



Gulf Research Center
Knowledge for All

Saudi Arabia Healthcare Industry Outlook



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1. EXECUTIVE SUMMARY

1.1. INITIATIVES TO PROMOTE HEALTHCARE

The healthcare sector in Saudi Arabia is undergoing continuous changes and witnessing significant growth. In 2018, the healthcare sector accounted for 4.7 percent of Saudi Arabia's Gross Domestic Product (GDP), and the sector is expected to grow at a rate of 13.7 percent by 2025. The three major factors driving this sector are demographic profile, government initiatives and policies, and latest technologies. Preventive Care and Medical Care are the two segments of healthcare that are expected to expand significantly in the coming years in Saudi Arabia. The country has a high demand for orthopedics; obstetrics and gynecology; in vitro fertilization (IVF); Ear, Nose, and Throat (ENT); gastroenterology; cardiology/cardio surgery; and ophthalmology services, among other healthcare services.

Highlighting the role of the private sector in healthcare by privatizing government services, increasing public-private participation (PPP), scaling up education and training of the local workforce, and boosting the adoption of digital information systems are among the key priorities of the government of Saudi Arabia. It has already initiated numerous projects to meet these objectives, including mandated insurance for both Saudi and non-Saudi employees in the private sector along with their families and increasing the private sector's contribution to healthcare spending by 25 percent to 35 percent. By 2020, the percentage of patients with a digital health record would reach 70 percent, owing to the investment of US\$1.5 billion in healthcare IT and digital transformation.

1.2. FUTURE OUTLOOK

Saudi Arabia is strengthening telemedicine services, which therefore presents an excellent investment opportunity for healthcare providers. The COVID-19 pandemic is likely to support the quick implementation of telemedicine services by healthcare facilities, thus accelerating the ongoing digital transformation efforts of the country. According to Frost and Sullivan, Saudi Arabia is targeting a 3 percent reduction in the prevalence of obesity and a 10 percent decrease in the prevalence of diabetes by 2030. This is expected to boost the growth of the pharmaceutical industry in the future. According to a new Gulf Cooperation Council (GCC) report published in 2020, Saudi Arabia is expected to invest SAR250 billion (US\$66.67 billion) in healthcare infrastructure by 2030, with the growth in private sector participation rising from 40 percent in 2021 to 65 percent by 2030. Healthcare privatization is likely to be a crucial aspect of the economic diversification efforts of Saudi Arabia.

2. HEALTHCARE SECTOR

2.1. COMPONENTS OF HEALTHCARE INDUSTRY

FIGURE 1. COMPONENTS OF HEALTHCARE INDUSTRY¹



Medical Devices, Equipment, and Hospital Supplies Manufacturers

- Medical Device Manufacturers
- In-Vitro Diagnostic Product Manufacturers



Pharmaceuticals Manufacture and Related Segments

- Prescription Drugs
- Generic Drugs
- Over-the-Counter (OTC) Drugs

Source: Gulf Research Center

¹ <https://www.technofunc.com/index.php/domain-knowledge/healthcare-industry/item/sectors-of-healthcare-industry>.

- Medical Devices, Equipment, and Hospital Supplies Manufacturers:

Hospital supplies, products, and services, as well as specific applications, are all included in this area. This stage also includes participants such as in-vitro diagnostic component manufacturers and electromedical and electrotherapeutic device manufacturers.

- Pharmaceuticals Manufacture and Related Segments:

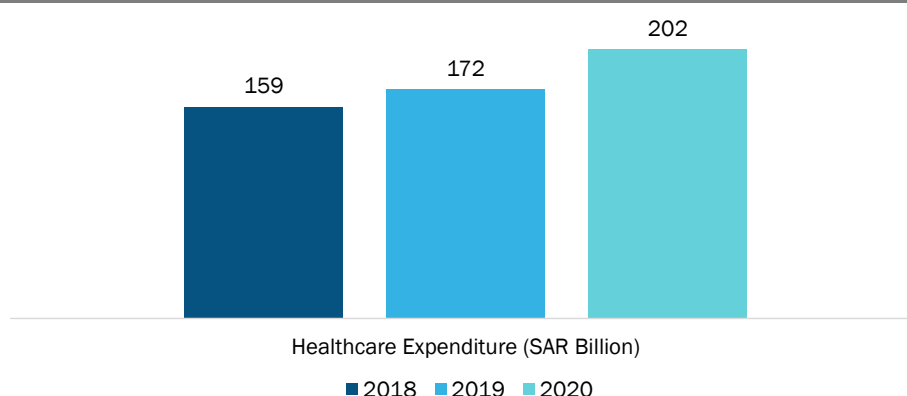
The pharmaceuticals industry develops, manufactures, and distributes drugs and pharmaceuticals that are approved for therapeutic purposes.

2.2. ECONOMIC CONTRIBUTION

According to a Gulf Cooperation Council (GCC) report published in 2020, Saudi Arabia expects to invest SAR250 billion (US\$66.67 billion) in healthcare infrastructure by 2030, with private sector participation expected to rise from 40 percent in 2021 to 65 percent in 2030.² Saudi Arabia has the largest healthcare sector in the Middle East. Its budget for health and social affairs increased by 8 percent in 2019, to reach US\$46 billion from US\$42.4 billion in 2018. The healthcare environment in Saudi Arabia would continue to change in the coming years owing to the government's efforts to restructure the sector. Healthcare privatization is likely to be a crucial aspect of the country's economic diversification efforts. In 2018, the healthcare sector accounted for 4.7 percent of Saudi Arabia's GDP. By 2025, the sector is projected to grow at a rate of 13.7 percent.³

² <https://www.arabnews.com/node/1837271/business-economy>.

³ https://2016.export.gov/industry/health/healthcareresourceguide/eg_main_108615.asp.

FIGURE 2. HEALTHCARE EXPENDITURE (SAR BILLION)

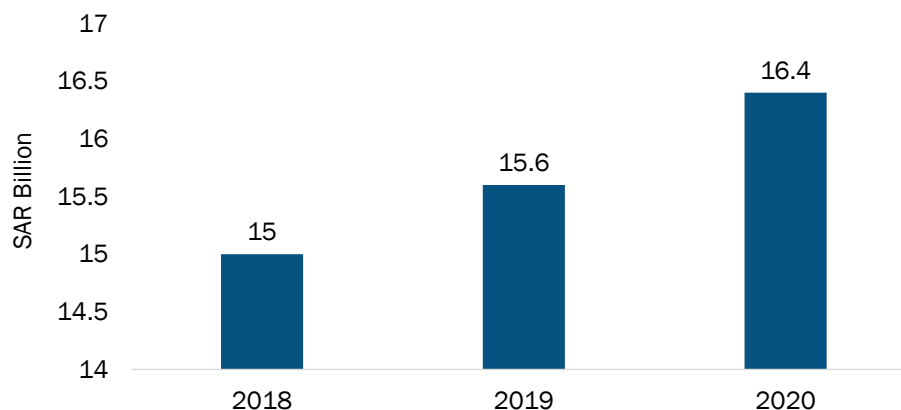
Source: Arab News, "Saudi Arabia to Invest \$66 Billion in Healthcare Infrastructure by 2030."⁴

2.2.1. Government Initiatives and Programs

Increasing the role of the private sector in healthcare by privatizing government services, increasing public-private participation (PPP), scaling up education and training of the local workforce, and boosting the adoption of digital information systems are among Saudi Arabia's top priorities. The government has launched a number of projects to meet these objectives, including mandated insurance for both Saudi and non-Saudi employees in the private sector along with their families. By 2020, the percentage of patients with a digital health record would reach 70 percent, owing to the investment of US\$1.5 billion in healthcare IT and digital transformation.⁵

⁴ <https://www.arabnews.com/node/1837271/business-economy>.

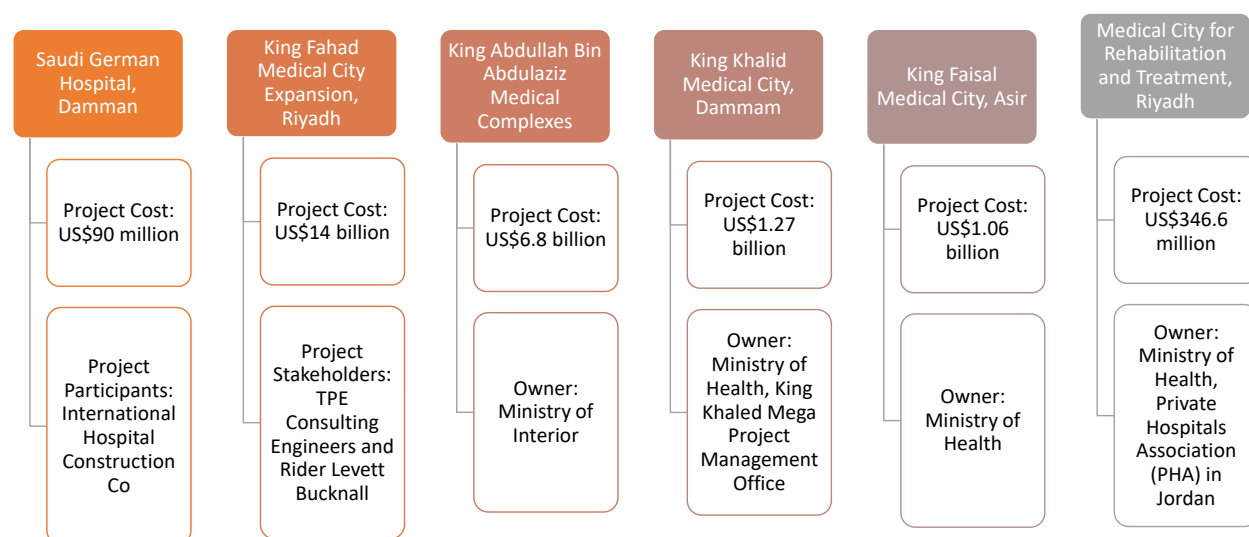
⁵ <https://insights.omnia-health.com/hospital-management/top-priorities-ksas-healthcare-sector>.

FIGURE 3. BUDGET ALLOCATION BY HEALTH AND SOCIAL DEVELOPMENT SECTOR (SAR BILLION)

Source: Ministry of Finance (MoF).

2.3. MAJOR INVESTMENTS IN THE HEALTHCARE INDUSTRY

Major investment programs in the Saudi healthcare sector are shown in Figure 4.

FIGURE 4. MAJOR INVESTMENTS IN SAUDI HEALTHCARE INDUSTRY

Source: KSA Hospital projects overview.⁶

⁶ file:///Z:/2021/Consulting%20Project/Saudi%20Arabia%20Healthcare%20Market/GHE19-KSA-HOSPITAL-PROJECTS-OVERVIEW-ENG.pdf.

3. INTRODUCTION TO HEALTHCARE SECTOR

3.1. OVERVIEW AND KEY INDUSTRY TRENDS

FIGURE 5. SAUDI HEALTHCARE INDUSTRY TRENDS



Source: Gulf Research Center Analysis.

Public-Private Participation: The Saudi government has been actively exploring private sector involvement in the construction of healthcare infrastructure to boost efficiencies and lower costs. The government is striving to add value to the health system and services as well as to accelerate reforms in the sector by introducing public-private participation (PPP) models, with the ultimate goal of boosting the contribution of the private sector to 35 percent of the overall healthcare spending by 2020.⁷

⁷ <https://www.globalhealthsaudi.com/content/dam/Informa/globalhealthsaudi/downloads/GHE19-KSA-HEALTHCARE-INDUSTRY-OVERVIEW.pdf>.

New Hospital Construction Projects: The demand for hospitals and specialized beds is estimated to increase by 5,000 and 20,000 by 2020 and 2035, respectively.⁸ Al Murjan, a Saudi Arabian company, has teamed up with Mediclinic International to open a 200-bed private hospital in Jeddah.

The hospital would be managed by Mediclinic Middle East, which will also provide Al Murjan Group with expertise and consultancy services in the planning, design, building, and commissioning phases. The hospital is likely to commence operations by the second quarter of 2022.

Wearable Technologies: Biosensors embedded in wearable devices facilitate continuous monitoring of patients' progress while generating big data of information. This health data can be analyzed in various ways, resulting in better population health insights and patient management. According to the World Health Organization (WHO), Saudi Arabia has the second highest diabetes rate in the Middle East and ranks seventh globally. Around 7 million people are diabetic, and almost 3 million have pre-diabetes, according to estimates.

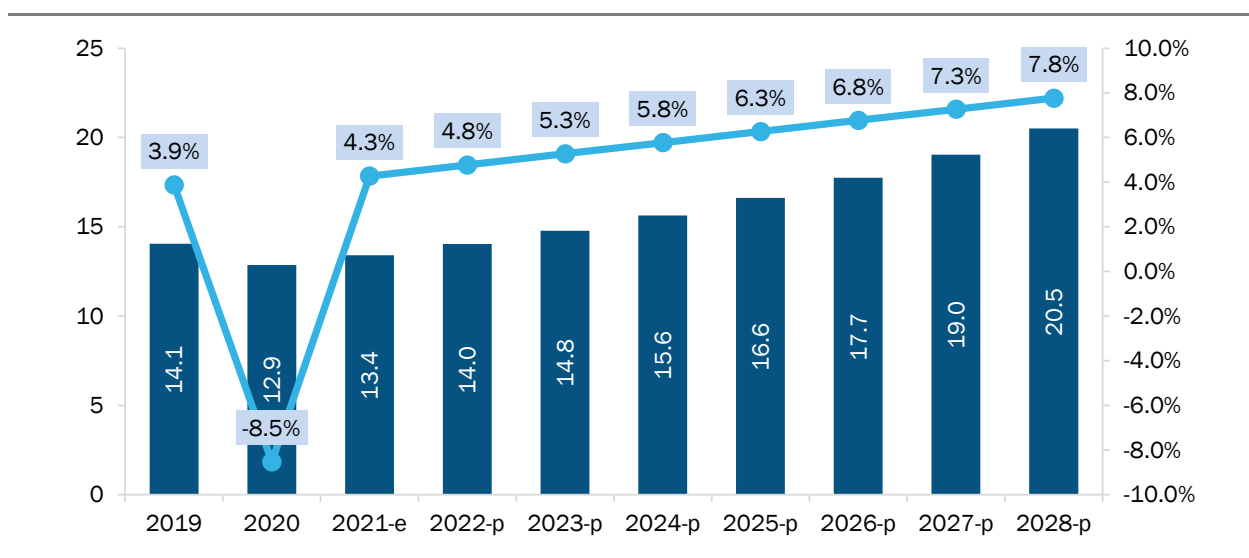
Telemedicine: The Saudi Ministry of Health has developed an e-Health strategy to use telemedicine to increase access to healthcare and improve the quality of care in rural areas, where specialty services are unavailable. The COVID-19 pandemic is contributing significantly to the ongoing digital transformation efforts of the Ministry of Health, as healthcare facilities are quickly establishing telemedicine services in the rural areas for managing the disease.

AI in Healthcare Workflow: AI-based cognitive technologies are benefitting drug discovery and research, clinical decision support, and medical imaging and diagnostics capabilities. The UAE and Saudi Arabia have been at the forefront of the implementation of AI in the healthcare, finance, and public sectors, particularly in administration and public utilities.

⁸ <https://www.globalhealthsaudi.com/en/overview/saudi-news/Trends-in-KSA-healthcare-market.html>.

3.2. SAUDI HEALTHCARE SECTOR: MARKET SIZE AND FORECAST (2019 – 2028)

FIGURE 6. SAUDI HEALTHCARE SECTOR: MARKET SIZE AND FORECAST, 2019 TO 2028 (US\$ BILLION)



Source: Gulf Research Center Analysis.

The Saudi healthcare market is projected to reach US\$20.51 billion by 2028 from US\$14.05 billion in 2019. Growing aging population, investments in healthcare projects, COVID-19 impact on surgical procedures are some of the major factors used in the estimation of market size.

3.3. COVID-19 IMPACT ON SAUDI HEALTHCARE SECTOR

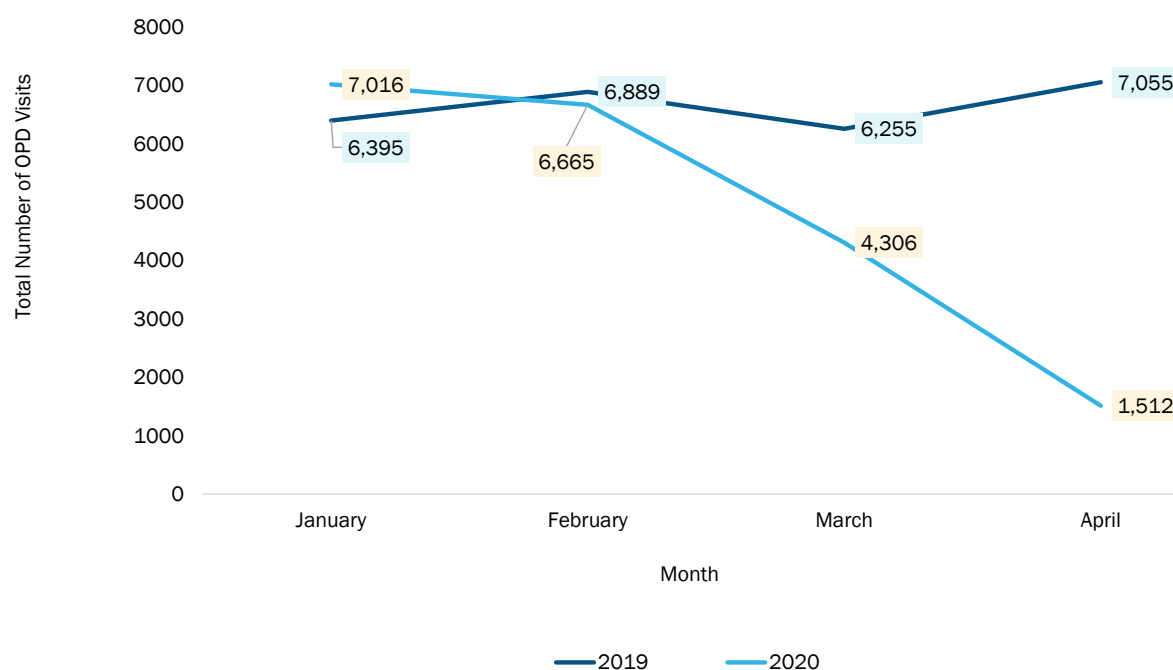
The pandemic has had both positive and negative effects on Saudi Arabia's healthcare industry.

Impact on the medical device industry: Saudi Arabia imports ~90 percent of its medical equipment needs, primarily from European countries and the US, due to the lack of local supply. However, the rapid spread of COVID-19 propelled the local production of several healthcare products and medical devices. According to current statistics from the Saudi Food and Drug Authority, 3.7 million face masks, 1.5 million liters of sanitizers, and a significant number of ventilators were made domestically from March 2020 to May 2020.⁹

⁹https://www.flandersinvestmentandtrade.com/export/sites/trade/files/market_studies/Healthcare%20Industry%20in%20Saudi%20Arabia.pdf.

However, the pandemic has negatively impacted surgical procedures in hospitals.

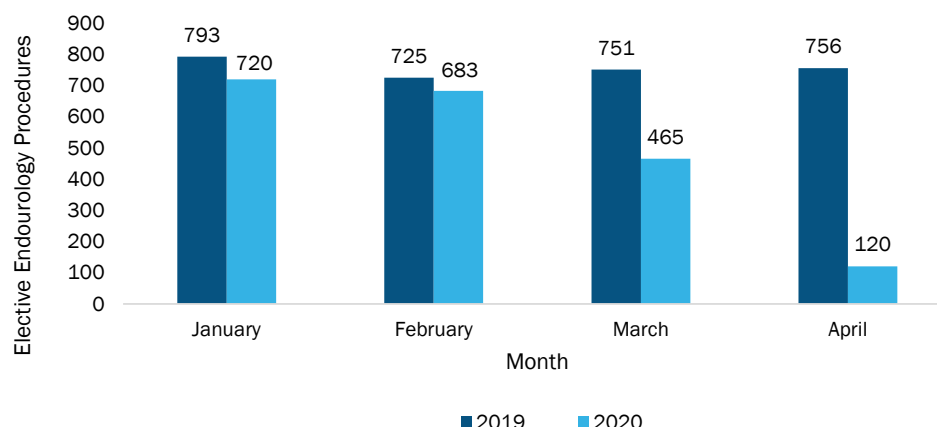
FIGURE 7. IMPACT OF COVID-19 ON TOTAL NUMBER OF OPD VISITS



Source: Asian Journal of Urology, 2020.¹⁰

As shown in Figure 7, in response to the spread of COVID-19 and restrictions imposed by the government to contain the spread, the number of OPD visits decreased from 7,055 in April 2019 to 1,512 in April 2020.

¹⁰ <https://www.sciencedirect.com/science/article/pii/S2214388221000096>.

FIGURE 8. IMPACT OF COVID-19 ON ELECTIVE ENDOUROLOGY PROCEDURES

Source: Asian Journal of Urology, 2020.¹¹

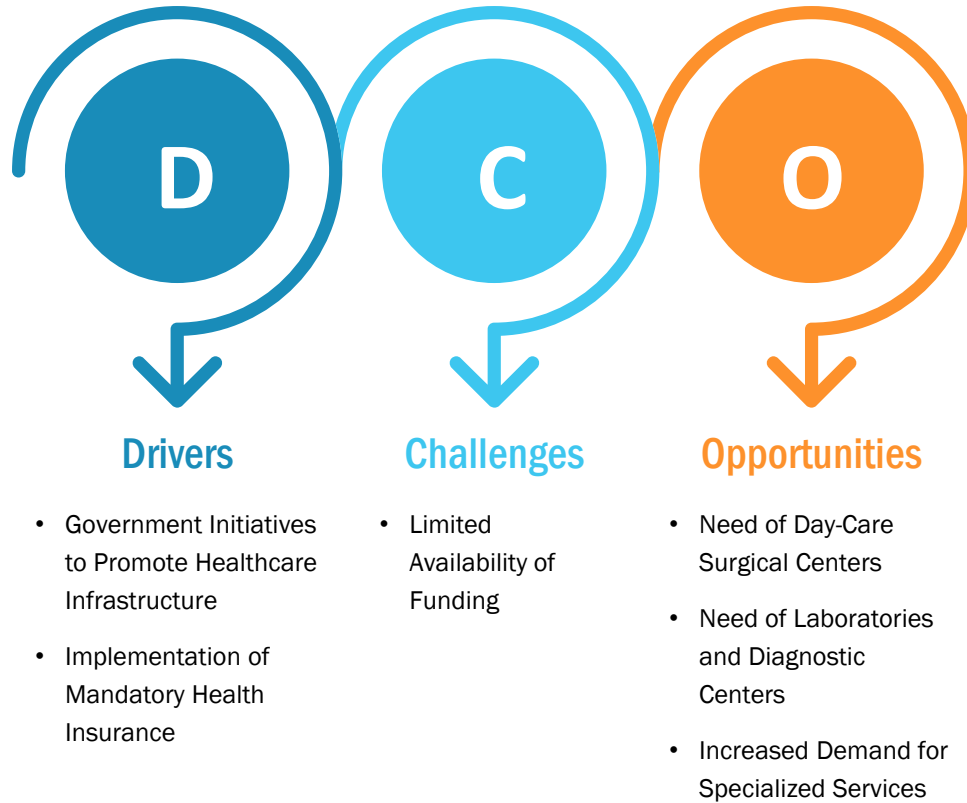
As shown in Figure 8, elective endourology surgeries dropped from 756 in April 2019 to 120 in April 2020.

To combat COVID-19, the Saudi Food and Drug Authority (SFDA) has started taking a variety of drug security efforts, with an aim to ensure the availability of important pharmaceuticals and vaccines as well as to assist pharmaceutical firms in procuring necessary raw materials. The Saudi Industrial Development Fund (SIDF) provided loans to pharmaceutical and medical supply companies to fund the procurement of raw materials for up to six months.

¹¹ <https://www.sciencedirect.com/science/article/pii/S2214388221000096>.

4. HEALTHCARE INDUSTRY DYNAMICS

FIGURE 9. SNAPSHOT HEALTHCARE INDUSTRY DYNAMICS



Source: Gulf Research Center

4.1. KEY INDUSTRY DRIVERS

4.1.1. Government Initiatives to Promote Healthcare Infrastructure

Healthcare is one of the fields of focus of Saudi Arabia's Vision 2030 and National Transformation Program (NTP). The NTP, which was created to aid in the accomplishment of the goals of Vision 2030, has established many critical objectives that each government agency must meet by 2030. According to a Knight Frank report, diversifying the economy away from hydrocarbons and increasing private sector engagement by promoting both domestic and foreign investments in critical areas such as healthcare are the major objectives of Vision 2030. For increasing the contribution of private sector to the GDP from 40 percent to 65 percent by 2030, the government is striving to privatize its major services. In accordance with the NTP, Saudi Arabia has begun fast-tracking the privatization of the healthcare sector, on a priority basis.

