider Sukoon International Holding for \$47.78 million (SR179.2 million) in 2015.
- Abu Dhabi's NMC Health also announced in August 2016 that the firm had bought a 70 percent stake in As Salama Hospital in Al Khobar for \$28 million (SR105 million). NMC Health also invested \$4 million (SR15 million) in a 120-bed long-term care facility in Jeddah that has the potential to expand to 220 beds.
- In 2016, Aster DM Healthcare Group from Dubai planned to build or acquire four healthcare facilities in Saudi Arabia within four years.
- In January 2017, Dubai-listed Amanat Holdings acquired a 13.2 percent stake in Saudi-based International Medical Company (IMC) for \$97.01 million (SR363.85 million). Amanat said it will assist IMC, which operates a 300-bed multi-disciplinary hospital in Jeddah, with expertise and capital as the Saudi hospital expands operations both within the existing facility and the Western Region over the next five years.
- Pfizer opened a \$50 million (SR187.52 million) manufacturing facility in January 2017 in King Abdullah Economic City.

Along with sector growth driven by demand, healthcare providers continue to provide more diversified and broadened services, and recent deals point towards consolidation in the sector. Notably, Saudi Arabia has seen a trend of increasing mergers and acquisitions (M&A), expected to continue with further consolidation. Throughout 2015 and 2016, NMC Health deployed a strategy to diversify its portfolio, acquiring multiple healthcare providers such as fertility services provider Fakh IVF and long-term care provider ProVita Medical Center. Dubai-based Aster DM Healthcare also acquired the majority stake in Sanad Hospital. Consolidation of healthcare services provides well-documented benefits such as cost-efficiency and patient safety. Creation of more specialized services will aid in removing duplicate services provided at government hospitals and centers.

Growing Value of Healthcare Industry

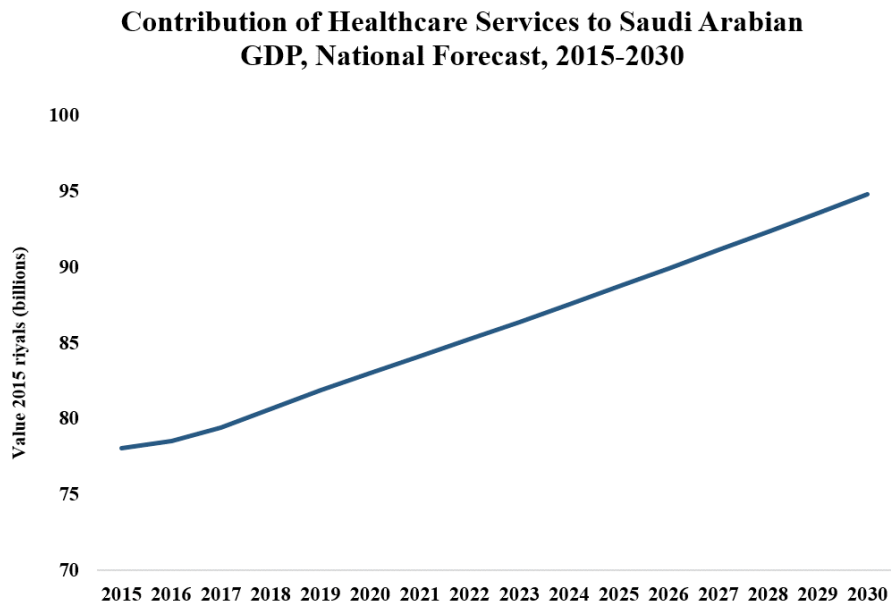
Overall, the healthcare industry in Saudi Arabia contributes an estimated 12 percent to the country's gross domestic

product (GDP). Regionally, Riyadh and Makkah had the greatest impact on GDP from the sector, comprising 29 percent and 28 percent, respectively. Nationally, health services contribution to GDP is forecasted to increase by 4.5 percent between 2017 and 2020 and by 19.4 percent between 2017 and 2030. Riyadh and Makkah each have high growth levels of nearly 4.4 percent through 2020. The Eastern Province sees a 5.6 percent increase in value-added activities in the sector followed by Al-Jouf with a 4.5 percent increase in contribution. The healthcare sector is projected to see continued expansion in the near future with over a 13 percent increase in the contribution of the healthcare sector towards Saudi Arabian GDP by 2025 [see figure 4].

in 2015 set a new record and included construction of 11 new hospitals, two medical cities, and 20 medical centers and polyclinics. Looking to increase cost-efficiency, the 2016 budget for the sector was \$27.96 billion (SR104.86 billion), accounting for 12.5 percent of total budget.

The 2017 budget appropriation to healthcare and development services increased to over 13.5 percent of budget allocation at \$32.11 billion (SR120.42 billion), nearly a \$5 billion (SR18.75 billion) increase. A large proportion of the healthcare budget is devoted to building new health infrastructure. A total of 38 hospitals and primary health facilities are to be built with a total capacity of 9,100 beds, along with two medical cities

FIGURE 4: Contribution of Healthcare Services to Saudi Arabian GDP
National Forecast, 2015-2030



Source: REMI, USSABC

Research has shown that domestic healthcare expenditure stimulates long-run economic growth.¹ Much of the growth seen in the healthcare sector today might be attributed to past public investment in national infrastructure. Between 2003 and 2014, the Saudi Government invested over \$7 billion (SR26.25 billion) in the construction of more than 80 hospitals. The Saudi Government allocated an average of \$34.25 billion (SR128.43 billion) per year between 2015 and 2017 with a total investment of \$76.07 billion (SR285.28 billion) in the healthcare sector. With a record health budget of \$42.7 billion (SR160 billion), expenditure

with a combined capacity of over 2,000 beds.

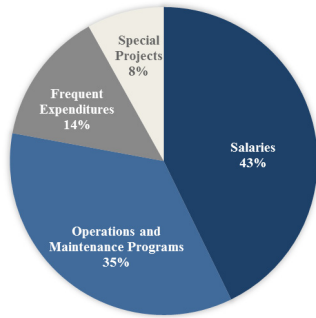
In terms of budget appropriation to MOH, 2015-2016 allotted \$16.62 billion (SR62.34 billion), 2014-2015 year was \$16 billion (SR59.98 billion) and previous year was \$12.55 billion (SR47.08 billion). The proportion allotted to staff salaries has decreased to 43 percent, down from nearly 50 percent two years prior [see figure 5]. The amount spent on operations and maintenance programs has grown to 35 percent from 28 percent two years prior.

While the Government has budgeted larger amounts towards the sector, Saudi Arabia's 4.7 percentage of

¹ Alshahrani and Alsadiq Economic Growth and Government Spending in Saudi Arabia: an Empirical Investigation, IMF

FIGURE 5: 2015-2016 MOH Budget Appropriation

2015-2016 MOH BUDGET APPROPRIATION



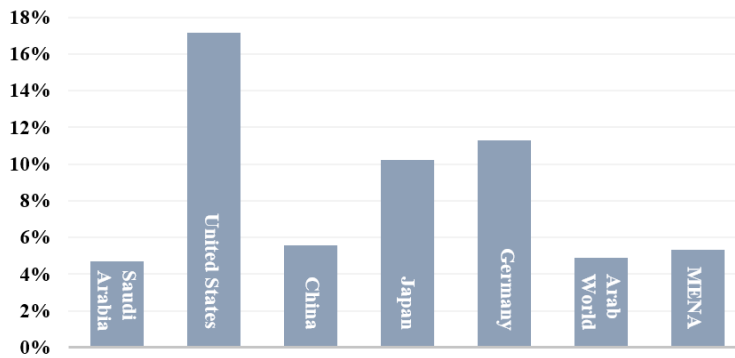
Source: General Authority for Statistics, USSABC

healthcare spending as percentage of GDP lags behind other developed countries, though the level is on par with the MENA Region and Arab world [see figure 6]. Public healthcare expenditure was approximately 3.5 percent of GDP and private healthcare expenditure was nearly 1.2 percent of GDP [see figure 7]. Healthcare expenditure indicates the value of final consumption of health care goods and services including personal health care and collective services, though does not include investments.

Overall health expenditure grew, but this was accounted for by an increase in public health spending. There remains room for private health spending across a variety of subsectors with growing demand such as specialized care, long-term and rehabilitation centers, home care, primary health care centers, and manufacturing of biotechnology and disposable medical equipment.

FIGURE 6: Healthcare Spending as Percentage of GDP

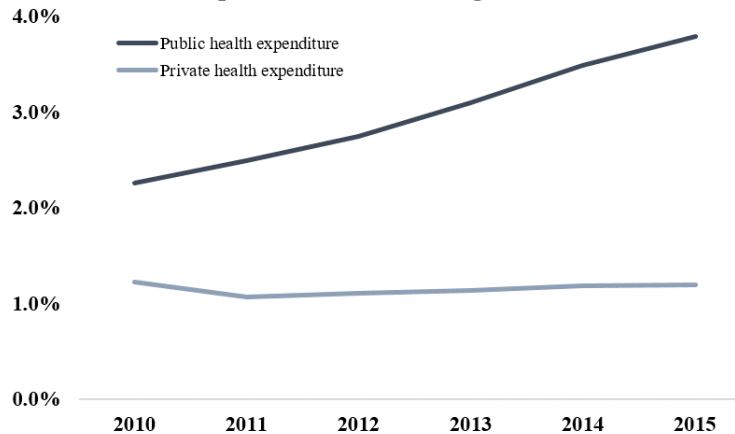
Healthcare Spending as Percentage of GDP



Source: 2014 World Health Organization Global Health Expenditure database, USSABC

FIGURE 7: Saudi Arabian Public and Private Health Expenditures as Percentage of GDP

Saudi Arabian Public and Private Health Expenditure as Percentage of GDP



Source: World Bank Development Indicators, USSABC

Healthcare Sector Structure and Regulatory Environment

Key Agencies and Changes

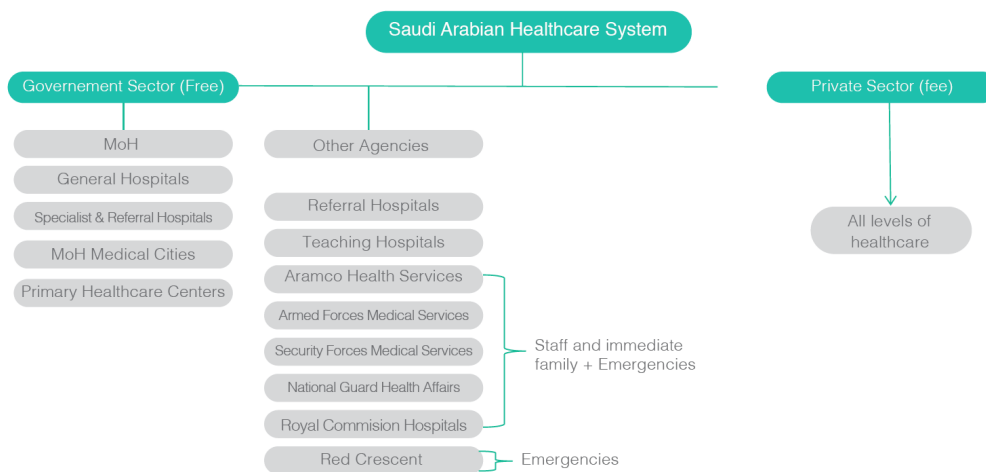
The Ministry of Health (MOH), government organizations, and the private sector participate in operation of the healthcare sector [see figure 8]. The Ministry of Health is responsible for a broad range of activities. The MOH oversees provision of healthcare, promoting health in Saudi Arabia, monitoring health institutions, training in health investment, and governing both public and private branches of the sector. Regulations require that all pharmaceutical companies register. Historically, the regulatory process for registration has taken 6 months to 18 months to complete and require renewed registration every five years. However, time to approval has become increasing faster, especially in light of efforts to attract more foreign players to the sector. The structure of healthcare services in Saudi Arabia is tiered [see figure 9], with the tier 1 covering primary health care services. This network of care covers basic, emergency, and preventative services along with prenatal care and vaccinations. Tier 2 services include

advanced hospitals and specialized care. Saudi Arabia’s specialized hospitals provide an array of specialties such as treatments for eye diseases or respiratory conditions.

The Saudi Commission for Health Specialties (SCHS) supervises and evaluates training programs. The scientific body also controls standards for licenses of health professionals. The SCHS has been involved in the establishment of modern healthcare institutions to train health personnel. The commission works to strengthen the performance of health professionals to apply expert knowledge in various health specialties and to contribute to scientific literature.

The Saudi Food and Drug Authority (SFDA) regulates the import, distribution, and market withdrawal of manufactured products including medical devices and pharmaceuticals. It is the SFDA’s responsibility to keep an ongoing account of registered manufactured products. It oversees the inspection of manufacturers, importers, and dispensaries of medications. The regulatory body also controls prices and monitors drug safety, quality, and efficacy. In order to license a new drug, the process takes an average of 18 months from submission to license. A

FIGURE 8: Saudi Arabian Healthcare Systems Flowchart



Source: Ministry of Health, General Directorate of Hospitals

FIGURE 9: Saudi Arabian Healthcare Systems Organization

<i>Saudi Arabian Healthcare System Organization</i>	
Tier 1	Primary health centers and clinics providing basic, preventative, and emergency services Mobile clinics serving remote regions
Tier 2	Network of secondary care hospitals in major urban areas Specialized treatment facilities in major urban areas

company is required to undergo quality tests and a stability assessment to show stability in Saudi Arabia's physical climate if it wants to launch a new product. Once the authorities have reviewed a product's adherence to certain specifications, a license will be issued to the applicant assuming that all specifications are met. Following SFDA approval and pricing, a product can then be sold. Reportedly, local manufacturers or producers as part of joint ventures have a much shorter registration process, as few as three months. For approval of new pharmaceuticals, the SFDA follows the same Good Manufacturing Practice guidelines set by the U.S. FDA.

The Saudi Arabian General Investment Authority (SAGIA) oversees and promotes investments into Saudi Arabia, including those in the healthcare sector. The authority works not only to attract investment, but also to foster a productive business environment. According to SAGIA, Saudi Arabia will spend approximately \$70 billion (SR262 billion) over the next decade on investment opportunities in the healthcare sector to meet a growing demand for services.

Special Projects and Joint Ventures

Security Forces Medical Complexes: This ten-year strategic plan laid out in 2010 by the MOH, has the goal to create an integrated network, merging nearly 3,500 health care facilities and over 70,000 beds. The program incorporates new hospitals, specialized medical centers, and primary health care centers and includes medical cities – King Khalid Medical City in Dammam, King Abdullah Medical City in Makkah, King Faisal Medical City in Abha, King Abdulaziz Medical City in Riyadh expansion (part of the Ministry of National Guard Health Affairs), Prince Mohammed Medical City in Al Jouf.

