TRANSFORMING UAE HEALTHCARE THROUGH TECH DISRUPTION

REPORT
October 2024

PRAXIS GLOBAL ALLIANCE

UAE

Foreword

Aryaman Tandon

Managing Partner & Head of Healthcare

The UAE healthcare sector is poised for remarkable growth, fueled by market expansion and rapid technological advancements. The UAE healthcare ecosystem in FY24 is ~US$ 34B and is expected to grow at a CAGR of ~8% over the next five years.

As the region grapples with healthcare workforce shortages, rising treatment costs, and the need for more specialized care, the integration of the technologies is not just augmenting the current system but addressing critical challenges at scale.

This report analyzes the current state of the UAE healthcare ecosystem and highlights the transformative potential of emerging technological disruptions.

These include a) Artificial intelligence, b) Genomics, c) Telemedicine, d) Digitally enabled hospitals, e) Digitally enabled labs, f) Insurtech, g) Digital therapeutics, h) Robotic surgery, and i) 3D printing and 3D bioprinting

With the UAE well-positioned to leverage technological advancements, the healthcare sector is set to achieve significant strides in improving patient outcomes, enhancing operational efficiencies, and driving sustainable growth.

Our endeavor with this report is to understand the impact that these technologies and trends will have on the UAE healthcare ecosystem in short to medium term.

We, at Praxis, hope you will find the report informative and look forward to continuing the discussion.

We hope that this report serves as an indispensable guide for stakeholders seeking to understand the complexities of the UAE healthcare market and harness the transformative power of technological innovations.

01

Global health outlook

Healthcare is transforming globally

Industry trends

Global **connected healthcare** market expected to grow at **CAGR ~28%** by 2028

Focus on **preventive care** with wellness **prioritization** increasing **~50%+** for major countries

Efforts to advance **health equity** in major countries such as the US affecting **~200M+** black lives

Tech enablement of clinical workflows to minimize **admin cost of ~US$ 50 per transaction**

Increasing efforts towards **predictive & precise healthcare**, resulting in the growth of CAGR **~5-15%**

Global **personalized medicine** market expected to grow at **CAGR ~9%** by 2030

Focus to **enable faster care delivery**, resulting in growth of **CAGR ~5-30%** in related sub-sectors

Increasing use of **analytics and AI** resulting in market growth of **CAGR ~55%** by 2022

Re-alignment of profit growth to payer segment, expected to expand at **CAGR ~9.3%** by 2025

Growing demand of **value-based care** resulting from **~50%+ disruption in chronic diseases** in ~80 out of 155 countries

Demand shapers

~2%
Increase in **aging population**[1]

6.2 years
Increase in **life expectancy**[2]

~US$ 1.7T
Rise in **healthcare spending**[3]

~7%
Expected CAGR for the **global health insurance market**[4]

~6%
Increase in death due to NCD[5]

~5% and **~9%**
Increase in the no. of ill people in **US** and **UK respectively**

4 years
Higher no. of ill years for women as compared to men

21%
Increase in **internet adoption driving consumer awareness**

+

Catalysts

Developments in medical technology

Advancement in the understanding of diseases

Rising investments in the healthcare sector

Advancement in telecom n/w and computing technology

Note(s): 1 - From 2022 to 2030, 2 - From 2021 to 2050, 3 - From 2015 to 2022, 4 - Projected to reach US$ 2.6T from 2022 to 2028, 5 - Change in death by NCD from ~74% in 2022 to ~80% in 2030, 6 - From 2017 to 2022, 7 - Focus to advance health equity as the no. of ill years for women is more than for men (19 vs. 15 years), 8 - From 41% in 2015 to 62% in 2022
Source(s): Praxis analysis

Trends witnessed in healthcare globally [1/2]

1	2	3	4	5
Healthcare becoming more connected	**Focus on preventive care to manage increasing treatment cost**	**Efforts to advance health equity**	**Tech enablement of workforce to transform care delivery**	**Efforts to make healthcare more predictive and precise**

1
- Electric health records **(EHRs)**
- Digital **health exchanges**
- **Connected health eco-systems**

2
- **Mental health and wellness**
- **Health management**
- **Chronic health management**
- Specific group wellness **such as women hygiene**

3
- Equitable access to different **racial groups**
- Equitable access to all **genders**
- **Tech-enabled care** to patient groups in different geographies

4
- Tools for **clinical decision assistance**
- **Digitalized clinical workflows**

5
- **Genetic testing** for genetic abnormalities
- Testing for **genetic pre-disposition**
- Molecular diagnostics

Trends witnessed in healthcare globally [2/2]

6	7	8	9	10
Emergence of personalized treatments	**Enabling faster care delivery – anytime, anywhere**	**Use of large clinical data sets through advanced analytics and AI**	**Re-alignment of profit pool across the industry**	**Growing importance of value-based care**

6 — Emergence of personalized treatments

- **Microbiomes**
- **Personalized nutrition**
- **Custom interventions**

7 — Enabling faster care delivery – anytime, anywhere

- **Wearables** for health monitoring
- **Point of Care** diagnostic devices
- **Virtual consultations**

8 — Use of large clinical data sets through advanced analytics and AI

- Long-term **patient data for risk modeling**
- Generating **real-world evidence**
- Evolving **distinct care pathways**
- Sharper **customer engagement**

9 — Re-alignment of profit pool across the industry

- **Re-alignment of profit pool** towards:
  - Healthcare technology
  - Non-acute site healthcare
  - Specialty pharma drugs

10 — Growing importance of value-based care

- **Cost-effective care**
- Better outcomes owing to **reduced complications**

Celara Diagnostics • Roche • deCODE genetics

dr. on demand • EKF Diagnostics for life • CALA HEALTH • Cipla

merative • OPTUM • Oncora MEDICAL

MCKESSON • CVS Health • AmerisourceBergen

athenahealth • nextgen

Key factors shaping the demand of the healthcare industry globally [1/2]

Aging population	Life expectancy	Rising healthcare spends	Increasing health insurance

Percentage of global population above the age of 60
(%)

CAGR 2%

- 2015: 12%
- 2022: 14%
- 2030P: 16%

Average life expectancy globally
(# of years, 2012-50P)

- 2012: 71.0
- 2018: 72.8
- 2020: 72.0
- 2021: 71.0
- 2050P: 77.2

Global spend on healthcare
(US$ T, %)

CAGR 15-20

- 2015: 7.3 (Government 4.2, Others 3.1)
- 2020: 9.0 (Government 5.7, Others 3.3)
- 4% / 1% / 6%

■ Government ■ Others

Health insurance market
(US$ T, 2023-28)

CAGR 7%

- 2022: 1.7
- 2028: 2.6

Impact
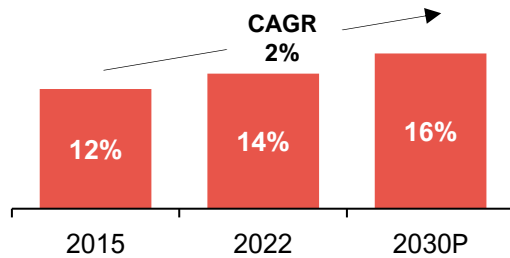
- **Increasing chronic health conditions** require costly and extended medical care
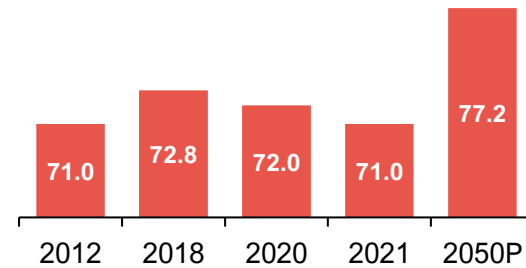
- Higher **healthcare support** requirements mainly to an aging population with increasing life expectancy
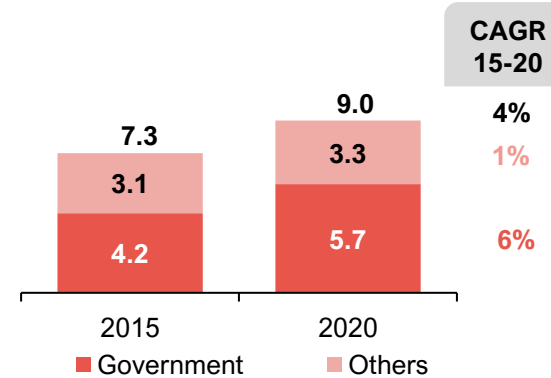
- **Uninsured and underinsured** individuals and families face significant financial burdens
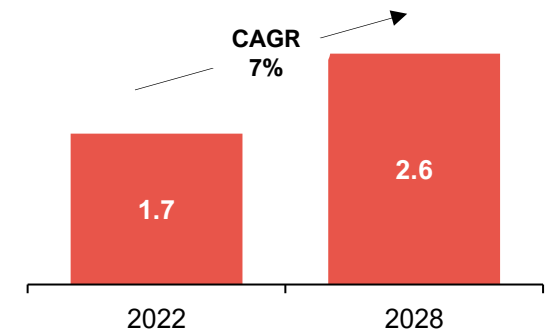
- Improved healthcare access leads to **early detection of chronic illnesses, better health outcomes**, and long-term cost savings