4.1.2. Implementation of Mandatory Health Insurance

In July 2016, the government of Saudi Arabia began implementing a universal health insurance program, which was completed in 2017. According to Knight Frank, the country implemented its Mandatory Health Insurance (MHI) program for private sector employees in stages.

FIGURE 10. MANDATORY HEALTH INSURANCE (MHI) PROGRAM PHASES



According to the Council of Cooperative Health Insurance (CCHI), an independent government agency formed to oversee health insurance in the Kingdom, all private sector companies adopted one health insurance policy to cover both Saudi and non-Saudi employees and their families in 2018. In 2018,

there were 27 insurance firms operating in Saudi Arabia, which offered health insurance cover to 10,801,693 people. This number included ~1 million Saudi employees along with 1.77 million dependents and ~6 million expatriate employees along with 1.9 million dependents.

4.2. KEY INDUSTRY CHALLENGES AND SUSTAINABILITY ISSUES

4.2.1. Limited Availability of Funding

Huge capital requirement is one of the most important challenges associated with the construction of high-tech hospitals in Saudi Arabia. Though banks and other financial institutions aggressively seek investments in the healthcare sector, they frequently limit their risk by only dealing with well-known market participants having a track record. International or regional companies willing to enter the Saudi healthcare market typically prefer acquiring project funding, even if they have access to a different type of funding.

Moreover, the terms of these funding plans might be associated with certain risks. Investments in the healthcare sector are generally long-term matters that may extend to 3–5 years, and banks tend to avoid such risks.

4.3. KEY INDUSTRY OPPORTUNITIES

4.3.1. Need for Day-Care Surgical Centers

The number of day-care surgeries has increased with advancements in medical technologies such as laparoscopy. Moreover, rise in the prevalence of lifestyle diseases such as diabetes, obesity, depression, strokes, cardiovascular diseases, and blood pressure, which may not require treatment in traditional hospital settings, is also propelling the demand for daycare surgical centers in Saudi Arabia. Dedicated purpose-built daycare surgical centers and centers of excellence might be part of a major office building or retail center, with space requirements ranging from 3,000 to 5,000 m². Thus, the escalating need for these centers is providing major opportunities for healthcare stakeholders in the country.

4.3.2. Need for Laboratories and Diagnostic Centers

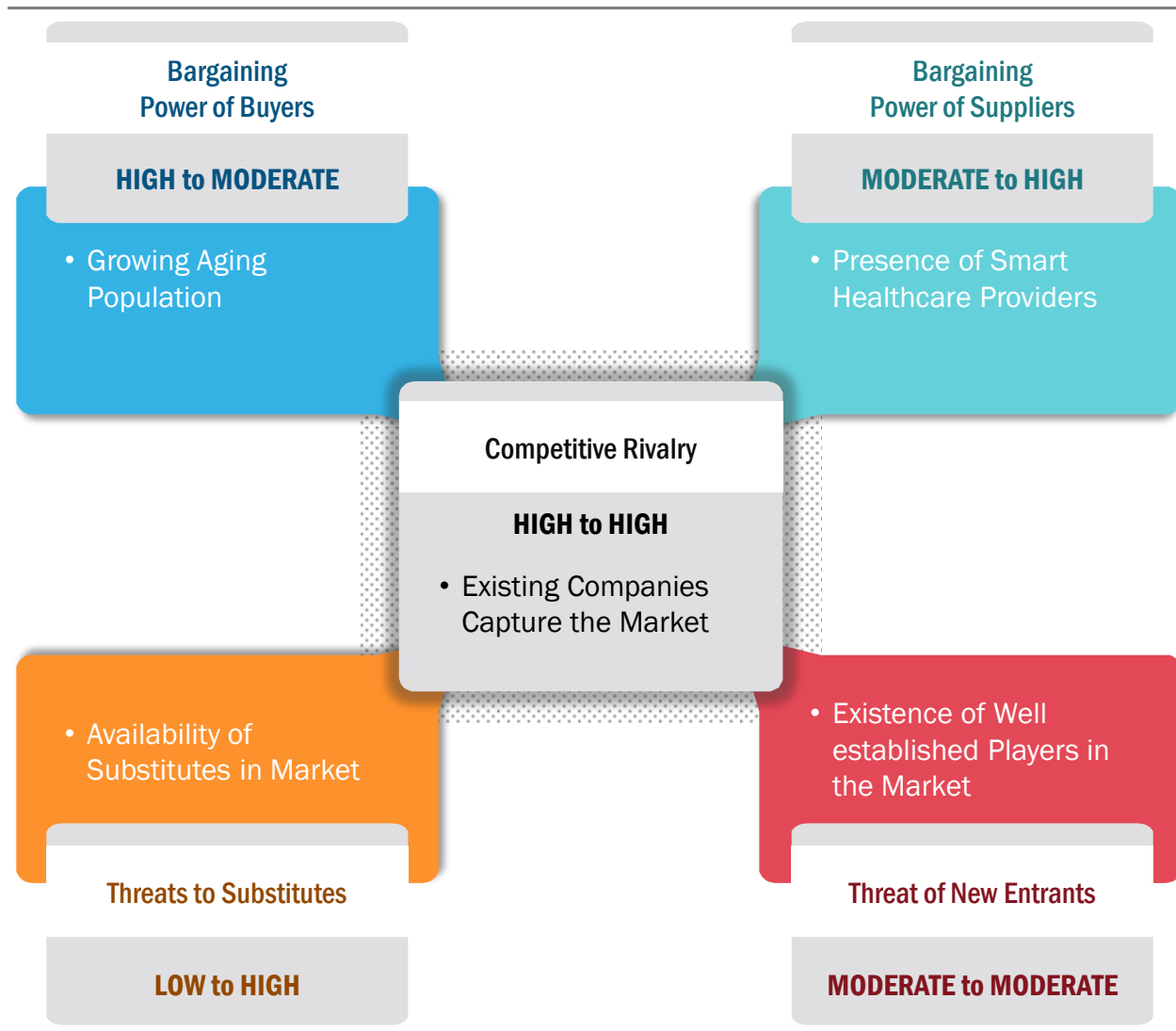
To serve the expanding number of outpatient facilities in Saudi Arabia, stand-alone laboratories and diagnostic centers are required. Furthermore, due to an aging population, Saudi Arabia requires a considerable number of long-term care (LTC) / rehabilitation centers. The government is looking for private long-term care facilities where their patients who require rehabilitation or long-term care might be sent.

4.3.3. Increased Demand for Specialized Services

Centers of excellence are projected to expand their operations in different streams such as ophthalmology, cosmetic surgery, in-vitro fertilization (IVF), and orthopedics, particularly in Riyadh and Jeddah. Many general hospitals include dedicated wings to provide highly specialized treatments, which has been a major aspect of their success.

4.4. PORTER'S FIVE FORCE ANALYSIS

FIGURE 11. PORTER'S FIVE FORCE ANALYSIS



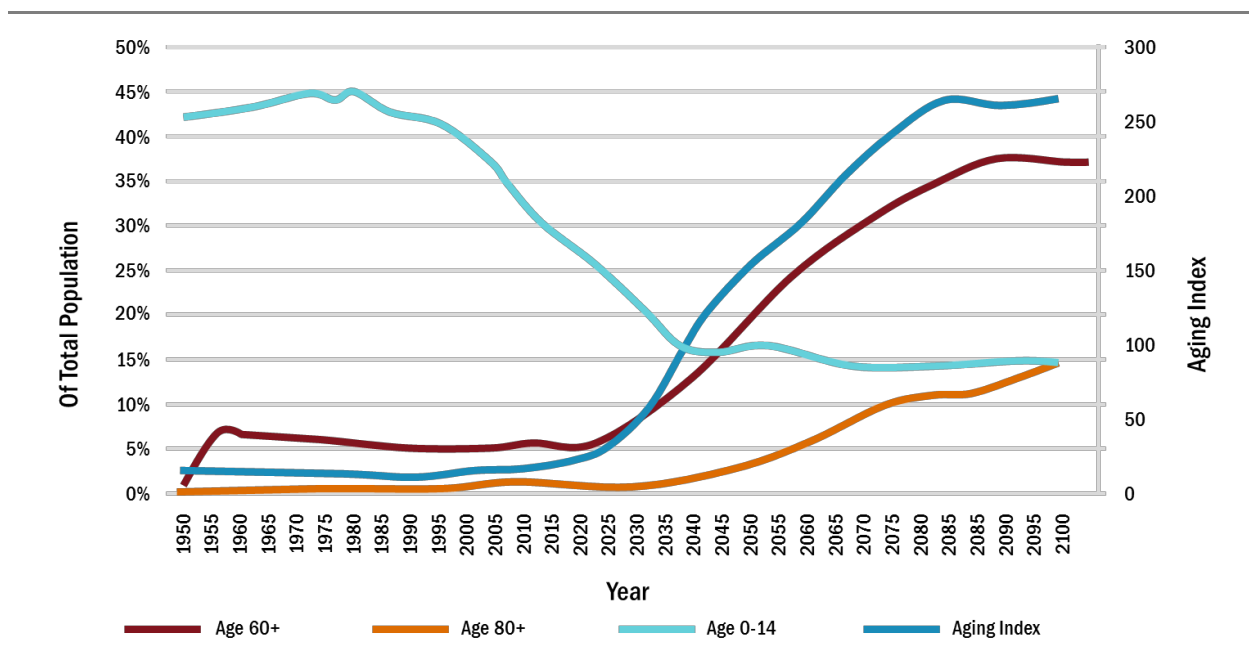
4.4.1. Bargaining Power of Suppliers

- Growing Aging Population

Healthcare professionals are present in large numbers in Saudi Arabia. Elderly people and patients suffering from chronic conditions are the ones who frequently visit healthcare facilities. Numerous well-known healthcare players have entered the market in Saudi Arabia to leverage such high demand for healthcare services, and thus, the presence of a large number of suppliers strengthens the negotiating power of purchasers.

However, consumers' negotiating power is likely to decline to some extent in the coming years as general and technological demands from healthcare services do not vary much.

FIGURE 12. SAUDI ARABIA POPULATION



Source: Newsletter, Yearbook.

4.4.2. Bargaining Power of Buyers

- Presence of smart healthcare providers

Players in the healthcare sector have been recording considerable revenue growth since many years, and this is mainly attributed to rise in the number of patients suffering from chronic medical conditions. Thus, a surge in the procurement of healthcare services among various age groups offers strong negotiating power to market participants, based on which they can also swap clients. With the currently rising number of end users, the impact of suppliers' bargaining power is expected to shift from moderate to high.

4.4.3. Threat of New Entrants

- Presence of well-established healthcare market players

Companies such as Pfizer, Sanofi, and Medtronic dominate the healthcare sector in Saudi Arabia. The existence of such renowned firms, as well as their strong brand image, inhibits the entry of new players into the market. Furthermore, healthcare products and services are governed by several regulatory bodies; further, obtaining licenses to build such facilities is a capital-intensive procedure.

High capital requirement is another issue preventing the entry of new businesses in Saudi Arabia. As a result, the risk of new entrants is likely to have little influence on the market over the next few years.

4.4.4. Threat of Substitutes

- Availability of substitutes in the market

Hospitals and clinics are critical components of any large healthcare infrastructure, so healthcare firms are focusing on ground-breaking technologies and improvements to provide alternatives. As a result, during the projection period, the prospect of replacements is anticipated to have a substantial impact.







4.4.5. Competitive Rivalry

- Dominance of established companies

The healthcare sector is dominated by a few well-established and financially sound firms who win most of the contracts from governments all over the world. These companies compete on a variety of levels, including technology, lead time, and pricing. These factors boost the competitiveness of healthcare players.

4.5. POLITICAL, ECONOMIC, SOCIAL, TECHNOLOGICAL, LEGAL (REGULATORY) AND ENVIRONMENTAL FACTORS ANALYSIS

FIGURE 13. PESTLE ANALYSIS

Political	Availability of Government Subsidies	
Economic	Increasing Investments in Healthcare Sector	
Social	Changes in Beliefs	
Technological	Availability of Advanced Medical Instruments	
Legal	Closed Captions and Disabled Discrimination	
Environmental	Easy Ways for Hospital and Clinics to be Eco-Friendly	

Source: Gulf Research Center.

5. CURRENT INDUSTRY LANDSCAPE

5.1. PROMINENT HEALTHCARE FACILITIES AND PRESENT INFRASTRUCTURE

In line with Vision 2030 and the National Transformation Program (NTP) of Saudi Arabia, the Ministry of Health (MoH) is expected to spend ~US\$71 billion during 2016–2020. The country is witnessing a significant rise in population, with an increase in middle age population (20-40 years); it is also experiencing a surge in the adoption of mandatory health insurance. By introducing public–private partnership (PPP) models in the healthcare sector, the government has been striving to add value to the health system and fast track healthcare reforms. Moreover, the government is targeting the privatization of 290 hospitals and 2,300 primary health centers by 2030. In February 2020, the first privatization of a government-owned healthcare entity under Vision 2030 was announced.

MAJOR STATS ABOUT THE SAUDI HEALTHCARE SECTOR

- The population of Saudi Arabia is estimated to reach 77.2 million by 2050.
- People below 40 years of age account for 70 percent of the total population.
- Life expectancy is expected to increase to 78.4 percent and 81.3 percent among males and females, respectively, by 2050.
- Foreign investors can have 100 percent ownership in the healthcare sector.
- By 2030, 290 hospitals and 2,300 healthcare centers are expected to be privatized.

The medical equipment market in Saudi Arabia is valued at ~US\$ 2 billion, and it is growing at an annual rate of 10 percent, according to Global Health Exhibition. The country presents huge potential for the market owing to the increasing awareness regarding health issues, resulting in the high consumption of healthcare services. The recently introduced Medical Device Interim Regulations govern all types of medical devices in Saudi Arabia, and the medical devices suppliers in this country require Saudi Food & Drug Authority (SFDA) Market Authorization. Medical device manufacturers and services providers need to acquire the ISO 13485:2016 certification, which is the international quality management system (QMS) standard for medical devices.

The growth of the healthcare market in Saudi Arabia is directly proportional to the increase in the number of patient outcomes and shorter inpatient stay. This is mainly attributed to the decreased risk of hospital-acquired infections and low dependency on hospitals, which results in faster rehabilitation of patients. Moreover, shorter inpatient stays enable hospital authorities to better utilize their resources, thereby lowering the treatment costs, which in turn benefits the patients and medical insurance institutions. Additionally, improved resource utilization, followed by high turnover, would result in greater profitability for healthcare providers. At a broader level, these outcomes significantly boost the macroeconomic environment as the good overall health of individuals uplifts productivity and resource utilization at workplaces, creating favorable conditions for the overall growth of the economy.

Additionally, Saudi Arabia is focusing on scaling up the domestic manufacturing of pharmaceuticals in the coming years, while Bahrain is investing heavily in the digital transformation of healthcare services and delivery. These transformative steps toward healthcare digitalization would reach a peak in the next 2–3 years, attracting investments of ~US\$0.5–0.6 billion by 2025.

Hospital Projects:

TABLE 1. CURRENT AND UPCOMING HOSPITAL PROJECTS

City	Project Cost	Size	Bed Count	Owner	Project Participants
Damman	US\$90 million	39,000 m ²	300	Middle East Healthcare Company	International Hospital Construction Co. (IHCC)
Riyadh & Jeddah	US\$6.8 billion	1.1 million m ² each	1,500 each	Ministry of Interior	ABV Rock Group (Riyadh) Saudi Binladin Group (Jeddah)
Riyadh	US\$14 billion	1.2 million ft ²	600	Ministry of Health	TPE Consulting Engineers and Rider Levett Bucknall
Dammam	US\$1.27 billion	700,000 m ²	1,500	Ministry of Health King Khaled Mega Project Management Office (PMO)	Vanir Construction Management AECOM
Asir	US\$1.06 billion	2.2 million m ²	1,350 beds in 2 phases	Ministry of Health	Al-Fouzan Trading & General Construction (Phase 1) Zuhair Fayez Partnership (Phase 1) HDR
Riyadh	US\$346.6 million	1.2 million m ²	1,100	Ministry of Health Private Hospitals Association (PHA) in Jordan	-

5.2. UPCOMING HEALTHCARE RELATED PROJECTS

TABLE 2. UPCOMING HEALTHCARE PROJECTS

Date	Type	Description
June 2021	Development Project	Health Minister Tawfiq bin Fawzan Al-Rabiah launched construction and development projects worth US\$84.8 million for the health sector.
June 2021	Investment	The Ministry of Health will spend US\$18.5 billion on healthcare, every year for the next decade. The focus of the investment would be on the digitalization of the sector and adoption of modern and futuristic processes to increase the life expectancy of Saudi citizens. By Q4 2021, the King Saud Medical City aims to treat up to 2,500 patients a week via digital platforms.
June 2021	Service Launch	The Saudi Commission for Health Specialties (SCFHS) launched a “Telemedicine” training program for remote patients. This program will train health providers for the best global practices in telemedicine.
June 2021	Partnership	Acino, Switzerland signed a partnership with Pharmax, UAE. The agreement entails the licensing, manufacturing, and supply of Acino products across the Middle East and Africa.
May 2021	Collaboration	Takeda Pharmaceutical Co. announced its plan to focus on producing therapeutic products related to cancer, rare diseases, and gastroenterology disease as well as plasma-derived therapies to boost global sales by more than 50 percent in the next decade.
April 2021	Service Launch	The Ministry of Health, in collaboration with Abdul Latif Jameel Health, launched a pioneering new medical procedure for the surgical reconstruction of the aortic heart valve using the Aortic Valve Neocuspidization (AVNeo) technology for open-heart surgery.
March 2021	Agreement	Philips signed a three-year agreement to provide sleep disorders management services at the Saudi German Health hospitals in Saudi Arabia. The partnership is aimed at providing innovative solutions to patients suffering from acute disorders such as obstructive sleep apnea (OSA).
March 2021	Development Project	Saudi German Hospital announced its plan of spending US\$92.3 million on upgrading its clinics in Saudi Arabia.
March 2021	Expansion	Nabta Health, a UAE-based startup dedicated to supporting women’s health, is planning to expand into Saudi Arabia in 2021.
March 2021	Acquisition	Amanat acquired Cambridge Medical and Rehabilitation Center for US\$232 million to enhance the post-acute healthcare market in Saudi Arabia.
February 2021	Agreement	The Saudi Investment Ministry and Roche Group signed an agreement to work together for the establishment of public-private partnerships in the life sciences ecosystem.
January 2021	Service Launch	The King Salman Humanitarian Aid and Relief Center (KSrelief) launched a campaign to combat blindness and other eye diseases in Al-Mukalla. The center’s medical team has planned to perform 400 eye surgeries and examine 1,500 patients.

6. CURRENT INDUSTRY COMPETITIVE LANDSCAPE

6.1. PROMINENT HEALTHCARE COMPANY PROFILES

6.1.1. PFIZER INC.

6.1.1.1. Key Facts

Pfizer Inc.	
Foundation Year	1848
Corporate Address	235 East 42nd Street NY, NY 10017 (212) 733-2323
Telephone	+ 1 800 879 3477
URL	www.pfizer.com
Location	Europe, Middle East and Africa, North America, South and Central America
Exchange Ticker Symbol	NYSE:PFE
Fiscal Year End	December 2020

6.1.1.2. Business Description

Pfizer is a globally leading research-based biopharmaceutical company that incorporates its scientific expertise and resources to provide advanced and innovative therapeutic solutions. The company is primarily engaged in discovering, developing, manufacturing, and selling its healthcare products across the world. It operates through two distinct business segments—Innovative Health (IH) and Essential Health (EH). The Innovative Health segment comprises medicine, vaccines, oncology, inflammation and immunology, rare disease, and over the counter consumer healthcare products. The Essential Health segment includes legacy brands that have lost or would soon lose market exclusivity in both developed and emerging markets; these entities are branded generics, generic sterile injectable products, biosimilars, and selected branded products including anti-infectives, among others. The company has established partnerships with healthcare providers, government agencies, and local communities. Its local community partners include pharmacies and hospitals that support and help in making access to reliable, affordable healthcare easy. It has been offering vaccines, medicines, and healthcare supplies worldwide for more than 150 years.

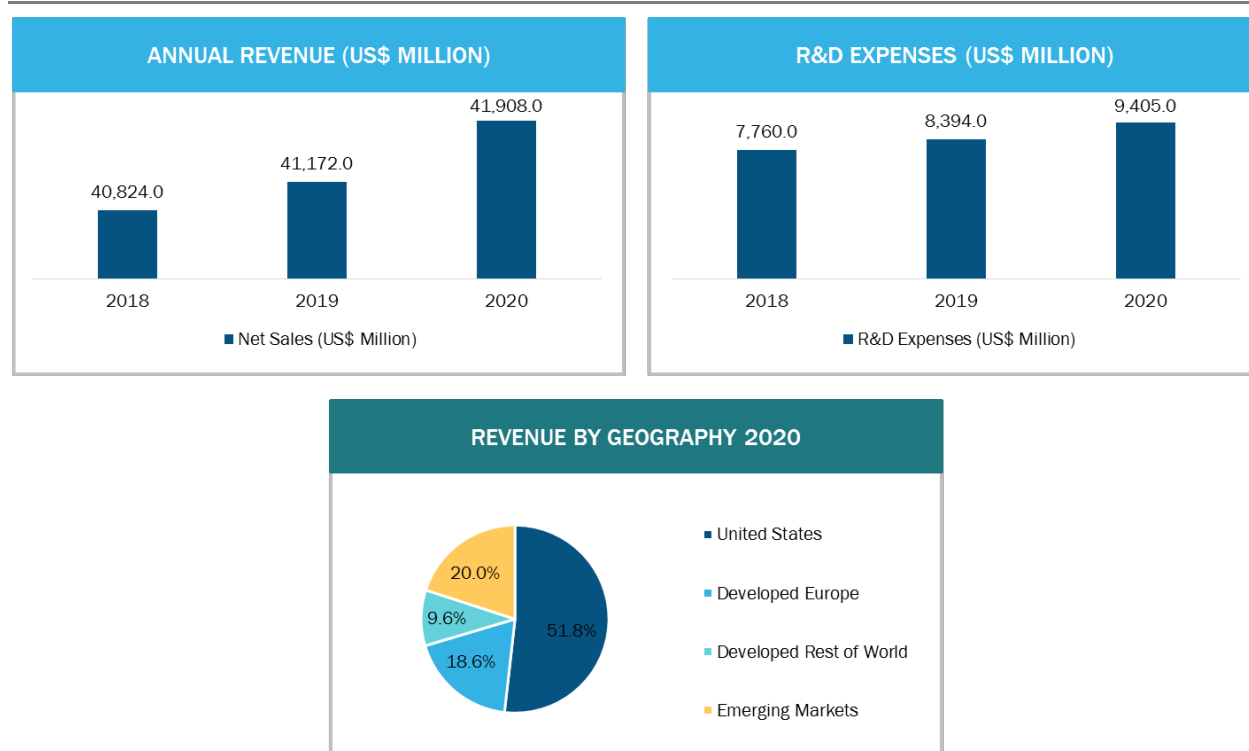
6.1.1.3. Products and Services

Product/Service Category	Description
Hemostats	Thrombi-Gel is applied topically and is indicated as a trauma dressing for temporary control of moderate to severely bleeding wounds and for the control of surface bleeding from vascular access sites and percutaneous catheters and tubes.
	Thrombi-Pad is applied topically and is indicated as a trauma dressing for temporary control of moderately to severely bleeding wounds as well as for the control of surface bleeding from vascular access sites and percutaneous catheters and tubes.
	Gelfoam is indicated for application on bleeding surfaces as a hemostatic. It is a water-soluble, off-white, porous, pliable product from purified porcine skin gelatin USP Granules and Water for Injection, USP.
	Antihemophilic factor (recombinant) is indicated for on-demand diagnosis and prevention of bleeding episodes in adults and children with hemophilia A and for perioperative managers.
	BeneFix, Coagulation Factor IX (recombinant), is a human blood coagulation factor indicated for the regulation and prevention of bleeding episodes and perioperative treatment in adult and pediatric patients diagnosed with hemophilia B (congenital factor IX deficiency or Christmas disease).
	This product is prescribed for patients with hemophilia for short-term use (2–8 days) to prevent or lower the chances of hemorrhage and to reduce the need for replacement therapy.
Neurology	Pfizer's neurology drugs include therapies for Alzheimer's disease, Parkinson's disease, Huntington's disease, cerebrovascular disease, and schizophrenia.
Antibacterial	Tobramycin injection is used to treat bacterial infections of the skin, heart, stomach, brain and spinal cord, lungs, and urinary tract (bladder and kidneys). It is also used in the treatment of cystic fibrosis.
	Zithromax is used to treat different types of bacterial infections, such as respiratory infections, skin infections, and ear infections.
	It is a topical antibiotic used in partial thickness and full thickness burns to prevent sepsis.
	Pfizerpen is used to treat different types of severe infections, including streptococcal and staphylococcal infections, diphtheria, meningitis, gonorrhea, and syphilis.
	Cefazolin, for injection, USP is indicated in the treatment of serious infections such as respiratory, skin, urinary tract, biliary tract, bone and joint, and genital infections.
	Lincocin is used in the treatment of serious infections caused by Gram-positive organisms (staphylococci, including penicillinase-producing staphylococci; streptococci; and pneumococci).
Small Molecules	Oral, small molecule modulators of GPCR were developed (in collaboration with Sosei Heptares) for treating multiple disease indications.
4E (eIF4E)	Small-molecule inhibitors of eukaryotic initiation factor 4E (eIF4E) was developed (as a part of an agreement with eFFECTOR Therapeutics) for treating multiple cancer types.
Application	Under the application category, the company provides drugs.