Integrated and Comprehensive Health Program (IChP): This ten-year strategic plan laid out in 2010 by the MOH, has the goal to create an integrated network, merging nearly 3,500 health care facilities and over 70,000 beds. The program incorporates new hospitals, specialized medical centers, and primary health care centers and includes medical cities – King Khalid Medical City in Dammam, King Abdullah Medical City in Makkah, King Faisal Medical City in Abha, King Abdulaziz Medical City in Riyadh expansion (part of the Ministry of National Guard Health Affairs), Prince Mohammed Medical City in Al Jouf.

Johns Hopkins Aramco Healthcare (JHAH): This joint venture between Johns Hopkins Medicine and Saudi Aramco began in 2013 to expand the medical capabilities previously offered by Aramco. In addition to providing healthcare, JHAH provides clinical program development, research, training, and health care administration expertise.

King Fahad Medical City (KFMC): The Riyadh medical city was commissioned in 2005 and has been operating as a model medical city. It includes a general hospital along with pediatric, maternity, and rehabilitation hospitals. Dr. Mahmoud Al-Yamany, CEO of KFMC reports that the medical city has developed a local training program across a variety of medical specialties and healthcare administration. Master's degree programs in health administration collaborate with U.S. universities such as the University of Minnesota and Washington University in St. Louis. Master's degree programs in research and medical education collaborate with other international universities from the United Kingdom.

Riyadh's Medical Village: An area of over 250,000 square meters is currently under development by a group of private investors. The area contains eight hospitals with 130 beds each and 60 outpatient clinics.

Other planned projects that are currently under construction or pending include:

King Abdullah Medical City: This \$1 billion (SR3.75 billion) project located in Makkah is in the design phase. The medical city is planned to have three hospitals and 10 medical centers, with a 1,500 bed capacity of the primary hospital building, of which 500 beds have been allotted for specialist referrals.

King Khalid Medical City: This \$1.2 billion (SR4.50 billion) design-phase project, located in Dammam will serve as an academic medical center with 1,500 single-patient rooms, a 500-bed private community hospital, and medical schools and hotels.

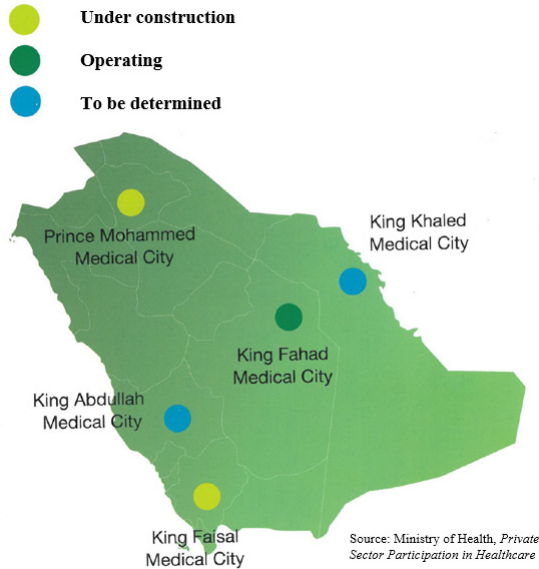
King Faisal Medical City: Located in Abha, this \$1.1 billion (SR4.13 billion) project will have a 1,350-bed capacity and serve the southern part of Saudi Arabia.

Prince Mohammed Bin Abdulaziz Medical City: Located in Al-Jouf, this project will serve the northern region and will have a 1,000-bed capacity.

Clemenceau Medical Center: This medical center is affiliated with Johns Hopkins International. The center will be located on King Fahd Road in Riyadh, Saudi Arabia with a 180 bed and 62-consultation unit capacity. Services will be provided for acute care treatment, intermediate care, and home care, along with a broad offering of medical and surgical specialties. The center plans to integrate advanced screening and diagnostic services.

The Medical Park at Prince Sultan Cultural Center: This healthcare campus will be built at the north end of the mixed-use development project, just west of Jeddah. Total capacity will be 900 hospital beds.

FIGURE 10: Medical City Map

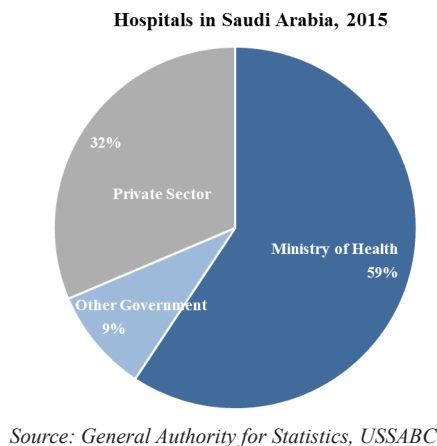


Facilities

Establishing a hospital requires approval from the Ministry of Commerce and Investment as well as MOH. The General Directorate of Health gives the final authorization, and SAGIA gives approval if the establishment application is a foreign national entity.

The number of total hospitals in the Kingdom rose from 420 in 2011 to 462 in 2015, with a total of 69,394 beds. The Ministry of Health operates most of the government-run hospitals, accounting for 59 percent of all of Saudi Arabia’s hospitals in 2015 [see figure 11]. Between 2012 and 2016, the Ministry of Health issued decisions to close 280 facilities including hospitals, clinics, and pharmacies. These closures included Kingdom hospital in Riyadh.

FIGURE 11: Hospitals in Saudi Arabia, 2015



Other government-run hospitals which are not operated by the Ministry of Health include university hospitals and health centers, Ministry of National Guard centers, hospitals managed by the armed services, Ministry of Interior health centers, and those operated by the Royal Commission for Jubail and Yanbu and Saudi Aramco. King Faisal Specialist Hospital and Research Center is independently managed.

Privately managed facilities have grown over the past few years in stride with government initiatives and regional trends towards growing private sector involvement in the health industry. There were 145 private hospitals in 2015 [see figure 12], a seven percent increase from 2013, the majority of which are in the Riyadh and Jeddah provinces. During the same time period, the number of MOH hospitals increased by 2.2 percent from 268 to 274 hospitals [see figure 13]. In 2015, there were 16,648 private hospital beds, up from 14,310 in 2013, a 16 percent increase. Makkah has 45 private hospitals, 31 percent of the nation’s total and a quarter of the nation’s hospital beds. Riyadh contains 36 private hospitals, a quarter of the nation’s private hospitals. In Riyadh, there were 4,904 private hospital beds (30 percent of total). The Eastern Province contains 26 private hospitals, 18 percent of nation’s private hospitals and 26 percent of total private hospital beds. As the Ministry of Health shifts the burden of care to the private sector, long-term and post-acute care service (LTPAC) opportunities will emerge. At times over 30 percent of beds in Ministry of Health hospitals have been occupied by patients requiring these services due to a high rate of severe traffic accidents.

FIGURE 12: Saudi Arabian Private Sector Health Facilities, 2015

Saudi Arabian Private Sector Health Facilities, 2015	
Hospitals	145
Beds	16,648
Polyclinics	2,670
Clinics	77
Laboratories	104
Physiotherapy Center	122
Opticals	2,262
Dental Prosthetics	77
Pharmacies	7,815

Increased capacity through private sector facilities and number of beds is an example of private sector success in meeting growing demand. As reported in 2012, Saudi Arabia had experienced a bed shortage, among other resources at healthcare facilities.²

In addition to hospitals, the Ministry of Health operates a number of other health facilities with specialized practices. These facilities include cardiology, diabetes, dental, oncology, dialysis, and rehabilitation centers. They also include individual facilities for laboratory work, forensic medicine, and anti-smoking clinics. A growing number of these facilities exist to help combat health concerns in the Kingdom. In 2015, there were 146 dialysis centers, 53 anti-smoking clinics, and 21 diabetes centers.

FIGURE 13: Saudi Arabian Ministry of Health Facilities, 2015

Saudi Arabian Ministry of Health Facilities, 2015	
Health Care Center	2,282
Hospital	274
Cardiology Center	9
Oncology Center	4
Diabetes Center	21
Dialysis Center	146
Dental Center	35
Rehabilitation Center	16
Central Laboratory	10
Health Centers Control	22
Anti-Smoking Clinic	53
Forensic Medicine	20

Primary Health Care Centers

In 2015 the MOH network increased to 2,282 primary health care centers (PHCs) and mobile clinics from the 2,109 centers in 2011, with 18 percent of PHCs located in Riyadh. The number of total personnel, including

physicians, dentists, nurses, and other allied health professionals increased from 36,758 in 2011 to 38,514 in 2015. There were 29,395 Saudis employed by PHCs in 2015, a 12.3 percent rise from 2011, and 9,119 non-Saudis employed, a 13.9 percent decrease from 2011. With only 77 private clinics in operation in 2015, there is still room for growth. The largest number of private clinics in 2015 provided general medicine (11), obstetrics and gynecology (10), dentistry (9), ophthalmology (9), and ear, nose, and throat (7).

The NTP targets to raise the number of primary care visits per capita from two to four by 2020 through addressing underutilization of primary health care centers.

Underutilization of PHCs presents a key opportunity for growth as some patients have tended to use hospitals and specialists as their primary contact. As part of Vision 2030, the Government has set a goal of a greater role for these PHC services, and the Ministry of Health has set an objective to make PHCs more than gatekeepers for secondary care through increasing the effectiveness of PHC centers in protection, prevention, and health promotion. Not only would this model improve quality of primary care, it would ideally reduce costs and decrease pressures on hospitals and specialized health center facilities.

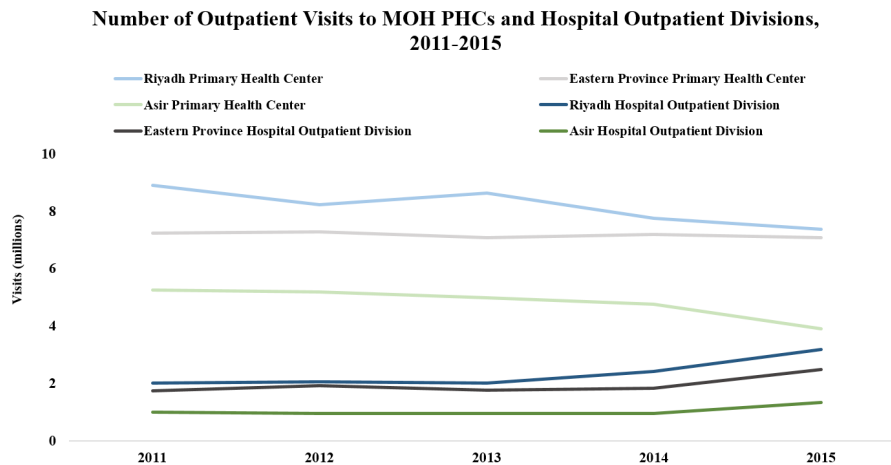
As a result of the influx of patients, it is common for major hospitals to have primary care facilities that see patients before they see specialists. For instance, King Faisal Specialist Hospital and Research Center offers primary care.

Private sector growth outside of highly populated areas has remained low because of lack of financial incentives and underutilization of PHCs. Between 2011 and 2015, the number of total visits to Ministry of Health healthcare centers in the Kingdom declined by nearly 4.9 million. This also appears to be a regional issue as most of the net decline in outpatient visits at primary health care centers can be accounted for by substantial dips in visits in Riyadh, Makkah, and Asir [see figure 14]. Simultaneously, there is some increase in the number of outpatient visits at Ministry of Health hospital outpatient divisions.

It will be necessary to change the common public perception around PHC care as lesser than hospitals through public awareness campaigns to underscore the available services and key benefits. Saudis also prefer to visit locations with Saudi staff, though traditionally Saudi medical professionals have preferred to be tertiary care providers where they perceive benefits of better career advancement opportunities and access to specialized treatment technologies. In 2015, 35.6

² Kingdom of Saudi Arabia Healthcare Overview. Colliers International, 2012.

FIGURE 14: Number of Outpatient Visits to MOH PHCs and Hospital Outpatient Divisions 2011-2015



Source: General Authority for Statistics, USSABC

percent of physicians at MOH health centers were Saudi. These efforts will shift the model away from secondary and tertiary care centers as primary contact points and allow more economical use of Saudi facilities. There is potential to maximize utility, streamline services, and reduce wasted resources.

In its *Healthcare Commercial Prospectus* guide, the Ministry of Health hopes to increase the average annual number of visits to PHCs to at least 3.5 per person. To this end, the Ministry of Health has outlined objectives to enhance and rebrand PHCs, create a competitive market for provisions, shift PHCs towards family medicine, and restructure these centers by moving dental care to separate dental centers and moving laboratory services to centralized locations. The MOH is currently implementing a pilot program to construct five new PHCs and to renovate 50 more PHCs in Riyadh covering a catchment area of nearly one million people. This is nearly an \$80 million (SR300 million) investment that is expected to create nearly 1,500 health care jobs. Services will include family physician clinics, minor surgical services, pediatric clinics, and obstetrics and gynecology services.

The new operating model will involve private-sector partnerships and divide PHCs in urban areas into at least three groups such that each group will have PHCs in all urban districts and will then assign a separate PHC provider to each of these groups. The overlapping catchment areas in urban districts will drive quality since providers will have to compete for patients. Patients will initially be assigned to a specific PHC, and after the first year, will be free to choose. As effective competition is not possible in rural areas because the sparsity of patients, each PHC provider will be assigned a single rural area

in its bundle of PHCs. Each provider will be paid a base payment calculated from a per capita fee, number of registered patients, Saudization multiplier, and the population profile. A performance incentive payment will be added to the base payment.

Operation of the network will also change, with dental services moved out of PHCs and to separate dental clinics operated by the same business group overseeing PHCs. Pharmacies will continue to be located inside of PHC centers but will be operated by private pharmacy companies. Laboratories will be moved outside of PHC centers to be privately operated by primary care central laboratory (PCCL) companies. The scope of services provided by PHCs will cover diagnosis and treatment, health prevention and promotion, and imaging.

The high volume of centers and capitation-based payments in the model supports a viable commercial feasibility. Revenue is guaranteed in the first year because of the fixed number of registered patients at each centers. Incentive payments will promote outperformance of key performance indicators and improve health outcomes. Through competition there is potential to increase the patient base, and there a possibility of expanding the market to non-Saudi residents once they become eligible for services.

Private Sector Participation Initiatives

Radiology

In 2015, there were nearly 6.5 million patients using radiography services from Ministry of Health hospitals

across the country and another 200,000 radiography patients spread across Ministry of Health primary care centers, with the largest numbers of patients in Makkah, Riyadh, and the Eastern Province. As part of the new Private Sector Participation (PSP) initiative, the Ministry of Health aims to address issues in radiology services such as underutilization of equipment and low number of scans, poor access and long wait times to access MRI and CT scans, and low patient satisfaction. Objectives include increasing utilization rates of equipment, reducing access times for services and supplying new services, and increasing efficiency. Another important objective is the recruitment and training of staff, especially technicians.

Under the PSP model, private partnerships will provide medical imaging services inside public hospitals. Private providers will be granted 5-10 year contracts with fee-for-service payments per report and incentives based on performance. Operating rights of existing equipment will be transferred to the private partner. The private partner will undertake the responsibility of performing scans, reporting and physician interaction, tele-radiology, mobile imaging, and maintenance.