Business model changes

- **Rise in out-of-hospital care**
- **Homecare is growing** – step-down care is less expensive and delivered in a more comfortable environment

- Increased **focus on preventive care drives shift to wellness and disease prevention**
- **Emphasis on preventive care**
- Greater focus on **patient engagement** for active care participation in a patient's life

- **Focus on preventive care to help** detect and treat health conditions before it becomes serious and expensive to treat

- **Growing shift towards insurance-based healthcare models**, where patients access healthcare services through their insurance provider
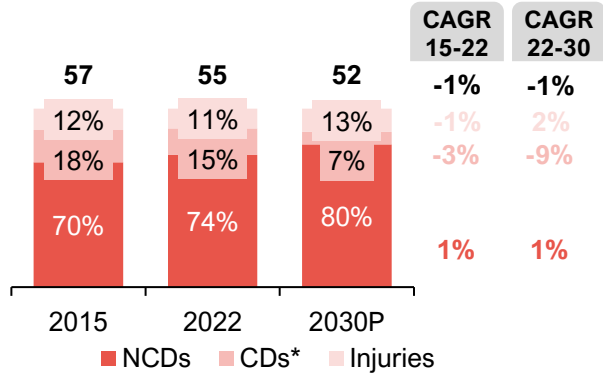
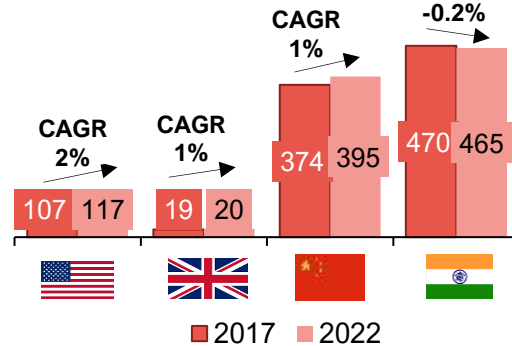# Key factors shaping the demand of the healthcare industry globally [2/2]

Epidemiological shift from CD to NCD	Number of ill people	Focus on health equity	Rising consumer awareness

Global deaths by NCDs and CDs
(% of deaths, 2015–2030P)

			CAGR 15-22	CAGR 22-30

	2015	2022	2030P
Total	**57**	**55**	**52**
Injuries	12%	11%	13%
CDs*	18%	15%	7%
NCDs	70%	74%	80%

CAGR 15-22: -1%, -1%, -3%, 1%
CAGR 22-30: -1%, 2%, -9%, 1%

- NCDs - CDs* - Injuries

Number of people suffering from illness
(M, 2017-2022)

CAGR 2% (US): 107 → 117
CAGR 1% (UK): 19 → 20
CAGR 1% (China): 374 → 395
CAGR -0.2% (India): 470 → 465

- 2017 - 2022

Average life span of humans in healthy and ill health
(# of years)

	Women	Men
Years of ill health	19	15
Healthy life years	64	64

- Healthy life years - Years of ill health
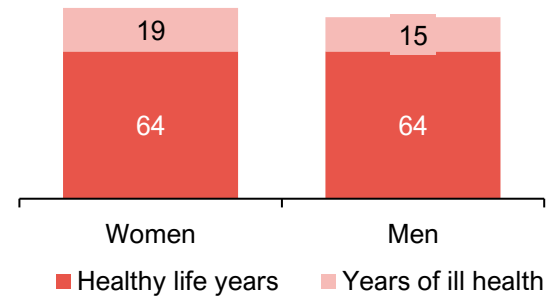
Percentage of people using the internet
(%)

CAGR 6%

2015	2018	2022
41%	49%	62%
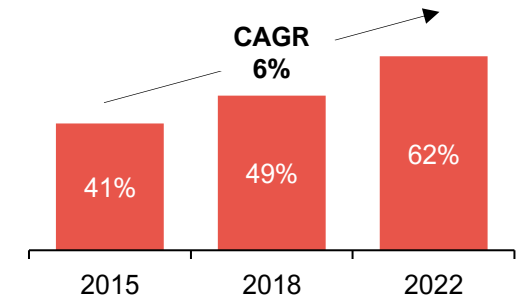
Impact

- Affects populations having **lower socioeconomic status or living in certain geographic regions**, worsening existing health inequalities

- Increased healthcare demands can **strain hospitals** with shortages of beds, equipment, and staff

- 70% of chronic pain patients are **women**
- Health resources **are unfairly allocated** for the diseases that mostly affect men

- Access to the internet **made patients well-informed about symptoms and treatment options**

Business model changes

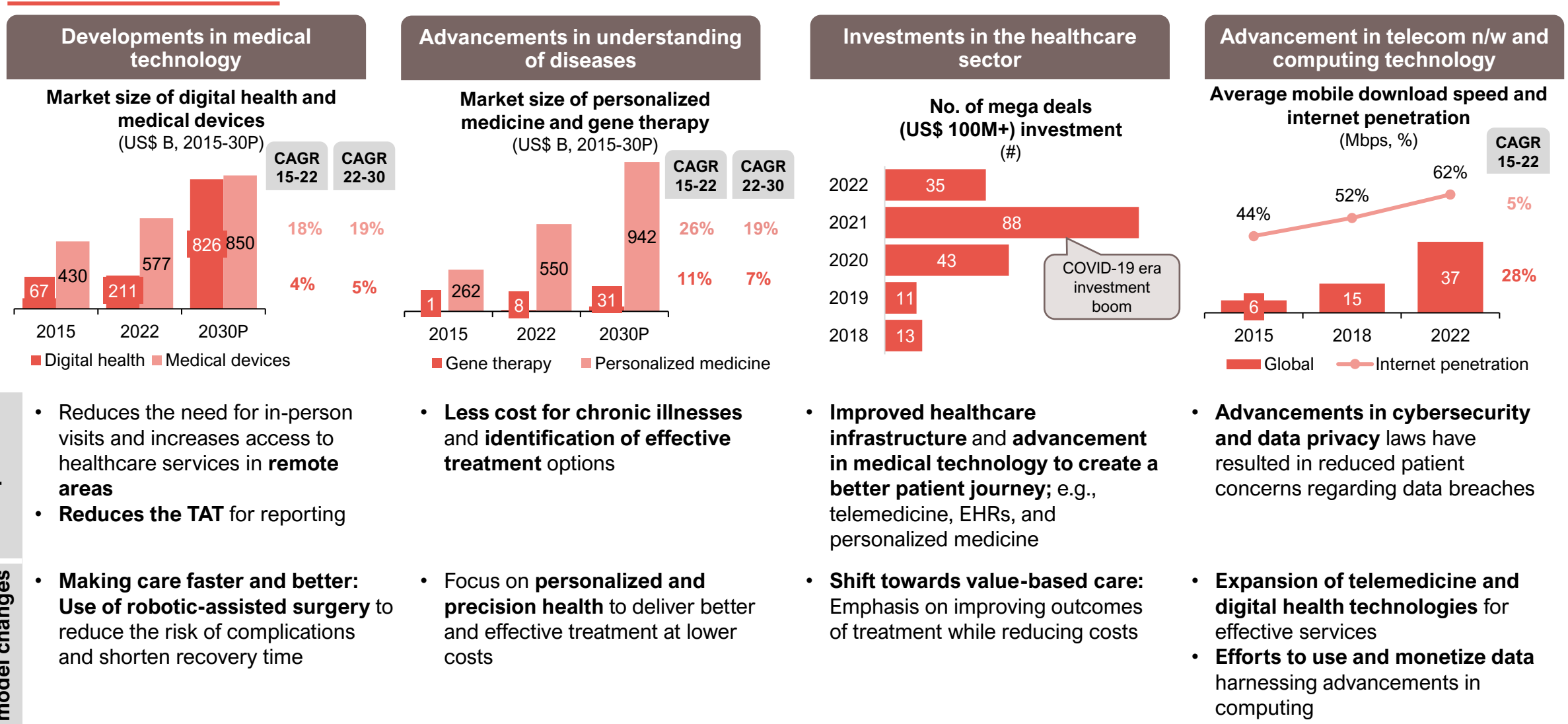- **Disease management** business models gaining prominence

- Building capacity to **cater to the increasing demand of sick people**
- **Pricing constraints** for pharma companies to ensure the affordability of medicines

- Emphasis on **diversity inclusion** by recruiting underrepresented groups such as women and people of color

- **Patients prioritize** healthcare providers who **offer transparent pricing, competitive rates and value-based care**

Note(s): CD: Communicable diseases, NCD: Non-communicable diseases; *This includes communicable, maternal, neonatal, and nutritional diseases
Source(s): WHO, World Bank, OECD, Macrotrends, Industry reports, Praxis analysis