Product/Service Category	Description
	Drugs
	Under the Infections & Infectious Diseases category, the company provides vaccines.
Pain Management	Hospira, a subsidiary of Pfizer, operates in the global pain management devices market.
Eye Health Supplement	These are offered in separate forms for men and women. The product for men has micronutrients to support muscle function as well as the heart, brain, and eye health. The products meant for women have micronutrients to feed the cells and help support bone, heart, brain, and eyes.
	These are multivitamins and formulated to support heart, brain, and eye health. It has a combination of 11 micronutrients, including Vitamins A, C, E, Zinc, B-Complex, and Omega-3s. Vitamins A, C, and E, and lutein to support the health of eyes.
	These offer advanced whole-body benefits for men and women as well as support health of heart, brain, and eyes. These multivitamins provide 22 essential vitamins and minerals along with the added boost of Omega-3 (200 mg) EPA and DHA (180 mg).
	These products provide 18 essential vitamins and minerals, and 1 billion CFUs of probiotics. This advanced formula comes with multivitamin BB-12 probiotics. Vitamins A, C, E and Omega-3 (DHA) help keep vision healthy.
Kidney Disease	BAVENCIO is the first anti-PD-L1 in combination with INLYTA for first-line treatment of patients with advanced renal cell carcinoma (RCC). SUTENT has been a standard of care for the treatment of advanced RCC the most common type of kidney cancer.
Nasal Spray	Nicotrol NS (nicotine nasal spray) is an aqueous solution of nicotine intended for administration as a metered spray to the nasal mucosa. Synarel is indicated for the treatment of central precocious puberty (CPP) (gonadotropin-dependent precocious puberty) in children of both sexes. Dristan 12 Hour nasal spray is used to treat nasal congestion. Corex Nasal Spray provides relief from blocked nose, congestion due to seasonal allergies, year-round allergies, sinusitis, and ear infections.
Nebulizer	Intal is a prophylactic agent indicated in the management of patients with bronchial asthma.
Inhaler	Nicotrol Inhaler helps to quit smoking by reducing the urge to smoke.
Addiction Therapeutics	Champix is used in adults to help them quit smoking. It contains the active substance varenicline and is available as a tablet. Champix can help relieve the craving and eliminate symptoms associated with smoking.
	Troxyc ER is an extended-release capsule for pain management and long-term opioid treatment, for which alternative treatment options are inadequate.
	It is a parenteral opioid analgesic used to relieve moderate to severe pain.
Urinary Tract Infection Treatment	Zavicefta is indicated for the treatment of complicated urinary tract infection (cUTI), including pyelonephritis infections, in adults.
Antacid	Through its major brand Gelusil, the company operates in the antacid market. The products are available in different flavors and dosage forms. For instance, Gelusil MPS is available in the form of chewable tablets and liquid; it is also available in Original-Mint / Xtracool-Mint flavors.

Product/Service Category	Description
Oncology	Ellence is made from an anthracycline topoisomerase inhibitor. It is indicated as a component of adjuvant therapy to treat axillary node tumor involvement, showing resection of primary breast cancer. It was approved in 1999. It is available in 50 mg / 25 mL and 200 mg / 100 mL solutions in single-dose vials.
Anticoagulant Reversal Drugs	Cyklokapron is a prescription medicine used to prevent bleeding related to dental extraction in patients with hemophilia. Cyklokapron may be used alone or with other medications.
Prokinetic Agent	The product is used to stimulate gastrointestinal motility.
Systemic Antifungal	Cresemba is an intravenous (IV) and oral azole antifungal and the active agent of the prodrug isavuconazonium sulfate.
Anti-allergy Products	Corex Nasal Spray is used to attain relief in blocked nose, congestion due to seasonal allergies, year-round allergies, sinusitis, and ear infections. Pfizer's Reactive antihistamine has demonstrated efficacy in the once-a-day treatment of both seasonal and perennial allergic rhinitis, and chronic idiopathic urticaria, at doses of 5, 10, and 20 mg per day.
Intermediate	Pfizer CentreOne has been delivering intermediates; from farm to factory, raw ingredients to API, the company secures a safer supply chain, the highest-quality intermediates, regulatory support, and transparent timelines.

6.1.1.4. Financial Overview



Source: Press Release, Newsletters, and Company Annual Report.

6.1.1.5. SWOT Analysis



Source: Press Release, Newsletters, and Company Annual Report.

6.1.1.6. Key Developments

Date	Development	Category	Description
November 2020	Pfizer completed the spin-off and the combination of Upjohn Business with Mylan	Company News	Prior to the separation of the Upjohn Business, in the beginning of 2020, the Upjohn Business, Meridian, a manufacturer of EpiPen and other auto-injector products, went into a pre-existing strategic collaboration between Pfizer and Mylan for generic drugs in Japan
July 2020	Pfizer Acquired Array BioPharma Inc.	Mergers & Acquisitions	This deal fuels groundbreaking research for the discovery, development, and commercialization of targeted small molecular medicines to treat cancer and other diseases.
April 2020	US FDA approved Braftovi (Encorafenib) in combination with Cetuximab for the treatment of Brafv600e-mutant metastatic colorectal cancer (CRC) after prior therapy.	Product Approval	Pfizer Inc. received an FDA approval for its Braftovi (Encorafenib) in combination with Erbitux (Cetuximab) for the treatment of adult patients with metastatic colorectal cancer (CRC), characterized by the BRAFV600E mutation.
April 2020	Valneva and Pfizer announced collaboration to codevelop and commercialize Lyme disease vaccine—VLA15	Collaboration	Pfizer Inc. collaborated with Valneva SE to develop and commercialize Valneva's Lyme disease vaccine candidate VLA15, which is currently in Phase 2 clinical studies.
March 2020	US FDA approved supplemental new drug application (sNDA) for expanded indication of Eucrisa (Crisaborole) Ointment, 2%, in children as young as 3 months of	Product Approval	Pfizer Inc. received an FDA approval for its sNDA for Eucrisa (Crisaborole) ointment, 2%. As a part of it, the ointment can be used among children above 3 months with mild-to-moderate atopic dermatitis (AD), also known as eczema.

Date	Development	Category	Description
	age with mild-to-moderate atopic dermatitis		
January 2020	Pfizer enters an agreement with eFFECTOR Therapeutics	Partnership	In January 2020, eFFECTOR Therapeutics and Pfizer, Inc. entered into a collaboration agreement for the development of small molecule inhibitors of eukaryotic initiation factor 4E (eIF4E) to treat multiple types of cancer.
December 2019	Threats findings released from real-world data analysis of Eliquis (Apixaban) for the treatment of venous thromboembolism in patients with active cancer	Strategy and Business Planning	The Bristol-Myers Squibb-Pfizer Alliance announced results from retrospective real-world data, analyzing reporting outcomes on the safety and effectiveness of Eliquis.
December 2019	The US FDA approved Xtandi (Enzalutamide) for the treatment of metastatic castration-sensitive prostate cancer	Product Approval	Pfizer Inc. and Astellas Pharma Inc. received US FDA approval for its Xtandi (Enzalutamide) for the treatment of patients with metastatic castration-sensitive prostate cancer (mCSPC).
December 2019	Sosei Heptares announced the nomination of a third clinical candidate by Pfizer from multi-target drug discovery collaboration	Collaboration	Pfizer, a strategic alliance partner of Sosei Group Corporation, nominated the third clinical candidate from the multitarget drug discovery collaboration between the two companies. Achievement of this milestone triggers a payment of US\$3 million to Sosei Heptares. This new candidate is an oral small molecule targeting a G protein-coupled receptor (GPCR) implicated in metabolic and other diseases.
September 2019	Pfizer and Flatiron Health expanded strategic collaboration to unlock the power of real-world evidence in oncology	Collaboration	Pfizer Inc. collaborated with Flatiron Health to further integrate and increase Pfizer's development of innovative targeted cancer medicines.
July 2019	Pfizer completed acquisition of Array Biopharma	Mergers and Acquisitions	Pfizer Inc. acquired Array BioPharma Inc. for the commercialization of targeted small molecule medicines to treat cancer and other diseases of high unmet need.
July 2019	FDA approved Pfizer's biosimilar Ruxience (Rituximab-PVVR) for treating certain cancer types and autoimmune conditions	Product Approval	Pfizer Inc. received an FDA approval for its Ruxience (Rituximab-pvvr), a biosimilar to Rituxan (Rituximab), for the treatment of adult patients suffering from non-Hodgkin's lymphoma (NHL), chronic lymphocytic leukemia (CLL), granulomatosis with polyangiitis (GPA), and microscopic polyangiitis (MPA).

Source: Press Release, Newsletters, and Company Annual Report.

6.1.2. SANOFI

6.1.2.1. Key Facts

Sanofi	
Foundation Year	1973
Corporate Address	54, Rue La Boétie, Paris, 75008, France
Telephone	+33 1 53 77 40 00
URL	www.sanofi.com
Location	Global
Exchange Ticker Symbol	EPA: SAN
Employee Count	500
Fiscal Year End	December 2020

6.1.2.2. Business Description

Sanofi is one of the world's leading manufacturers of pharmaceuticals and medical solutions. The company has operations in over 100 countries. Sanofi has 75 manufacturing sites located in 33 countries. From prevention to treatment, it brings innovations into healthcare solutions, rare diseases, human vaccines, oncology, immunology, infectious diseases, multiple sclerosis, diabetes, cardiovascular, and consumer healthcare. In 2018, Sanofi changed its organizational structure, refocusing its operations on specific needs in both mature and emerging markets. The company handles its services through four major reportable segments—Specialty Care, Vaccines, Consumer Healthcare, and Primary Healthcare.

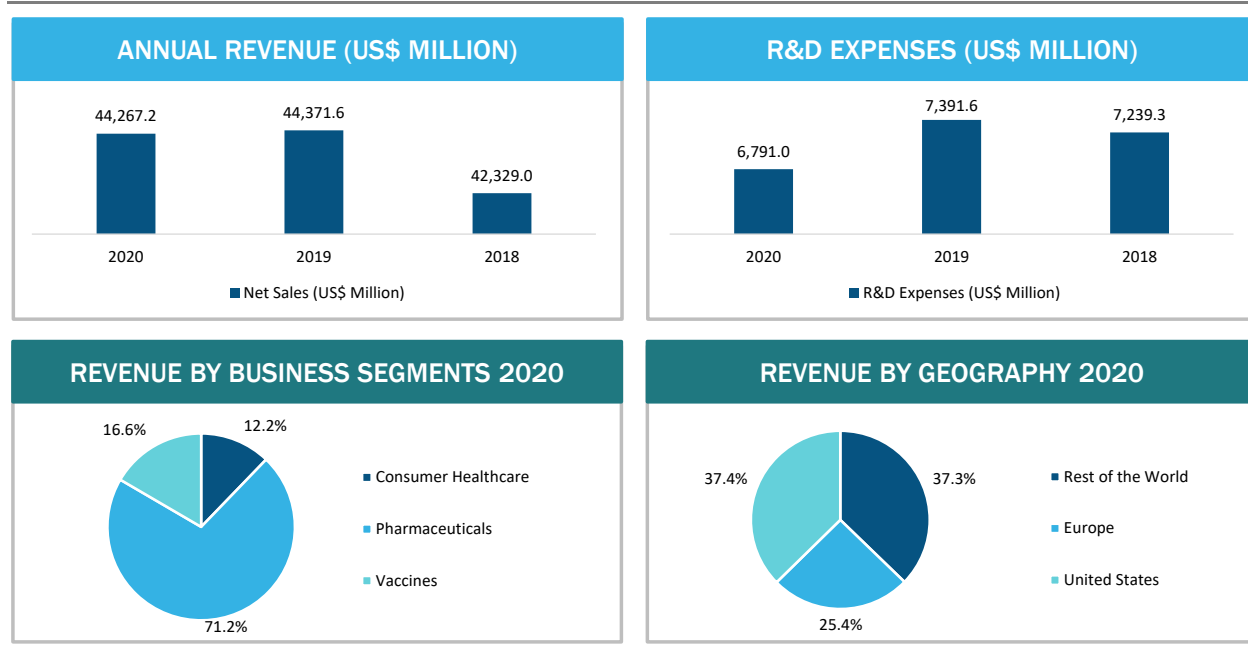
6.1.2.3. Products and Services

Product/Service Category	Description
Rare Blood Disorder	Eloctate is an injectable medicine used for treating people with hemophilia A to help control and prevent bleeding. Alprolix is an injectable medicine used in humans with hemophilia B to help control and prevent bleeding.
Neuroscience	Aubagio and Lemtrada are used to treat multiple sclerosis. Sanofi is building up a neuroscience portfolio from its legacy multiple sclerosis and rare disease foundations by pursuing early-stage research in neurodegeneration, neuro-inflammation, and rare brain diseases.
Antibiotics	Antibiotics
Viral Vector	Adeno-associated virus capsids for the delivery of gene therapies are in the company's product pipeline; the therapies are in the development phase.

Product/Service Category	Description
Over the counter (OTC) Products	The company offers a wide range of OTC products, including anti-allergy, antacid, and pain relief products in the global market. It provides some of its products to the US only; these products include Gold Bond and Zantac, among others.
RNAi Therapy	Sanofi is developing an RNAi therapy named Fitusiran in collaboration with Alnylam Pharmaceuticals for the treatment of hemophilia A and B.
Oncology Vaccine	Gardasil is HPV vaccine for active immunization of females and males of age 9 and above against premalignant lesions and cancers affecting the cervix, vulva, vagina or anus; it is also effective in the prevention of genital warts (Condyloma acuminata) caused by the HPV types.
Phosphate Binding Drug	Renvela (Sevelamer carbonate) is used to control phosphorus levels post dialysis among adults and children (age 6 and above) with chronic kidney disease (CKD).
	Renagel (Sevelamer hydrochloride) is indicated for the control of serum phosphorus in patients with chronic kidney disease (CKD) on dialysis.
	Dulcolax available in various formulation such as chews, tablets, suppositories, and liquid is indicated for constipation in adults as well as children. It contains bisacodyl gastric stimulant laxative acting directly on the colon to produce significant bowel movement.
Acid Neutralizers	It offers Ranitidine Tablets USP 75 mg and 150 mg tablets (as ranitidine hydrochloride).
Antiemetic and Antinauseants	Anzemet Injection multidose vials contain a clear, colorless, nonpyrogenic, sterile solution for intravenous administration. Anzemet (Dolasetron mesylate) is an antinauseant and antiemetic agent. R-Zacopride is thus a unique and potent antiemetic agent as it selectively inhibits the emetic response to cancer chemotherapy agents and peptide YY. Prochlorperazine mesylate injection Stemetil (prochlorperazine) is a piperazine phenothiazine derivative with antipsychotic, antiemetic, and weak sedative activity.
Anti-Inflammatory Drugs	Combiflam is manufactured by Sanofi India Ltd., which belongs to the category of non-steroidal anti-inflammatory drugs (NSAID); it combines paracetamol and ibuprofen.
Antispasmodics	Buscopan 10 mg tablets are indicated for the relief of spasm of the genito-urinary tract or gastrointestinal tract and for the relief of irritable bowel syndrome.
Nasal Spray	The US Food and Drug Administration (FDA) approved Sanofi's Nasacort AQ Nasal Spray (triamcinolone acetonide) for children of age 2–5 years for the treatment of nasal symptoms associated with seasonal and perennial allergic rhinitis. Allegra nasal spray is indicated for the treatment of symptoms of allergic rhinitis. The DDAVP Nasal Spray is indicated as antidiuretic replacement therapy in the management of central cranial diabetes insipidus and for management of the temporary polyuria and polydipsia following head trauma or surgery in the pituitary region.
Antacid	Sanofi offers different antacid products. Ulcar oral suspension is used for treatment and management of stomach acidity levels in stomach ulcer conditions.
Malaria Awareness Kit	The MOSKI KIT range was developed to adapt learning methods to society's evolution, especially for children of age six and above. MOSKI Memory is an online memory game easily accessible via computers. MOSKI Toon is a dedicated cartoon broadcast on TV and YouTube.
Anti-Fungal	Clotrimazole is an antifungal that is commonly used in the treatment of vaginal yeast infections, oral thrush, and ringworm in both humans and animals. It is also used to treat athlete's foot and jock etc.

Product/Service Category	Description
Multiple Sclerosis	Lemtrada is a prescription drug used to treat relapsing forms of multiple sclerosis (MS), including relapsing-remitting disorder and active secondary progressive disease in adults.
	Aubagio (Teriflunomide) is a prescription drug used to treat relapsing multiple sclerosis (MS), including clinically isolated syndrome, relapsing-remitting disorder, and active secondary progressive disease in adults.
Allergy Medications	Allegra is an anti-allergic medicine. It is used for relieving the symptoms of allergies such as hives (urticaria) and allergic rhinitis (hay fever). Allegra 120 tablet contains fexofenadine as an active ingredient, which is an antihistamine, produced in the body in response to an allergen during an allergic reaction. Thus, it controls allergic symptoms such as itching, redness, skin swelling, sneezing, stuffed nose, and watery eyes.
Intermediate	Sanofi Active Ingredient Solutions provide various types of intermediates and more than 120 APIs.
Joint Pain Injection	Sanofi offers Synvisc-One for the treatment of pain associated with osteoarthritis. The company is marketing this drug in ~60 countries worldwide.

6.1.2.4. Financial Overview



Source: Press Release, Newsletters, and Company Annual Report.

6.1.2.5. SWOT Analysis



Source: Press Release, Newsletters, and Company Annual Report.

6.1.2.6. Key Developments

Date	Development	Category	Description
September 2020	Sanofi Genzyme continues its ongoing research for enhancing the lives of patients with multiple sclerosis, with new evidence presented at MSVirtual2020.	Company News	New research on Tolebrutinib (SAR442168), an investigational brain-penetrant BTK inhibitor, is likely to improve its potential for modulating debilitating inflammatory processes in the central nervous system (CNS).
August 2020	LTL Pharma Acquired Sanofi SA – Dellegra.	Mergers and Acquisitions	LTL Pharma Co., Ltd. acquired Dellegra from Sanofi SA.
August 2020	Sanofi to buy a US-based developer of multiple sclerosis treatment	Mergers and Acquisitions	Sanofi agreed to acquire Principia Biopharma Inc. in an agreement worth US\$3.68 billion to concentrate more on specialty therapies than mass-market medicines.
June 2020	Sanofi and Translate Bio extended their collaboration.	Expansion	Sanofi Pasteur and Translate Bio extended their collaboration, which they formed in 2018, and license agreement to develop mRNA vaccines for infectious diseases.



Date	Development	Category	Description
May 2020	Launch of Buscobiota will strengthen Sanofi's digestive health portfolio	Product Launch	Sanofi, a leading manufacturer of brands such as Buscopan for irritable bowel syndrome and Dulcolax for constipation relief, has entered the digestive wellbeing market space with the launch of a new food supplement, Buscobiota. Buscobiota comprises three types of lactobacilli and two types of bifidobacteria which can be used as a preventive medication for chronic constipation.
April 2020	Cara Care collaborated with consumer healthcare business unit of Sanofi Germany for digestive health.	Collaboration	Cara Care collaborated with the Consumer Healthcare Business Unit of Sanofi Germany on a holistic approach to digestive health that combines Sanofi's Buscomint bei Reizdarm pharmaceutical drug with Cara Care's digital companion app for digestive conditions.
April 2020	FDA approved MenQuadfi™, the latest innovation in meningococcal (MenACWY) vaccination.	Product Approval	Sanofi received an approval from the FDA for a Biologics License Application for MenQuadfi™ Meningococcal (Groups A, C, Y, W) Conjugate Vaccine for the prevention of invasive meningococcal disease in persons with age 2 and above.
March 2020	Sanofi and Babylon collaborated to tackle digestive health	Collaboration	Sanofi collaborated with a video consultation business Babylon to offer an online AI Health Service for people suffering from digestive health issues.
December 2019	Sanofi Allegra showed positive results in the Phase 3 study for allergic rhinitis.	Product News	The study demonstrated that Allegra/Telfast 180 mg significantly decreased pollution-exacerbated AR symptoms by 21% (p=0.0148) in adult allergic rhinitis patients.
December 2019	Sanofi acquired Synthorx for US\$2.5 billion to bolster its immuno-oncology pipeline.	Mergers and Acquisitions	Sanofi acquired Synthorx, Inc. to come up with therapeutic solutions for people suffering from cancer and autoimmune disorders.
October 2019	Sanofi started on a viral vector production facility with a shift in R&D focus to gene therapies.	Expansion	Sanofi has developed adeno-associated virus capsids for the delivery of gene therapies for up to two non-CNS diseases.
July 2019	Sanofi entered into a strategic deal for exclusive US OTC rights to Tamiflu used for the treatment of flu	Strategy and Business Planning	Sanofi and Roche made an agreement for the exclusive OTC rights to Tamiflu, which is used for the treatment and prevention of influenza or flu in the US. As per terms of the agreement, Sanofi



Date	Development	Category	Description
			would be accountable for managing FDA negotiations for the OTC switch and subsequent exclusive marketing, scientific engagement, and distribution of Tamiflu OTC in the country. In the US, Tamiflu is currently sold under prescription by Genentech (Roche Group).
July 2019	Nosopharm and Evotec joined forces to accelerate the development of novel antibiotics.	Collaboration	Nosopharm and Evotec collaborated to advance Nosopharm's lead candidate of antibiotic to clinical stage and develop a second drug candidate.

6.1.3. JOHNSON & JOHNSON SERVICES INC.

6.1.3.1. Key Facts

Johnson & Johnson Services Inc.	
Foundation Year	1887
Corporate Address	One Johnson & Johnson Plaza, New Brunswick, New Jersey
Telephone	+1 732 524 0400
URL	www.jnj.com
Location	APAC, Europe, Middle East and Africa, North America, South and Central America
Exchange Ticker Symbol	NYSE: JNJ
Number of Employees	134500
Fiscal Year End	January 2021

6.1.3.2. Business Description

Johnson & Johnson Services Inc. (J&J) offers consumer healthcare products. The company is engaged in manufacturing, distribution, and research and development in the healthcare industry. It operates through three segments—pharmaceutical, consumer, and medical devices. Through its subsidiaries, the company caters to markets such as medical devices, pharmaceuticals, biotechnological, and consumer products. Its significant partnerships in different regions allows it to perform business operations smoothly and effectively. The company is renowned for its WSJ and Fortune rankings. Johnson and Johnson Services Inc. has an active presence in the Americas, Europe, and Africa, Asia Pacific, and other regions.