In theory, removing barriers to improve access will increase demand for these services, especially with the expected increase in visits to hospitals and health centers under Saudi Arabia's other NTP health initiatives. Private partners will have access to incentive payments and additional revenue streams from tele-radiology based distant reporting services and through the introduction of new services such as Positron Emission Tomography (PET). With the possible change in eligibility criteria for public health services, there is also possibility to expand the market.

Currently, only about one third of Ministry of Health hospitals include picture archiving and communication systems (PACs). There are around 7,000 technicians and 832 radiologists nationally, including foreign residents.

Laboratory

In 2015, there were over 150 million laboratory checkups performed at Ministry of Health hospitals and nearly six million laboratory checkups across Ministry of Health PHCs. Through private-partnerships, the Ministry plans to address a number of challenges that exist within the country's current laboratory system. New strategies will reduce inefficiencies such as long turnaround times, slow transportation of samples, slow machine maintenance, under supply of reagents for demand of laboratory tests, duplication of tests, and unavailability of advanced tests causing samples to be sent overseas.

Under the new operating model, laboratory services

will be moved from centralized primary healthcare centers to labs run by private sector partnerships. Private partners will provide all transportation, analysis, and reporting related to laboratory services. A new integrated laboratory information system will be a conduit for test requests and results reporting. Laboratory services will also be performed in hospital laboratories and a single regional laboratory in each region. Regional Laboratory Service (RLS) companies will be responsible for the availability of required facilities and delivering sample collection, transportation, analysis, and reporting to all hospitals in a given region. Hospital laboratories will perform a set of core tests, while non-core tests will be conducted at the regional laboratory. Also, a Kingdom Reference Laboratory (KRL) will be established via the private sector to fill gaps in the laboratory service provision.

Private sector partnerships will be feasible given an increasing demand trend for laboratory testing. Also, physicians will be encouraged to use laboratory services more often, and types of offered testing will be expanded. There will be guaranteed availability payments for construction, renovation, and equipment activities, reliable income flow to meet a guaranteed minimum demand, performance-based incentive payments, and possible additional revenue streams through service provision to private hospitals and clinics and exported laboratory services for advanced testing.

Pharmacy

Pharmacies have been segmented in terms of distribution channel, via retail and hospital pharmacies, with retail pharmacies comprising the largest market share in the pharmaceuticals market. Retail pharmacies have seen growth driven by increased modernization and a breadth of product offerings. A host of challenges exist in the pharmaceutical space in Saudi Arabia that also represent opportunities for private sector players. The Ministry of Health identifies challenges and objectives as a guideline for reform efforts [see figure 15].

For in-patient services, the private partner will be responsible for inventory management and processing prescriptions and dispensing medications. For retail and outpatient services, the private partner will provide all reimbursement medications with proper consultation and sell medical products such as consumables and devices. Other services like disposal of unwanted medicines and advice on treatment of minor conditions and healthy living will also be provided by private participants. As home delivery of medications is a relatively new market in Saudi Arabia, private partners will have the opportunity to establish a home delivery system for immobile patients and refill medications.

FIGURE 15: Ministry of Health Pharmaceuticals Challenges and Objectives, 2017

Ministry of Health Pharmaceuticals Challenges and Objectives 2017	
Challenges	Objectives
<ul style="list-style-type: none"> • High costs of pharmaceuticals • Inefficient logistics management • Planning not currently based on consumption • Low inventory turnover and high stock • Security and storage conditions need improvement • Large volume and expired items • Low workforce utilization • Lack of IT infrastructure • Weak dispensing records • Weak monitoring and analysis of stock 	<ul style="list-style-type: none"> • Reduce the stock ownership in outpatient pharmacies to zero • Eliminate logistics operations expenses • Reduce the number of pharmacists and technicians to more sustainable levels • Increase the usage of generic drugs and incentivize local production • Digitize pharmacy operations • Improve accuracy and demand forecasts

Source: Ministry of Health, USSABC

The changes will provide increased traffic to retail pharmacies with increased ad-on services. Retail pharmacies will also expand the medication portfolio offered. These pharmacies will have a steady stream of revenue with guaranteed catchment areas along with performance-based incentive payments.

Extended Care

Private sector participation will be enlisted to remake extended care capabilities including rehabilitation, long-term care, and home care services. Within extended care there is a need to increase extended care capacity, increase use of human resources in areas such as home care visits, free up acute hospital beds that are occupied by long-term care patients, and recruit and train a qualified workforce.

In this area of service, especially, there is an opportunity to meet a growing gap in supply and demand for services. Currently, there are only 1,680 staff that provide home care services nationwide. Home care services range across of variety of areas such as elder and disabled care, care during post-operative periods, rehabilitation care for those recovering from an injury or illness, and pediatric care for children with illnesses and special needs. With a high number of expatriates in Saudi Arabia, the domestically retained market for long-term care services is substantially larger than that of other GCC countries. According to industry sources, over 30 percent of hospital beds are occupied by long-term care patients, and a large number of patients seek treatment abroad because of the lack of domestic long-term care solutions.

A new operational model creates long-term care (LTC) facilities to provide differing levels of services based on medical complexity. The model creates home care services to be provided by home care teams. The payment model consists of availability payments for construction, renovation, and furnishing activities, per diem service payments, and per visit service payments.

Lifestyle Diseases

The prevalence of lifestyle-related diseases is well document in Saudi Arabia and remains a concern for health care leaders. Over the past decade, sedentary lifestyles associated with economic and social factors have contributed to the growth in rates of non-communicable diseases. The occurrence of type 2 diabetes, obesity, cardiovascular, and kidney disease continues to rise.

In 2012, Ischemic heart disease accounted for 22 percent of deaths, and strokes accounted for 16 percent of deaths. In 2015, deaths caused by ischemic heart disease increased to 24 percent, according to World Health Organization data while deaths caused by all cardiovascular diseases accounted for 42 percent of deaths. According to Saudi medical experts, 55 percent of the Saudi population experiences high cholesterol blood levels. Data released by the WHO indicates the probability of premature mortality for people 30 to 70 years in age because of the top four non-communicable diseases (cancer, diabetes, cardiovascular disease, and chronic respiratory disease) for Saudis is 17 percent. These conditions are exacerbated by lack of exercise, unhealthy diets, and excessive tobacco use.

Kidney disease is a growing health concern in the Kingdom, with diabetes and high blood pressure, the two leading causes of renal failure, on the rise. An estimated 25 percent of Saudis suffer from Type 2 diabetes. In 2015, there were 15,371 kidney dialysis patients, up from 14,366 the year prior, of which 2,307 were treated by the private sector. There were 651 peritoneal dialysis patients. The bulk of dialysis patients are 26-65 years, with about eight percent over 75. The majority of Saudis, 72.2 percent, being treated for hemodialysis were treated at Ministry of Health hospitals, while 21.6 percent were treated at other government hospitals, and the remaining 6.2 percent were treated at private sector facilities. Most non-Saudis (65.2) percent were treated at private facilities, while 30.4 percent were treated at Ministry of Health facilities, and the remaining 4.4 percent were treated at other government hospitals. Of the country's 8,461 patients receiving kidney transplants, the majority (75.6 percent) were treated at other government hospitals. The total number of dialysis centers continues to grow an average of two percent year-on-year, reaching 190 national dialysis centers in 2015. With only 22 percent of

considerable funds towards not only building additional facilities, but towards health promotion and disease prevention campaigns such as the National Osteoporosis Awareness Campaign, the National Campaign for Breast Cancer Awareness, and the National Campaign against Overweight and Obesity. Certain campaigns are focused on raising awareness of certain diseases that have fallen under the radar in Saudi Arabia. For instance, the Ministry of Health, in collaboration with AbbVie, launched a national awareness campaign in May 2016 on the Hepatitis C virus.

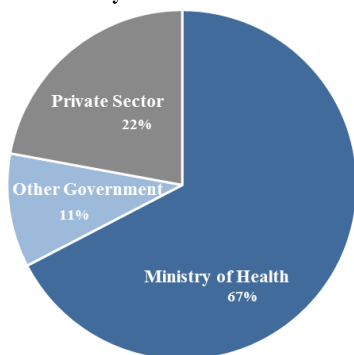
Information on the Ministry of Health portal provides information on topics such as cardiovascular disease, covering risk factors, symptoms, and preventative means. For instance, in 2014, the Ministry of Health participated in over 9,000 awareness campaigns on diabetes, cancer, and smoking, and issued over four million materials for distribution such as booklets and posters. Primary health care centers have also been tasked with a preventative role. In addition to spending on health campaigns, the Ministry of Health has allocated large parts of its budget to spending on new hospitals and facilities.

Despite these efforts to build better facilities and educate with campaigns, the number of annual health visits to health clinics are falling, as we estimate, by a compound annual growth rate of two percent. A number of possible explanations exist for decreased visits – people may be getting healthier, patients are shifting their primary health services for hospitals, or they are not visiting clinics to consult with physicians about their health until they are sick enough to need to be treated at hospitals. Moreover, the prevalence of lifestyle diseases are rising. The growth of outpatient visits at Ministry of Health hospitals has been less than one percent over a five year period – while some of this growth represents PHC patients shifting to hospitals' outpatient division, it does not appear to account for the full decline in patients who no longer visiting PHCs. These factors suggest that the relatively healthy patients who cease going to health clinics may no longer continue regular healthcare visits. These numbers do not capture those who have not attended any clinic during this time period, including those who will remain healthy or develop a disease.

The first evaluation of a national multistage survey used to identify barriers to healthcare in Saudi Arabia identified evidence that individual healthcare-seeking practices pose barriers to healthcare utilization, rather than healthcare-system based barriers.³ Saudis seem to seek healthcare mostly when sick, and free and available

FIGURE 16: Artificial Kidney Centers in Saudi Arabia, 2015

Artificial Kidney Centers in Saudi Arabia, 2015



Source: General Authority for Statistics, USSABC

centers run by the private sector, and a projected 18,600 dialysis patients by 2020, there is opportunity to meet the growth in demand for these services [see figure 16].

Cardiovascular disease is projected to be the leading cause of death in Saudi Arabia by 2025, and to curb the prevalence of these diseases, the Ministry of Health has set a target of one percent reduction in obesity by 2020.

Spending Evaluation

Saudi Arabia has increased its focus on preventative healthcare to combat lifestyle diseases like cardiovascular and kidney disease. Over the past few years, the Saudi Ministry of Health has invested

³ *Access and barriers to healthcare in the Kingdom of Saudi Arabia: findings from a national multistage survey.* BMJ Open 2015. Charbel El Bcheraoui et al, University of Washington, and Mohammed A AlMazroa et al Ministry of Health.

healthcare facilities nearby are not enough for Saudis to utilize the services offered. Neither distance nor type of facility were barriers to diagnosis, treatment, and control of chronic diseases. This study found that Saudis are not using existing preventative services such as routine exams and health screenings for preventable diseases.

To understand how health outcomes are related to how Saudi patients seek out treatment and to understand effectiveness of campaigns, further primary research and program evaluation efforts would be needed. Factors related to the healthcare system such as quality of care may be a fruitful area to study. Through evaluation efforts of past spending on health outcomes, those interested in boosting wellbeing of Saudi citizens and residents could better pinpoint cost-effective spending or methods to change behavior.

Pharmaceuticals and Medical Device Market

Saudi Arabia's pharmaceutical market is the largest in the GCC region, reaching over \$8.5 billion (SR31.7 billion) in 2015, more than half of the GCC market. This industry is segmented into pharmaceutical manufacturing and pharmaceutical distribution. We project the overall market will increase at a CAGR of over nine percent through 2025. During the same period, we project that prescription drug spending will see similar growth, driven by demand for long-term care and chronic care treatments, and supported by changes in healthcare provision and privatization efforts. SAGIA noted that pharmaceuticals is over an \$8 billion (SR30 billion) opportunity in Saudi Arabia that would *"spur the development of a diverse and integrated pharmaceuticals manufacturing cluster, reducing the portion of purchasing spent on imports to less than 70 percent."*

Localization

Presently, only around 20 percent of the pharmaceutical market is locally manufactured. In a February 2017 address to the Council of Saudi Chambers, Minister of Health H.E. Dr. Tawfig Al-Rabiah addressed local manufacturers and suppliers to medical facilities, commenting that *"Saudi Arabia will do its best to boost its pharmaceutical industry"* through production of pharmaceutical products that cater to the health concerns of Saudi Arabia. The NTP has set a goal of increased local manufacturing to 40 percent of the market by 2020, and the Government has revised regulatory guidelines to support and develop the domestic market. These improved regulations include a variety of incentives to attract multinational players to the Kingdom and incentivize international firms to establish local manufacturing and packaging facilities.

For instance, the SFDA implemented measures allowing companies to avoid price reductions. The Saudi Industrial Development Fund (SIDF) will also provide interest-free loans up to 75 percent of the cost of capital. In early 2016, SIDF approved a \$42 million (SR157.5 million) loan deal with AJA Pharma, a subsidiary of Saudi Chemical Company, for the financing of a local manufacturing center in Hail that will manufacture drugs for foreign firms under license. In 2015, SIDF issued a loan deal to Dammam Pharma, a subsidiary of Saudi Pharmaceutical Industries and Medical Appliances, worth \$14.4 million (SR54 million) to partially finance construction of a pharmaceutical plant. The Minister of Energy, Industry and Mineral Resources announced in November 2016 that the SIDF would be used in the coming years to further develop the pharmaceutical sector. The pharmaceutical and medical device spaces will continue to be key subsectors for Saudi Arabia's economic growth under the state's efforts to strengthen and maintain long-term growth. As demand continues to increase, international companies will increasingly have opportunities to establish local manufacturing facilities in Saudi Arabia.

The pharmaceutical and medical device subsectors have already proven a role in the economic expansion of the Saudi Arabian healthcare sector. In 2015, manufacturing of pharmaceutical products and preparations in Saudi Arabia generated \$842 million (SR3.16 billion) in revenue. Revenues in this manufacturing segment have steadily increased in the Kingdom over the past years, with an average yearly growth rate of 9.4 percent, according to data released by the General Authority for Statistics. Manufacturing of pharmaceuticals is expected to maintain this growth trend through 2020. As of early 2017, there were 27 firms manufacturing pharmaceuticals in Saudi Arabia.

The pharmaceutical market is segmented into over-the-counter and prescription products, with prescription products accounting for nearly three-fourths of all market revenue as of 2016. Further, the prescription market is comprised of both branded and generic products. Historically, the market for pharmaceuticals in Saudi Arabia has been driven by brands, and approximately 80 percent of the prescription market was attributed to brand-name pharmaceutical imports. Generic medicines accounted for less than ten percent of market share in Saudi Arabia compared with approximately 50 percent in European countries. To some extent, however, the demand for pharmaceuticals is undergoing restructuring. The share of branded drugs still make up the majority of market share but has trended downwards from past years. In 2016, branded drugs accounted for nearly 56 percent of the total drug market and for 64 percent of the prescription market. Government health institutions are

seeking out cheaper drug replacements as a cost-cutting measure, and as the role of health insurance companies continues to emerge, healthcare providers are expected to begin prescribing generics in order to lower costs. For these reasons, there has been a spike in demand for cheaper, generic drugs. In addition, many patents on pharmaceuticals are set to expire in the coming years, and as a result, more generic alternatives will be available on the market. However, given the historic appetite and Saudi preference for branded drugs, brand-name products will likely continue to have a strong representation in the market and are projected to see continued growth as the total demand levels for prescription drugs increase. When Saudis can obtain medicines without a prescription, in practice they exhibit a preference for brand names.