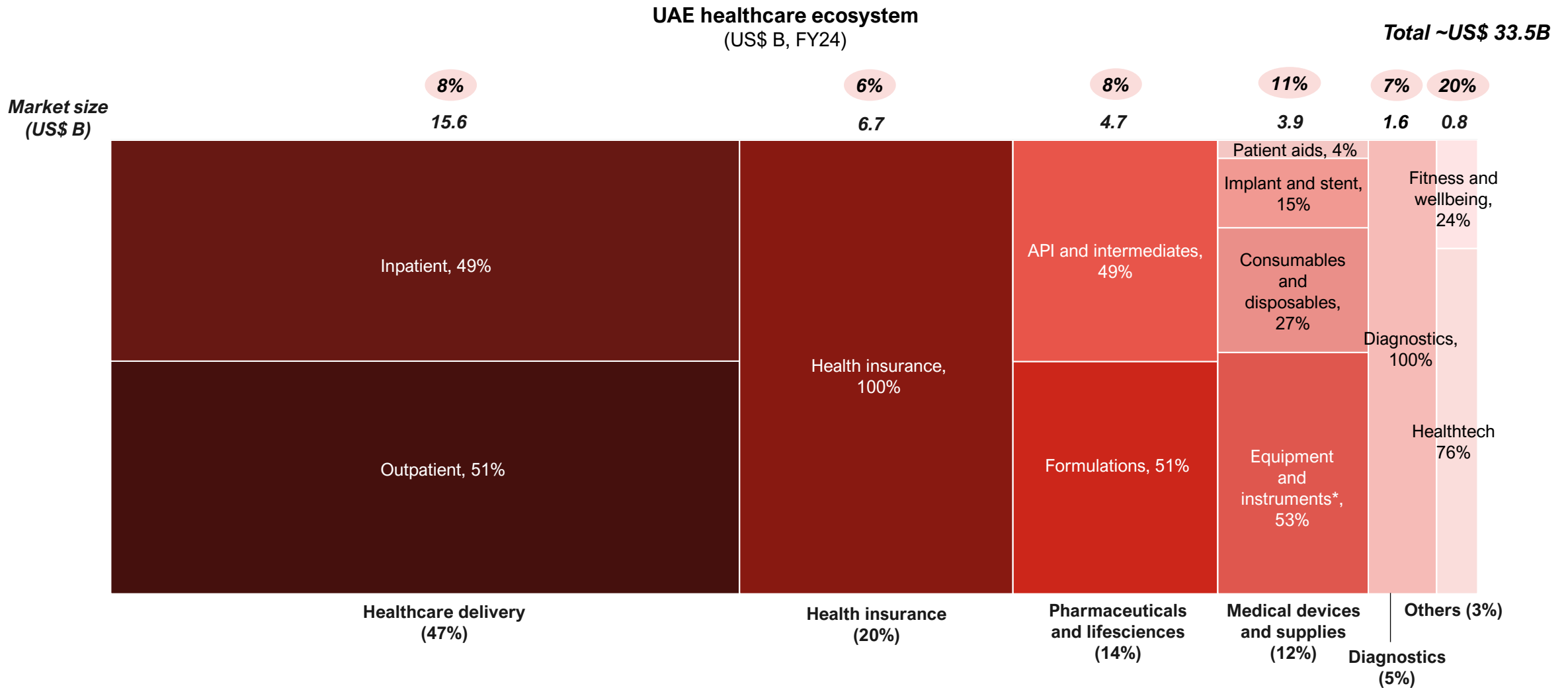# Catalysts influencing the demand in the healthcare industry globally

Developments in medical technology	Advancements in understanding of diseases	Investments in the healthcare sector	Advancement in telecom n/w and computing technology

Market size of digital health and medical devices
(US$ B, 2015-30P)

	CAGR 15-22	CAGR 22-30
Medical devices	18%	19%
Digital health	4%	5%

- 2015: Digital health 67, Medical devices 430
- 2022: Digital health 211, Medical devices 577
- 2030P: Digital health 826, Medical devices 850

■ Digital health ■ Medical devices

Market size of personalized medicine and gene therapy
(US$ B, 2015-30P)

	CAGR 15-22	CAGR 22-30
Personalized medicine	26%	19%
Gene therapy	11%	7%

- 2015: Gene therapy 1, Personalized medicine 262
- 2022: Gene therapy 8, Personalized medicine 550
- 2030P: Gene therapy 31, Personalized medicine 942

■ Gene therapy ■ Personalized medicine

No. of mega deals (US$ 100M+) investment
(#)

- 2022: 35
- 2021: 88
- 2020: 43
- 2019: 11
- 2018: 13

COVID-19 era investment boom

Average mobile download speed and internet penetration
(Mbps, %)

	CAGR 15-22
Internet penetration	5%
Global	28%

- 2015: Global 6, Internet penetration 44%
- 2018: Global 15, Internet penetration 52%
- 2022: Global 37, Internet penetration 62%

■ Global —●— Internet penetration

Impact

- Reduces the need for in-person visits and increases access to healthcare services in **remote areas**
- **Reduces the TAT** for reporting

- **Less cost for chronic illnesses** and **identification of effective treatment** options

- **Improved healthcare infrastructure** and **advancement in medical technology to create a better patient journey;** e.g., telemedicine, EHRs, and personalized medicine

- **Advancements in cybersecurity and data privacy** laws have resulted in reduced patient concerns regarding data breaches

Business model changes

- **Making care faster and better: Use of robotic-assisted surgery** to reduce the risk of complications and shorten recovery time

- Focus on **personalized and precision health** to deliver better and effective treatment at lower costs

- **Shift towards value-based care:** Emphasis on improving outcomes of treatment while reducing costs

- **Expansion of telemedicine and digital health technologies** for effective services
- **Efforts to use and monetize data** harnessing advancements in computing

02

Healthcare snapshot in UAE

# UAE healthcare ecosystem is US$ 34B in FY24; healthcare delivery forms ~50% of the market

UAE healthcare ecosystem
(US$ B, FY24)

Total ~US$ 33.5B

Market size (US$ B)

	8%	6%	8%	11%	7%	20%
	15.6	6.7	4.7	3.9	1.6	0.8

- Inpatient, 49%
- Outpatient, 51%
- Health insurance, 100%
- API and intermediates, 49%
- Formulations, 51%
- Patient aids, 4%
- Implant and stent, 15%
- Consumables and disposables, 27%
- Equipment and instruments*, 53%
- Diagnostics, 100%
- Fitness and wellbeing, 24%
- Healthtech 76%

Healthcare delivery (47%)   **Health insurance (20%)**   **Pharmaceuticals and lifesciences (14%)**   **Medical devices and supplies (12%)**   **Diagnostics (5%)**   **Others (3%)**

CAGR (FY24-29P)

Note(s): AED 1 = US$ 0.27, *includes IVD reagents, Healthtech includes tele-healthcare, wearables and connected medical devices, remote monitoring apps, digital health systems and healthcare analytics
Source(s): Government reports, Industry reports, Praxis analysis

UAE ecosystem is expected to reach US$ 50B by FY29; improved life expectancy, prevalence of NCDs, and medical tourism are key drivers

Healthcare ecosystem in UAE is expected to reach US$ 50B by FY29, growing at a CAGR of 8% (FY24-29)

Healthcare ecosystem in UAE
(US$ B, 2024-29P)

CAGR
(2024-29P)

Category	CAGR
33.5 (2024)	**8%**
50.1 (2029P)	
Others: 2.0	20%
Diagnostics: 2.2	6%
Medical devices and supplies: 6.7	11%
Pharmaceuticals: 6.8	8%
Health insurance: 9.2	6%
Healthcare delivery: 23.3	8%

2024 values: 0.8, 1.6, 3.9, 4.7, 6.7, 15.7

Legend:
- ▪ Others
- ▪ Diagnostics
- ▪ Medical devices and supplies
- ▪ Pharmaceuticals
- ▪ Health insurance
- ▪ Healthcare delivery