6.1.3.3. Products and Services

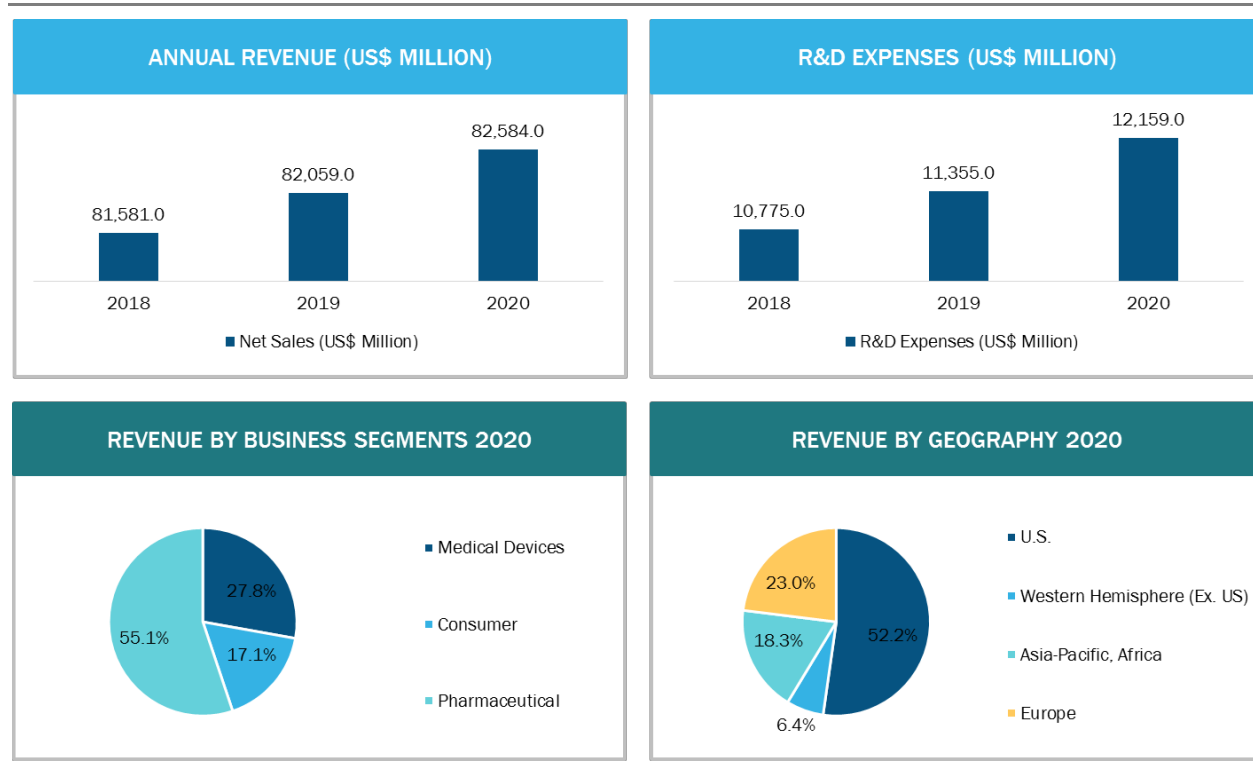
Product/Service Category	Description
Hemostats	Surgicel absorbable hemostat (oxidized regenerated cellulose) is used adjunctively in surgical procedures to assist in the control of capillary, venous, and small arterial hemorrhage when ligation or other conventional methods of control are impractical or ineffective.
	Vistaseal is the first fibrin sealant without gas, exclusively designed to be sprayed in both open and minimally invasive procedures, and it comes in pre-filled syringes.
Craniomaxillofacial Surgery	chronOS Bone Graft Substitute contains calcium and phosphorus, two of the main mineral constituents of bone.
	DBX DBM is an allograft bone void filler processed by the Musculoskeletal Transplant Foundation (MTF).

Product/Service Category	Description
Trauma & Extremities	Vivigen is a cellular allograft intended for repair or reconstruction of musculoskeletal defects.
Neuroscience	Janssen Neuroscience Department is focused on developing drugs for neurodegenerative diseases such as mood disorders, schizophrenia, and Alzheimer's.
Brain Aneurysms Treatment	Cerenovus, a part of Johnson & Johnson, has developed Galaxy G3 mini coil with an aim to treat brain aneurysm. The product received an FDA approval in 2018. PulseRider is recommended for the treatment of brain aneurysm.
Antibiotic	Vermox and Terconazole are antifungal agents.
Oncology	The company offers Doxil (i.e., doxorubicin hydrochloride) through the Janssen Global Services, LLC for cancer treatment.
Transdermal Patch	These products help consumers quit smoking.
	Ortho Evra is indicated for the prevention of pregnancy in women who elect to use a transdermal patch as a method of contraception.
	Duragesic is indicated for the management of pain in opioid-tolerant patients.
Absorbable Sutures	The products are used to minimize tissue trauma, optimize healing, and improve patient outcomes.
Non Absorbable Sutures	These products are used in surgical procedures.
Small Molecule	Janssen Pharmaceutical Companies collaborated with Theravance Biopharma, Inc. to develop TD-1473. It is a gastrointestinal (GI) restricted JAK inhibitor that is administered orally for the treatment of inflammatory bowel disease (IBD), including Crohn's disease and ulcerative colitis (UC).
Infectious Diseases	Aloid is used for the treatment of infectious diseases.
Neuroscience	Haldol (Haloperidol) is an antipsychotic medication for the treatment of CNS-related disorders.
Cardiovascular Diseases	Arestal (Loperamide oxide monohydrate) is used for the treatment of cardiovascular diseases as well as for the management of metabolism-related issues.
Oncology	Balversa (Erdafitinib) is the first FGFR kinase inhibitor that is prescribed for the treatment of locally advanced or metastatic urothelial carcinoma.
Immunology	Prograf is an anti-rejection medication used for the treatment of kidney, liver, or heart transplant patients.
Wound Closure	Ethicon, a subsidiary of J&J, operates in the global medical adhesive and sealant market. It offers simple and easy to handle products. Dermabond Advanced Adhesive product is intended for topical application only. The product is capable of comfortably holding edges of wound skin of surgical incisions in procedures such as minimally invasive surgery and other wounds.
Orthopedic	Orthopedic business of J&J includes medical devices and instruments required for the treatment of trauma, spine, and sports injuries. Further, the company also offers power tools for the dissection of large and small bones.

Product/ Service Category	Description
Surgery	J&J offers a wide range of surgical products such as surgical staplers, dissection products, endocutters, and wound closing devices under several brand names, such as Ethicon, Mentor, and Acclarent.
Interventional Solutions	Biosense Webster and Cerenovus are prominent brands of the company, dealing with interventional solutions. The products are majorly used to treat patients experiencing irregular heartbeats and strokes.
Zyrtec	The products offered under the Zyrtec brand have relatively quick response time, and longer effect to ~24 hours. The products have been made available in different dosage forms for facilitating easy administration and quick results.
Cartilage Regeneration	The COR precision targeting system is a single-patient use osteochondral autograft transfer system that allows maximum graft acceptance.
Eye Drops & Rewetters	Blink Eye Drops and Rewetters are used to lubricate and rewet soft (hydrophilic) and rigid gas permeable (RGP) contact lenses, to help relieve dryness, discomfort, and irritation.
Infectious Diseases	Prezista (Darunavir), Edurant (Rilpivirine), and Prezcobix/Rezolsta (Darunavir/Cobicistat) are the antiretroviral medicines for the treatment of human immunodeficiency virus (HIV-1); they are prescribed in combination with other antiretroviral products. Further, Symtuza (Darunavir/Cobicistat/Emtricitabine/Tenofovir alafenamide) are used for the treatment of HIV
OTC	Under its consumer segment, J&J offers different types of OTC products, including acid reflux products, smoking cessation products, allergy products, and therapeutics for cold and flu.
Sinus Dilation	Acclarent Inc., a subsidiary of J&J, operates in the global sinus dilation market. For instance, Relieva Spinplus Balloon Sinuplasty System provides one-time access during the procedure for confirmation, dilation, and irrigation. The system is precise and single-handedly control sinus access.
Hip	These products are used in hip reconstructive procedures.
Knee	These products are used in the knee replacement procedure
Acid Neutralizers	Pepcid Complete tablets are recommended for providing relief from heartburn. The tablet works in two different ways—the patented Dual Action formula features a fast-acting antacid that neutralizes acid on contact and the Pepcid AC prevents the production of excess acid at the source for up to 12 hours.
Antidiarrheal and Laxatives	Imodium products contain an active ingredient called loperamide that helps restore body's natural rhythm.
Patient-Controlled Injector	The product is used as a one-press patient-controlled injector with moderate-to-severe plaque psoriasis.
Mouthwash	The company offers a wide range of antiseptic mouthwash for the prevention of gingivitis, plaque formation, etc.
	Blocks 97 percent of dentin tubules in just six rinses, and the product is meant for patients of age 18 and above.
	These products are specifically for people who prefer alcohol-free mouthwash.
	Products under this category contain fluoride and are enabled by rapid fusion technology.

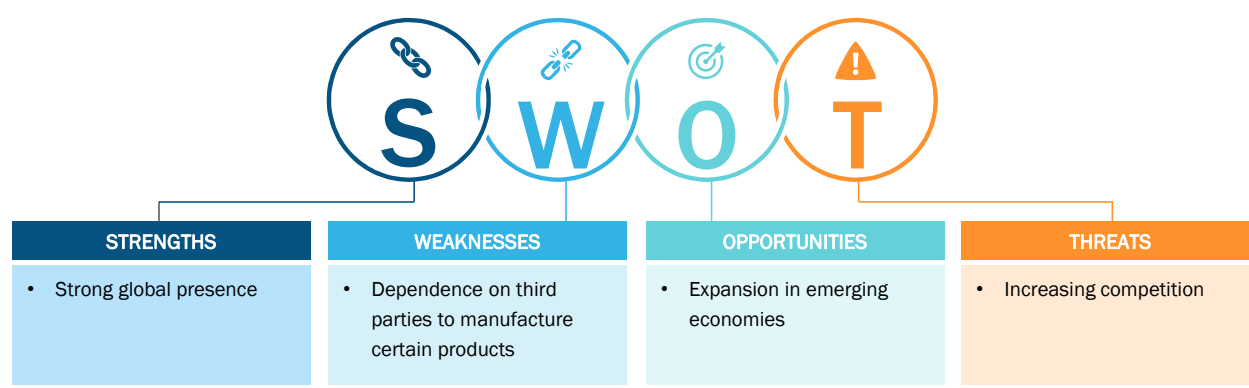
Product/ Service Category	Description
Prokinetic Agent	Imodium (Loperamide hydrochloride) is a product prescribed for the treatment of diarrhea. Prucalopride, a selective, 5-hydroxytryptamine (4) receptor agonist used in the treatment of constipation, can enhance the gastric emptying rate.
Antiemetic Agents	The product is used for lowering the discomfort caused by a slow-moving stomach—gastroparesis.
Osteotomies and Fracture Fixation	The product is recommended for the fixation of fracture and osteotomies of the femur in infants, children, and adolescents.
Healthcare AI	J&J has developed a mobile friendly AI-powered application to analyze the skin. The application is capable of processing 100,000 skin pixels; also, the application provides personalized routines and recommendations as per skin type.
	Andy, a virtual assistant, helps customers understand all the aspects of uses and precautions associated with contact lenses.
Contact Lens	The company offers a wide range of disposable contact lenses for people suffering from myopia, presbyopia, and astigmatism. Its contact lenses are available from 1–90-day packs. These lenses are designed by using exclusive technologies such as HydraLuxe, Lacreon, and Hydraclear 1 that provide eye lubricant properties, and long-lasting cushion to retain moisture in eyes.
Cataract	The Tecnis Symphony™ Range is indicated for the visual correction of aphakia in adult patients with less than 1 diopter of pre-existing corneal astigmatism. These IOLs provide improved intermediate and near-visual acuity, while maintaining comparable distance visual acuity.
Blood Glucose Monitoring	Johnson & Johnson Diabetes Care Companies (JJDCC) offer OneTouch self-monitoring blood glucose system along with OneTouch Reveal mobile app.

6.1.3.4. Financial Overview



Source: Press Release, Newsletters, and Company Annual Report.

6.1.3.5. SWOT Analysis



Source: Press Release, Newsletters, and Company Annual Report.

6.1.3.6. Key Developments

Date	Development	Category	Description
February 2021	CE mark for Acuvue Oasys Multifocal contact lens.	Product Approval	Johnson & Johnson Vision received CE Mark for its multifocal contact lens Acuvue Oasys offered with pupil-optimized design. It would be used for patients with presbyopia in Europe.
February 2021	FDA Approval for Tecnis Eyhance and Tecnis Eyhance Toric II intraocular lens (IOLs)	Product Approval	Johnson & Johnson Vision received FDA approval for the Tecnis Eyhance™ and Tecnis Eyhance™ Toric II IOL for the treatment of cataract patients in the US.
November 2020	Partnership with Insilico Medicine	Partnership	In November 2020, Janssen Pharmaceutical Companies signed a strategic partnership with Insilico Medicine to develop an AI-powered drug discovery platform.
August 2020	Launch of Tecnis Synergy and Tecnis Eyhance Intraocular in Canada	Product Launch	Johnson & Johnson Vision received approval from Health Canada for the launch of its Tecnis Synergy and Tecnis Eyhance IOLs in Canada.
July 2020	Collaboration with WHO	Collaboration	In July 2020, the WHO collaborated with Johnson and Johnson, Amazon, and Google Inc. to develop an anti-tobacco program. This new AI-based anti-tobacco program is aimed at helping people to quit smoking.
May 2020	FDA approval for Darzlex Faspro	Product Approval	The Janssen Pharmaceutical Companies announced the FDA approval of Darzalex Faspro (Daratumumab and Hyaluronidase-fihj) for multiple myeloma patients, including newly diagnosed and transplant ineligible patients as well as relapsed or refractory patients.
May 2020	Launch of Tecnis Multifocal Toric II IOL in the US	Product Launch	Johnson & Johnson Vision launched Tecnis Multifocal Toric II IOL that features a new generation of frosted haptics, offering more surface texture and friction between the lens haptics and the capsular bag.
May 2020	Partnership with Biomedical Advanced Research and Development Authority (BARDA)	Strategy and Business Planning	As part of a partnership, Johnson & Johnson and BARDA together committed more than US\$1 billion of investment to co-fund vaccine R&D activities and clinical testing. Further, J&J anticipates the initiation of human clinical studies of its lead vaccine candidate at the latest by September 2020 and expects the first

Date	Development	Category	Description
			batches of a COVID-19 vaccine to be obtainable for emergency use authorization in early 2021. Furthermore, Johnson & Johnson aims to establish new vaccine manufacturing facilities in the US, along with an additional production capacity outside the country, to begin production to support global vaccine supply.
January 2020	Launch of a multi-pronged response to coronavirus, a global public health threat	Strategy and Business Planning	Johnson & Johnson launched a multi-pronged response to SARS-CoV-2, a global public health threat. As part of this initiative, J&J has initiated efforts for developing a vaccine candidate against the virus and join forces with others to screen a library of antiviral therapies.
December 2019	Vistaseal – first innovation to emerge from Ethicon’s strategic partnership with Grifols, a pioneer in the plasma industry	Product Launch	Ethicon, a subsidiary of Johnson & Johnson Medical Devices Companies, launched Vistaseal Fibrin Sealant (Human) to help surgeons manage bleeding during surgery. The product contains a combination of fibrinogen and thrombin, clotting proteins found in human plasma.
December 2019	Acquisition of Verb Surgical Inc.	Mergers and Acquisitions	In December 2019, the company announced the acquisition of the remaining stakes in Verb Surgical Inc. This acquisition will help the company to consolidate its portfolio of robotics and data science capabilities.
October 2019	Launch of Tecnis Eyhance Monofocal Intraocular Lens in India	Product Launch	Johnson & Johnson Vision launched Tecnis Eyhance IOL, a superior monofocal IOL implant, for patients who have undergone cataract removal surgery. This IOL is designed to extend depth of focus from distance to intermediate vision.
July 2019	Launch of Consortium to Discover and Develop New TB Antibiotics	Product Launch	J&J launched an international research consortium to discover and develop new TB antibiotics in collaboration with eight biotechnology partners and European academics.

Source: Press Release, Newsletters, and Company Annual Report.

6.1.4. MEDTRONIC PLC

6.1.4.1. Key Facts

Medtronic PLC	
Foundation Year	1949
Corporate Address	20 On Hatch, Lower Hatch Street, Dublin 2, Ireland
Telephone	+353 1 438 1700
URL	www.medtronic.com
Location	Global
Exchange Ticker Symbol	MDT (NYSE)
Number of Employees	9,000
Fiscal Year End	April 2020

1.1..1.1 Business Description

Medtronic plc is one of the vital players providing medical technologies, services, and solutions. The company is engaged in the development, manufacturing, and marketing of medical devices. The vast customer base of Medtronic comprises hospitals, clinicians, physicians, and patients. Its business segments are as follows: Cardiac and Vascular Group, Minimally Invasive Therapies Group, Restorative Therapies Group, and Diabetes Group. Medtronic has a presence in ~160 countries. Some of the subsidiaries of the company are Covidien Ltd. (Republic of Ireland), Medtronic Sofamor Danek USA Inc. (US), HeartWare International Inc. (US), Given Imaging (Israel), RF Surgical Systems (US), Medtronic Puerto Rico Operations Co. (US), ATS Medical (US), Medtronic Spine LLC (US), Medtronic Vascular Inc. (US), and Medtronic MiniMed Inc. (US).

6.1.4.2. Products and Services

Product/Service Category	Description
Neurological	Neurovascular products are offered to treat diseases of the vasculature in and around the brain.
	Durepair is a non-synthetic dura substitute meant to be used in the repair of the dura mater during neurosurgical procedures.
Ablation Products for Atrial Fibrillation (AF)	These drugs are used for the treatment of drug-refractory, recurrent, symptomatic, and paroxysmal atrial fibrillation (PAF).
Blood Management & Diagnostics	The autoLog Autotransfusion System is fully automated, and its design consistently produces a high-quality end product. The systems are easy to set up, and their intuitive design feature ensures improved and maintained efficiency and allows system operators/users to save time.



Product/Service Category	Description
Spinal & Orthopedic	Infuse Bone Graft is a premium product for autograft replacement due to its high osteoinductivity.
Neurostimulators	Doctors may prescribe neurostimulators or drug pumps for patients suffering from chronic pain who show no response to medication or for patients who cannot tolerate side effects.
Brain Aneurysm Treatment	These devices are used to divert intracranial blood flow. Additionally, they are also recommended for coiling purpose.
Radiofrequency Ablation	Under its Ablation Systems category, the company caters to the global radiofrequency ablation market. It is one of the world's leading players engaged in designing and manufacturing advanced energy-based medical systems and associated devices. The medical systems comprise Cool-tip radiofrequency ablation systems.
Treatments & Therapies	The chronic pain therapies offered by Medtronic plc— neurostimulators and drug pumps—are among the proven pain therapies that offer long-term relief. These products include spinal cord stimulation and targeted drug delivery.
Biopsy Devices	Owing to strong R&D facilities, the company has developed advanced biopsy products that have applications in the treatment of breast cancer and pulmonary disorders, and in neurological procedures, among others. Its widespread distribution and robust post-sales support systems allow the company to provide satisfactory services to the customers.
Intraoperative Neuromonitoring	These are advanced nerve monitoring devices with an easy-to-use interface. NIM systems monitor EMG activity from multiple muscles. They help in reducing the risk of nerve damage during various procedures, including ENT and general surgeries.
	These are DEHP-free PVC tubes that come with conductive silver ink electrodes and a cross-band to guide the replacement procedure.
Diabetes Care	Medtronic Diabetes Care division offers an integrated system that combines insulin pumps and continuous glucose monitoring.
Aortic Valves	Medtronic offers aortic valves under the heart valve replacement in the cardiovascular category.
Transcatheter Pulmonary	The Melody (TPV) offered by the company is specifically designed to treat the right ventricular outflow tract (RVOT) dysfunction in conduits and dysfunctional bioprosthetic pulmonary valves.
Advanced Surgical Technologies	These products confer efficiency in surgical navigation, tissue dissection, vessel coagulation, and other surgical aspects.
Cardiac Rhythm	Cardiac rhythm devices are meant to deal with arrhythmia. Further, the diagnostic products offered under this category analyze and assess heart-related abnormalities. In addition, the company also provides surgical products that are used during cardiac surgical procedures.
Pulse Oximeters	The Nellcor bedside respiratory patient monitoring system is enabled with digital signal processing and cardiac-based technology that

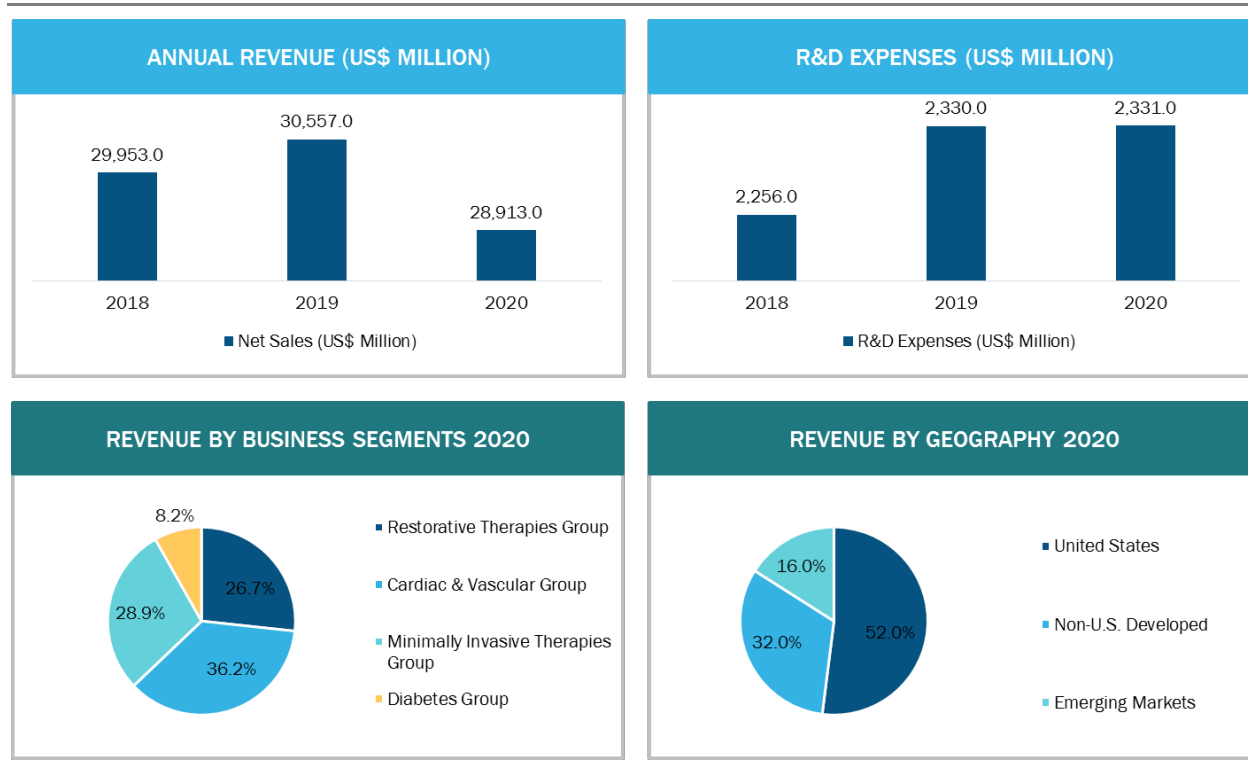


Product/Service Category	Description
	provides real-time patient respiratory status information, including continuous SpO ₂ and pulse rate monitoring and trend data. These are ideal for spot-checks or continuous monitoring in various healthcare and home use settings.
Ventilators	Medtronic offers a range of ventilator systems along with the associated consumables, such as ventilator filters. Its ventilator systems are easy to operate and exhibit easy mobility. The company also offers training services for the companies buying its ventilator products.
Sinus Dilation	Medtronic offers NuVent, a balloon sinus dilation product. This is a simple, targeted system that is used for balloon sinus surgery. It has built-in electromagnetic (EM) surgical navigation technology.
Drug Infusion Pumps	The Medtronic SynchroMed II pump is part of the SynchroMed II programmable drug infusion system that enables precise drug delivery for chronic therapy for severe spasticity.
Implantable cardioverter defibrillators (ICDs)	Cobalt ICDs and Crome ICDs with BlueSync technology enable tablet-based programming and app-based remote monitoring as well as offer exclusive algorithms to manage AF patients. Visia AF MRI and Visia AF are single-chamber ICDs that can detect AF using a traditional lead. Evera MRI ICDs are the first portfolio of ICDs to be approved for full body scanning in the MR environment, when MR conditions for use are met.
Ventilator	Puritan Bennett ventilation systems are designed to promote more natural breathing and help improve patient comfort.
Patient Monitoring	The Bispectral Index (BIS) technology is the first clinically proven and commercially available direct measure of the effects of anesthetics and sedatives on the brain. It enables medical professionals to reliably gauge the precise amount of anesthetic medication required by each patient.
Cervical Disc Degeneration	The product is placed between two adjacent cervical vertebrae to replace a diseased cervical disc. It is designed to maintain the precise distance between two adjacent cervical vertebrae.
Spinal Cord Neurostimulation Systems	The Intellis platform with AdaptiveStim implantable neurostimulator is powered by the proprietary Overdrive Battery technology. It is designed to overcome limitations associated with other SCS systems and is optimized for the increased energy demands of the high dose (HD) therapy.
Deep Brain Stimulation Systems	Percept PC device is used for the management of Parkinson's disease, essential tremor, dystonia, obsessive-compulsive disorder (OCD), and epilepsy.
Sacral neuromodulation (SNM)	InterStim systems, the implanted neurostimulator, electrically stimulate the sacral nerve.
Percutaneous Tibial Neuromodulation (PTNM)	Medtronic Nuro system delivers electrical pulses through a needle to stimulate the afferent fibers of the tibial nerve.