The pricing system for drug approvals is currently under reform discussions. Prices for prescription drugs in Saudi Arabia are nearly the lowest in the GCC, and the new price system would potentially capture prices in countries of low economic development, pushing prices lower. While the Saudi Government is attempting to encourage local and generic production, a lack of imported products due to pricing could cause a shortage of needed prescription drugs. A pricing change, while not yet implemented, has caused great debate. The system would have a potential benefit of encouraging collaboration between local manufacturers and foreign companies, supporting the Saudi goal of increasing localization of medical manufacturing.

In 2016, the top pharmaceutical manufacturing and distribution companies in Saudi Arabia were Saudi Pharmaceutical Industries & Medical Appliances Corporation (SPIMACO), Tabuk Pharmaceuticals, Sanofi, Saudi International Trading Company Ltd

(SITCO) Pharma, Jazeera Pharmaceutical Industries, Riyadh Pharma, Saudi Center Group (SCG), Tamer Group, and Jamjoom Pharma. Among these key players, many domestic pharmaceutical companies concentrate on manufacturing generic products; however, some local producers also contract work for international firms [see figure 17]. For instance, Riyadh Pharma has partnered with the international firms Smith & Nephew, Merck, and Janssen.

The market for medical devices is valued at nearly \$2 billion (SR7.5 billion). Imports represent approximately 90 percent of the market with a CAGR of over 10 percent. As of 2016, American products accounted for 21 percent of imports. The strong market for medical devices and equipment is sustained by both growing awareness of health issues encompassing early-stage detection and diagnosis and a growing need for extended care.

U.S. multinationals like GE, Pfizer, and Merck have a long-established presence in device and pharmaceuticals manufacturing and are continuing to expand. Multinationals are encouraged to establish or expand drug manufacturing facilities in Saudi Arabia through incentives like 100 percent ownership in economic free zones. Through the effort of King Abdullah Economic City to attract foreign investment, Pfizer and Sanofi Aventis have committed to opening manufacturing operations. Production of drugs will be relevant to regional needs, for instance, as the Sanofi operation will produce drugs used to treat cardiovascular disease and diabetes. The Indian company Aurobindo is also opening a manufacturing facility to meet the growing need for these drugs in the GCC. In 2014, AbbVie partnered with Arabio to manufacture biopharmaceuticals in Saudi Arabia in an effort to localize production of

FIGURE 17: Saudi Arabian Contract Manufacturing Examples

Saudi Arabian Contract Manufacturing Examples	
<i>Local Firm</i>	<i>International Partners</i>
Batterjee Pharma	Abbott, Bristol-Myers Squibb, Glenmark, Sensor Kline, Servier, Takeda
Riyadh Pharma	Janssen, Merck, Smith & Nephew
Saja Pharmaceuticals	Astellas, Daiichi-Sankyo
SPIMACO	Bayer Healthcare, GlaxoSmithKline, Lilly, MSD, Sanofi
Tabuk Pharmaceuticals	Boehringer Ingelheim, Pfizer

Source: SAGIA, USSABC

key therapies. A new partnership was struck between Johnson & Johnson and Saudi Arabia in 2015 aimed at manufacturing and promoting pharmaceutical products. Merck Sharp & Dohme (MSD) entered an agreement with Pharma Pharmaceutical Industries (PPI) in Saudi Arabia in December 2016, allowing PPI to manufacture MSD medicines and distribute them throughout many GCC countries. Numerous small and medium-sized companies are also involved in this health subsector.

The Government's efforts to develop an integrated pharmaceuticals and medical device manufacturing cluster are in the beginning stages but show signs of early success with a boost in the number of national or joint licenses for manufacturing in 2015 and 2016. Multinational corporations and small and medium enterprises have an expanding role in the local production of key therapies. Manufacturing of pharmaceuticals is growing in contribution to industrial activity. In 2015, Saudi Arabia had 36 producing facilities with national or joint licenses for the manufacturing of pharmaceutical products, employing 10,245 workers (about one percent of the total industrial labor force). The total financing of these licenses was \$1.3 billion (SR4.88 billion). At the end of 2015, there were 16 additional licensed pharmaceutical factories planned for 2016 with over \$400 million (SR1.5 billion) in financing, which would create a total of an estimated 1,658 jobs. This is a 31 percent year-on-year increase in financing, 16 percent boost in labor, and 44 percent increase in manufacturing facilities.

Historically, domestic manufacturing has been limited to less complex medical products such as gloves, syringes, and medical furniture. However, Saudi Arabia is attempting to expand this capacity for private sector manufacturing of medicines and medical appliances.

Saudi Arabia has aimed to develop human resources in support of research and development activities through the National Science, Technology and Innovation Plan (NSTIP) established in 2002. The plan has developed a variety of research programs, devoting the majority of funding to nanotechnology, biotechnology, and medical and health research. The King Abdulaziz City for Science and Technology (KACST) launched the technology incubator program Badir, through which companies have created products for the life sciences research market. Another incubator program at the Riyadh Techno Valley (RTV), as part of King Saud University, houses entrepreneurial activity specifically in life sciences with the goal to leverage academic strengths and eventually commercialize products. The RTV has invested in advanced dental technologies and produced a number of patents.

Pharmaceutical biotechnology in Saudi Arabia is mainly represented by the Jeddah BioCity complex, which operates seven companies: the Arabian Pharmaceutical Products Company (Arabio), Blood Derivatives International (BDI), Environmental Services Development (ESD), Genway, Jeddah Biopharma, Jeddah Bioscan and RetHab. Additionally, there is a network of advanced laboratory and research centres, some of which work with pharmaceutical producers.

With investment efforts over the past decade, there have been advancements towards building out the country's medical and supporting life sciences research and development activities. However, domestic research capabilities in pharmaceuticals and medical devices have remained relatively limited in growth, and extended patent registration times may also present a barrier. Regulatory and patent approvals are an issue that foreign research-based pharmaceutical companies must still navigate. Overcoming market barriers and encouraging a culture of research and development within industrial cities would likely trigger further market growth. Saudi Arabia's renewed efforts to enhance training capabilities through joint ventures and to promote local manufacturing will both benefit from and contribute to the existing research community.

Intellectual Property

In order to align with the goals of the WTO agreement on Trade Related Aspects of Intellectual Property Rights, Saudi Arabia has updated its laws related to intellectual property. The Saudi Government revised its Patent Law in 2004 which presently covers patents, layout designs of integrated circuits, plant varieties and industrial designs. The law protects products and products-by-process with a protection term of 20 years. The Patent Office has expanded its staff and attempted to make its processes more efficient to handle the influx of applications.

Key International Presence in Saudi Arabia

Key international and local firms play an important role in Saudi Arabia's medical device, pharmaceutical, health services, and health information markets. The following highlights some of the major players in these markets by region of origin as well as recent strategic activities for new players developing a market presence. While the U.S. and Europe have traditionally comprised the majority of investments in the sector, notably, the Saudi healthcare sector has attracted new international interests, reflecting the expansive investment opportunities offered by Saudi Arabia.

United States

Abbott Laboratories is a multinational health care company providing medical research and development, drugs, medical devices, and nutritional products. Abbott operates a diabetes care center and scientific center in Riyadh.

AbbVie discovers and develops biopharmaceuticals and small molecule drugs. In May 2016, the Ministry of Health launched a national awareness campaign for the Hepatitis C virus with AbbVie. As part of the campaign, the company will open seven new centers across Saudi Arabia to raise awareness of the population and health professionals on the latest treatments. The MOH partnership allowed AbbVie to lower its costs while raising awareness about the virus and consumer awareness of the brand. The company intends to increase local manufacturing of treatments for diseases impacting the Saudi population, including cancer and kidney treatments.

Cerner formed a joint venture with King Saud University and the Al Zamil Holding Group in 2012, forming the Saudi Health Information Systems Company (SHIS). SHIS develops systems and hardware for clinical and medical applications software, and among their clients are King Faisal Specialist Hospital, Prince Mohammed bin Abdulaziz Hospital, and Prince Sultan Military Medical City. The joint venture provides equipment and services as well training to Saudi nationals in areas such as health informatics.

GE Healthcare has a well-established and multifaceted presence in Saudi Arabia, supporting the operational needs of the Ministry of Health, aiding in preventative care, and investing in health training. Currently, nearly 90 percent of Saudi hospitals incorporate GE technology and GE Healthcare continues to be a leading provider of medical devices. GE has partnered with the MOH to deploy technologies for the National Breast Cancer Screening Program, launching mobile mammography clinics. Also in coordination with the MOH, GE is investing in the Healthcare Skills and Training Institute in partnership with King Fahad Medical City, creating an inaugural facility to offer healthcare management, clinical, and technical courses. GE has focused on providing medical device products to meet regional needs in neonatal care, cardiac exams, and imaging technology for cancer detection.

Janssen, Johnson & Johnson's pharmaceutical arm, partnered with Riyadh Pharma in 2015 to promote manufacturing and promotion of Janssen products. Janssen also operates a scientific office in Saudi Arabia.

Merck & Co (known as Merck Sharpe & Dohme outside of North America) entered a manufacturing agreement with Pharma Pharmaceutical Industries (PPI) in December 2016, through which PPI will distribute Merck medicine to Saudi Arabia and other GCC countries.

Pfizer Inc opened a manufacturing facility in King Abdullah Economic City in early 2017, in line with Saudi Arabia's National Transformation Program (NTP) 2020 and Vision 2030 goals to localize manufacturing of medicines. Tabuk Pharmaceuticals entered a manufacturing and licensing agreement with Pfizer in 2014, allowing the local firm to distribute four medicines in the Saudi market. Pfizer has collaborated with a medical NGO in launching a diabetes prevention campaign and collaborated with the Saudi Society for Dermatology and Dermatologic Surgery on a national psoriasis campaign. SPIMACO and TAMAR both manufacture and promote multiple Pfizer products such as antibiotics and anti-rheumatics.

Welch Allyn manufactures medical diagnostic devices and monitoring systems. The company works with Abdulrehman Algosaibi in Riyadh to promote and distribute its products in Saudi Arabia.

3M has been involved across diverse industry sectors in Saudi Arabia for decades, and the company has entered the rapidly growing healthcare sector with the goal of allowing healthcare providers to attend to more patients at lower costs. 3M has supplied infrastructure for medical facilities including dental chairs, video facilities, and operating rooms for training programs. The company established its first manufacturing facility in the MENA region in Dammam.

Europe

GlaxoSmithKline plc (GSK) has had a presence in Saudi Arabia dating back over 40 years. Glaxo was the first multinational to manufacture medicines in Saudi Arabia by way of joint venture. The company's main local partner is Banaja but also works with other local distributors Sitco Pharma, Al Haya Medical and Al Naghy Brothers. GSK is a significant player in the OTC sector – Novartis and SPIMACO are the main competitors in this space.

Medtronic is a multinational medical device and services company with headquarters in Ireland. Medtronic recently acquired other medical device companies such as Covidien, and has launched new technologies for the management of lifestyle diseases such as diabetes and heart disease and is working towards addressing patient diabetes needs in collaboration with IBM Watson to develop a series of applications that would monitor glucose to predict hypoglycemic events. Other products

include innovative pacemaker and insulin delivery technologies. Saudi Arabia and Turkey are Medtronic's largest markets in the MENA region. Medtronic CEO Omar Ishrak comments that *"In both areas we have completed these partnerships with our distributors and now we connect with our customers much more directly, and that's had measurable results in our growth... In many ways Saudi Arabia is an emerging market because the level of healthcare that is received compared to developed markets is still below what one would expect; so there's a huge access problem."*

Novartis AG distributes products in Saudi Arabia through the Saudi Pharmaceutical Distribution Company (Saphad). Saphad works with the promotion, sales, and distribution of imported Novartis therapies. Novartis entered an agreement with Arabio in 2010 to provide GCC countries with vaccines for common diseases. Novartis also has a presence in the market for its ophthalmic medicines and generic products. The company's product Otrivin holds 88 percent of the market share for nasal decongestants.

Philips Healthcare operates offices in Riyadh, Jeddah, and Al Khobar and focuses on providing solutions for consumers and health care professionals with equipment such as medical imaging systems, patient monitoring systems, and clinical information systems. A joint venture between Philips Healthcare Saudi Arabia Ltd. and a subsidiary of Al Faisaliah Group sells Philips Healthcare solutions and services throughout Saudi Arabia. In 2015, Philips Healthcare Saudi Arabia entered an agreement with Associated Medical Enterprise Company (AMECO) to provide installation, and upgrading of medical imaging equipment in Obeid hospitals.

Roche products are distributed in the private sector by Banaja Saudi Import Company. Under its license, SPIMACO manufactures Roche products such as breast cancer drugs. The company also operates a scientific office in Riyadh.

Sanofi established a manufacturing plant in King Abdullah Economic City, and was the first multinational pharmaceutical firm to launch local manufacturing of its products in Saudi Arabia. Sanofi has worked with the Ministry of Health on ongoing diabetes education for healthcare professionals.

Siemens Healthcare is a German multinational providing medical devices to Saudi Arabia. The firm partners with Saudi business group E.A. Juffali & Brothers. The subsidiary Siemens Saudi Arabia has provided mobile breast screening technology and support to training and recruitment programs in the life sciences. The company upgraded the radiology department at King Faisal Specialist Hospital & Research Center in Jeddah.

Middle East

Jamjoom Pharma is Saudi Arabia's third-largest domestic drug manufacturer and distributes products across many countries in the Middle East and North Africa. It holds a place in the top five retail pharmacy markets players, offering therapies in cardiovascular, dermatology, gastrointestinal, ophthalmology, and general medicine. Jamjoom is a private company, though industry estimates indicate the firm has a 3.2 percent market share in Saudi Arabian pharmaceuticals. Jamjoom Pharma is a subsidiary of Jamjoom Group, that owns a network of pharmaceutical distributors and retail pharmacies, positioning the company as a top competitor for OTC medications. Jamjoom has a facility in Jeddah that manufactures ampoules, creams, eye drops, tablet and oral liquid formulations. The facility produces products under international license and specializes in dermal products, medicines for treatment of hypertension and high cholesterol, and various OTC products.

Mouwasat is a public company that provides both health care services and medical equipment, operating four hospitals and two dispensaries by way of its subsidiaries. Mouswasat provides specialty services ranging from general surgery, internal medicine, and obstetrics and gynecology, to dentistry and plastic surgery.

National Medical Care Company, provides health care services and medical supplies in Saudi Arabia, operating its two private hospitals in Riyadh, Riyadh National Hospital and Riyadh Care Hospital. Its specialties include internal medicine, general surgery, obstetrics, and radiology, among others. The company is also a distributor of medical supplies.