Improved life expectancy, high prevalence of NCDs, and medical tourism are key drivers for healthcare ecosystem
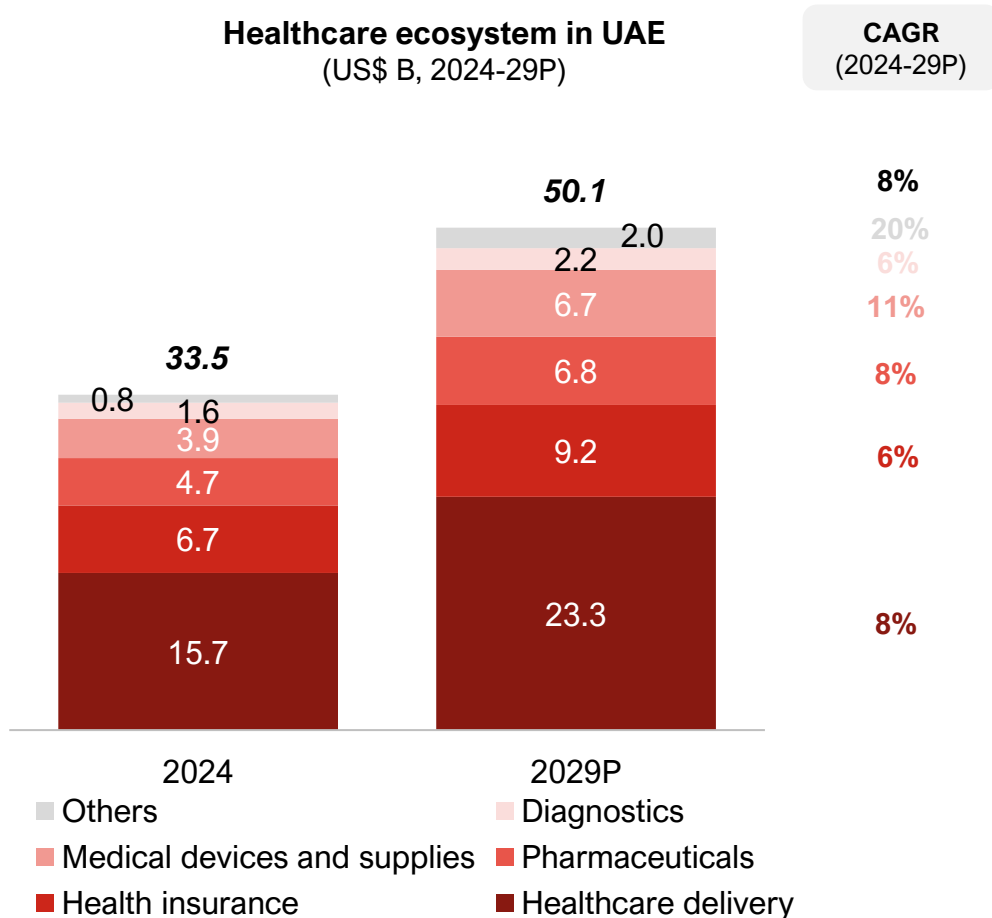
1 Improved life expectancy
- Life expectancy rose to **78 years** in 2021, up by **5 years** compared to **2010**
- Elderly population (>60 years) is expected to be **~20%** by 2050 up from **~3%** in 2020

2 High prevalence of NCDs
- NCDs account for more **than 55% of deaths** in UAE with **cardiovascular diseases** contributing to 34% of all deaths and 70% of NCD related deaths
- Higher incidence of lifestyle diseases is expected to increase healthcare costs and demand for specialized tertiary medical facilities

3 Inbound medical tourism
- **Dubai** and **Abu Dhabi** attract the most medical tourists in GCC, and **rank among the top ten most popular medical tourism destinations** in the world

4 Growth of private sector
- Private healthcare spending is **projected to grow at a 9.5% CAGR**, outpacing the government's **4.4% growth** over the next few years, creating opportunities for **private** and **international companies** to expand through **partnerships** and **investments**

5 Robust project pipeline
- Large funding in favor of **healthcare projects** and the **rise of PPP** allows for a more diversified healthcare system
- Healthcare expenditure per capita in UAE has grown from **~US$ 1.7K** in 2017 to **US$ 2.4K** in 2021, reflecting a **CAGR of 9%**

Note(s): AED 1 = US$ 0.27, NCD: Non-communicable disease
Source(s): Government reports, Industry reports, Secondary research, Praxis analysis

Abu Dhabi, followed by Dubai, has the highest concentration of healthcare facilities and beds

3 emirates account for ~90% of UAEs population

47% beds are privately owned in UAE; Abu Dhabi accounts for 42% of the total beds

Clinics and health centers account for 97% of the total 5.5K healthcare facilities in UAE

Population split by Emirates
(%, FY21)
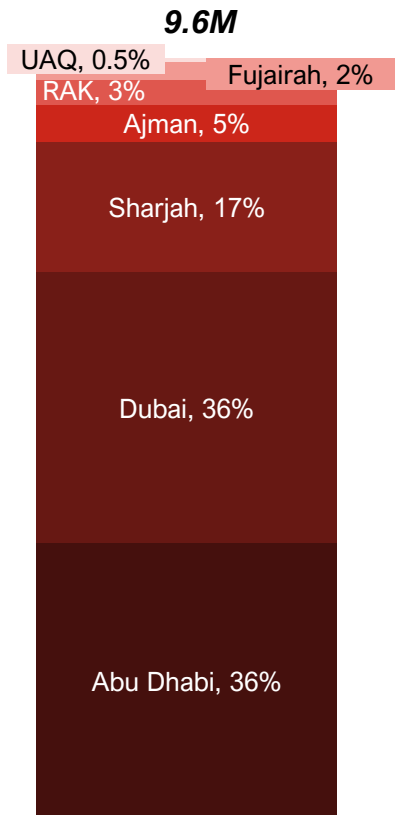
9.6M

- UAQ, 0.5%
- Fujairah, 2%
- RAK, 3%
- Ajman, 5%
- Sharjah, 17%
- Dubai, 36%
- Abu Dhabi, 36%

Beds split across hospital type and Emirates
(%, FY21)

18.4K

- Public, 53%
- Private, 47%

18.4K

- Others, 5%
- RAK, 6%
- Sharjah, 6%
- Dubai, 13%
- Abu Dhabi, 24%
- Others, 1%
- Ajman, 3%
- Sharjah, 3%
- Dubai, 22%
- Abu Dhabi, 18%

Hospitals, clinics and health centers split across Emirates
(%, FY21)

5.3K

- Fujairah, 3%
- UAQ, 1%
- RAK, 4%
- Ajman, 4%
- Sharjah, 15%
- Dubai, 42%
- Abu Dhabi, 31%

5.5K

- Hospitals, 3%
- Clinics and health centers, 97%

0.2K

- UAQ, 1%
- Fujairah, 3%
- RAK, 5%
- Ajman, 5%
- Sharjah, 15%
- Dubai, 32%
- Abu Dhabi, 39%
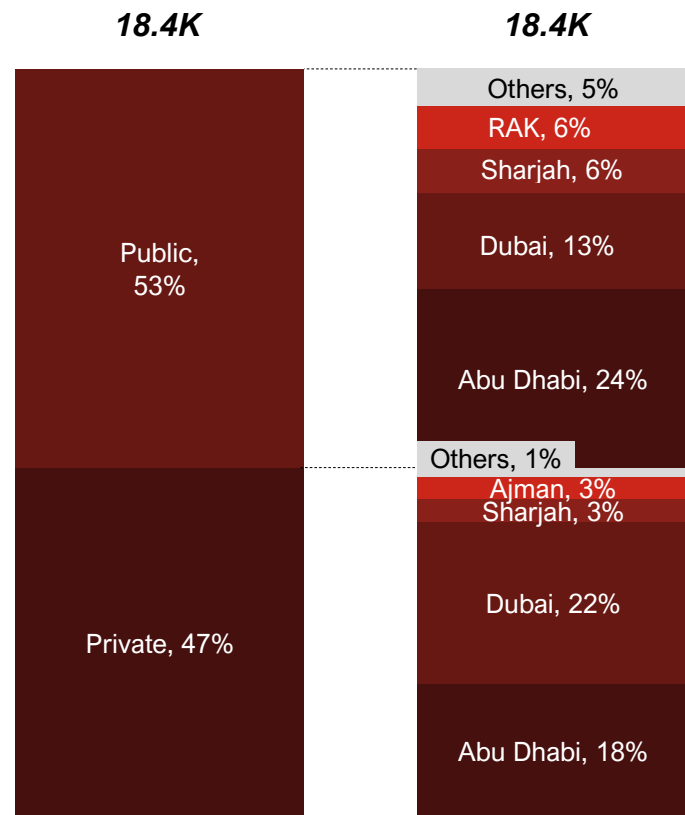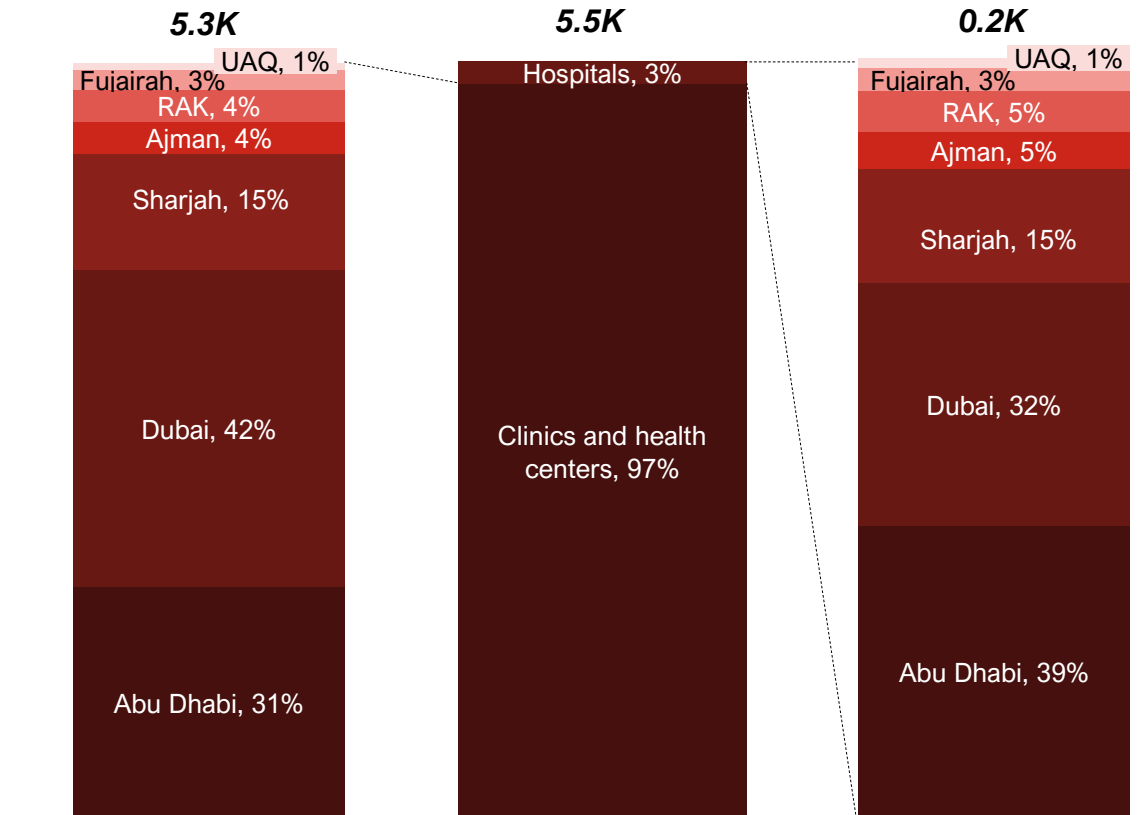
Population	Beds	Beds	Clinics and Health Centers	Healthcare faclities	Hospitals