Product/Service Category	Description
Microcatheter	The product is a single-lumen catheter used with steerable guidewire in the vasculature. The catheter is made from stainless steel and offers anti-kink characteristics.
Visualization Solution	The platform exhibits fine features such as high-definition visualization and real-time infrared fluorescence imaging. This visualization system is capable of real-time fluorescence signal intensity measurements in both open and laparoscopic procedures.
Glucose Sensor	Guardian Connect is a smart continuous glucose monitoring (CGM) system that helps monitor blood sugar levels. This system alerts patients 10–60 minutes before the glucose excursion, to allow them to act in advance.
Oxygen Sensors	Nellcor reusable SpO ₂ sensors are enabled with the OxiMax Technology that helps healthcare providers in making a right selection of sensors for patients.
Pulse Oximetry Sensors	OxiMax technology offered by Medtronics has opened up a new world of pulse oximetry that can help clinicians provide better patient care by more effectively monitoring a broader range of patients, including those who may have been difficult to monitor in the past due to certain clinical considerations.
Brain Monitoring Sensors	This monitoring sensor enables the detection of hemispheric differences in the brain, which may prove useful for advanced monitoring applications.
Medical Perfusion Technology	Acknowledging the commitment of cardiovascular surgical teams to integrate rigorous experience into the process, Medtronic offers cardiopulmonary products to assist them in fulfilling this goal.
Homecare Ventilation	Newport HT70 plus portable ventilators can be quickly set up in home care settings, and they offer an on-airway flow sensor that provides monitoring capabilities with alarm provisions.
EEG	Medtronic offers brain monitoring equipment such as BIS Complete 4-Channel Monitor, BIS Quatro (4-Electrode) Sensor, and Sensor BIS Bilateral.
Cardiac Telemetry	Reveal Linq System includes a tiny insertable monitor that is placed just under the skin and the MyCareLink Patient Monitor that is a bedside unit that collects heart rhythm data from the implantable cardiac monitor (ICM) and sends it to the doctor.
Remote Monitoring	MyCareLink Smart Patient Monitor includes CRT-P for pacemakers. It combines a handheld reader with a free app that connects to a smartphone or a tablet. The Linkview Wi-Fi platform is a video-based system that connects patients and others through a touchscreen interface that enables in person contact.
Hemorrhagic Stroke Products	Axiom Prime detachable coils are intended for the endovascular embolization of intracranial aneurysms. Axiom Prime and Axiom detachable coils are also intended for the embolization of other

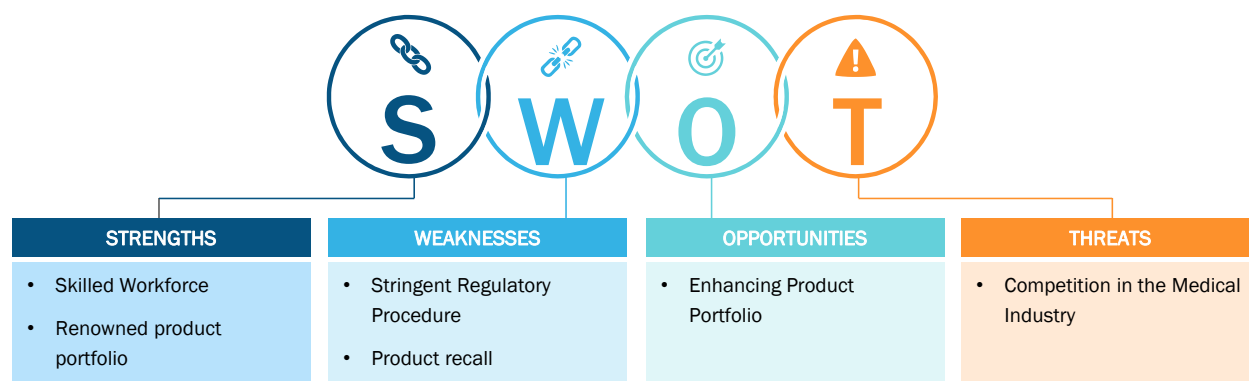
Product/Service Category	Description
	neurovascular abnormalities, such as arteriovenous malformations and arteriovenous fistulae.
Guidewires	Barrx RFA Endoscopic Guidewire is coated, including Depth Markers. The coated guidewire is intended particularly for the RFA balloon procedures, owing to the capability to indicate inadvertent wire movement during the exchange of the Barrx 360 RFA Balloon Catheter and Barrx 360 Soft Sizing Balloon.

6.1.4.3. Financial Overview



Source: Press Release, Newsletters, and Company Annual Report.

6.1.4.4. SWOT Analysis



Source: Press Release, Newsletters, and Company Annual Report.

6.1.4.5. Key Developments

Date	Development	Category	Description
May 2021	Launch of a new pediatric monitor that alerts doctors about potential airway obstructions during ventilation	Product Launch	Medtronic has commercially launched the SonarMed airway monitoring system in the US. The first and only of its kind, it uses acoustic technology to check for endotracheal tube (ETT) obstruction and verify position in real-time, providing clinicians with vital information to make more informed, life-saving decisions for their patients.
May 2021	Launch of CareGuidePro, a new mobile app and online platform that guides patients through their spinal cord stimulation therapy	Product Launch	Medtronic has released CareGuidePro™, a mobile app and web portal that acts as a virtual guide for patients as they progress through their Medtronic spinal cord stimulation therapy. The CareGuidePro platform would also help care providers to manage and support the patient's spinal cord stimulation experience.
October 2020	Launch of the world's first pacemaker capable of communicating directly with patients' smartphones and tablets	Product Launch	Medtronic has launched the Azure pacemaker enabled with BlueSync technology. The product can communicate directly with patients' smartphones and tablets. Remote monitoring of heart conditions allows patients to receive expert medical advice from their physician while at home.
June 2020	CE approval for its dual	Product Approval	Medtronic received CE approval for one-month dual antiplatelet therapy (DAPT) which would be conducted with

Date	Development	Category	Description
	antiplatelet therapy		the help of the company's Resolute Onyx drug-eluting stent (DES). The product is especially designed to manage cases involving high bleeding.
June 2020	Partnership with Foxconn to increase ventilator production	Partnership	Medtronic plc partnered with Foxconn Industrial Internet, a business group within Foxconn Technology Group, focusing on regulatory and quality requirements necessary to start manufacturing of Medtronic Puritan Bennett 560 (PB560) ventilators in the US. Medtronic and Foxconn are planning to produce 10,000 PB560 ventilators over the next year, which would be marketed and sold by Medtronic.
June 2020	Extended product investment	Expansion	The company announced investment of ~US\$337 million with the financial assistance of Blackstone Life Sciences to expand research and development activities for diabetes technologies.
March 2020	Launch of new solutions to help monitor COVID-19 patients	Product Launch	The Medtronic Care Management Services (MCMS) business has launched two new solutions designed to help assess and monitor patients that are concerned about COVID-19 and their respiratory symptoms. The COVID-19 Virtual Care Evaluation and Monitoring solution uses a virtual assistant to evaluate patients at home.
March 2020	Surge in Ventilator Production Capacity	Product Expansion	Medtronic increased its ventilator production capacity by more than 40 percent and is on track to more than double its capacity too in response to demand triggered amid the COVID-19 pandemic.
January 2020	CE Mark for Cobalt and Crome Portfolio of BlueSync	Product News	Medtronic plc received CE Mark for its Cobalt and Crome portfolio of implantable cardioverter defibrillators (ICD) and cardiac resynchronization therapy-defibrillators (CRT-D).
January 2020	Approval for Neurostimulators	Product Approval	The company received CE Mark for Percept PC Neurostimulator. This newly approved neurostimulator is a deep brain stimulation system equipped with Brainsense Technology.
January 2020	FDA approval for Micra AV	Product Approval	The company won FDA approval for its Micra AV, a leadless pacemaker designed to deal with arrhythmia. The device incorporates new algorithms that confer high efficiency.
January 2020	Acquisition of Stingenics	Mergers and Acquisitions	Medtronic plc acquired Stingenics, LLC, pioneer of a novel spinal cord stimulation therapy named the Differential Target Multiplexed (DTM).
December 2019	FDA clearance for brain surgery guidance system	Product Approval	Medtronic received FDA clearance for its brain surgery guidance system—Stealth Autoguide—for use in biopsy procedures. It is a robotic guidance system that is developed for spatial positioning and orientation of instrument holders and other associated tools that are used in neurosurgical procedures.

Date	Development	Category	Description
September 2019	Launch of the Envision Pro Continuous Glucose Monitoring (CGM) System in Europe	Product Launch	Medtronic announced the Envision Pro Continuous Glucose Monitoring (CGM) system—a fully disposable, zero calibration professional CGM system—which has obtained CE Mark approval. Medtronic has commercially released it in Europe and the Middle East. This new technology would allow healthcare professionals and their patients with Type 1 or Type 2 diabetes to accurately monitor glucose levels and trends over time, which will help develop more optimal diabetes therapy plans.

Source: Press Release, Newsletters, and Company Annual Report.

6.1.5. GENERAL ELECTRIC COMPANY

6.1.5.1. Key Facts

General Electric Company	
Foundation Year	1892
Corporate Address	41 Farnsworth Street Boston, MA 02210, US
Telephone	+001 877 394 9775
URL	www.ge.com
Geographic Presence	APAC, Europe, Middle East and Africa, North America, and South and Central America
Employee Count	1,74,000
Fiscal Year End	December 2020

6.1.5.2. Business Description

General Electric (GE) has operations in more than 180 countries; it operates through subsidiaries such as GE Capital, GE Digital, GE Healthcare, GE Lighting, GE Aviation, and GE Transportation. General Electric operates through four strategic business segments: Power, Renewable Energy, Aviation, and Healthcare. The company has 162 manufacturing plants in 34 states in the US and Puerto Rico. Additionally, 297 manufacturing plants are located across 41 countries.

6.1.5.3. Products and Services

Product/Service Category	Description
Healthcare Facility Lighting	The GE Lumination LED fixtures are enabled with TriGain technology, and the LUR series retrofit kits are developed to offer lighting designers improved CRI and R9, without sacrificing efficiency.
Pharmacy Management System	These tools help integrate CPOE, dispensing, pharmacy verification and in consolidating workflow.
Hemodynamic Recording System	GE offers an innovative Mac-Lab system that is easy to use and can be customized as per the user's workflow. The system focuses on the integration of IT data, interoperability between systems and solutions, and evolving requirements of cybersecurity. The ComboLab product is a combination of electrophysiology (EP) and hemodynamics recording system. It features seamless interoperability, excellent signal fidelity, and upgraded security.
Dual-Energy X-Ray Absorptiometry	Lunar iDXA features the latest generation of DXA technology. It is equipped with the enCORE software platform, which makes it suitable for a wide range of applications.
	Prodigy provides basic body composition analysis, including bone mineral density (BMD) and lean and fat tissue mass. It is available in full and compact sizes.

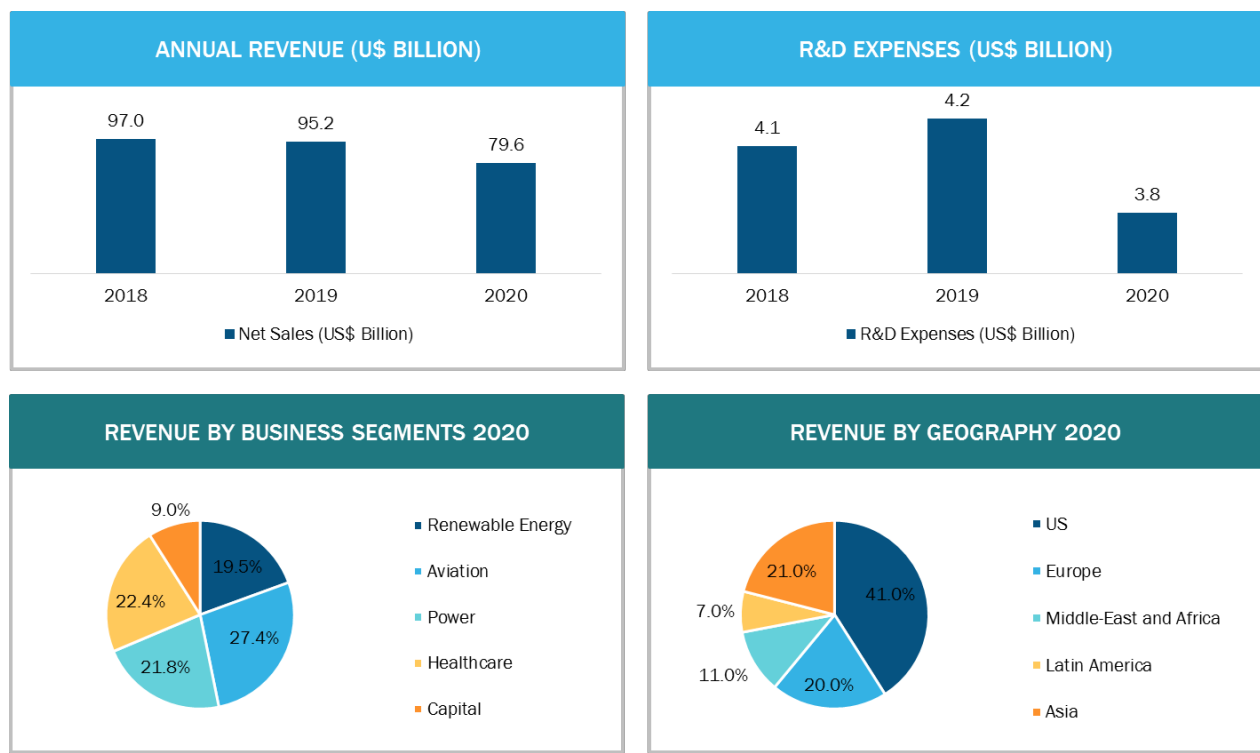
Product/Service Category	Description
Breast Cancer	These products are adopted in the breast cancer screening procedures.
	The solutions offered by the company feature high sensitivity and specificity to reduce false-positives and help prevent unnecessary examinations.
GE Digital	The System 1 Premium Package represents the seamless integration of the flagship online condition monitoring (CM) solution of GE Bently Nevada with its industry-leading line of online machinery protection and CM devices. This package enables online CM at the user's facility through permanently installed monitoring devices such as 3500 and Adapt platforms offered by Bently Nevada.
Virtual Care Solutions	These products are used for remote patient monitoring.
Cell Culture and Fermentation	The company offers a range of bioreactors for several biochemical processes in the pharmaceuticals and biotechnology industry.
RIS	RIS-IC enhances workflow with integration into GE PACS systems. It supports patient-centric workflow management that dissolves departmental boundaries for the entire enterprise.
TEE Probe Care Card	These products are TEE probes used in bite guard during intubation, examination, and extubation.
Ultrasound Transducers	These products are applied in abdomen, pediatric cardiac, and neonatal head
Baby Warmers	These products are used to provide warmth to infants.
Anesthesia Delivery	Under this product category, GE offers customized solutions for the delivery of anesthetics.
Bone Health and Metabolic Health	The Bone Health and Metabolic Health product portfolio offers dual-energy x-ray absorptiometry for the efficient management of osteoporosis.
Computed Tomography and Radiography	The products are used for diagnosis of diseases. Further, these diagnostic equipment are incorporated with advanced technologies, enabling efficient clinical capacity and significant economic value.
Diagnostic ECG	The products enable physicians to get advanced ECG analysis. Moreover, the systems are user-friendly, portable, and easy-to-use.
Mammography	These systems can be used as a better alternative for breast MRI.
Ventilators	Carescape R860 comes with an interactive design that provides a comprehensive analysis of vital body signs.
Digital Mammography	Senographe Pristina is a 3D mammography system that delivers superior diagnostic accuracy. Seno Iris™ is designed to effectively manage large volumes of data for accurate diagnosis, thereby improving the workflow. SenoBright HD is a contrast enhanced spectral mammography (CESM). It can be used as an alternative to breast MRI process. SenoBright HD provides high specificity and reduces false-positives; it also helps avoid unnecessary examinations. By highlighting unusual blood flow during the breast exam, it helps in accurate breast cancer diagnosis. It reduces acquisition time by up to 40 percent in large breasts. SenoClaire breast tomosynthesis is a three-

Product/Service Category	Description
	dimensional imaging technology that uses a low-dose short x-ray and is designed to separate the tissues as well as to reduce the overlapping of structures.
Anesthesia Machine	Avance CS ² is a sleek, intuitive user-interface enabled by a 15-inch touchscreen display. The Carestation 650c Anesthesia Delivery System features a simple user interface for improved workflows and a sleek integrated design that is suitable for constrained environments. Aisys CS2 features a movable 15-inch touch ventilator display screen for a unified Carescape-inspired user experience.
Patient Monitor	Carescape patient monitors are a family of scalable solutions that can be customized for all patient case types. These monitors are flexible and scalable, with customizable alarm and reporting capabilities. Carescape monitors can be installed to provide care to patients in ER, ICU, NICU, CCU, OR, and PACU, among others.
Medical Cyclotron	The PETtrace TM 800 series from Becker and Health+Wellness essentially stands out for its efficiency in producing the PETtrace. The cyclotron features high production potential and low cost, making it one of the leading products of its kind.
	A new, automatic cyclotron offered by MINITrace Qilin is capable of generating the isotopes required for 99 percent of all diagnostic PET scans. Furthermore, it is capable of performing multiple processes consecutively with high reliability. This option supports three to four scanners and is also easily accessible from your local distribution area.
	GENtrace provides a tracer development in-house solution. It is automated, easy-to-use, economical, and suitable for hospital use.
Patient Portal	Centricity Patient Portal is a flexible and scalable patient portal designed to help medium-sized clinics better engage patients and their families in their care.
Temperature Sensor	GE Healthcare's reusable temperature sensors allow the measurement of body and core temperatures. All probes offer proven, consistent accuracy and dependable performance in conjunction with GE Healthcare patient monitoring technologies.
Pressure Sensors	These sensors are used along with Lung INview technology developed by GE for examination of gas exchange capabilities.
Image Sensors	These are CT sensors used in various clinical operations for the visualization of minute details of organ structures, which ensures improved tissue characterization, more accurate material density measurement (or quantification), and lower radiation dose requirement.
Motion Sensor	It is respiratory motion management sensor solution. It can actively monitor respiratory motion in the background of every PET/CT procedure.
Biochemical Sensors	TruSignal adhesive SpO ₂ sensors are designed for use in continuous noninvasive arterial SpO ₂ and pulse rate monitoring; the sensors stay securely in place despite the patients' movement, delivering accurate readings. Sweat Equity Wireless Skin Sensors can remotely analyze sweat, check vital signs, and keep track of patients' medical progress after treatment.

Product/Service Category	Description
Holter and Event Monitors	GE has significantly enhanced the Holter Technology portfolio since the acquisition of Marquette in 1998. It provides flexible, reliable, and clinically versatile Holter Monitoring products.
Sleep Apnea Therapeutic Devices	Mars VSL enables a streamlined and quantitative analysis of cardiac and sleep apnea. It automatically reports the clinical data such as apnea hypopnea index, sleep staging, and respiratory events that are critical for diagnosing sleep apnea.
Nebulizers	GE Healthcare offers these nebulizers for the home healthcare segment.
Diagnostic Imaging Devices	Vscan Air and Vscan Extend aid care providers with the visibility of patients in homecare settings. Both the systems are compatible with a range of Android and iOS smartphones and tablets.
Cardiac Rehabilitation	Case V7 is a CE marked medical device. It is used for the detection and effective management of cardiovascular diseases. It provides comprehensive diagnostic measurements, offering deeper insights and broader perspective on cardiac patient management.
Health Information Exchange (HIE)	eHealth Solutions provide network services and applications for support of cross-institutional communication by connecting the involved stakeholders and relevant patient data.
Medical Imaging	GE offers products for various imaging categories, including bone and metabolic health, CT, fluoroscopy, MRI, mammography, molecular imaging, and radiography. The imaging accessories include injectors, tabletops and covers, laser systems, phantom and pin sources, table accessories, slickers and equipment covers, and so on.

Source: Press Release, Newsletters, and Company Annual Report.

6.1.5.4. Financial Overview



Source: Press Release, Newsletters, and Company Annual Report.

6.1.5.5. SWOT Analysis



Source: Press Release, Newsletters, and Company Annual Report.

6.1.5.6. Key Developments

Date	Development	Category	Description
May 2021	Acquisition of Zionexa by GE Healthcare	Mergers and Acquisitions	GE Healthcare acquired Zionexa, a leading innovator of in-vivo oncology and neurology biomarkers that help enable more personalized healthcare. The company is scaling up the production of Cerianna (Fluoroestradiol F-18), an FDA-approved PET imaging agent used as an adjunct to biopsy for the detection of estrogen receptor (ER) positive lesions; the detection assists in the selection of treatment for patients with recurrent or metastatic breast cancer.
March 2021	Addition of new point-of-care system and an AI offering in the ultrasound family	Product Launch	Vscan AirTM is a cutting-edge, wireless pocket-sized ultrasound launched by GE Healthcare that offers crystal clear image quality, whole-body scanning capabilities, and intuitive software.
November 2020	Acquisition of Prismatic Sensors AB by GE Healthcare	Mergers and Acquisitions	GE Healthcare acquired Prismatic Sensors AB, a Swedish start-up specializing in photon counting detectors. This acquisition has helped GE to expand its footprint in the biomedical sensors market by investing in photon counting computed tomography (PCCT). This technology has the potential to significantly enhance the performance of oncology, cardiology, neurology, and many other clinical CT applications.
April 2020	Ford Ventilator Licensing Agreement between GE Healthcare and Airon	Agreement Strategy	Airon, a private company involved in making life support technology, entered into an agreement to provide GE Healthcare with its ventilation design for the production of ventilators in response to huge demand amid the COVID-19 crisis.
April 2020	Ventilator Contract from Health and Human Services (HHS) under the Defense Production Act	Company News	The HHS department awarded a new contract to GE, in partnership with Ford, for ventilator production rated under the Defense Production Act (DPA). As part of the contract worth US\$336 million, GE is likely to produce 50,000 ventilators by July 13.
March 2020	Acquisition of GE BioPharma by Danaher	Mergers and Acquisitions	GE announced the completion of the sale of its biopharma business to Danaher. The company received ~US\$20 billion in net cash proceeds. According to the terms of the agreement, GE received total consideration of US\$21.4 billion, including ~US\$21 billion in cash and the rest as pension liabilities of Danaher.
January 2020	Product Promotion at Arab Health 2020	Product Launch	GE Healthcare launched ~30 imaging technologies and intelligent applications at Arab Health 2020. The company launched

Date	Development	Category	Description
			these products on an international platform to uplift the brand equity on the international level as well as to promote newly launched products in international markets.
November 2019	GE Healthcare launched Serena Bright	Product Launch	GE Healthcare introduced Serena Bright, the healthcare industry's first contrast-enhanced mammography solution for biopsy. This new mammography-guided biopsy technique offers an alternative to MR-guided breast biopsy, along with providing improved patient experience and allowing faster diagnosis capabilities.
October 2019	Collaboration of GE Healthcare and Premier Inc.	Collaboration	GE Healthcare and Premier Inc. completed collaboration to develop a model to bring a same-day breast cancer diagnosis and treatment model to the US.