NMC Health plc, a U.A.E. private healthcare network operator, entered the Saudi Arabian Market in 2016 with strategic expansion into long-term and home care. NMC invested in 260 bed capacity across long-term care facilities in Jeddah and Al Khobar noting a two-pronged strategy to 1) invest in start-up long-term care, and 2) acquire established assets. Prasanth Manghat, Deputy Chief Executive Officer of NMC commented: *"This geographic expansion into Saudi Arabia is a major milestone for NMC that carries tremendous strategic significance and expands the Group's long-term care growth prospects substantially as we emerge as the largest regional provider in this highly specialized area of care through our top-in-class offering, track-record and brand. Most importantly, this combined expansion is expected to be highly accretive from 2017 onwards."*

Saudi Pharmaceutical Industries and Medical Appliances Corp (SPIMACO) is one of Saudi Arabia's largest pharmaceutical manufacturers, producing medicines and

medical devices for domestic consumption and exporting. The firm manufactures over 70 branded products, many of which are under license from multinationals, including exclusivity agreements with Pfizer and Merck. The company's sales to the private pharmaceutical market are estimated to be nearly seven percent. SPIMACO has its own distribution network and is also a leading producer of OTC health products. SPIMACO has four subsidiaries dealing in sales, distribution, management, and manufacturing of pharmaceuticals and medical devices. The firm owns 85 percent of Dammam Pharma Co., 44 percent of CAD Middle East Pharmaceuticals Industries, and 51 percent of ENAYAH, a manufacturer of disposable medical products and licensed manufacture of Kimberly-Clark Healthcare disposable products. The main manufacturing facility, located in Qassim Industrial City, produces a variety of formulations. In 2016, SPIMACO made a plan to launch an approved treatment for the Hepatitis C virus in correspondence with the country's health campaign. The company also acquired a contamination control system from Fedgari.

Tabuk Pharmaceuticals is a subsidiary that formulates, registers, and promotes OTC, generics, and branded drugs. The company is fully owned by the Astra Industrial Group and the largest local manufacturer after SPIMACO. Its prescription drugs are targeted to therapy areas such as cardiovascular, respiratory, and muscular skeletal disorders. Tabuk Pharmaceutical's distribution operation is located in Riyadh, and its manufacturing facilities are located in the city of Tabuk. It produces products under license for multinational firms and also offers contract manufacturing to make use of an expansive sales and marketing network. Tabuk currently supplies products to local partners in the U.S. and Europe, and these partners distribute products. Branded OTC products are approved and currently sold in countries like Denmark, Finland, and France. The company aims to further establish in the U.S., Asia, and Western Europe.

Asia

Takeda, a Japanese pharmaceutical company, operates offices in Riyadh and Jeddah. The company has established a portfolio of therapies, and aims to launch cancer, diabetes, and hypertension medicines in the Saudi Arabian market.

South Korea

The South Korean Minister of Health and Welfare, Jeong Jin-yeop, has made further efforts to cooperate with Saudi Arabia in the healthcare sector. South Korea has promised to work towards the advancement of hospital information systems, privatization of hospitals, an expanded health insurance system, and medical training. Three South

Korean companies, Seoul National University Bundang Hospital, SK Telecom and ezCaretech have been working on healthcare information systems in state run facilities since 2014. In 2015, the South Korean firms BC World Pharma, Boryung Pharmaceutical, Chong Kun Dang, and JW Holdings entered five-year agreements to export products to Sudair Pharmaceutical based in Saudi Arabia. Korean based Yonsei University Severance Hospital has entered an agreement to run a cancer treatment facility for women in Riyadh beginning 2018. Further moves into Saudi Arabia would be in line with South Korea's aim to increase its market share in global healthcare.

Labor Force

With increasing demand for healthcare services, boosting the sector's labor force has become a key area of focus. In 2015, the Ministry of Health hospitals, not including clinics, employed over 146,000 health care workers, and private hospitals employed over 108,000 health care personnel [see figure 18]. The number of total healthcare jobs at private hospitals increased by nearly 50 percent between 2011 and 2015, and during the same time period total jobs at Ministry hospitals increased by 24 percent. While Ministry hospitals are expanding and currently have a greater capacity, the high growth rate of private sector hospital staff reflects the greater role that private sector hospitals are beginning to play in providing services in Saudi Arabia.

Still, the Ministry of Health continues to be the largest employer of healthcare staff. In 2015, including administrative workers and non-medical professionals, the Ministry employed 248,310 across all facilities. This number includes 41,240 physicians and 95,379 nurses nationwide.

Traditionally, service providers rely on expatriate workers for a large portion of the workforce. Of total hospital workers, 62 percent are foreign nationals. Of hospital physicians, around 80 percent are non-Saudis, with only 70 percent foreign physicians in Ministry hospitals as they employ a greater number of Saudis. Of all hospital nurses, nearly 65 percent were foreign nationals in 2015, with 48 percent of nurses foreign nationals in Ministry hospitals. As part of the NTP, the Ministry of Health has outlined a target for 2020 to increase the number of Saudi nurses and supporting staff per 100,000 people from 70.2 to 150.

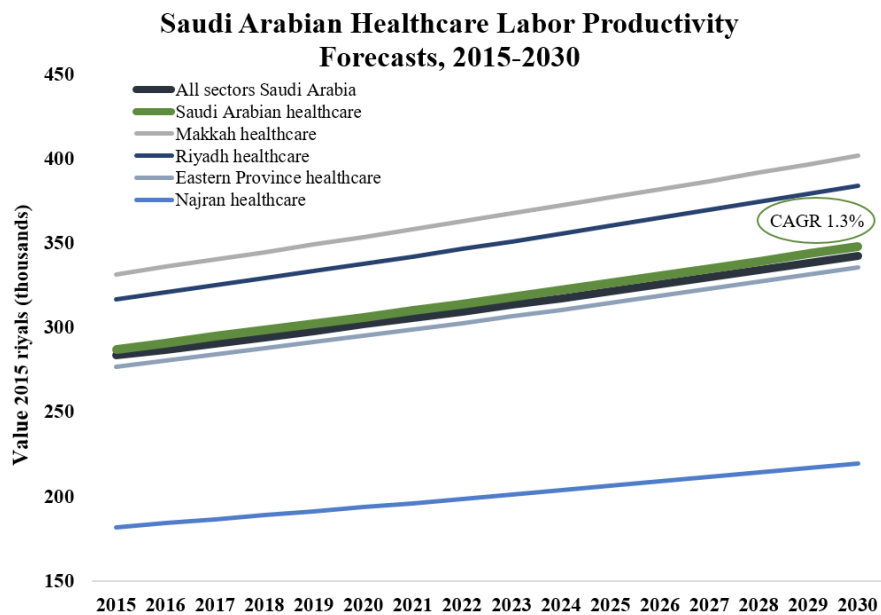
Overall, healthcare labor productivity is projected to increase by nearly 14 percent through 2025. That is, workers in the sector are producing more for the same amount of work, thus leading to improved living standards because a greater amount of healthcare services can ultimately be consumed. Labor productivity in the private health sector has seen improvement in recent

FIGURE 18: Saudi Arabian Health Personnel by Agency and Profession, 2015

2015 Saudi Arabian Health Personnel by Agency and Profession		
Ministry of Health	Physicians*	41,240
	Nurses	95,379
	Pharmacists	3,184
	Allied Health Personnel	55,080
Other Government Sectors	Physicians*	16,419
	Nurses	35,119
	Pharmacists	2,132
	Allied Health Personnel	27,647
Private Sector	Physicians*	29,097
	Nurses	41,985
	Pharmacists	18,308
	Allied Health Personnel	19,046

* Includes Dentists
 Source: Ministry of Health, USSABC

FIGURE 19: Saudi Arabian Healthcare Labor Productivity Forecasts 2015-2030



Source: REMI, USSABC

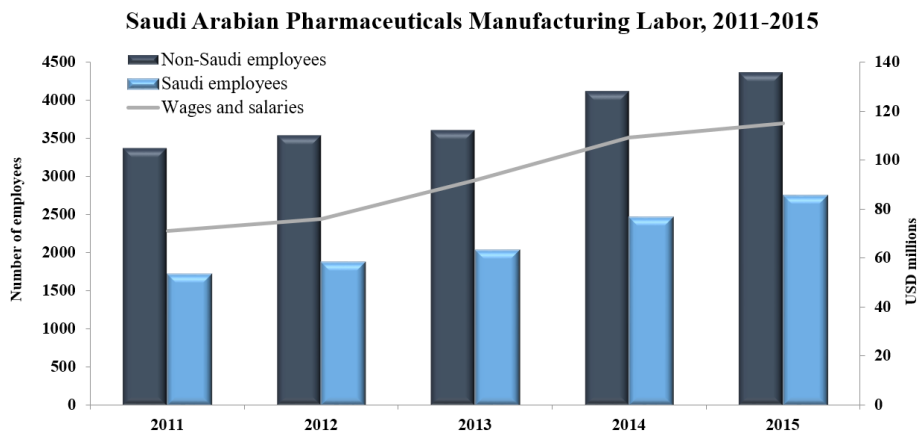
years and is forecasted to see continued improvement with an average year-on-year growth of 1.3 percent [see figure 19], highlighting that national reforms have shown enough effectiveness to hire more Saudis in the private sector without diminishing productivity. Growth in national labor healthcare productivity, as defined by output per employee, is slightly higher but on trend with growth in labor productivity across all sectors. Regions such as Makkah and Riyadh, locations of the Kingdom's best-ranked hospitals, have notably higher levels of overall labor productivity than other regions.

As the Saudi Government encourages development of domestic manufacturing of medical devices and instruments, local pharmaceutical manufacturing proves a key area for economic activity, and presents a potential industry area to accommodate, with the right training, the growing Saudi youth entering the labor force. In 2015, over 7,100 persons were employed in local manufacturing of pharmaceuticals, of which nearly 40 percent were Saudis [see figure 20]. SAGIA highlights that the manufacturing of medical devices is a key growth area that could grow the manufacturing sector

in the private sector continues to outpace employment growth of non-Saudi for the fourth straight year. As of 2016, the pharmaceutical and medicine industry was one of the top ten highest paying industries in Saudi Arabia. The private sector labor force in health care has increased overall, reflecting the expansion of the sector. Private sector labor force in health professions grew to 108,436 in 2015 from 72,609 in 2011. The 2015 figure includes 28,097 physicians, 41,985 nurses, 18,308 pharmacists, and 19,046 other allied health professionals.

Private sector hospitals have seen Saudization progress, more than doubling the number of Saudi workers between 2011 and 2015, though with 8,835 Saudi personnel in 2015, this is a much lower baseline for increase than Ministry hospitals. The relative proportion of Saudi workers in the private healthcare workforce remained around 7.5 percent, comparable to the year prior. The low number of Saudi workers in private hospitals relative to public hospitals reflects the long-standing Saudi preference for public sector work, which is perceived as more stable employment. Budget constraints are also a factor for private facilities given the high demand for workers.

FIGURE 19: Saudi Arabian Healthcare Labor Productivity Forecasts 2015-2030



Source: Ministry of Health, USSABC

while creating high-skilled employment. Wages in the sector also saw over five percent year-on-year growth.

Generally, private sector wages have increased, with the average monthly wage for private sector Saudis increasing by \$1,500 (SR5625) in 2015, 6.7 percent year-on-year, based on data from Jadwa Investment. Wages for non-Saudis in the private sector increased 12.2 percent year-on-year. Driven by labor market reforms such as Saudization, wage protection systems, and correction of status to foreign workers, employment growth for Saudis

Private hospital staff growth between 2011 and 2015 for allied health professional was the greatest with an 87 percent increase compared with 29 percent growth of physicians during the same time period. However, the growth rate of allied health staff and physicians in MOH hospitals were much closer figures at 27 percent and 21 percent, respectively. Allied health staff, which include professions such as technicians, therapists, and medical records, are typically technical but require less training than MDs, providing a broader pool of laborers available for hire. Also, these professionals often see patients for

more routine visits, are sometimes involved in hospital operations, and change positions at a higher rate than more highly specialized physicians, so the relatively high private sector growth rate of these professionals could reflect the privatization and expansion of hospital and care center facilities. Undoubtedly, these professionals will play an important role as more facilities are built.

As Saudi Arabia increasingly works to promote foreign direct investment and to attract multinationals into the health sector, Saudi workers have the potential to gain skills through the transfer of knowledge from the expertise of multinational employees in the country. It is well documented that technical capabilities of foreign entrants are transferred to the host country, and Saudis who are hired at multinationals may benefit in this respect.⁴ Through mechanisms such as labor turnover, domestic firms have the opportunity to benefit as well from the transfer of technologies and processes.

Mr. Fahad bin Ibrahim Al Khalaf, CEO of SPIMACO, commented:

“We have learned a lot from the experience of the multinational strategic partners from the people development and on job training perspectives. We are continuously sending some of our colleagues from Saudi Arabia to work and get training at these multinational companies through train the trainer programs. Also in multiple periodical occasions we invite a multinational expertise to train our colleagues in production facilities, And also by utilizing the capabilities and experience of our foreign colleagues from multinational background who work in SPIMACO, so the Saudi employees learn a lot in all manufacturing aspects especially in production and quality. Also having multicultural foreign Arabs and non-Arab colleagues who are having a lot of experience in their countries and the Saudi employees benefit a lot from their professional experience in a mixed multicultural working environment helping to achieve a sufficient competent level of Saudi employment accomplishing the Saudization plan, maintaining the required quality of work and maintaining the multicultural working environment.”

Based on findings in the literature, promoting foreign direct investment (FDI) in the health and medical space is a strong strategy because FDI-created jobs are good jobs for workers, providing more on-the-job training and higher wages than local firms.⁵ They are also good jobs from Saudi Arabia’s perspective since inflows of

FDI have been found to increase productivity of the host country through entrance of foreign affiliates with superior productivity, exit of less productive domestic firms, and knowledge spillovers from contacts mainly between multinationals and their local suppliers. Multi-country evidence shows that the impact of FDI on boosting economic growth is especially strong when the country has a well-developed financial market, as does Saudi Arabia. To this end, the investment promotion work by SAGIA and incentives in healthcare and life sciences currently provided by the government can expect positive return in the long-term.

Encouraging local firms to become suppliers to healthcare foreign affiliates could maximize the benefits of productivity from FDI. Potential methods include subsidized credit or establishment of a development program that allows local suppliers to better meet the needs of foreign customers.

Training

Even though workers are becoming more productive, there is still a need to recruit staff, either trained Saudis or from abroad to meet the increasing gap in supply and demand for physicians and nurses. As part of the NTP, the Ministry of Health set a target of increasing the number of Saudi physicians in training to 4,000 by 2020 from 2,200. The Government also set a goal of training 100,000 nurses by 2025. Saudi Arabia aims to attract more Saudis to medical training to minimize the sector’s dependence on foreign workers. University training programs are a way to implement Saudization in highly skilled fields like healthcare.

Between 2017 and 2020, we project that director and managerial positions across facilities in the sector will increase by 4.8 percent, while the number of technician positions are forecasted to grow by 3.4 percent, and specialist jobs are forecasted to increase by 3.3 percent.