9 strategic imperatives for technological disruption in the UAE healthcare sector

1

Improved asset utilization

- **Low hospital per capita ratio** signifying potential to increase the supply of healthcare facilities

- Digitalization **extends reach making healthcare accessible** and affordable

2

Optimizing healthcare workforce

- **Low doctor and nurse per capita** showing significant manpower shortage

- Technology **augments capabilities** and **increases service capacity**

3

Enhanced claims and payment processes

- **Expensive insurance plans and inefficient processing** result in inflated costs for patients

- Technology **streamlines claims, reduces frauds,** and optimizes premium pricing

4

Boosting cost efficiency

- Rapidly **increasing healthcare expenses** reduce accessibility

- Technology **optimizes resources**, **automates tasks,** and enables remote care

5

Prevention of drainage due to medical tourism

- **Outflow of patients** due to **limited specialized care** and **high costs**

- Technology matches patients with **curated options**

6

Proactive management of chronic diseases

- **Increasing aging population and lifestyle-related conditions** strain healthcare systems

- Digital tools **enable proactive and efficient care**

7

Strengthening local ecosystem of supplier

- **Heavy import dependence** on medical devices

- **Smart digital manufacturing technology** reduces import reliance

8

Utilization and management of health data

- Increasing need for **data-driven decision-making** in healthcare for **better outcomes**

- Technology **enhances interoperability** and helps **optimize treatment**

9

Products and services to cater to personalized care

- Patients expect tailored healthcare experiences

- Technology **enables custom plans, solutions, and rehabilitation programs**

Source(s): Industry reports, Secondary research, Praxis analysis

UAE's healthcare infrastructure is underpenetrated, with shortage of skilled medical professionals

UAE stands below the global average (2.0 vs. 3.3) in availability of hospital beds

UAE falls short in nurses per capita compared to key economies

UAE falls short in doctors per capita compared to key economies
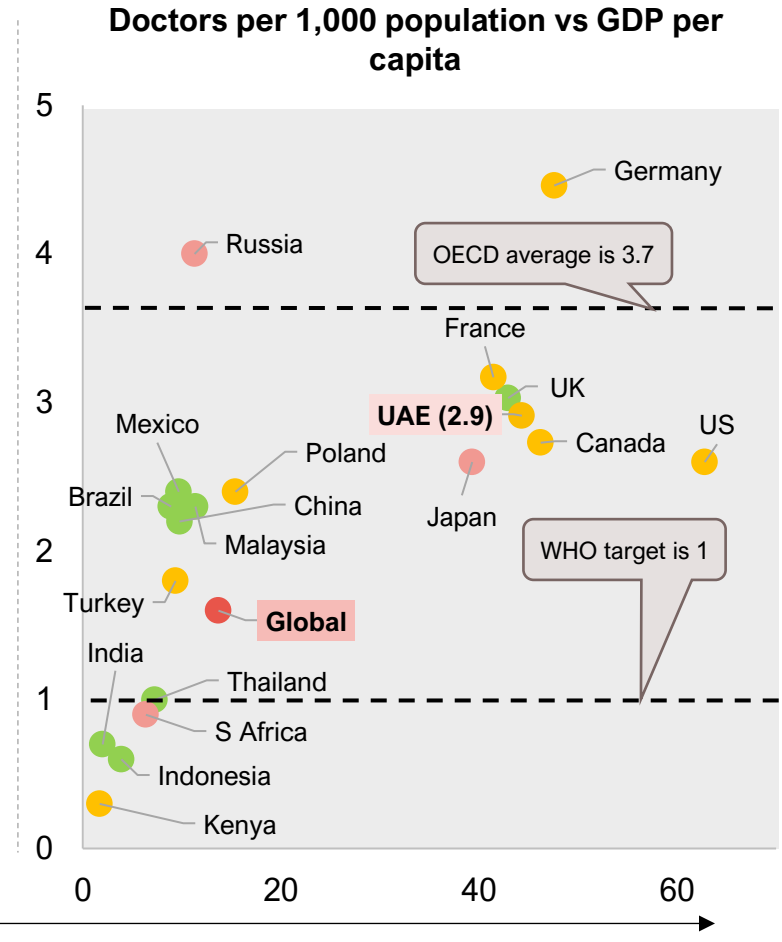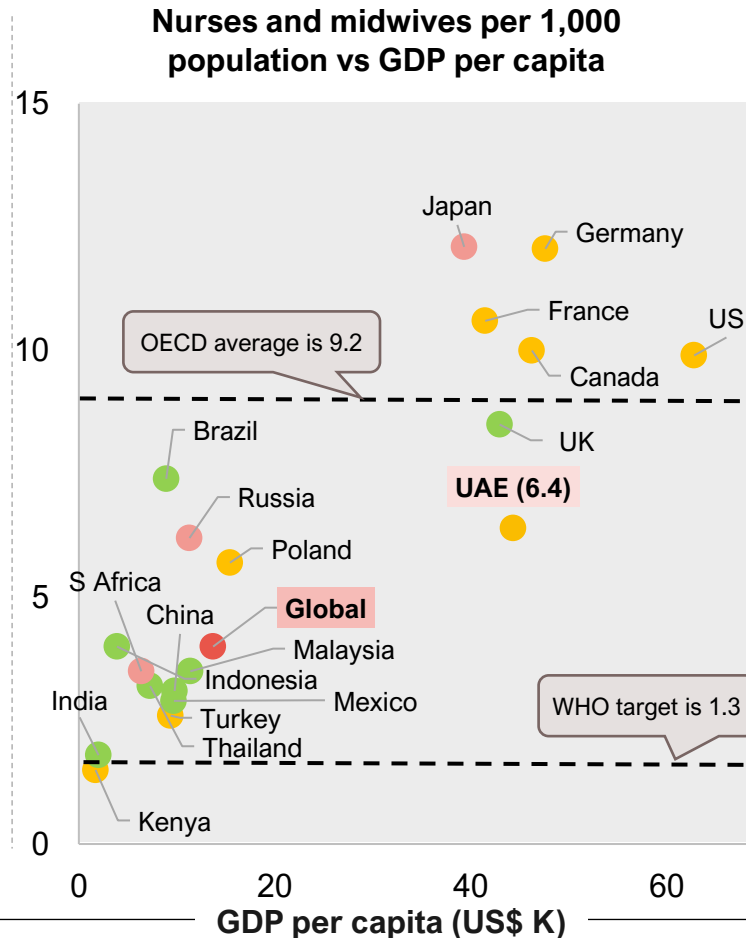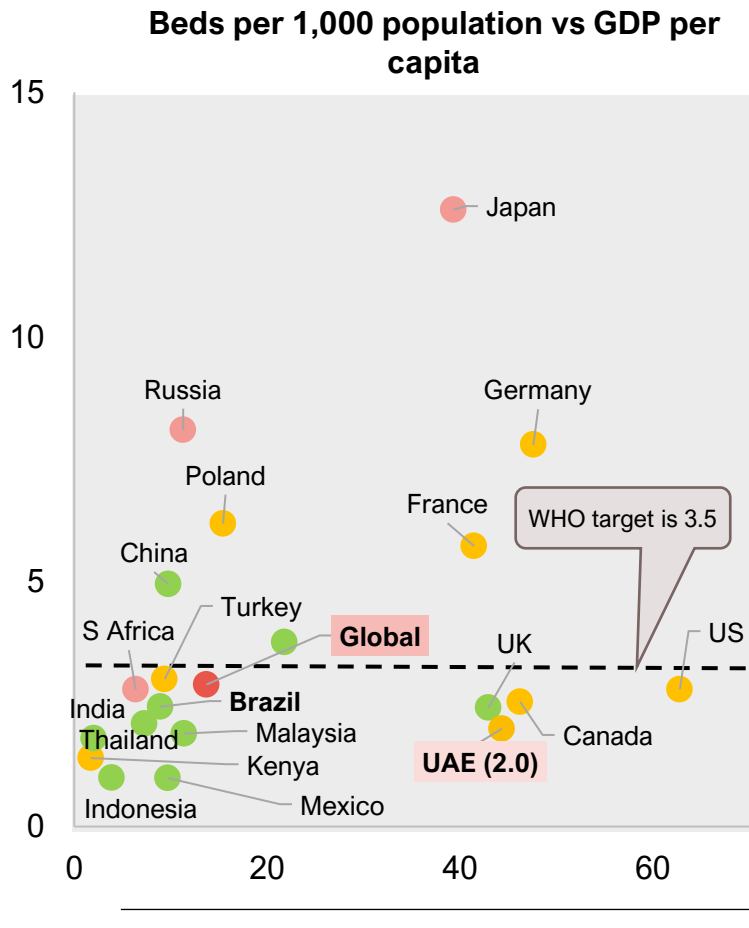
Beds per 1,000 population vs GDP per capita