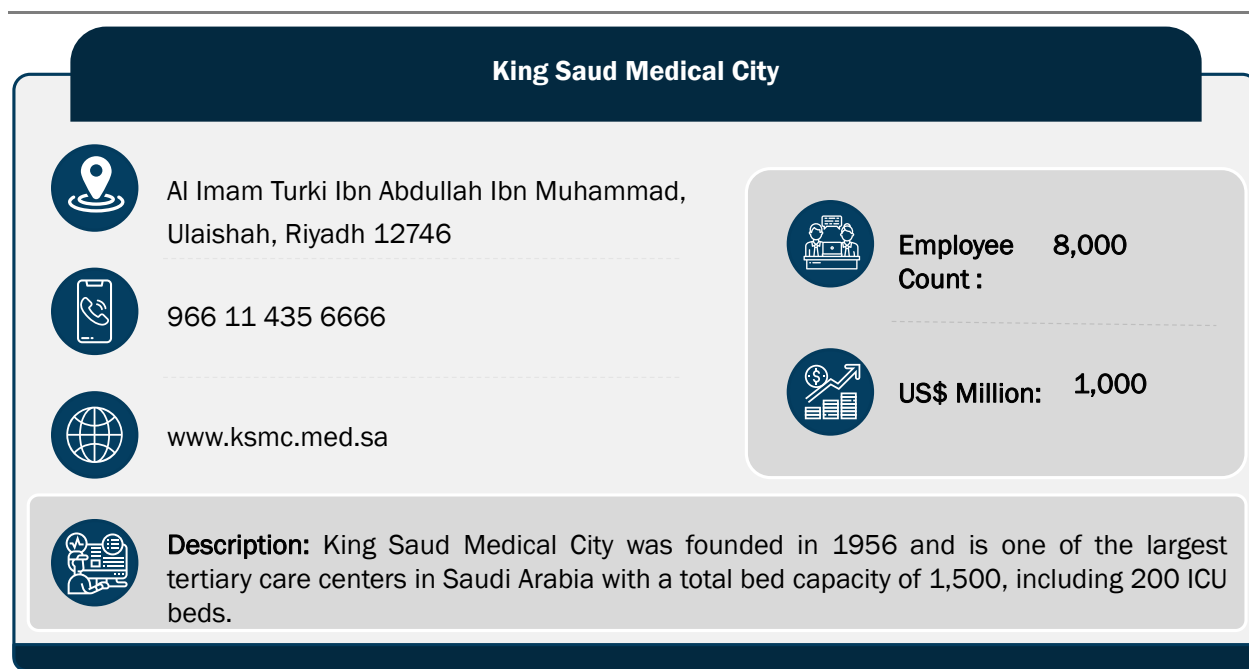
6.2. LIST OF HEALTHCARE COMPANIES IN SAUDI ARABIA

FIGURE 14. KING FAISAL SPECIALIST HOSPITAL RESEARCH CENTRE – COMPANY SNAPSHOT



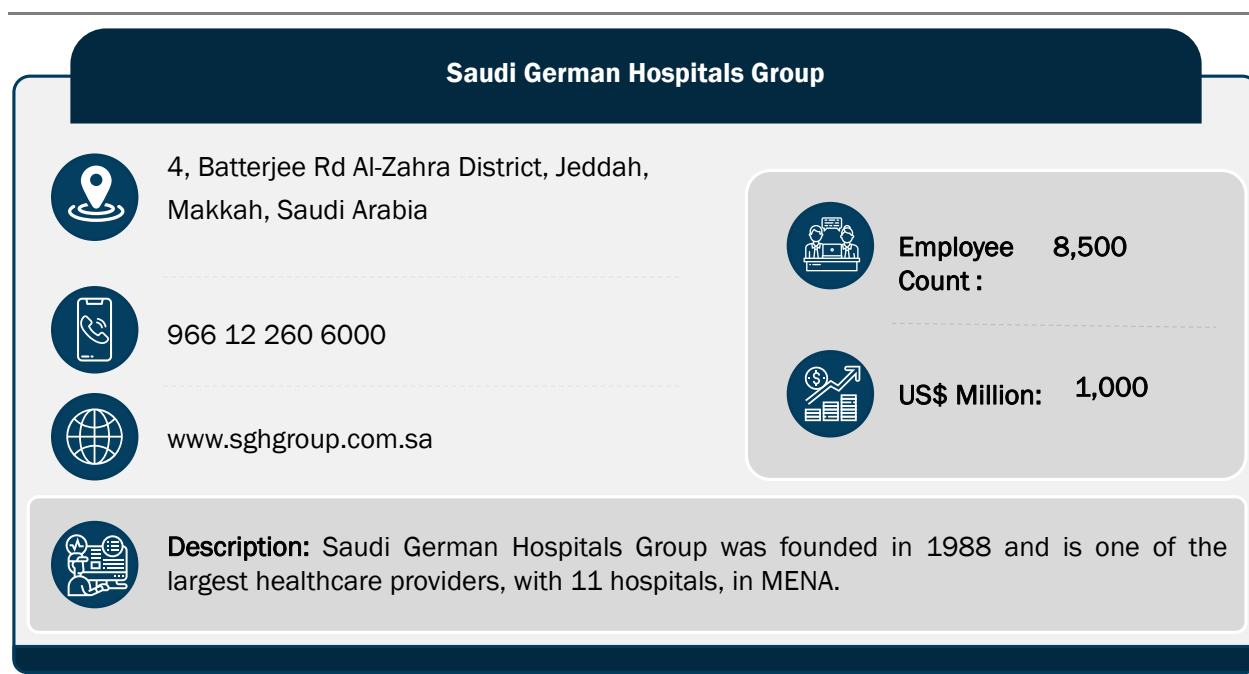
Source: D&B Hoovers Database, Accessed May 2021.

FIGURE 15. KING SAUD MEDICAL CITY – COMPANY SNAPSHOT



Source: D&B Hoovers Database, Accessed May 2021.

FIGURE 16. SAUDI GERMAN HOSPITALS GROUP – COMPANY SNAPSHOT



Note: MENA = Middle East and North Africa.

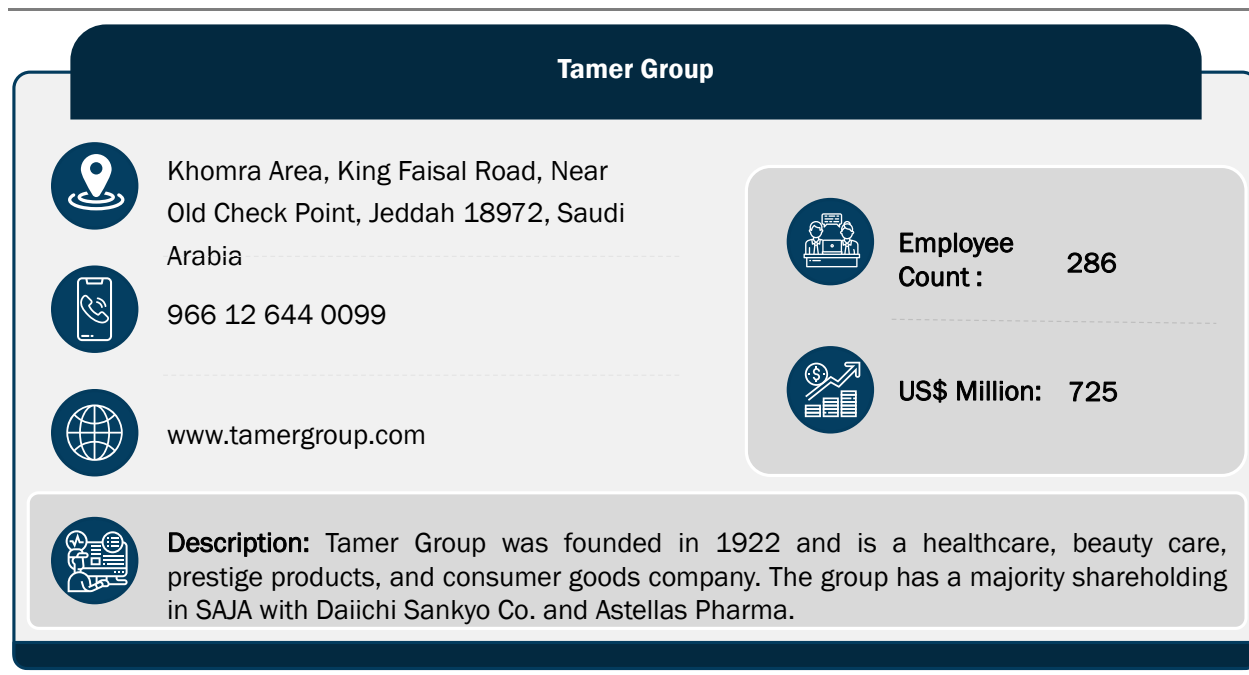
Source: D&B Hoovers Database, Accessed May 2021.

FIGURE 17. ALMANA GROUP OF HOSPITALS – COMPANY SNAPSHOT



Source: D&B Hoovers Database, Accessed May 2021.

FIGURE 18. TAMER GROUP – COMPANY SNAPSHOT



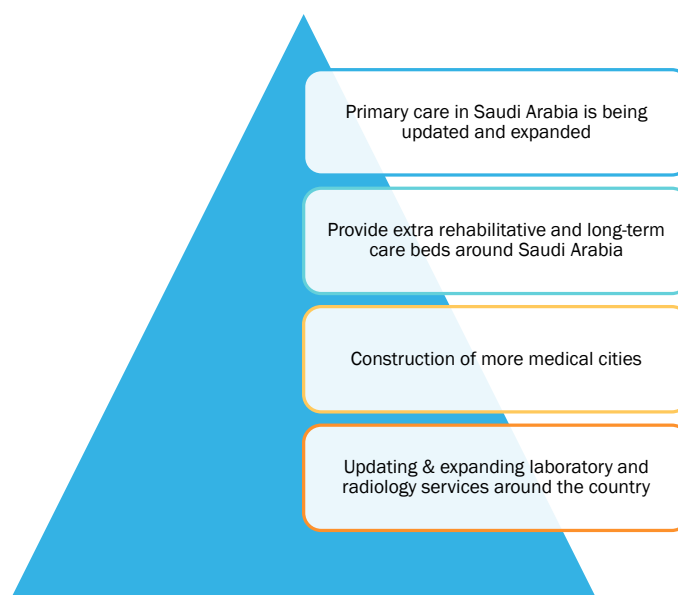
Source: D&B Hoovers Database, Accessed May 2021.

7. PUBLIC-PRIVATE PARTNERSHIPS IN HEALTHCARE SECTOR

7.1. RECENT DEVELOPMENTS IN PPP ACROSS THE HEALTHCARE SECTOR

Public-private partnership (PPP) is an important part of the National Transformation Program (NTP) of Saudi Arabia; the program intends to raise private sector investment from 40 percent of GDP in 2016 to 65 percent by 2030.¹² According to a study published by the Gulf Cooperation Council (GCC),¹³ by 2030 Saudi Arabia aims to invest SAR250 billion (US\$66.67 billion) in hospital infrastructure, simultaneously boosting private sector engagement. The Ministry of Health (MoH) has planned to spend ~US\$ 71 billion over five years, concluding in 2020, in accordance with the government's Vision 2030 and the NTP. The government is attempting to fast-track healthcare reforms by implementing the PPP method, with ambitions to raise the private sector share in total healthcare spending to 35 percent by 2020.¹⁴

FIGURE 19. MAIN OBJECTIVES OF HEALTHCARE PRIVATIZATION



Source: Knight Frank Research 2018.¹⁵

¹² <https://argaamplus.s3.amazonaws.com/321ad358-202d-47af-8536-e9c732863040.pdf>.

¹³ <https://www.arabnews.com/node/1837271/business-economy>.

¹⁴ Colliers International 2020-2021.

¹⁵ <file:///I:/Healthcare/Chapter/KSA-Healthcare-Thinkpiece-Bilingual-SP.pdf>.

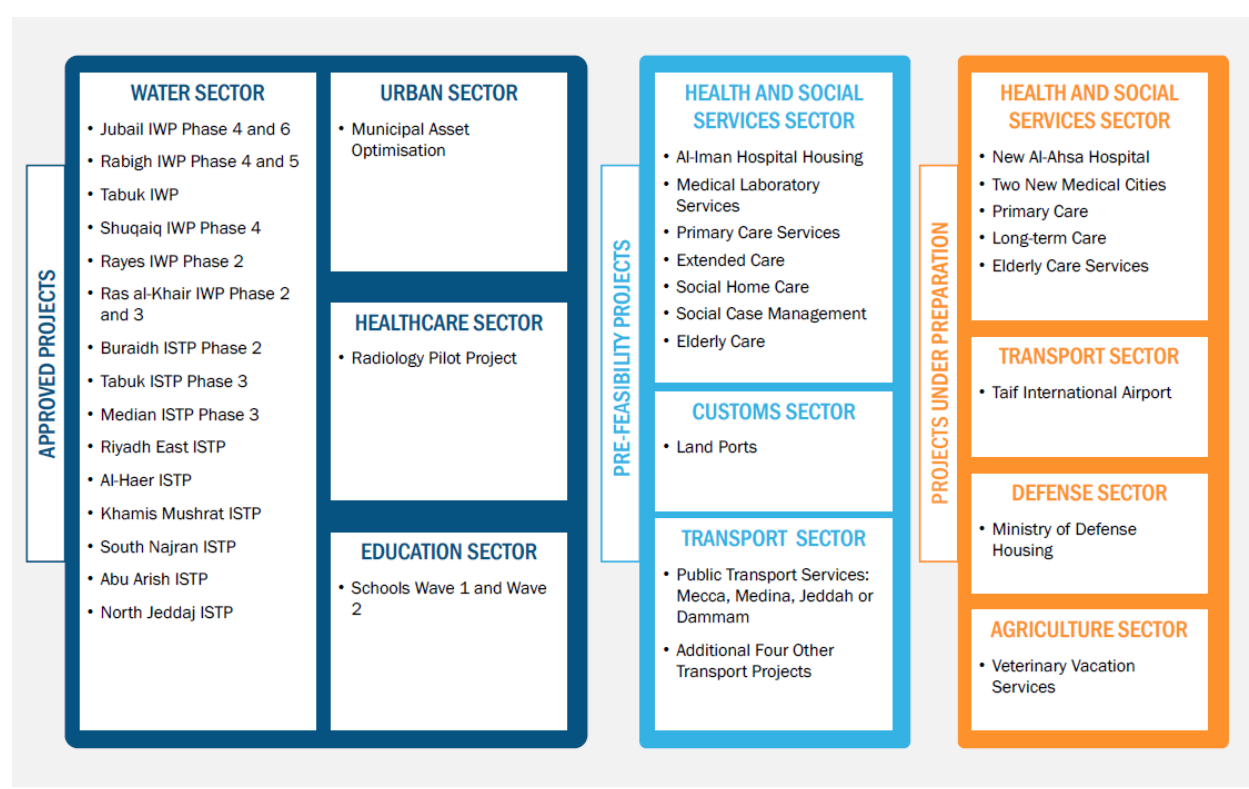
7.2. LIST OF MAJOR PUBLIC-PRIVATE PARTNERSHIPS

- Al-Ansar Hospital PPP

As the first stage of allowing the private sector to bid on the Al-Ansar Hospital project, the MoH released an Expression of Interest (Eoi) for the PPP in 2020.

Several recently completed and upcoming PPP projects, or their prefeasibility, are mentioned in Figure 20.

FIGURE 20. TENTATIVE SAUDI PPP PIPELINE, 2017



NOTE: IWP = Independent Water Projects and ISTP = Independent Sewage Treatment Plant.

Source: MEED and Saudi Arabia's National Center for Privatization 2017.¹⁶

¹⁶ [https://www.meed.com/saudi-ppp-and-privatisation-progress-and-prospects#:~:text=Public%2Dprivate%20partnership%20\(PPP\),participation%20of%20the%20private%20sector.](https://www.meed.com/saudi-ppp-and-privatisation-progress-and-prospects#:~:text=Public%2Dprivate%20partnership%20(PPP),participation%20of%20the%20private%20sector.)

8. CASE STUDY

8.1. CASE STUDY 1: RIYADH MILITARY HOSPITAL, SAUDI ARABIA

8.1.1. Challenge

The Riyadh Military Hospital faced a major issue in coping with the complexity of processes due to the large number of sectors, parties, and players engaged. Also, organizing and maintaining sensitive information as well as achieving coordination and essential interaction between different tasks, activities, and people are among other issues that needed attention and precision.

8.1.2. Solution

Military members used an advanced Business Process Management (BPM) system that improved healthcare exchanges within patient-centered multidisciplinary approaches such as physician to patient, physician to physician, and physician to pharmacist. The process-oriented system allowed physicians to update, manage, and alter a specific treatment protocol, as well as to display new ways of application of how to treat certain conditions, including information about a disease's course and patterns. Preplanned treatment methods, as well as organization policies and procedures, were also made available to users.

8.1.3. Benefits

The solution assisted the hospital in positively altering the system, especially in the following aspects.

- Cost Savings
- Time Reduction
- Increased Revenues
- Productivity Improvements

8.2. CASE STUDY 2: ADOPTION OF RIGHT BIOMETRIC PATIENT IDENTIFICATION SOLUTION BY NATIONAL GUARD HEALTH AFFAIRS

8.2.1. Challenge

The aim of the Ministry of National Guard Health Affairs (NGHA) is to offer the best possible treatment to its patients. Without a reliable patient identification system, providing reliable treatment to more than 30,000 patients at 500+ sites, every day, is a daunting challenge. The authorities at these sites faced issues such as patient misidentification, ID fraud, and duplicate medical records.

8.2.2. Solution

NGHA opted to use a smart fingerprint reader to create the RightPatient biometric patient identification system after carefully considering their alternatives and needs. The integration of biometrics for patient identification with the EHR systems of hospitals allowed the hospital to correctly identify patients across the treatment continuum.

8.2.3. Benefits

RightPatient provides all the benefits of a great biometric patient identification system with the extra bonus of multimodal capabilities. Patients no longer need to carry ID cards or hard copies of their medical records to confirm their identification. The use of RightPatient also lowered patient enrollment administrative expenses and saved money by removing unnecessary paperwork.

8.3. CASE STUDY 3: KING ABDULLAH BIN ABDULAZIZ UNIVERSITY HOSPITAL BPM

8.3.1. Challenge

Since everything was new at the King Abdullah bin Abdulaziz University Hospital (KAAUH), every process had to be conceived, produced, and delivered from scratch. Despite having a beautiful new hospital facility, it lacked staff, equipment, and patients. Hundreds of people had to be hired to avoid hospital staffing shortages, and many of them were expatriates. The hospital authorities had a limited timeframe to accomplish these tasks.

8.3.2. Solution

ES Consulting, a representative of BPTrends Associates in Arab States, was chosen to address the problem. The company's first step was to create the overarching strategy, which was developed in the form of strategy themes and a strategy map. Executives and employees were prepared for the process analysis through a variety of training courses, seminars, and executive briefings. All participants needed to have a clear and common grasp of process-based management theory and practice.

Following these interactions, a series of workshops resulted in the creation of a three-level business process architecture for the whole hospital system. The hospital's strategic themes served as the foundation for the process architecture.

8.3.3. Result

The benefits of the initiative to the hospital and those associated with it are as follows:

- High-level business processes have been documented, providing a solid foundation for process modelling, management, and improvement
- Hospital strategy themes and objectives are linked to actual business processes, resulting in a more integrated management and operations model
- Establishment of the care delivery and support systems will help the hospital to obtain accreditation
- Access to details on business processes will speed up the development of IT solutions
- Improvements in management knowledge of the relevance of process-based management

8.4. CASE STUDY 4: INTEGRATION OF HOSPITAL MANAGEMENT SYSTEM IN SPECIALIST HOSPITAL, SAUDI ARABIA

8.4.1. Requirement

- Identify patients and administer the appropriate therapy
- Protect patients' identities against identity theft
- Ensure a smooth connection between Bizagi (an automated patient onboarding platform) and HIS (Hospital Information System) (Legacy System)
- Integrate Bizagi with the National Information Center of the Ministry of the Interior
- Improve the accuracy of the patient information maintained in HIS

8.4.2. Solution

This specialty hospital used Bizagi to improve the process of patient registration and enhance the security of a 1,400-bed hospital after successfully completing end-to-end patient care automation for a 2,000 patient unit.

8.4.3. Results

- Registration time reduced by 50 percent.
- New patient registration cases rose by 50 percent.
- Human errors decreased by 80 percent.
- Staff productivity increased by 60 percent.
- A patient-centric solution was delivered, and the hospital became a clinician-led facility.

8.5. CASE STUDY – 5: BIM MEP MODELING FOR UNIVERSITY HOSPITAL BUILDING, SAUDI ARABIA

8.5.1. Business Needs

A Saudi Arabian project management business sought to create a coordinated BIM (Building Information Modelling) model for a university hospital building. The management wanted a precise coordinated 3D BIM model complying with LOD 500, which would help them achieve better scheduling ROIs.

8.5.2. Challenges

- The hospital required BIM modelling for architectural and structural disciplines for facility operation and management.
- During active onsite construction, the focus was on avoiding interdisciplinary conflicts, creating timetables, and estimating material takeoff.

8.5.3. Solution and Approach

- By using Revit and Navisworks solutions, the BIM and MEP engineering company created a fully coordinated 3D BIM model meeting LOD 500 and AIA requirements.
- Thus the team can allow faster communication and fulfil deadlines by allocating resources offshore and onshore.
- Accurate BIM geometry, documentation, and as-built BIM information were also documented for operations, maintenance, and facility management.
- Navisworks was used to discover and resolve interdisciplinary conflicts, alongside reducing risks and rework.

9. PRIMARY RESEARCH STUDY ANALYSIS

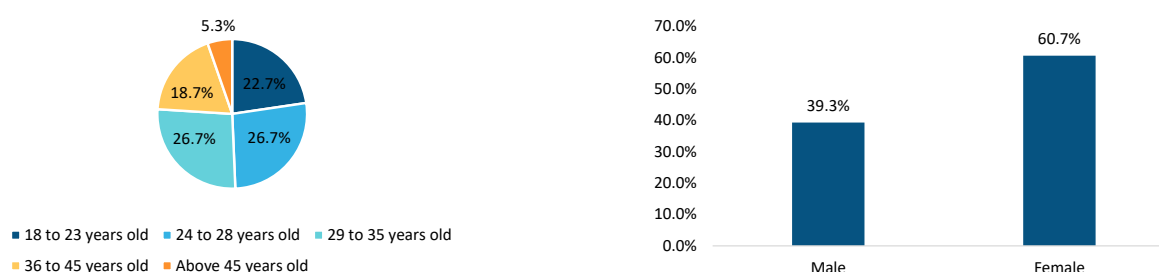
9.1. OVERVIEW

The following primary research was conducted through online mode across Saudi Arabia to gather insights pertaining to the healthcare industry. One hundred and fifty primary respondents were finalized for the study.

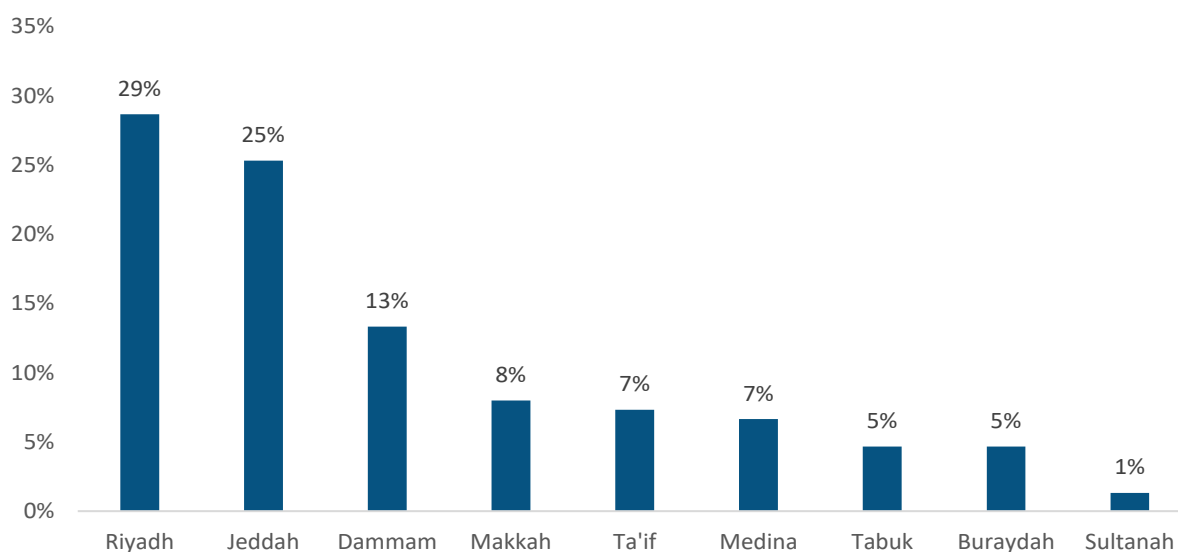
9.2. DEMOGRAPHICS

The young adult population between 23-35 years dominated the participation and accounted for 53.3 percent of the primary respondents. Of the group that attempted the survey, approximately 39.3 percent were male and 60.7 percent female.

FIGURE 21. AGE GROUP AND GENDER COMPOSITION OF RESPONDENTS

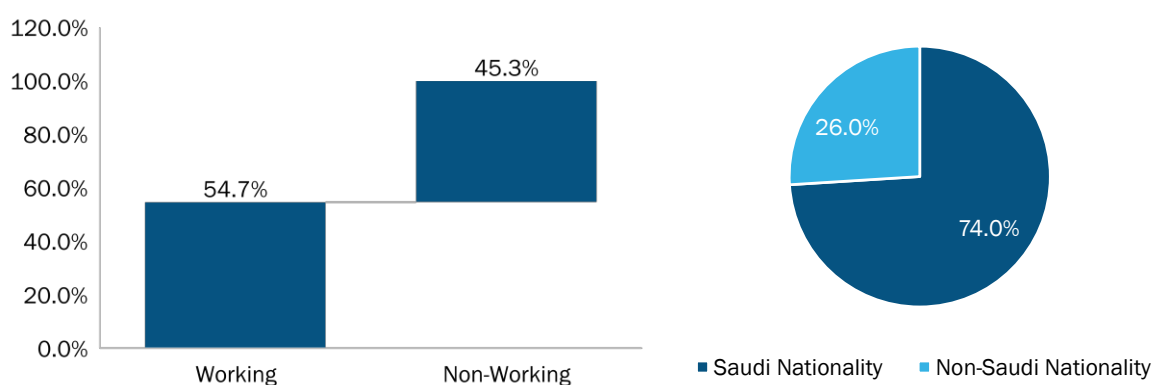


Source: Gulf Research Center Analysis and High Beam Global.