In 2016, the Ministry of Health set out recruitment of nurses from Pakistan, Egypt, and Sudan. Expatriate staff continues to play a large role in the healthcare sector, though the Ministry of Health has taken considerable measures to not only boost its staff overall, but to raise the number of Saudi staff. Across all Ministry hospitals, Saudi healthcare professional made up 59 percent of the workforce in 2015, a nine percent increase from 2011. The number of Saudi nurses grew from 27,040 in 2011 to 38,544 in 2015. In sum, the Ministry of Health employed over 178,000 Saudi men and women across all professions and facilities in 2015. Given the large number of jobs in the sector expected to see continued growth, training Saudis in the medical profession will allow them to get good jobs and will help to meet the growing need for services. This is especially true of

⁴ Knowledge Transfers from Multinational to Domestic Firms: Evidence from Worker Mobility. Jennifer P. Poole. The Review of Economics and Statistics, May 2013.

⁵ Does FDI Bring Good Jobs to Host Countries? Beata Javorcik. World Development Report – World Bank 2013.

allied health professions, which have seen the largest rate of growth of all professions, especially in the private sector, and requires less training than becoming a physician. Of all students enrolled nationally in health profession programs, the greatest share are enrolled in applied science colleges (35.4 percent) followed by 30 percent in medical schools or university hospitals.

A number of well-respected medical colleges operate at public universities across the country. Riyadh's King Saud University opened the country's first medical school in 1969 and had the largest number of students in the Kingdom, with over 8,000 enrolled across five medical colleges, and 2,162 enrolled in the College of Medicine as of 2015 (13 percent of its total enrollment). The University's College of Applied Medical Sciences has campuses in Abha, Qassim, and Riyadh. Many other medical schools now exist in the Kingdom that offers a range of health sciences programs, including the medical school at King Faisal University and King Saud bin Abdulaziz University for Health Sciences. The latter trains nearly 15 percent of Saudi Arabia's nurses and also offers programs for health professions outside of MD training in areas such as pharmacy, applied health sciences, and health informatics. King Khalid University has the Kingdom's largest allied health sciences program. Private, non-profit medical schools have opened in the past decade such as Alfaisal University in Riyadh, admitting its first class in 2008 and receiving full accreditation in 2016. The class size has grown to nearly 2,500, comprised of approximately one-third international students and two-third Saudi nationals. Ibn Sina National College for Medical Studies, located in Jeddah, was the first private medical school under the Ministry of Higher Education's supervision. The number of medical schools has increased to over 20, yet according to experts in the field, there is still a need for additional training facilities.

Enrollment in health care courses has grown over the past few years. In 2014-2015, approximately seven percent of the total student population was enrolled in medical and health science programs in Saudi Arabia. Enrollment in Saudi Arabian medical and health courses in Saudi universities was 61,421 in 2014-2015, more than doubling enrollment over five years.

Not only have a growing number of Saudis enrolled in medical college programs, but the number of graduates has also trended upwards, with a projected growth in the number of medical graduates at over 30 percent by 2020, indicating a move towards localization of expertise in the sector.

It may be beneficial to not only recruit more Saudis to medical professions, but also to consider how training resources are allocated. For instance, while shortages of

nurses and other hospital staff have become an issue in past years with increased demand, the Ministry of Health has noted an excess supply of pharmacists and pharmacy technicians at certain facilities across the Kingdom. With incentives to enter the most needed health professions, students embarking on a medically-related career path may be encouraged to shift their focus to areas of shortages as opposed to professions in pharmacy. Increased information on job availability and demand at the college level could help filter students into the most demanded professions, thereby increasing staffing efficiency for the Kingdom in the long term.

The Institute of Public Administration, an autonomous government agency established to increase the education and efficiency of public employees, has also increased enrollment and completion in Health Administration. During the 2014-2015 year, 1,747 students completed the program. The largest share of students (22 percent) completed Managing Health Education Programs, and 12 percent completed Organization in Health Facilities, mirroring the push to boost health education and manage a growing number of government hospitals and health care centers.

Local research and development efforts are supported by postgraduate education programs focused on training through fellowships and residency. Such programs are offered by King Faisal Specialist Hospital and the Research Center in Riyadh. Also, prominent hospitals in the U.S. have begun forming joint ventures with partners in Saudi Arabia to offer research centers and enhanced training. For instance, a collaboration began in 2013 between Johns Hopkins Medicine and Saudi Aramco. Johns Hopkins Aramco Healthcare provides healthcare to Saudi Aramco's employees as well as fund medical research and education.

At a specialist level, the Joint Centers of Excellence Programs (JCEPs) collaborate with leading universities globally to offer research appointments to high-achieving Saudi students at the graduate and post graduate level. The Center of Excellence in Nanomedicine (CENM) is a model program for training Saudi medical scientists while strengthening Saudi Arabia's medical research infrastructure. CENM is a joint partnership between researchers at several Saudi research institutions, including King Abdulaziz City of Science and Technology, King Saud University, King Abdullah Institute for Nanotechnology and King Faisal Specialist Hospital & Research Center, and the University of California, San Diego. CENM research applies the tools of polymer chemistry and nanotechnology to medical challenges such as disease-selective drug delivery, early detection of disease by noninvasive imaging, and stem cell-based therapies. Projects include the development

of light-responsive and bio-responsible materials, regenerative medicine to promote the healing of the heart muscle following heart attacks. Since opening, the center has been granted 11 patents on products and commercialized the liposuction technique, NanoLipo. Partnerships in other areas of medicine would allow further knowledge transfer of global expertise and allow Saudis to become experts in a given specialty.

Health IT and E-Health

Globally, the medical industry has experienced a substantial role of electronic health innovations, including centralized repositories for patient data and electronic filing systems. The Saudi health IT market is estimated to be between \$200 million (SR750 million) to \$500 million (SR1.87 billion) in value, a decline since a 2014 estimation, yet is viewed as relatively open.

In 2011, the Ministry of Health implemented an e-health initiative for the delivery of “safe and efficient health systems, based on care centered on the patient and supported by e-health.” With the NTP, the MOH set the target of increasing the percentage of Saudis who have unified medical records to 70 percent from zero by 2020. Organizations such as King Fahad Medical City, King Faisal Specialist Hospital and Research Center, and King Khalid Eye Specialist Hospital are exploring or currently implementing e-health programs. SAGIA notes that many opportunities, including the construction of an e-health system, focus on raising care standards for residents.

The Integrated and Comprehensive Health Program was designed to connect over 3,000 government health facilities by 2020. This project exemplifies steps taken by the state in constructing a nationwide e-health system. With these steps, opportunities for U.S. companies have emerged in the areas of data management and data security, regulation of medical information technology, and telecommunications. With emerging opportunities, the Government has implemented regulations related to Health IT and data security that are favorable to foreign businesses. The Ministry of Health has a procurement process for 10 to 15 percent of Health IT purchases.

Saudi Arabia continues to encourage the management of healthcare through international providers, opening up more opportunities for IT providers from the United States to undertake projects in both cost-revenue analysis and clinical quality. Public and private sector hospitals are adopting healthcare information systems, electronic medical records, and patient billing. Companies like SK Telecom, ezCaretech, Cerner, InterSystems, and CompuMedical are a sampling of private companies offering digital information systems. Growth in opportunities will continue along with additional

government projects to create a standard e-Health card and make insurance claims available online. A Memorandum of Understanding between the firm Elm and the Ministry of Health directs Elm to implement new e-Health projects such as infrastructure development, communication systems, and Enterprise Resource Planning, creating new procurement prospects.

A variety of private sector opportunities have begun to emerge with the remaking of primary healthcare centers (PHCs). An EY report suggested the following areas for private sector involvement in PHC information and communication technology:

- Improved referral systems between primary care and specialist or tertiary care providers
- Development of advanced diagnostic capabilities for health screening
- Specialist referrals through telehealth
- Increased focus on providing multidisciplinary teams through the introduction of nurse practitioners into healthcare staff
- Integration of innovative health care initiatives, such as accurate e-health, and telehealth which will deliver round-the-clock monitoring

With a system that updates and connects record systems, patients will have more freedom to travel for services because of information that is readily available. Improvement of systems will encourage increased use of primary healthcare centers, freeing hospital capacity. Telehealth and mobile access to healthcare will improve availability of specific services for patients outside of major cities. According to industry experts, increased coordination of information could use improvement, and being able to turn disparate data into actionable themes will inform managers in the sector on ways to provide enhanced service.

Globally, smartphones are increasingly used in healthcare prevention and treatment, with a global mobile health market valued at \$10.5 billion (SR40 billion) in 2014, and a projected compound annual growth rate of 33.5 percent by 2020. Mobile-based devices like wearable fitness tracking and blood pressure and respiratory monitors are on the market. Opportunities exist in mobile health applications that will allow for greater monitoring and service delivery, especially in more remote regions.

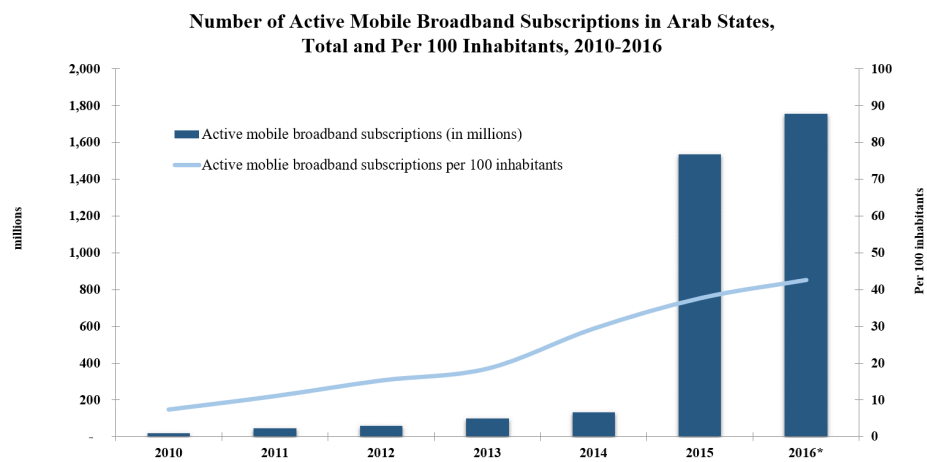
Notably, a large proportion of the Saudi population is young with this demographic rapidly growing. Approximately 30 percent of the population is 15 or younger in Saudi Arabia, and this group, which will

be highly familiar with mobile technology, presents an expanding consumer base for delivery of healthcare through mobile devices.

In the GCC region, active mobile broadband subscriptions increased sharply in the past two years, with nearly 43 percent of individuals receiving mobile broadband services in 2016 [see figure 21]. There has been a steady growth in internet users and fixed broadband subscriptions in Saudi Arabia, with over 70 percent of citizens using internet in 2016 [see figure 22]. Over the past two years, the growth rate in Saudi broadband subscriptions has outpaced the growth rate in proportion of internet users. The increased broadband

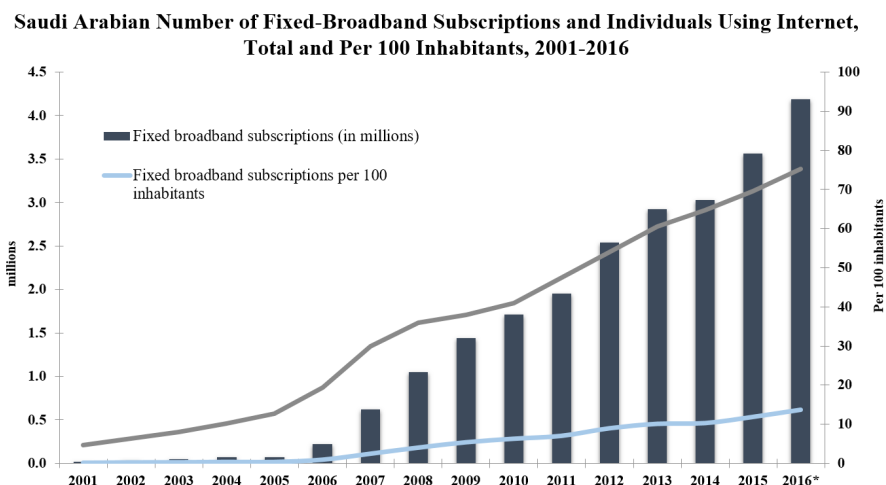
rate in recent years bodes well for mobile and internet-based health solutions in the Kingdom. Also, 3G services are available in less-urban areas, and 4G services have become increasingly prevalent in large Saudi cities with near-term plans to expand 4G services. As the Ministry of Health moves towards a preventative healthcare model to increase awareness of diseases impacting Saudi citizens, mobile campaigns have been used to send information and health and prevention strategies. The prevalence of mobile health strategies will undoubtedly expand along with increasing use of mobile broadband and smartphones.

FIGURE 21: Number of Active Mobile Broadband Subscriptions in Arab States, Total and Per 100 Inhabitants, 2010-2016



* Estimate
Source: ITU World Telecommunication/ICT Indicators database, USSABC

FIGURE 22: Saudi Arabian Number of Fixed-Broadband Subscriptions and Individuals Using Internet, Total and Per 100 Inhabitants, 2001-2016



* Estimate
Source: ITU World Telecommunication/ICT Indicators database, USSABC

Health Insurance Market

Medical insurance remains the largest segment of the domestic insurance market in Saudi Arabia, accounting for 50 percent share of the total market as of 2016. Growth in revenue and net profits have seen double digit increases over the past years as the sector has not been hit by declining oil prices as strongly as other sectors because of relatively inelastic demand. Albilad Capital reports that the number of health insurance policyholders reached 11 million at the end of 2015. With growing demand and economic reforms, the Saudi Government has worked to shift part of the growing healthcare burden to the private sector, including insurance. According to Thomson Reuters, the private health insurance market in Saudi Arabia is valued at \$6.7 billion (SR25 billion).

Presently, about one-third of the total population in Saudi Arabia has health insurance. As of 2014, only 13 percent of Saudis had health insurance while 71 percent of expatriates were insured, suggesting space for market growth given that in 2017, Saudis accounted for 62.6 percent of the country's population and foreign nationals accounted for the remaining 37.4 percent. Certain regulatory developments have a potential to increase market penetration. For instance, the insurance requirements have expanded for non-Saudis who wish to be treated at either public or private hospitals. A law introduced in 2016 on visitor health coverage requires that international visitors to Saudi Arabia must have a health insurance policy provided by a Saudi firm. The growing number of inbound tourists to Saudi Arabia and the Government's focus on expanding the tourism industry should expand the customer base for visitor's insurance. In 2016, there were an estimated 16 million visitors, and this number is expected to grow to around 20 million by 2020, based on Saudi projections.