- Japan
- Russia
- Germany
- Poland
- France
- China
- Turkey
- S Africa
- **Global**
- UK
- US
- India
- **Brazil**
- Thailand
- Malaysia
- Kenya
- Canada
- Indonesia
- Mexico
- **UAE (2.0)**
- WHO target is 3.5

Nurses and midwives per 1,000 population vs GDP per capita

- Japan
- Germany
- France
- US
- Canada
- Brazil
- UK
- **UAE (6.4)**
- OECD average is 9.2
- Russia
- Poland
- S Africa
- China
- **Global**
- Malaysia
- Indonesia
- Mexico
- India
- Turkey
- Thailand
- Kenya
- WHO target is 1.3

Doctors per 1,000 population vs GDP per capita

- Germany
- Russia
- OECD average is 3.7
- France
- UK
- Mexico
- **UAE (2.9)**
- Canada
- US
- Brazil
- Poland
- China
- Japan
- Malaysia
- Turkey
- **Global**
- India
- Thailand
- WHO target is 1
- S Africa
- Indonesia
- Kenya

GDP per capita (US$ K)

GDP growth rate

Low	<3.0%	3.0-5.5%	>5.5%	High	● Global
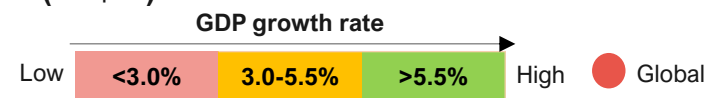
Low government healthcare spending and high insurance premiums are driving up treatment costs

UAE has high health insurance premium compared to developed economies

Average annual insurance premium by country
(US$ K, FY21)
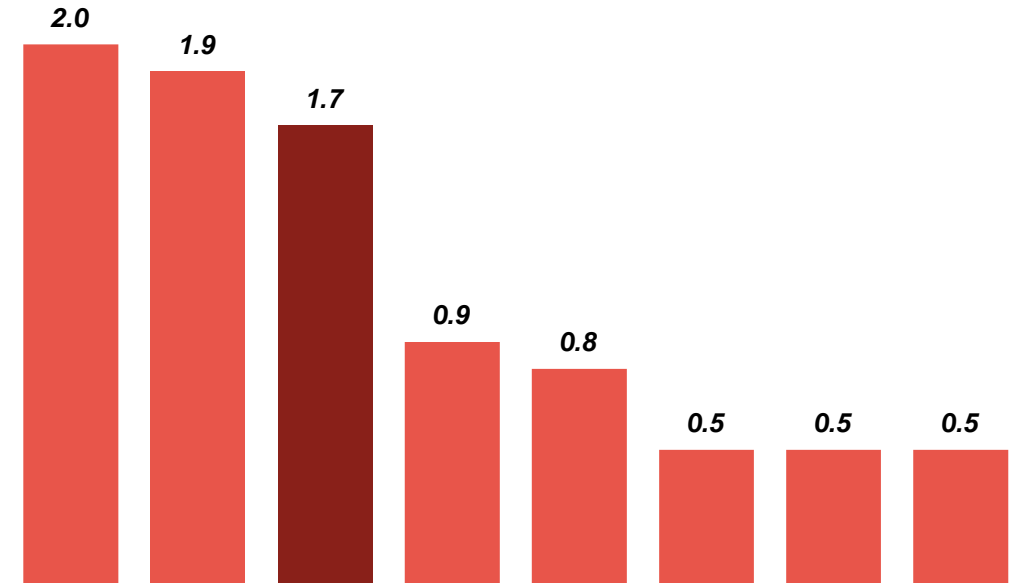
Country	Germany	US	UAE	Australia	UK	Brazil	France	Canada
Premium (US$ K)	2.0	1.9	1.7	0.9	0.8	0.5	0.5	0.5
Avg annual insurance premium/ GDP per capita (%)	3.9%	2.7%	3.8%	1.5%	1.7%	6.4%	1.1%	1.0%

Government healthcare spending in UAE is 3.4% of GDP, lower than global average (6.5%)
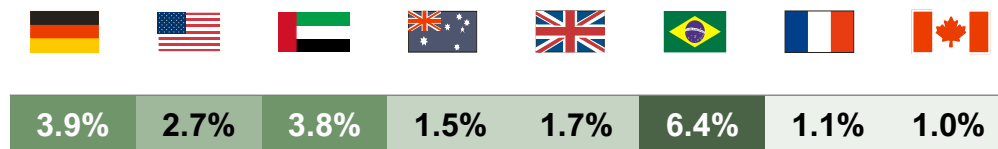
Government healthcare spending as % of GDP
(%, FY21)

Country	UK	Germany	US	France	Canada	Australia	Saudi Arabia	Brazil	UAE
% of GDP	10.4%	10.2%	9.6%	9.3%	9.0%	8.0%	4.6%	4.5%	3.4%

Global average is 6.5%
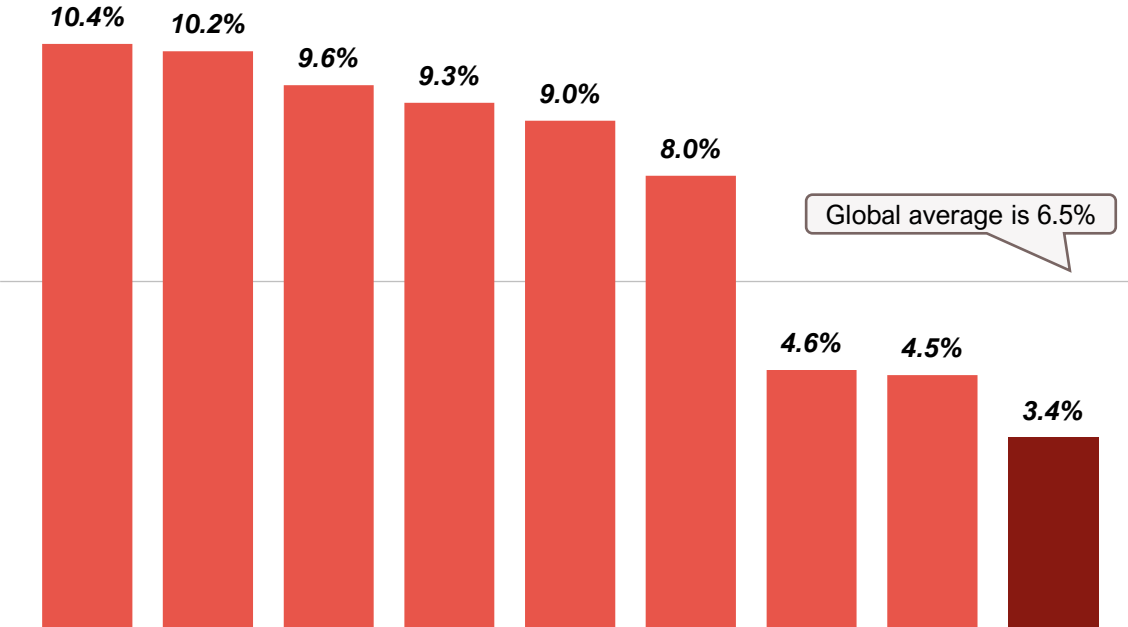
Note(s): Average insurance premium is premium for health insurance for individual resident of each country (25 years of age)
Source(s): Industry reports, World Bank data, OECD Statistics, IMF, WHO, News articles, Secondary research, Praxis analysis

High treatment costs are pushing patients in UAE to seek care abroad

Average cost of various medical procedures per person across countries
(US$ K, FY24)

UAE has been ranked as **the 2nd most expensive country** for access to mental health practitioners

Heart bypass: UAE 26.0, Poland 17.9, Thailand 17.8, Malaysia 12.1, KSA 10.0, India 5.2

Heart valve replacement: UAE 20.9, Poland 20.4, Thailand 16.8, Malaysia 11.0, KSA 10.6, India 5.5

Knee replacement: UAE 16.0, Poland 7.7, Thailand 9.9, Malaysia 8.3, KSA 16.7, India 6.2