FIGURE 22. LOCATION OF RESPONDENTS

Source: Gulf Research Center Analysis and High Beam Global.

As seen in Figure 22, most of the respondents in the survey came from three popular cities - Riyadh, Jeddah, and Dammam - which accounted for 67 percent of all respondents. Other non-metro city respondents made up about 33 percent of the total number of people surveyed.

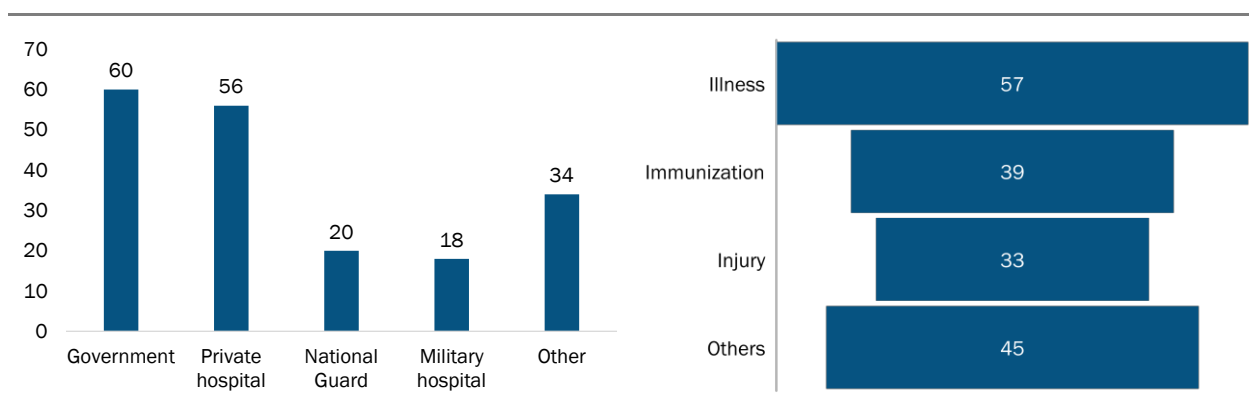
FIGURE 23. RESPONDENT OCCUPATION STATUS AND NATIONALITY

Source: Gulf Research Center Analysis and High Beam Global.

Furthermore, respondents from working groups dominated the poll, accounting for about 54.7 percent of the entire survey group, and Saudi nationals accounted for 74 percent.

9.3. HEALTHCARE FACILITIES

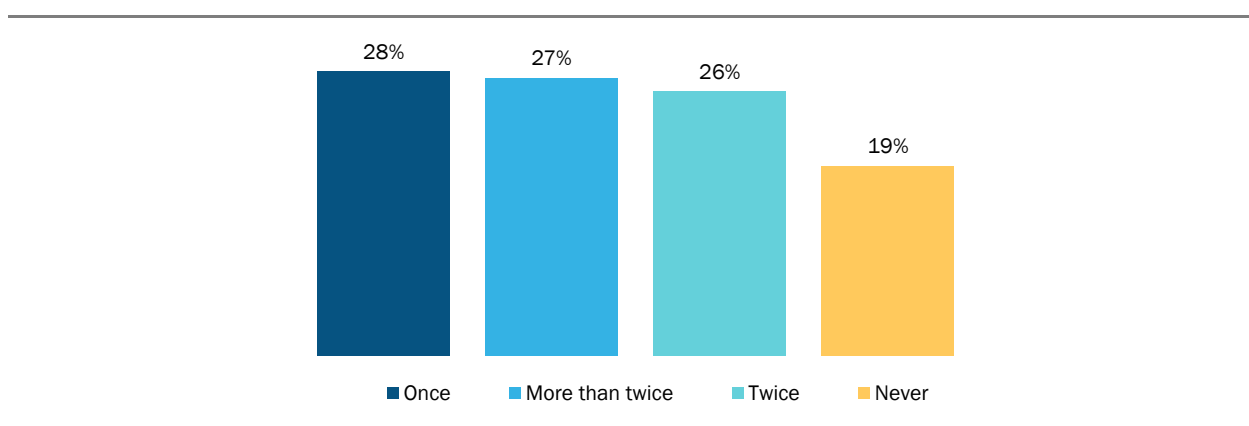
FIGURE 24. MOST POPULAR TYPE OF HOSPITAL/CLINIC AND REASON FOR VISIT



Source: Gulf Research Center Analysis and High Beam Global.

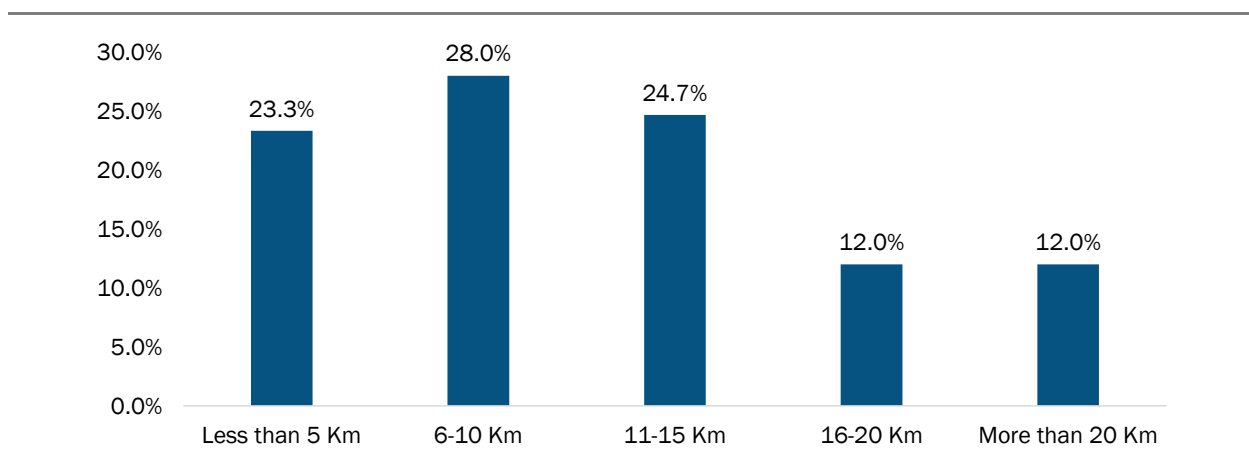
Government hospitals are the most common type of hospitals in Saudi Arabia. The majority of respondents go to hospitals to get treatment for their illnesses.

FIGURE 25. FREQUENCY OF ROUTINE CHECK-UPS PER YEAR



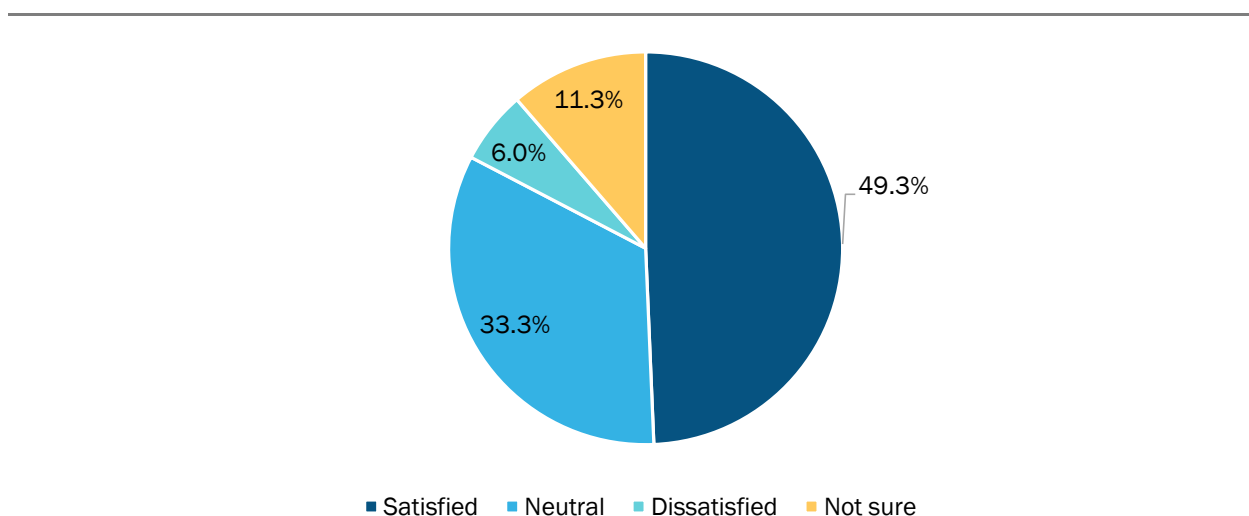
Source: Gulf Research Center Analysis and High Beam Global.

When it comes to routine check-ups, most respondents prefer to go once a year, as seen in Figure 25.

FIGURE 26. DISTANCE TO THE NEAREST MEDICAL FACILITIES

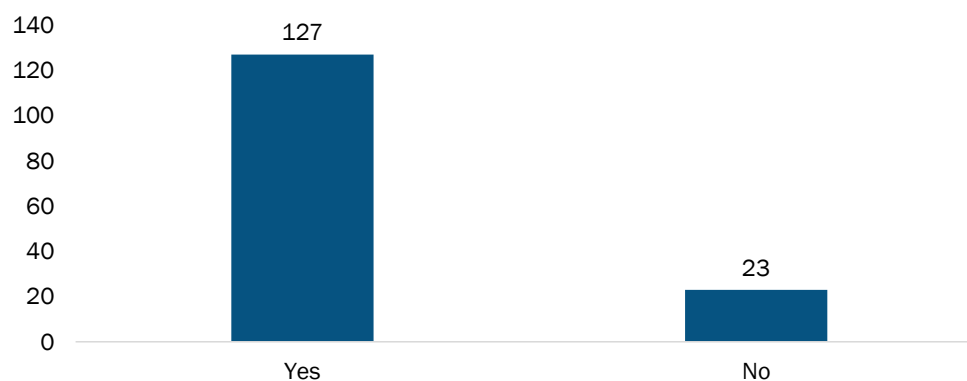
Source: Gulf Research Center Analysis and High Beam Global.

As shown in Figure 26, 28 percent of respondents travel between 6 to 10 kilometers to get to a healthcare facility for treatment.

FIGURE 27. MEDICAL STAFF SKILL AND COMPETENCY RATED BY RESPONDENTS

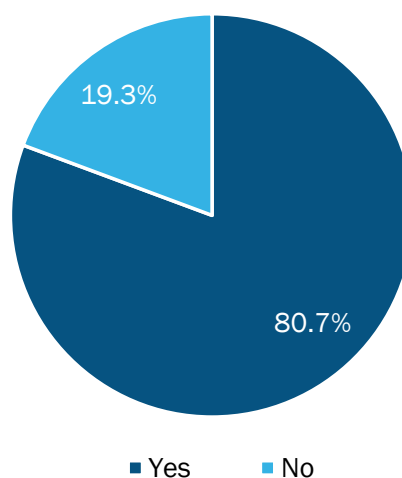
Source: Gulf Research Center Analysis and High Beam Global.

As shown in Figure 27, half of the respondents are satisfied with the medical staff's expertise and competency.

FIGURE 28. RESPONDENTS' VIEW REGARDING HOSPITAL FACILITIES (TREATMENT AND DIAGNOSIS)

Source: Gulf Research Center Analysis and High Beam Global.

As seen in Figure 28, around 84.7 percent of people believe that hospitals are well-equipped with advanced diagnostic and treatment equipment.

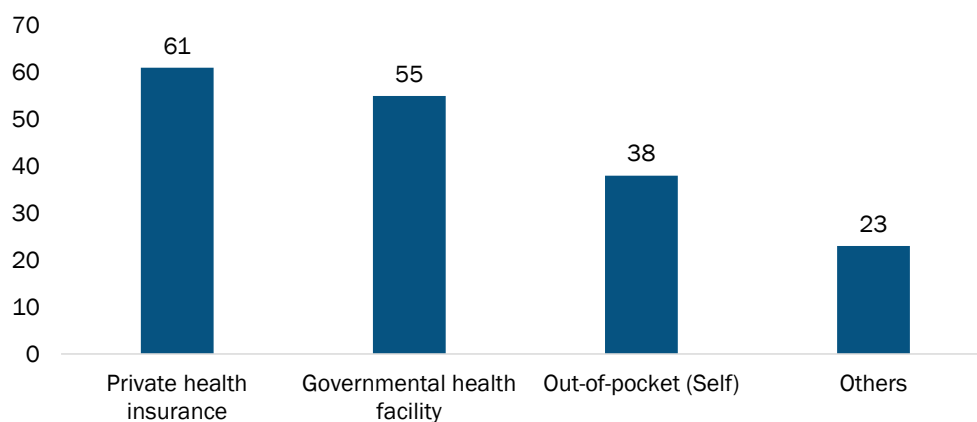
FIGURE 29. RESPONDENTS' VIEW REGARDING MODERN OPERATING FACILITIES IN HOSPITALS

Source: Gulf Research Center Analysis and High Beam Global.

As can be seen in Figure 29, approximately 80.7 percent of respondents feel that hospitals have modern operating rooms.

9.4. DISEASE STATUS

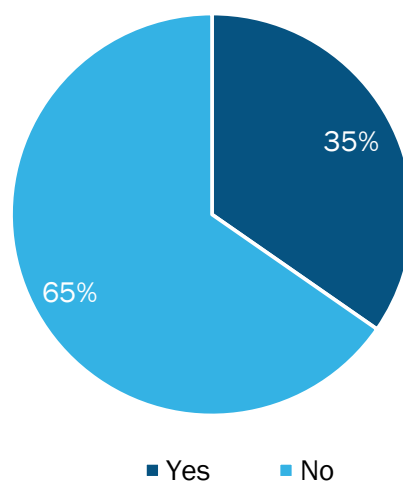
FIGURE 30. HOSPITALIZATION BILL PAYERS



Source: Gulf Research Center Analysis and High Beam Global.

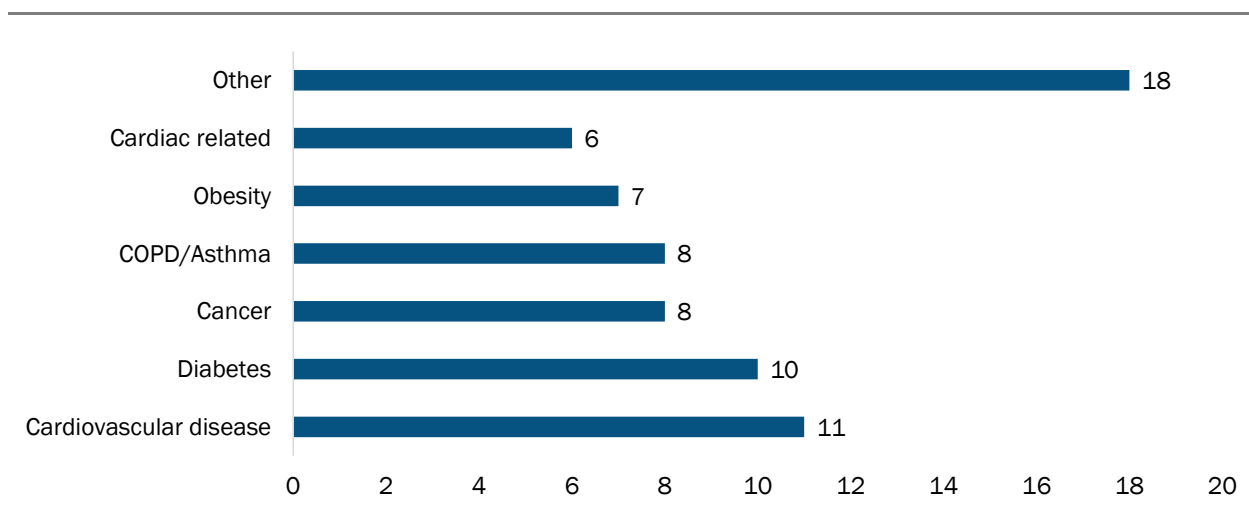
Most respondents will utilize their private health insurance to pay their hospitalization bill, as shown in Figure 30.

FIGURE 31. RESPONDENTS' CHRONIC CONDITION STATUS



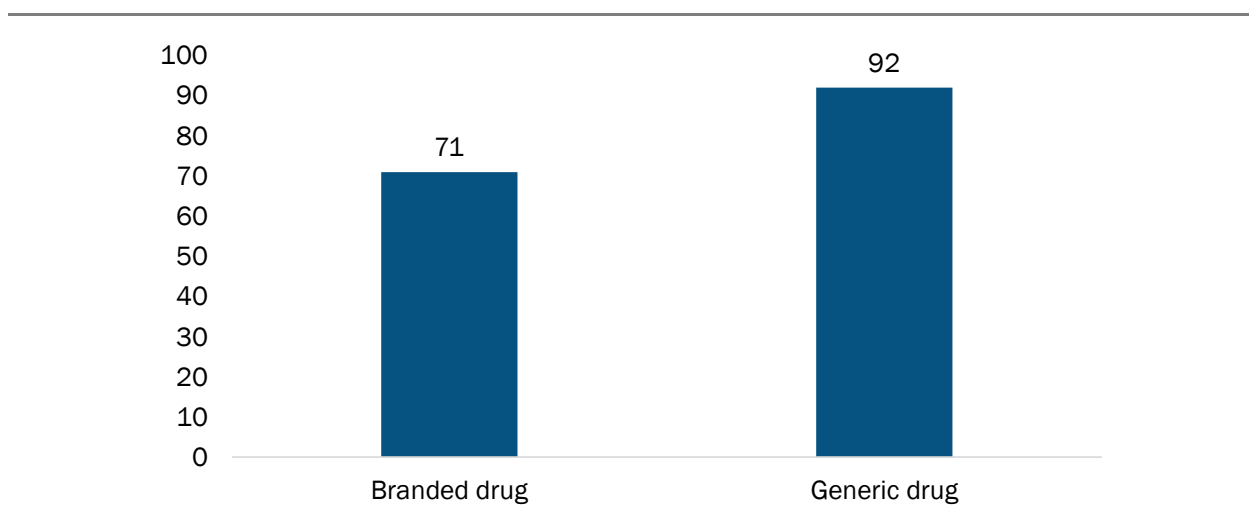
Source: Gulf Research Center Analysis and High Beam Global.

As indicated in Figure 31, the majority of respondents (65 percent) do not suffer from a chronic disease.

FIGURE 32. RESPONDENTS' CHRONIC CONDITION STATUS

Source: Gulf Research Center Analysis and High Beam Global.

As can be seen in Figure 32, the majority of respondents suffer from a chronic condition such as cardiovascular disease or diabetes, which accounted for 35.29 percent of all respondents.

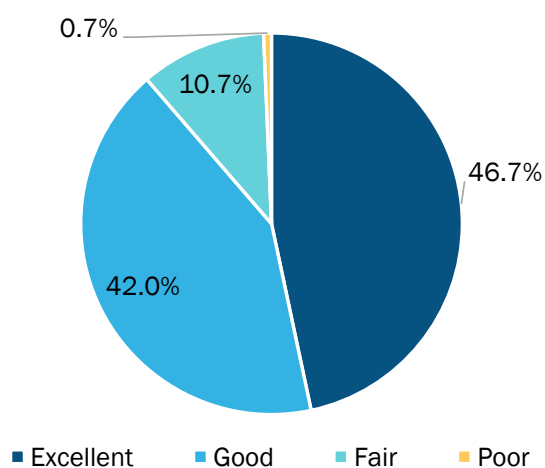
FIGURE 33. DOCTOR PREFERENCES FOR BRANDED VS GENERIC

Source: Gulf Research Center Analysis and High Beam Global.

In Saudi Arabia, the majority of medical practitioners favor generic medications in their prescriptions because they are less expensive than branded drugs.

9.5. RESPONDENTS' FEEDBACK

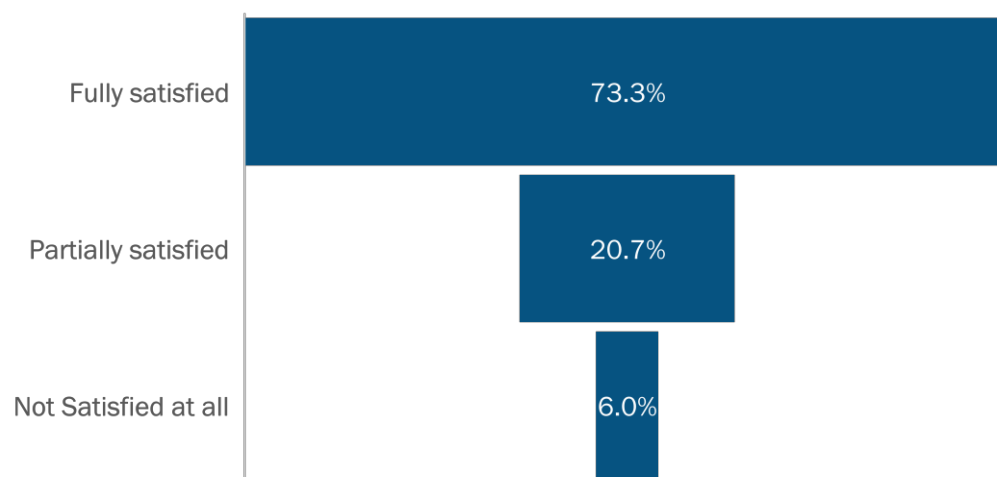
FIGURE 34. RESPONDENTS' VIEW ON SAUDI ARABIA'S HEALTHCARE FACILITIES



Source: Gulf Research Center Analysis and High Beam Global.

As demonstrated in Figure 34, 46.7 percent of Saudis think the country's healthcare services are outstanding.

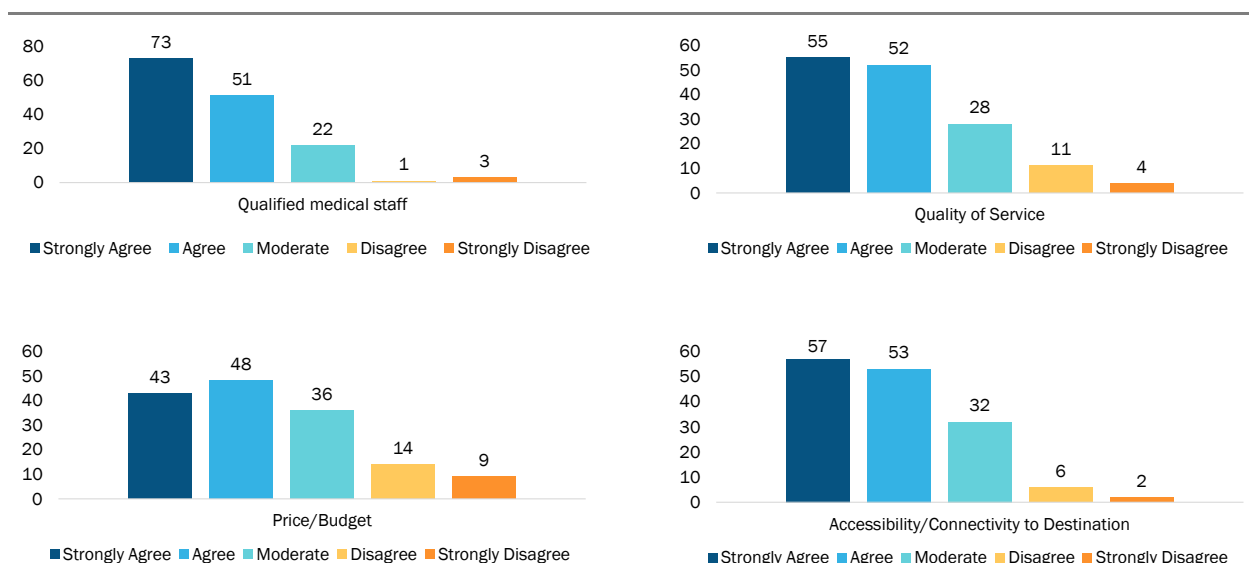
FIGURE 35. SAUDI GOVERNMENT'S RESPONSE DURING COVID-19 CRISIS



Source: Gulf Research Center Analysis and High Beam Global.

About three-quarters of respondents are fully satisfied with Saudi Arabia's response to the COVID-19 pandemic.