The insurance market is stable and well regulated. SAMA oversees regulation of the industry with requirements in capital adequacy, risk management, and solvency, among others. The Council of Cooperative Health Insurance (CCHI) was created in 1999 to protect consumer rights and ensure best practices and stability of the medical insurance segment. SAMA has commented that "further coordination between SAMA and the CCHI will reduce regulatory arbitrage and eliminate conflicts in the law implementation." CCHI serves as the main driver for increasing compulsory health insurance demand by way of increased regulations. In 2006, CCHI started the enforcement of compulsory health insurance for all expatriate employees in the private sector, and in 2014, mandated health insurance for private sector expatriate workers' families. By 2015, it was required that private companies provide health coverage for families of their Saudi employees.

With a population growth rate of over two percent, Saudi Arabia's population is expanding at one of the highest global rates aside from Africa. The country also has one of the lowest levels of insurance penetration, presenting an opportunity for market growth. In 2015, the value of gross written premiums (GWPs) in the health segment increased by 25 percent in value from the previous year. Analysts suggest that this increase in GWPs are because of the law requiring health insurance for families of private sector expatriate employees. In the health segment, GWPs expanded to \$2.64 billion (SR9.9 billion), and net earned premiums spiked from the previous year with 18 percent growth from the previous year, totaling \$2.45 billion (SR9.2 billion). While brokers have historically controlled the market, areas such as medical insurance have seen more sales directly to large clients to avoid fees.

As of 2016, medical insurance was offered by 26 Saudi Arabian insurance companies, all listed on the Tadawul. Some insurers offer a broad range of offerings while others specialize in the health segment. Together, Bupa Arabia, Tawuniya, and Medgulf comprise 82 percent of the health insurance market. Insurers in the segment include AXA-Cooperative, SAICO, Arabian Shield, and Malath Insurance, among others. The Capital Markets Authority reviews compliance of all companies with the Saudi capital markets law. The largest three insurers in the segment vary in their offering:

- *Bupa Arabia* exclusively offers health insurance and had the greatest percent of health insurance sales in Saudi Arabia at 43.1 percent. Bupa's market share increased by 2.7 percent from 2015 to 2016. The company has consistently been one of the most profitable in the insurance sector.
- *Tawuniya's* 2016 GWPs were split: health (60 percent), vehicle (21 percent), general (18 percent). The company's profits have increased in recent years, and it expanded its market share by 3.6 percent to comprise 23.3 percent of the insurance market last year.
- *Medgulf's* 2016 GWPs medical were split: (71 percent), vehicle (18 percent), general (11 percent). Market share declined by 4.2 percent from 2015 to 2016, yet Medgulf remains the third largest provider of health insurance account for 15.3 percent of sales in Saudi Arabia.

Heightened laws requiring coverage for private sector workers and families presents the greatest opportunity for growth in the medical sector. Experts observe that there is more room for enforcement of these regulations to a broader base of foreign residents, especially among

expatriate workers employed by private individuals. Growth of the private medical insurance market may be further stimulated as the Ministry of Health continues its attempts to shift state-employed Saudis towards private health insurance, similar to those workers in the private sector. The emerging markets investment bank Arqam Capital forecasts 15 percent growth in healthcare premiums between 2016 and 2020 attributed to expansion and enforcement of compulsory insurance. This level of growth equates to approximately 3.5 million new healthcare policyholders.

Discussion: Market Outlook, Opportunities, and Challenges

According to Thomson Reuters data, Saudi Arabia has 389 planned healthcare projects valued at \$26.5 billion (SR100 billion). That is 55 percent of all planned projects in the GCC, accounting for 40 percent of total project value.

Opportunities for foreign investors as identified in the National Transformation Program (NTP) include: local manufacturing of pharmaceuticals, private medical facilities, increased medical insurance, education in the healthcare field, expanded ICT in healthcare, increased professional development, and enhanced training facilities. U.S. companies are currently positioned to enter the Saudi Arabian market to equip the Saudi healthcare system with health information systems, world-class healthcare training, and local manufacturing of medicines. Additionally, the United States is a major supplier of medical equipment such as monitoring systems, therapeutic appliances, optical devices, and cooling for devices and specimens, so there is opportunity to expand these existing markets given general growth in demand.

Growing demand, potential in currently underserved areas, and increasing opportunities for private sector involvement will be drivers behind the expansion of Saudi Arabia's healthcare sector. Private sector healthcare providers are becoming increasingly vital in Saudi Arabia as the Government looks to share healthcare costs. Demand growth for healthcare services in Saudi Arabia includes demand for treatments targeting chronic diseases. To combat lifestyle diseases, preventative health campaigns have become an increasing focus of the Saudi Government, and primary health care centers are expected to shift focus to delivering preventative care. As the demand for health services grows, new systems – such as telehealth and electronic health systems – will play an increasing role. With a rising prevalence of lifestyle-related diseases such as diabetes, Saudi Arabia will continue its move towards a greater role for primary health care centers in preventative care, catalyzing offshoot opportunities in areas such as diet clinics, fitness

centers, and immunization campaigns. As the Saudi Government has emphasized provision of services by the private sector, Saudi Arabia offers attractive incentives for private sector investment, though more transparency and timely procedures may help in further increasing the attractiveness of Saudi Arabia for foreign companies.

Compulsory laws requiring health insurance are helping to boost the private sector. As private healthcare insurance becomes more prominent, demand for private services will increase. The Saudi Arabian government may further continue to limit its contribution to funding healthcare services as private coverage expands. As this example suggests, rising private-sector involvement will help to fill a growing gap in supply and demand, which is driven by many interacting factors, including the government's shifting the nature of healthcare provision. The capacity of a qualified labor force has proven to be a key challenge with expansion of the Saudi healthcare sector, as providers have relied heavily on an expatriate work force. The Government continues to steadily invest in training programs, and health education will be a central area focus for foreign investment and joint ventures. The data shows increasing numbers of Saudis enrolled in medical colleges, which will reduce the dependency on foreign medical staff over the coming years. Further boosting training efforts towards research and development capacity in line with international standards may foster a culture that can sustain long-term domestic innovation in the healthcare sector.

Given the Vision 2030 goal to increase utilization rates and Ministry of Health goals to invest in PHCs, the Government will likely continue its focus on the integration and development of primary health care centers. The Ministry has outlined a target to increase the average annual number of visits to a PHC to at least 3.5 per person annually, and to this end will begin a pilot program, investing in the construction and renovation of a new PHC system. Overall, the Ministry of Health is working toward a more efficient use of resources, and industry experts suggest that the new budget presents an opportunity to optimize spending.

The pharmaceutical and medical device market has come into focus as a priority of the Saudi Government and presents a key area for future growth. Government initiatives to boost manufacturing, Saudi Arabia's wealth, and steady population growth will support long-term success of the market. Further relaxation of price regulations on pharmaceuticals would position the market to grow further. Although a macroeconomic environment with lower public health expenditure presents a more difficult operating environment for multinational pharmaceutical companies, conditions are expected to ease with oil price increases over recent months

and eased austerity measures. Both private and public investments are driving the country's pharmaceutical and medical device markets, and opportunities for local manufacturing are expected to increase. Prescription and generic uptake is on an upward trajectory in Saudi Arabia, and ongoing privatization and modernization efforts and diseases impacting Saudi Arabia will support an increase in prescription drugs. With the largest market size in the GCC and one of the greatest levels of per-capita pharmaceutical expenditure, Saudi Arabia is a relatively attractive location for foreign investors in this space.

U.S. – Healthcare Market Trends and Outlook

With a broad and developed market spanning many enterprises, there are many topics to consider in the U.S. healthcare market. However, it may be most productive to consider the current state of U.S. healthcare, where the sector is going, and opportunities for investors.

We examine the NAICS Healthcare sector and subsectors, including ambulatory health care services, private hospitals, and nursing and residential care facilities.

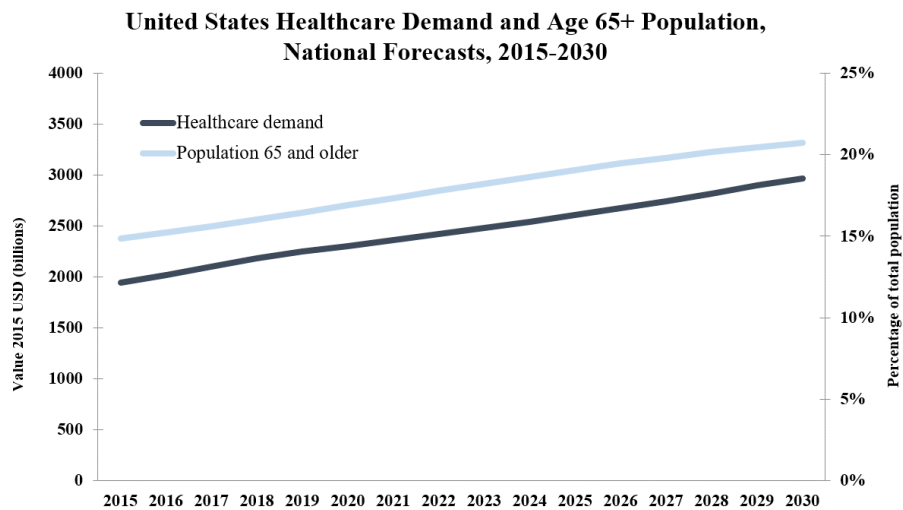
Aging demographics are helping to fuel a growing U.S. health care sector. Nearly 15 percent of the U.S. population was over 65 years in age in 2015, up from

Rising healthcare costs for pharmaceuticals and services are driving health care spending. Innovation and disruption are expected to drive down costs in the healthcare system, providing inexpensive alternatives for service providers.

The economy of the health care sector is becoming more consumer-driven and value-based. Following the trend of recent years, employees will shoulder a greater proportion of healthcare costs. Based on data from the Henry J. Kaiser Family Foundation, the percentage of U.S. companies offering high-deductible health care plans has notched up from four percent to 26 percent over the past decade.

New business models will offer consumers a wider array of service choices as the U.S. payment model shifts to a model that emphasizes consumer value. One example of this is urgent care centers. Consumers who must pay for a higher proportion of costs out-of-pocket will visit these centers as an alternative to higher cost emergency rooms. Some patients are deciding to receive more services at ambulatory centers that were traditionally just inpatient services, like surgeries and other procedures. We project that U.S. demand for ambulatory health services will increase at a CAGR of 3.3 percent through 2030 while U.S. demand for hospitals will increase at a CAGR of 2.8 percent during the same period [see figure 24].

FIGURE 23: United States Healthcare Demand and Age 65+ Population, National Forecasts, 2015-2030

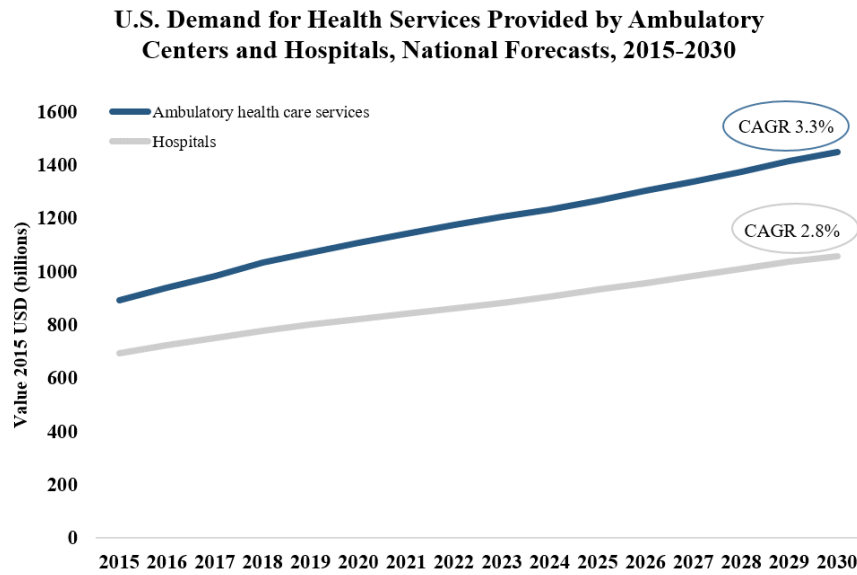


Source: REMI, USSABC

12.3 percent in 2005. The proportion of the U.S. elderly population is expected to grow to over 20 percent of the population by 2030 as life expectancy for the baby boomer generation increases [see figure 23].

In terms of health services value-added to the economy, ambulatory services is projected to be the subsector with the greatest contribution to U.S. GDP, followed by hospitals and nursing care. Ambulatory services will

FIGURE 24: United States Healthcare Demand and Age 65+ Population, National Forecasts, 2015-2030



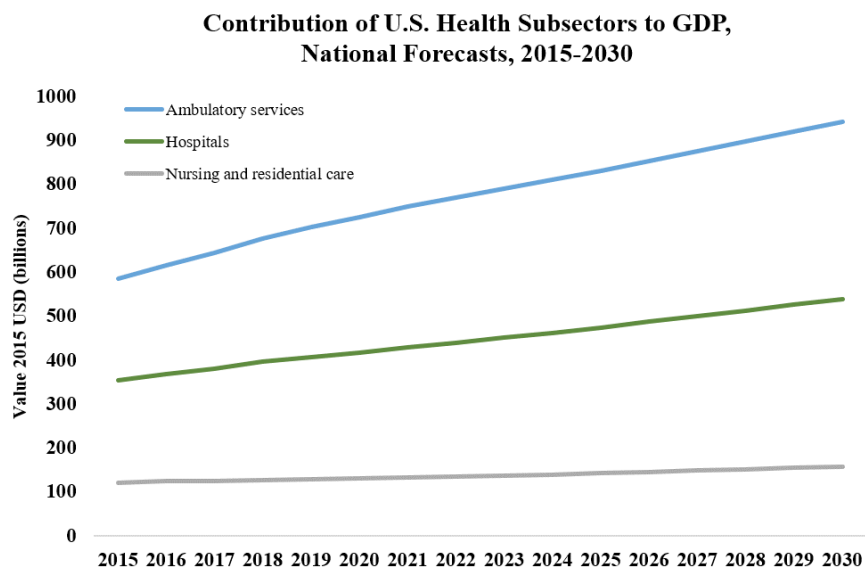
Source: REMI, USSABC

also see the greatest growth through 2030 [see figure 25]. The value of medical imports used by the health sector is projected to grow overall, with the greatest rate of import use among hospitals [see figure 26]. Hospitals rely more heavily on imported products than the ambulatory services and nursing and residential care subsectors.

As of 2016, the top regional marketplaces for ambulatory health services were California, Florida, Illinois, New York, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, and Texas [see figure 27].