Angioplasty: UAE 11.7, Poland 5.1, Thailand 5.5, Malaysia 8.0, KSA 7.5, India 3.3

Hysterectomy: UAE 7.2, Poland 5.0, Thailand 4.8, Malaysia 4.7, KSA 4.0, India 2.5

Rhinoplasty: UAE 6.7, Poland 4.0, Thailand 2.2, Malaysia 3.7, KSA 6.7, India 4.0

12 one-hour therapy sessions: UAE 2.0, Poland 1.2, Thailand 0.9, Malaysia 0.1, KSA 0.8, India 0.2

Legend: UAE, Poland, Thailand, Malaysia, KSA, India

Top destination countries for medical tourism due to low costs

Source(s): News articles, Hospital and clinic websites, Secondary research, Praxis analysis

NCDs are leading cause of death in the UAE and their prevalence is increasing

Deaths due to NCDs grew the fastest at 1.2% CAGR (2017-21)

Prevalence of diabetes and cardiovascular diseases in UAE grew at 9.9% and 8.1% CAGR respectively (2017-21)

Causes of deaths in UAE
(K, 2017-21)

CAGR (2017-21)

Year	NCD	Injuries	Communicable diseases	Total
2017	12.0	3.2	1.1	16.3
2018	12.6	3.0	1.1	16.7
2019	13.6	3.0	1.1	17.7
2020*	11.7	2.7	0.9	15.3
2021*	12.6	2.5	0.8	15.9
CAGR	1.2%	-5.6%	-9.2%	-0.7%

■ NCD ■ Injuries ■ Communicable diseases

Prevalence of NCDs in UAE
(K, 2017-21)

CAGR (2017-21)

	2017	2018	2019	2020	2021	CAGR
Chronic liver	3,494	3,603	3,692	3,747	3,829	2.3%
Musculoskeletal disorders	1,787	1,868	1,946	2,021	2,099	4.1%
Chronic respiratory	872	905	933	960	984	3.1%
Chronic kidney	841	865	890	915	941	2.8%
Diabetes	562	617	678	752	820	9.9%
Cardiovascular	534	576	621	670	730	8.1%
Neoplasms	76	80	86	82	85	3.0%

Neoplasms — Cardiovascular — Diabetes — Chronic kidney — Chronic respiratory — Musculoskeletal disorders — Chronic liver

Note(s): NCD: Non-communicable diseases, CVD: Cardiovascular diseases, *excluding death due to COVID-19
Source(s): OECD Statistics, Euromonitor, IMF, WHO, Secondary research, Praxis analysis

UAE's aging and diversified population is expected to further exacerbate healthcare challenges

Rising elderly population is set to drive demand for healthcare services in UAE

Population by age in UAE
(M, 2021-28P)

Age group	2021	2022	2023	2028P	CAGR (2021-23)	CAGR (2023-28P)
Total	9.4	9.6	9.7	10.0	0.4%	0.8%
65+	2%	2%	2%	2%	5.9%	5.4%
55-64	4%	5%	5%	6%	10.6%	6.5%
45-54	13%	14%	14%	19%	8.6%	6.0%
35-44	30%	31%	31%	27%	2.9%	-1.9%
25-34	29%	28%	27%	23%	-4.2%	-1.8%
15-24	9%	9%	8%	9%	-8.2%	1.5%
0-14	13%	13%	13%	14%	1.3%	1.6%

Average age (years)

2021	2022	2023	2028P
33	34	34	35

Legend: ■ 0-14 ■ 15-24 ■ 25-34 ■ 35-44 ■ 45-54 ■ 55-64 ■ 65+
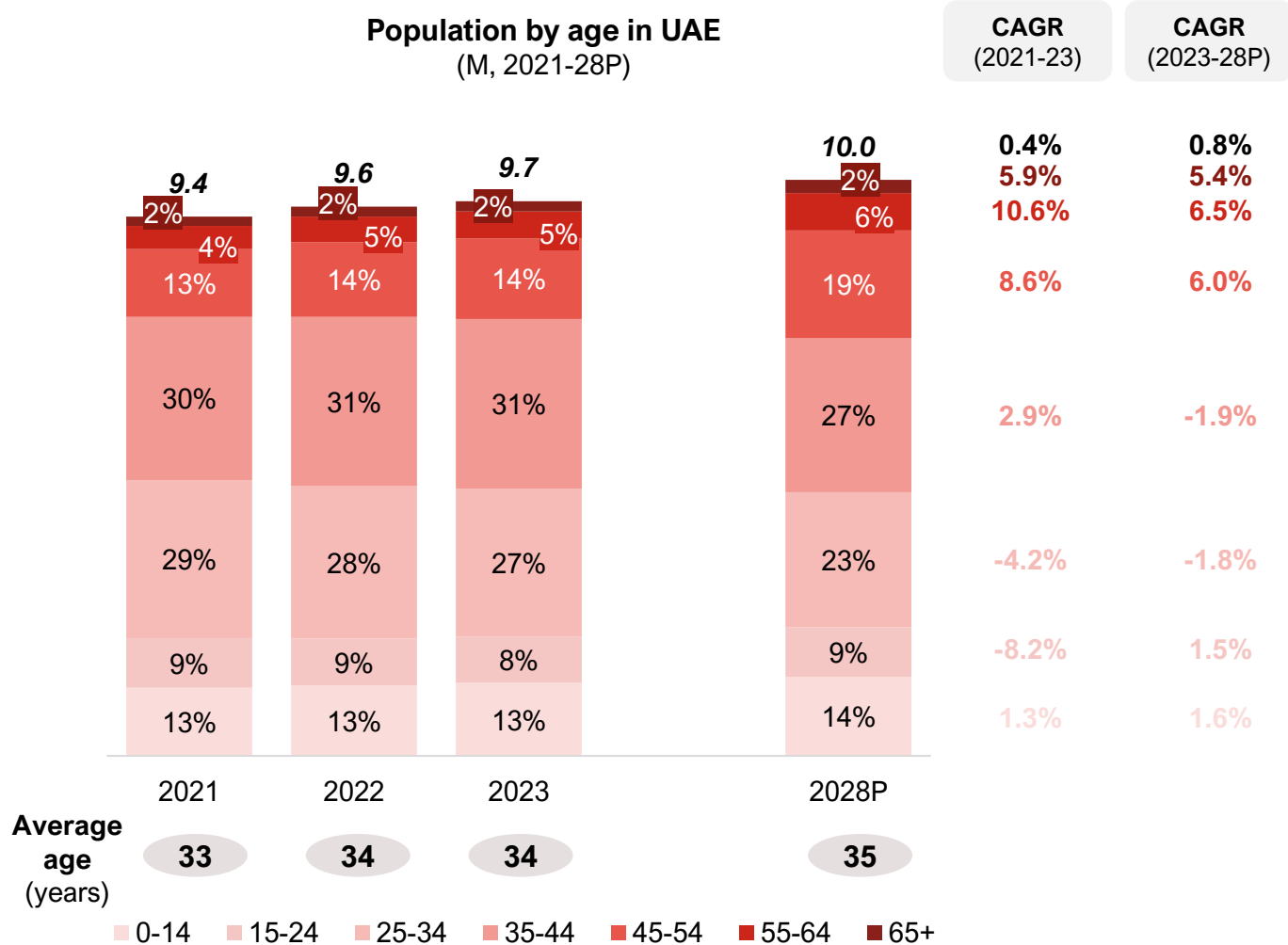
Expatriates form ~90% of UAE's population with people from diverse nationalities

Population by nationalities
(M, 2024)

10.2

Nationality	%
UAE	12%
Others	2%
China	2%
Sri Lanka	3%
Nepal	3%
Egypt	4%
Iran	5%
Philippines	7%
Bangladesh	7%
Pakistan	17%
India	38%