FIGURE 36. SATISFACTION LEVEL REGARDING HEALTHCARE FACILITIES IN SAUDI ARABIA FOR SELECTED PARAMETERS



Source: Gulf Research Center Analysis and High Beam Global.

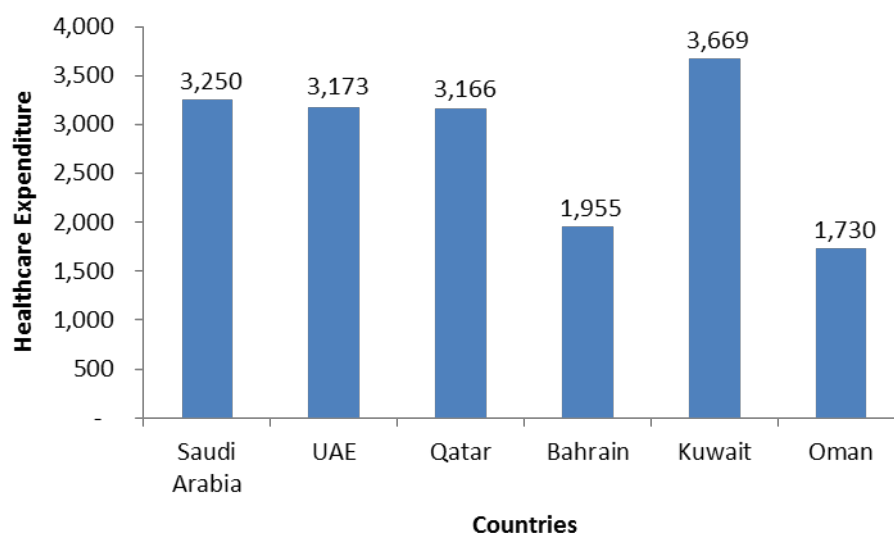
In terms of satisfaction, most survey participants appear to be satisfied with the trained medical staff as well as the accessibility/connection to the destination. Figure 36 depicts how satisfied people are with different aspects of Saudi Arabia's healthcare system.

10. HEALTHCARE SECTOR COMPARISON – SAUDI ARABIA VERSUS REST OF MIDDLE EASTERN ECONOMIES

10.1. OVERVIEW

The healthcare sector in the Middle East and North Africa (MENA) region is witnessing significant growth. The MENA region's healthcare market is projected to grow at a CAGR of 11.7 percent US\$243.6 billion in 2023. The countries of the region are investing heavily in their healthcare and pharmaceutical industry, with a major goal of improving the quality of life. Private sector share in healthcare expenditure has already captured more than 30 percent of the market. Saudi Arabia is spending heavily and making big reforms for the development of a thriving healthcare business. Among the key goals are to improve people's lives, spend on domestic infrastructure, and stimulate hygiene by creating private hospitals, Healthcare is a key area of focus of the Saudi Vision 2030.

Middle Eastern countries have witnessed less spending on healthcare compared to high income countries. The average healthcare expenditure in total GDP in MENA countries is 5.96 percent, which is lesser compared to North America (16.42 percent), OCED (12.46 percent), Europe (10.14 percent), and East Asia and Pacific (6.67 percent). Moreover, Middle Eastern countries show a large variation in healthcare spending as a percentage of GDP. Lebanon, Tunisia, and Saudi Arabia spend 8.35 percent, 7.29 percent, and 6.36 percent of GDP on health, respectively, which is relatively higher compared to other MENA countries such as UAE (3.3 percent), Kuwait (2.7 percent), Oman (2.3 percent), and Qatar (2.49 percent). Hence, the lower healthcare spending in this region compared to others is expected to be an incentive for policy makers to improve healthcare expenditure for the better health of the population.

FIGURE 37. PER CAPITA HEALTHCARE EXPENDITURE, BY COUNTRIES 2018 (US\$)

Source: <https://knoema.com/atlas/ranks/Health-expenditure-per-capita>.

10.2. COMPARATIVE ACCOUNT OF COVID-19 IMPACT AND HEALTHCARE FUNDING ON MIDDLE EASTERN COUNTRIES

According to WHO, MENA reported more than 3.6 million cases of COVID-19 out of the 55 million ongoing cases worldwide. In this situation, healthcare funding channels in MENA are looking for future sustainability of the industry and governments are coming up with new policies and approaches to withstand and even increase the financing of healthcare, especially after the COVID-19 pandemic. MENA countries are expected to moderate the impact of COVID-19 by improving the equity and flexibility of their health systems.

TABLE 3. COVID 19 STATISTICS IN MENA¹⁷

Country	Total Cases	Total Deaths	Active Cases	Cases/1 million Population	Deaths/1 million Population	Total Tests	Tests/1 million Population	Total Population
Saudi Arabia	483,221	7,775	11,190	13,671	220	21,601,544	611,116	35,347,685
UAE	628,976	1,802	19,568	62,846	180	57,152,316	5,710,568	10,008,167
Qatar	221,692	588	1,771	78,956	209	2,150,184	765,788	2,807,805
Bahrain	265,247	1,345	4,115	150,752	764	5,002,880	2,843,317	1,759,489
Kuwait	351,481	1,933	18,533	81,122	446	2,933,563	677,064	4,332,768
Oman	264,302	3,013	29,571	50,496	576	1,550,000	296,133	5,234,140

Source: MEED; Worldmeters, June 28, 2021.

SAUDI ARABIA

To limit the negative impact of the COVID-19 crisis, the Saudi Arabian Monetary Authority (SAMA) announced a set of measures and guidelines for banks, including instructing banks to postpone loan payments until December 2020, increasing lending to the private sector, and restructuring loans without additional charges, thus supporting businesses and individuals affected by the crisis. This was supported by an overall package of SAR100 billion.

The Ministry of Health (MOH) provides 60 percent of the total health services, through 13 health directorates in Saudi Arabia and is the major government provider. The other governmental healthcare providers provide comprehensive health services to their targeted population, usually employees and their dependents, and represent 20 percent of health services.¹⁸ Their budgets are allocated directly from the Ministry of Finance through their respective ministries and agencies.

¹⁷ <https://www.meed.com/latest-news-on-the-pandemics-economic-impact>.

¹⁸ https://saudijournals.com/media/articles/SJLS_511_236-245.pdf.

These agencies include:

- Ministry of Interior
- Ministry of Defense
- National Guard Health Affairs
- Education/ University Hospitals
- King Faisal Specialist Hospital and Research Center
- Royal Commission for Jubail and Yanbu
- ARAMCO Hospital

UAE

The cost of healthcare in UAE has been rising approximately 13 percent annually. The Central Bank of the UAE decreased its main policy rate for the second time since the onset of the COVID-19 crisis; it unveiled a stimulus package of AED256 billion to ease loans. This policy includes permitting loan repayment delays, reducing banks' reserve requirements, and allowing zero-interest rate collateralized loans to support SMEs.

The Ministry of Health and Prevention (MOHAP) is responsible for overseeing healthcare in the country; however, healthcare is usually dealt with by a health authority in each Emirate. There are four different regulatory bodies for healthcare in the country, namely:

- The Ministry of Health and Prevention (MOHAP)
- Emirates Health Authority (EHA)
- Health Authority Abu Dhabi (HAAD)
- Dubai Health Authority (DHA)

The UAE Government allocates a significant share of the federal budget for the healthcare sector each year to provide quality medical services.

TABLE 4. FEDERAL BUDGET ALLOCATION FOR HEALTHCARE IN UAE

Year	Budget Allocated (AED Billion)	Percentage of Federal Budget allocated to Healthcare
2016	3.8	8%
2017	4.2	8.6%
2018	4.5	7.4%
2019	4.4	7.3%
2020	4.8	6.9%

Source: <https://u.ae/en/information-and-services/health-and-fitness/healthcare-budget>.




QATAR

According to Legatum Prosperity Index produced by the Legatum Institute in 2019, Qatar ranked 48th out of 167 countries for health, with a score of 76.07 out of 100, the third highest in the MENA region. Two government-owned entities are responsible for providing public healthcare in Qatar: HMC, a non-profit organization, and the Primary Health Care Corporation (PHCC), an independent body established in 2012. The PHCC covers most primary care services while HMC provides inpatient care. The HMC increased the total number of inpatient beds by 25 percent, opening five new hospitals from 2016 till 2019.¹⁹ Moreover, the PHCC has 27 health centers located across the country.

The Qatar government announced an economic incentive package of QAR75 billion (US\$20.6 billion) to support the private sector in the COVID-19 pandemic. The Central Bank of Qatar reduced its main policy rates. Moreover, the Qatar Development Bank declared consent for delaying loan repayments by six months. A QAR3 billion (US\$820 million) has been allocated to support companies compensating their employees, under a program directed by the Qatar Development Bank.

¹⁹ <https://www.gulf-times.com/story/645761/25-rise-in-inpatient-beds-across-HMC-hospitals-sin>.

Performance of Qatar Healthcare compared to other countries and progression since 1990

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

Source: <https://www.consultancy-me.com/news/2560/heavy-investment-lifts-qatars-healthcare-system-to-world-class>.

BAHRAIN

Bahrain has the lowest density of healthcare workers per capita in the Gulf Cooperation Council (GCC), according to research from the World Health Organization. The Central Bank of Bahrain increased its loan conveniences to BHD3.7 billion (US\$9.8 billion) and decreased its key policy interest rates to 1.7 percent. Moreover, it reduced cash reserve ratios for commercial banks to 3 percent. Bahrain has newly introduced mandatory health insurance schemes for all its citizens as well as for expats and certain visitors. This law requires all Bahraini citizens, residents, and certain visitors to pay monthly contributions to a health insurance fund to access health services in public and private hospitals and health centers.

The Bahrain Economic Development Board (EDB) has announced the signing of an MoU with Foundation Holdings to invest BD2.18 billion into launching its affiliate companies in Bahrain, including a new state-of-the-art medical center focused on specialized healthcare and non-communicable diseases.

The government is currently focusing on Muharraq Medical Complex project worth U\$32 million (BD12.1 million) funded by the Saudi Fund for Development (SFD) which is expected to be completed by Q3 2021.²⁰

KUWAIT

The healthcare spending of Kuwait is around 4 percent of the country's GDP, which is far less compared to the other countries in MENA. However, the government announced an incentive package to support SMEs and important sectors during the Covid outbreak, including a cut in capital competence requirements. As a part of this package, an amount of KWD5 billion (US\$16.5 billion) was made available for supplementary lending from local banks.

There are seven different government entities that send patients abroad for medical tourism in Kuwait. These include:

- The Amiri Diwan
- The Diwan of the Crown Prince
- The Diwan of the Prime Minister
- The Ministry of Health
- The Kuwait Oil Company
- The Ministry of Defense (including Army, National Guard, Air Force, Navy)
- The Ministry of Interior (Police)

Kuwait Health Assurance Company, known as Dhaman, opened their first healthcare center in the Cairo Complex located in Hawally in November 2019. While patients in Kuwait pay KD2 to KD5 for each government health center visit, Dhaman asks for KD0.5 extra on top of these government fees. The Gulf Insurance Group (GIG) has offered health insurance cards to approximately 123,000 individuals. Members are entitled to up to KD17,000 per year of coverage.

²⁰ <https://www.constructionweekonline.com/projects-and-tenders/269292-construction-of-32m-medical-complex-53-complete-in-bahrain>.

OMAN

The MoH offers free universal healthcare to all Omani nationals and for expatriates working in the government sector, including access to mental health services and associated medicines. In 2019, the government allocated \$3.4bn to the healthcare sector, accounting for approximately 4.3 percent of Oman's GDP. Despite public funding cutbacks caused by lower oil revenue, spending on healthcare as a percentage of overall public expenditure has steadily increased in recent years, from 6 percent in 2015 to 11 percent in 2019.

The Central Bank of Oman introduced a comprehensive package of OMR8 billion (US\$20.78 billion) in the form of supplementary liquidity for banks to enable loans to sectors severely impacted by the COVID-19 crisis; the package focuses on reducing capital preservation buffers by 50 percent, aggregating the lending/financing ratio by 5 percent, and lowering the main policy rates. Social measures have also been introduced to provide cash and in-kind support to the most vulnerable households. The Public Authority for Consumer Protection (PACP) launched an initiative for providing low-income households affected by business shutdowns with a weekly grocery kit comprising essential commodities.

According to the "GCC Healthcare Industry Report" published by investment bank Alpen Capital, total public and private health expenditure in Oman is expected to expand at a CAGR of 9.1 percent to reach \$4.9bn by 2022 due to rising demand for services.²¹ The government is focusing on the construction of the \$1.5bn Sultan Qaboos Medical City Complex (SQMCC) in the coastal city of Barka. It is the country's first medical city expected to be built under a PPP contract, envisioned to house five major hospitals with 2,000 beds, and a dedicated imaging center and laboratories.

²¹ <https://oxfordbusinessgroup.com/overview/expansion-opportunity-greater-private-sector-involvement-will-be-integral-meeting-growing-health><https://oxfordbusinessgroup.com/oman-2020>.

10.3. TOP HOSPITAL PROJECTS IN MIDDLE EAST

UAE

TABLE 5. CURRENT & UPCOMING HOSPITAL PROJECTS

City	Project Cost (US\$)	Size	Beds	Owner	Project Participants
Abu Dhabi	381 mn	1 million sqm	400	VPS Healthcare Group	NSCC International Limited Society Technology House
Dubai	-	13,000 sqm	300	Thumbay Group	Thumbay Builders
Fujairah	235 mn	57,800 sqm	300	Ministry of Presidential Affairs	CC Group
Dubai	-	157,935 sqm	120	Dubai Health Authority	Eng. Adnan Saffarini Office OBE Architects
Ras Al Khaimah	-	-	100	Middle East Healthcare Company	-
Abu Dhabi	81.6 mn	-	100	UEMedical	HKS Amar Golden Design

KUWAIT

TABLE 6. CURRENT & UPCOMING HOSPITAL PROJECTS

City	Project Cost (US\$)	Size	Beds	Owner	Project Participants
Al Jahra	1 bn	426,000 sqm	1,171	Amiri Diwan and the State of Kuwait	Mohammed Abdul Mohsin Al Kharafi & Sons (EPC) PACE e.construct
Kuwait City	928 mn	-	Additional 955	Ministry of Health Kuwait Health Assurance Company (KHAC)	Sayyed Hameed Behbehani & Sons KEO International Consultants
Mubarak Al-Kabeer	588 mn	471,103 sqm	Additional 632	Ministry of Health Kuwait Health Assurance Company (KHAC)	Sayyed Hamid Behbehani & Sons Co. SSH Dar International Engineering Consultants PACE System Development and Project Management (SDPM)

City	Project Cost (US\$)	Size	Beds	Owner	Project Participants
Kuwait City	596 mn	200,000 sqm	Additional 618	Ministry of Health Kuwait Health Assurance Company (KHAC)	Alghanim International General Trading & Contracting Company W.L.L PACE NBBJ Gulf Consult
Al Sabah	617 mn	265,000 sqm	Additional 617	Ministry of Health Kuwait Health Assurance Company (KHAC)	Shapoorji Pallonji & Co. Ltd. SSH TRO Jung Brannen e.construct

Egypt

TABLE 7. CURRENT & UPCOMING HOSPITAL PROJECTS

City	Project Cost (US\$)	Size	Beds	Owner	Project Participants
Giza	-	500,000 sqm	1,000	National Cancer Institute (NCI)	Skidmore Owings & Merrill LLP (SOM) Hill International
Cairo	200 mn	215,660 sqm	300	Association of Friends of National Cancer Institute (AFNCI)	Arabian Construction Co. (ACC) Callison RTKL Dubai Al Amar Consulting Group
Alexandria	500 mn	-	300	Middle East Healthcare Company	-
Alexandria	72 mn	37,000 sqm	192	The Global Hospital Co.	Engineering Consultants Group (ECG)/ Navmatica

Bahrain

TABLE 8. CURRENT & UPCOMING HOSPITAL PROJECTS

City	Project Cost (US\$)	Size	Beds	Owner	Project Participants
Durrat Al Bahrain	1 bn	1 million sqm	500	Bahrain Ministry of Health	-
Muharraq	81.7 mn	-	210	Bahrain Ministry of Municipalities Affairs & Urban Planning	Saleh Abdullah Al-Mahana
Awali	106 mn	44,000 sqm	150	Supreme Council of Health Development	Mohamed Abdulmohsin Al Kharafi and Sons Company WS Atkins & Partners Overseas

Oman

TABLE 9. CURRENT & UPCOMING HOSPITAL PROJECTS

City	Project Cost (US\$)	Size	Beds	Owner	Project Participants
Barka	1.5 bn	5 million sqm	2,000	Ministry of Health Muscat National Development and Investment Company (Tatweer)	-
Salalah	1 bn	800,000 sqm	800	Apex Medical Group (AMG)	Atkins PSOMAS
Salalah	350 mn	850,000 sqm	700	Ministry of Health	-
Muscat	553 mn	1 million sqm	600	Royal Oman Police	Galfar Engineering and Contracting Company
Suwaiq	200 mn	100,000 sqm	250	Ministry of Health	React Studio

11. WAY FORWARD

- The need for day-care surgical centers is increasing with advancements in healthcare technologies and a surge in the prevalence of lifestyle disorders. The government of Saudi Arabia is focused on the development of day-care surgery centers in major cities of the country.
- Saudi Arabia plans to establish more primary care clinics and medical centers to meet the huge demand, which can be attributed to the large population and high hospital occupancy rates. Similarly, the country requires a large number of long-term care/rehabilitation facilities due to the aging population.
- Saudi Arabia is projected to report the birth of ~8 million babies during 2019–2030, which highlights the need for obstetrics, gynecology, pediatrics, and maternal care and childcare facilities and services. Therefore, both government and commercial health institutions in Saudi Arabia are likely to focus on developing maternity and pediatrics facilities in the coming years.
- Saudi Arabia can focus more on Digital Health. The worldwide digital health industry was valued at \$96.5 billion in 2020 and is expected to increase at a 15.1 percent compound annual growth rate (CAGR) from 2021 to 2028. Adoption of artificial intelligence tools in healthcare has increased the opportunity for doctors to reach patients across the world. Emerging technologies such as cloud computing, artificial intelligence, virtual reality, machine learning, and others can become critical tools for health-related organisations as well as healthcare providers in Saudi Arabia.

12. APPENDIX

12.1. LIST OF ABBREVIATIONS/GLOSSARY

TABLE 10. LIST OF ABBREVIATIONS/GLOSSARY

Acronym	Expansion
US\$	US Dollar
Bn	Billion
CAGR	Compound Annual Growth Rate
DROT	Drivers, Restraints, Opportunities, Trends
GCC	Gulf Cooperation Council
PPP	Public–Private Partnership
PIF	Public Investment Fund
SWOT	Strengths, Weaknesses, Opportunities, and Threats
Mn	Million
GDP	Gross Domestic Product
IVF	In Vitro Fertilization
ENT	Ear, Nose, and Throat
MoF	Ministry of Finance
SFDA	Saudi Food and Drug Authority
SIDF	Saudi Industrial Development Fund
NTP	National Transformation Program
MHI	Mandatory Health Insurance
CCHI	Council of Cooperative Health Insurance
LTC	Long-Term Care
QMS	Quality Management System
IHCC	International Hospital Construction Co.
PHA	Private Hospitals Association
SCFHS	Saudi Commission for Health Specialties
AVNeo	Aortic Valve Neocuspidization
OSA	Obstructive Sleep Apnea
KSrelief	King Salman Humanitarian Aid and Relief Center

Acronym	Expansion
RCC	Renal Cell Carcinoma
CPP	Central Precocious Puberty
IV	Intravenous
CRC	Colorectal Cancer
AD	Atopic Dermatitis
GPCR	G Protein-Coupled Receptor
NHL	Non-Hodgkin's Lymphoma
GPA	Granulomatosis with Polyangiitis
MPA	Microscopic Polyangiitis
OTC	Over the Counter
CKD	Chronic Kidney Disease
NSAID	Non-Steroidal Anti-Inflammatory Drugs
FDA	US Food and Drug Administration
MS	Multiple Sclerosis
CNS	Central Nervous System
MTF	Musculoskeletal Transplant Foundation
GI	Gastrointestinal
IBD	Inflammatory Bowel Disease
UC	Ulcerative Colitis
RGP	Rigid Gas Permeable
IOLs	Intraocular Lens
WHO	World Health Organization
BARDA	Biomedical Advanced Research and Development Authority
PAF	Paroxysmal Atrial Fibrillation
RVOT	Right Ventricular Outflow Tract
ICDS	Implantable Cardioverter Defibrillators
BIS	Bispectral Index
OCD	Obsessive-Compulsive Disorder
SNM	Sacral Neuromodulation
PTNM	Percutaneous Tibial Neuromodulation
CGM	Continuous Glucose Monitoring

Acronym	Expansion
DES	Drug-Eluting Stent
ICD	Implantable Cardioverter Defibrillators
GE	General Electric
HIE	Health Information Exchange
PCCT	Photon Counting Computed Tomography
DPA	Defense Production Act
Eoi	Expression of Interest
BPM	Business Process Management
NGHA	Ministry of National Guard Health Affairs
KAAUH	King Abdullah bin Abdulaziz University Hospital
HIS	Hospital Information System
MENA	Middle East and North Africa
SAMA	Saudi Arabian Monetary Authority
PACP	Public Authority for Consumer Protection
NCI	National Cancer Institute
MOHAP	Ministry of Health and Prevention
EHA	Emirates Health Authority
HAAD	Health Authority Abu Dhabi
DHA	Dubai Health Authority
PHCC	Primary Health Care Corporation
EDB	Bahrain Economic Development Board
GIG	Gulf Insurance Group
SQMCC	Sultan Qaboos Medical City Complex

Source: Gulf Research Center Analysis.

12.2. QUESTIONNAIRE: HEALTHCARE SECTOR

Target Audience: Anyone above the age of 18 who is either a resident of Saudi Arabia or has lived more than 3+ years in the country.

Questionnaire: Total 4 sections and 20 questions

Section A – Demographics (5 questions)	
Question	Options
Q1. Age	18 to 23 years old
	24 to 28 years old
	29 to 35 years old
	36 to 45 years old
	Above 45 years old
Q2. Gender	Male
	Female
Q3. Location	Riyadh
	Jeddah
	Makkah
	Madinah
	Sultanah
	Dammam
	Ta'if
	Tabuk
	Al Kharj
	Buraydah
	Other City - Please specify
Q4. Occupation	Working
	Non-Working
Q5. Nationality	Saudi Nationality
	Non-Saudi Nationality
Section B – Healthcare Facilities (7 questions)	
Question	Options
Q1. What was the type of hospital/clinic that you visited for medical attention for any reason?	Government
	National Guard

	Military hospital
	Private hospital
	Other
Q2. What was the reason for your last visit to a hospital/clinic?	Illness
	Injury
	Immunization
	Others
Q3. In a year, how many times do you visit a hospital/clinic for regular check up?	Never
	Once
	Twice
	More than twice
Q4. What is the distance between your residence and the hospital/clinic facilities?	Less than 5 Km
	6-10 Km
	11-15 Km
	16-20 Km
	More than 20 Km
Q5. How satisfied are you with the skill and competency of the medical staff?	Satisfied
	Neutral
	Dissatisfied
	Not sure
Q6. Does the hospital you regularly visit have equipment for modern diagnosis and treatment?	Yes
	No
Q7. Does the hospital have modern operating room facilities?	Yes
	No

Section C –Disease Status (5 questions)	
Question	Options
Q1. Who usually pays your hospitalization fees?	Governmental health facility
	Private health insurance
	Out-of-pocket (Self)
	Others
Q2. Are you suffering from any chronic condition? If yes, kindly see below Question	Yes
	No
Q3. What kind of chronic illness are you suffering from? (Multiple Choice)	Cardiovascular disease
	Cardiac related
	Cancer
	COPD/Asthma
	Diabetes
	Obesity
	Other
Q4. What types of medication does the doctor give in the prescription? (multiple choice)	Branded drug
	Generic drug

Section D – Citizens' Feedback (3 questions)	
Q1. How would you rate healthcare facilities available in Saudi Arabia	Excellent
	Good
	Fair
	Poor
Q2. Are you satisfied with the government's response to the Covid-19 crisis?	Fully satisfied
	Partially satisfied
	Not satisfied at all

Q3. Factors that influence your choice of healthcare facility					
Factor	Strongly Agree	Agree	Moderate	Disagree	Strongly Disagree
Qualified medical staff					
Quality of Service					
Price/Budget					
Accessibility/Connectivity to Destination					

12.3. REFERENCES

- Saudi Arabian Monetary Authority
- Ministry of Health – Kingdom of Saudi Arabia
- Ministry of Finance
- Saudi Food and Drug Authority
- Saudi Industrial Development Fund
- US Food and Drug Administration
- World Health Organization
- National Cancer Institute



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