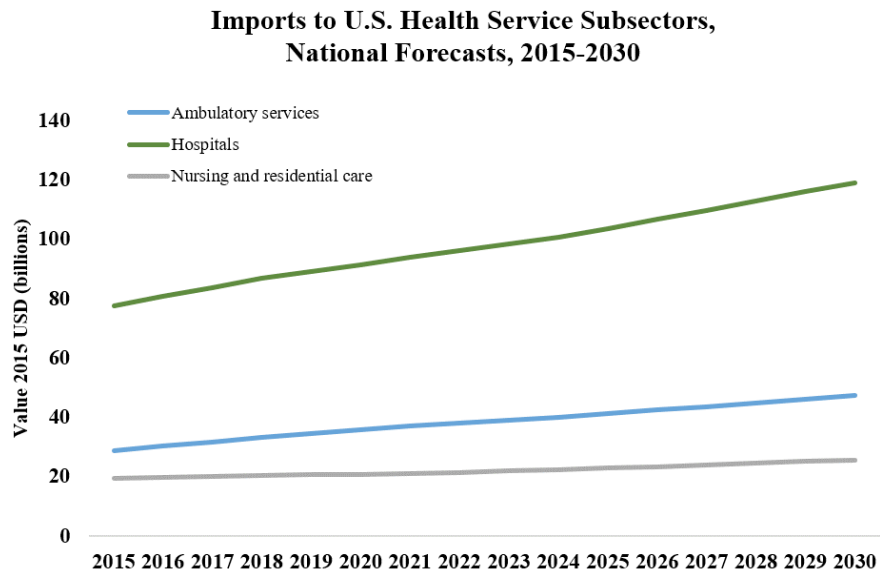
New technologies continue to emerge and remake the healthcare system, shifting business trends and hindering upward cost movement. Emergent business models,

FIGURE 25: Contribution of U.S. health subsectors to GDP, National forecasts, 2015-2030



Source: REMI, USSABC

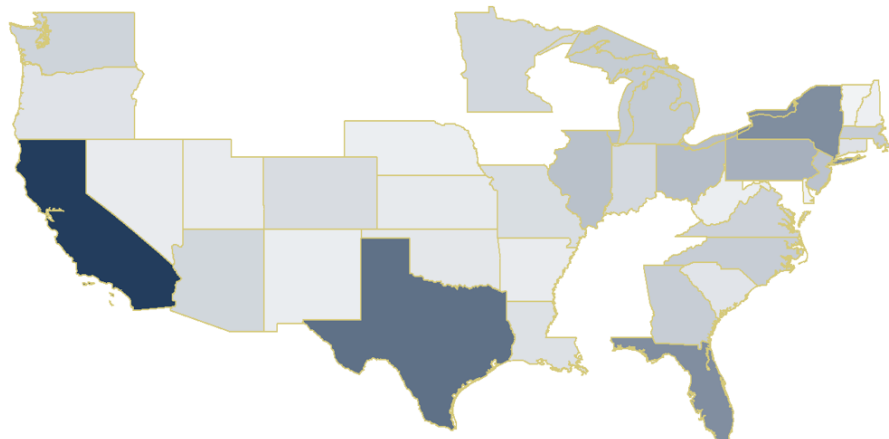
FIGURE 26: Imports to U.S. Health Service Subsectors, National Forecasts, 2015-2030



Source: REMI, USSABC

FIGURE 27: Regional Marketplace for Ambulatory Healthcare Services, 2016

Regional marketplaces for ambulatory health care services, 2016



Notes: The figure represents the regional levels of market factors such as supply and demand, and the overall value-added to the national economy. Darker colors reflect greater levels of activity. White areas represent states where no data is available.

Source: REMI, USSABC

such as tele-medicine, allow patients to receive virtual services outside of a traditional office visit by way of video, phone, or a variety of web-based applications.

Medical devices help to drive down costs in the health care system as costs are removed when new devices and products are introduced in the marketplace, increasing

diagnostic and procedural efficiency. Transcatheter heart valves are being used as a substitute for open heart surgery in some patients. These valves increase blood flow in patients that have damaged valves, and are less expensive and safer than some surgeries. Innovations in glucose monitoring allow patients to place a sensor on the skin to monitor blood glucose and to receive smartphone

alerts, disrupting the previous monitoring model which used skin-prick method.

The United States is the largest medical device market in the world, expected to reach \$155 billion (SR580 billion) by the end of 2017. As of 2015, the U.S. market value comprised 43 percent of the global market. There are over 6,500 companies that produce medical devices located across the U.S. and are largely concentrated in regions with high-tech industries like biotechnology and microelectronics such as California, Florida, Illinois, Massachusetts, Michigan, Minnesota, New York, and Pennsylvania. Most companies are small and medium-sized enterprises (SMEs). Since the medical device industry requires other industries like biotechnology, microelectronics, software development, and telecommunications, the U.S. holds a comparative advantage with these readily available products. Investment in medical device development has doubled since the 1990s with projected positive growth over the next decade.

The number of U.S. Food and Drug Administration (FDA) approvals for drugs and therapeutics in the United States are expected to increase in 2017 driven by a large number of regulatory submissions and increased research and development spending in 2016. Additionally, the FDA has taken steps to facilitate an expedited approval process in response to requests from patients and companies aiming to improve both sales and health outcomes. For instance, Fast Track expedites the process for drugs that have a potential to treat medical areas without current treatments through increased communication and pre-

review prior to a formal application. Of the 22 novel drugs approved on the U.S. pharmaceutical market in 2016, 16 of these therapies were from U.S. companies, reflecting U.S. innovation capabilities.

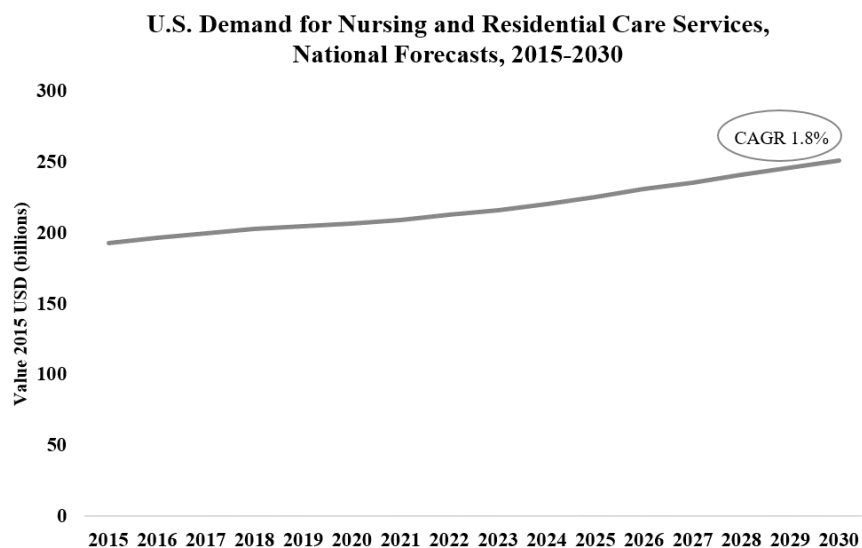
By sales, the top ten pharmaceutical companies in 2016 in the U.S. market were Pfizer, Johnson & Johnson, Gilead, Roche, Amgen, Novartis, Merck & Co, AbbVie, GlaxoSmithKline, and Sanofi. Bristol-Myers Squibb saw a 31 percent increase in U.S. revenues boosted by acquisitions. Similarly, acquired products increased Pfizer's U.S. revenues by 22 percent, and AbbVie's revenues by 18 percent.

As of March 2017, the health sector is one of the leading performers for 2017, whereas healthcare equities were largely undervalued in 2016. Based on data from Cornerstone Research, the health care sector has seen the largest double-digit earnings growth over the past five years. Health care accounts for a 14 percent share of the S&P 500 Index.

Biotech proves to be the leading subsector in healthcare as it drives the highest amount of value creation among subsectors. Between 2010 and 2015, the total returns to global shareholders from biotech was 27 percent followed by medical devices with 15 percent total returns to shareholders .

While demand for nursing and residential care services is not growing as quickly as other subsectors, overall national demand is expected to increase by 26 percent between 2017 and 2030 with a CAGR of 1.8 percent

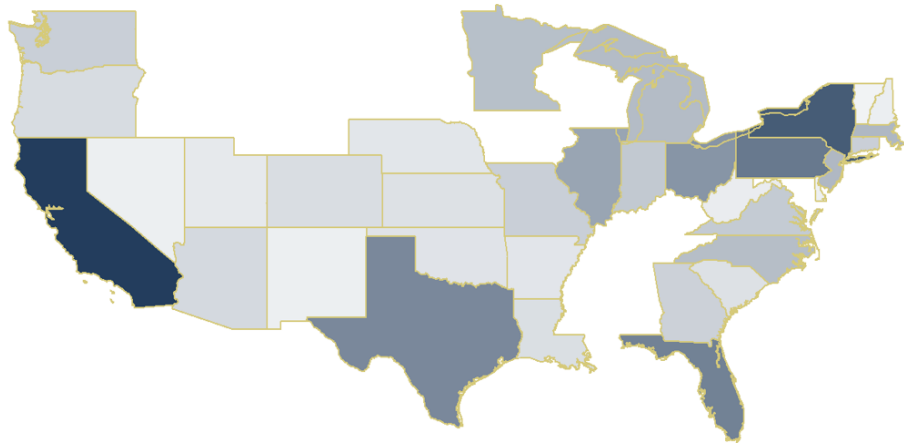
FIGURE 28: U.S. Demand for Nursing and Residential Care Services, National Forecasts, 2015-2030



Source: REMI, USSABC

FIGURE 29: U.S. Demand for Nursing and Residential Care Services, National Forecasts, 2015-2030

Regional marketplaces for nursing and residential care facilities, 2016



Notes: The figure represents the regional levels of market factors such as supply and demand, and the overall value-added to the national economy. Darker colors reflect greater levels of activity. White areas represent states where no data is available.

Source: REMI, USSABC

[see figure 28]. The top regional marketplaces in terms of demand and value-added activity for nursing and residential care are California, Florida, Illinois, New York, Ohio, Pennsylvania, and Texas [see figure 29].

The U.S. healthcare industry is both consolidating and disintermediating. Especially among health providers, an increasing trend of merger and acquisition (M&A) deals stands out. In 2015, there were 939 deals in U.S. health services, valued at \$71.7 billion (SR270 billion). Examples include Aetna’s acquisition of Humana and Anthem’s acquisition of Cigna in 2015. In New Jersey, Robert Wood Johnson Health System and Barnabas Health merged their hospitals to form the state’s largest health system. Long-term care was the most active deal sector in 2015 and 2016 with about a 36 percent share in deals. Consolidation in this industry has a history of positive outcomes for consumers through increased quality and lowered prices.

Fueled by mega-mergers and acquisitions of small and medium companies, mergers and acquisitions (M&As) in the medical device industry have been on the rise globally. In 2014, the healthcare subsector saw 96 M&As, an 18.5 percent increase from 2013, based on data from fDi Markets. U.S. firm Zimmer Holdings acquired Biomet for \$13.4 billion (SR50.25 billion). The global asset manager Carlyle Group acquired Ortho Clinical Diagnostics for \$4.2 billion (SR15.75 billion) in the same year. As larger companies aim to expand

their product portfolios, they acquire small and medium companies for novel technologies that have been proven to be superior to devices already on the market. As the market consolidates in the medical device industry, larger players will compete while innovation will be driven by growing demand.

Imports contribute 30 percent of the U.S. medical device market. For consumable medical products, such as bandages and syringes, imports comprise nearly half of the market, with Mexico, Ireland, China, Japan, and Switzerland leading suppliers to the U.S. For diagnostic and imaging equipment, imports contribute 20 percent to the market, with the majority of imports from Germany, Japan, China, and Mexico.

Health insurance has been a highly debated topic in the United States, with recent efforts by President Donald Trump to repeal the Affordable Care Act (ACA) and to replace it with the American Healthcare Act (AHCA). The Congressional Budget Office, a non-partisan organization, estimated that the passing of the AHCA would have led to 14 million more uninsured Americans by 2018 as compared with the current law. Although the AHCA bill did not pass, the current national health plan may resurface in legislation discussions as the federal government looks for ways to increase federal budget savings. Changes to the ACA could include reduction of cost-sharing subsidies to states and reduced penalties on individuals who do not sign up for mandatory health insurance.

Data Sources

BMI Research

The online research platform provides country-specific macroeconomic and financial market data.

General Authority for Statistics (GaStat)

In 2016, the Council of Ministers approved the General Authority for Statistics to oversee technical supervision and organization of the Saudi Statistics and Information Sector. GaStat has created and manages a system of national statistical databases through development of the central information center and aims to develop and maintain statistical information in an accurate and unified system.

International Trade Administration, U.S. Department of Commerce

The ITA releases country case studies for 2016, discussing country subsector rankings and opportunities for U.S. companies.

ITU World Telecommunication

ITU Telecom World is a global platform for government, corporations, and small and medium enterprises (SMEs) to accelerate ICT innovation for economic growth. The ICT Indicators database provides time series data for over 200 economies across selected key indicators.

Regional Economic Models, Inc. (REMI)

REMI models have been used globally for a wide range of topic areas including economic development, the environment, energy, transportation, taxation, forecasting, and planning. The model incorporates input-output (IO) tabulation, computable general equilibrium, econometrics, and new economic geography. The REMI model generates forecast data for each the U.S. and Saudi Arabia across a variety of country-specific industry sectors.

World Bank

The World Bank provides open access to global development data through a collection of indicators, compiled from officially recognized international sources. The database compiles the most current and accurate global development data available, and includes national, regional and global estimates.

U.S.-Saudi Arabian Business Council Members Involved in the Healthcare Industry:

3M Saudi Arabia
Abbott Laboratories
Abdulla Fouad Holding Co.
Aggad Investment Company (AICO)
Al Araba Commercial & Industrial Group
Al Kholi Group
Al Zaid Engineering Consultants
Al-Afandi Trade, Industry & Contracting Est.
Al-Minwal Trading Est. for Investment
Al-Sulaiman Group (Rolaco)
Alkafi Holding Co. Ltd.
Arabian Health Care Supply Company (AHSCC)
Arabian Medical Products Manufacturing Company (ENAYAH)
Bassam Trading Company
Baxter Company Limited
Becton, Dickinson & Company
Dallah Albaraka Holding Co.
E.A. Juffali & Brothers
El Seif Development Co.
El Seif Group
General Electric Healthcare
Gulf Care International
Houston Methodist
ITEAC
Jamjoom Medical Industries Co. Ltd.
Kingdom Holding Co.
Kingdom Hospital and Consulting Clinics
NewYork-Presbyterian Hospital
Pfizer International Inc.
Prima Global Company LLC
Rezayat Group of Companies
Saad Al-Sanea Center for Communication Disorders
SAH Global
Salehiya Trading Establishment
Salman Group of Companies
Sujan Trading Est.
The Children's Hospital of Philadelphia
The Dow Chemical Company
The Olayan Group
Xenel Group
Zamil Group Holding



مجلس الأعمال السعودي الأمريكي
U.S.-Saudi Arabian Business Council

United States Office

8081 Wolftrap Road, Suite 300
Vienna, VA 22182
United States
Telephone: 703-962-9300 or 888-638-1212
Fax: 703-204-0332
E-mail: ussaudi@us-sabc.org

Saudi Arabian Office

WASEL 2163
Urouba Street
Office 6-1
Mather North – Unit No. 43
Riyadh 12334-7795
Kingdom of Saudi Arabia
Telephone: 966-11-474-3555 or 966-11-476-2697
Fax: 966-11-476-7167
E-mail: ussaudibc@us-sabc.org

www.us-sabc.org