2024
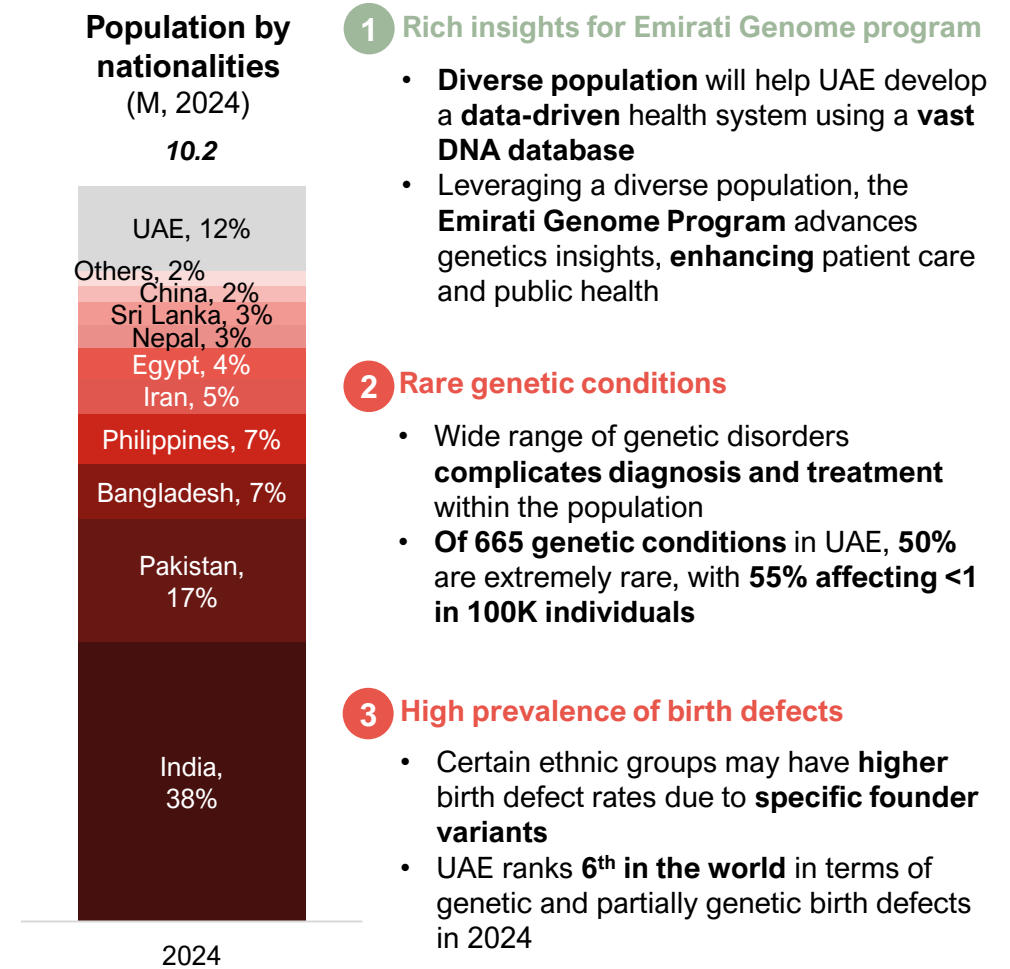
1 **Rich insights for Emirati Genome program**

- **Diverse population** will help UAE develop a **data-driven** health system using a **vast DNA database**
- Leveraging a diverse population, the **Emirati Genome Program** advances genetics insights, **enhancing** patient care and public health

2 **Rare genetic conditions**

- Wide range of genetic disorders **complicates diagnosis and treatment** within the population
- **Of 665 genetic conditions** in UAE, **50%** are extremely rare, with **55% affecting <1 in 100K individuals**

3 **High prevalence of birth defects**

- Certain ethnic groups may have **higher** birth defect rates due to **specific founder variants**
- UAE ranks **6th in the world** in terms of genetic and partially genetic birth defects in 2024

● Benefits ● Challenges

Source(s): OECD Statistics, Euromonitor, IMF, WHO, Secondary research, Praxis analysis

Heavy reliance on medical device imports, coupled with regional instability, adds another layer of complexity and risk

UAE has heavy import dependence for medical devices

Medical devices market in UAE
(US$ B, 2019-22)

CAGR
(2019-22)

2.6 | **2.9** | **3.2** | **3.5**

11.1%

46% | 58% | 46% | 41%

5.2%

2019 | 2020 | 2021 | 2022

■ Imports
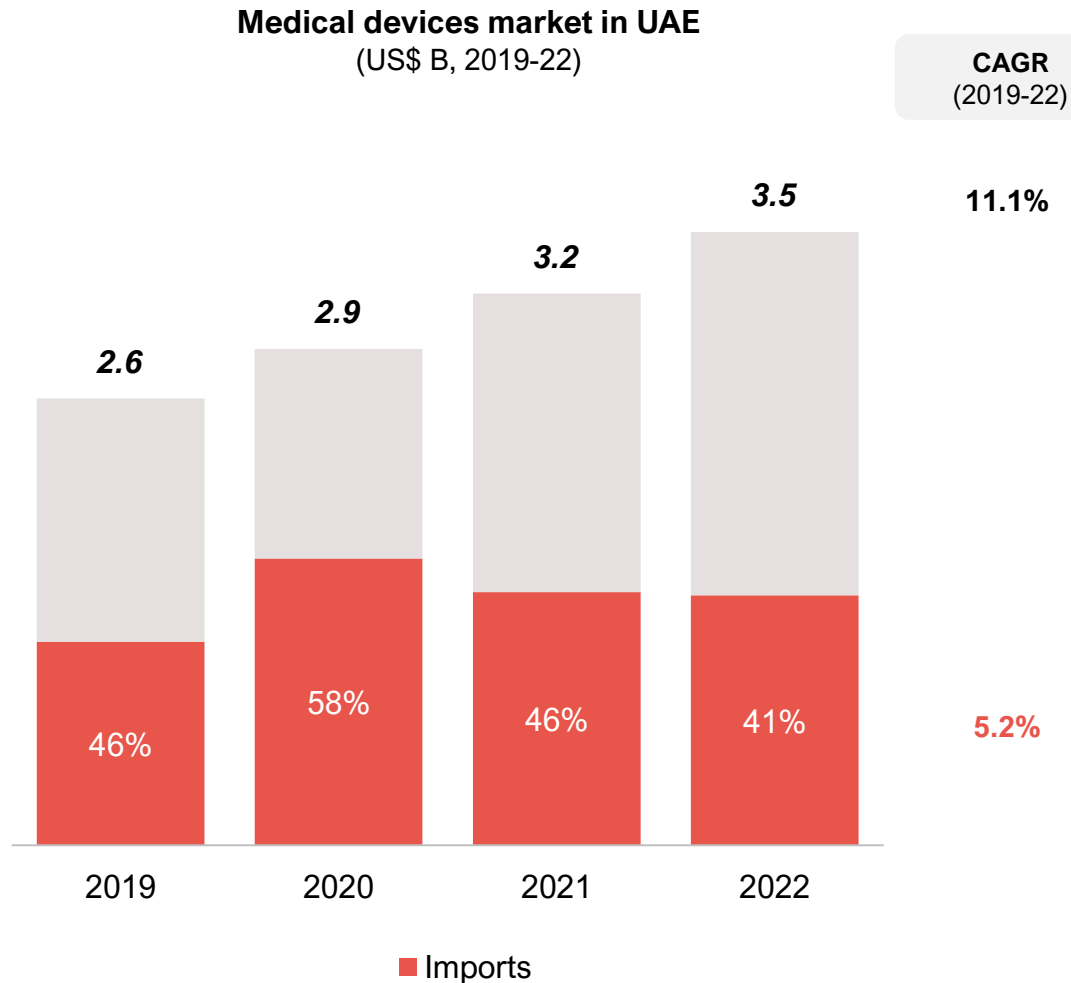
Regional conflicts and tensions can disrupt supply chains and limit healthcare workforce availability

1 **Regional conflicts and security concerns**
- Instability in places like Yemen and Syria can lead to an influx of refugees, increasing pressure on the UAE's healthcare system

2 **Heavy reliance on imports**
- Geopolitical tensions, such as trade disputes or sanctions against supplier countries, can lead to shortages of essential medical products in heavily import-reliant UAE

3 **Public threat from regional diseases**
- The UAE's geographical proximity to regions with endemic diseases raises concerns about public health threats, such as outbreaks of infectious diseases from neighboring countries

4 **Healthcare workforce challenge**
- A significant portion of the UAE's healthcare workforce comprises expatriates whose return to home country would pose workforce shortage

5 **Investment fluctuations**
- Geopolitical tensions can deter foreign investment and medical tourism

03

Technology trends impacting healthcare in UAE

Technological innovations are crucial for addressing key challenges in UAE healthcare ecosystem

	Description and impact	Challenges addressed
1 Artificial Intelligence	*AI systems that can analyze medical data, assist in diagnostics, and improve patient care*	Rising healthcare costs, healthcare workforce shortages, high burden of chronic diseases, undersupply of healthcare facilities
2 Genomics	*The study and manipulation of genetic material to understand diseases and develop personalized treatments*	Increased demand for personalized care, utilization and management of health data, drainage of medical patients
3 Telemedicine	*Remote delivery of healthcare services and information using telecommunications technology*	Healthcare workforce shortages, high burden of chronic diseases, rising healthcare costs, undersupply of healthcare facilities, increased demand for personalized care, drainage of medical patients
4 Digitally enabled hospitals	*Hospitals utilizing advanced digital technologies to enhance patient care, operations, and data management*	Rising healthcare costs, healthcare workforce shortages, undersupply of healthcare facilities, utilization and management of health data
5 Digitally enabled labs	*Laboratories equipped with digital tools and systems for more efficient and accurate testing and analysis*	Rising healthcare costs, healthcare workforce shortages, utilization and management of health data
6 Insurtech	*Technology-driven innovations in the insurance industry focused on improving healthcare coverage & claims processing*	Inefficient claims and payment processes, rising healthcare costs, utilization and management of health data
7 Digital therapeutics	*Software-based interventions used to prevent, manage, or treat medical disorders or diseases*	Rising healthcare costs, high burden of chronic diseases, increased demand for personalized care
8 Robotic surgery	*Use of robotic systems to assist surgeons in performing complex procedures with greater precision*	Healthcare workforce shortages, rising healthcare costs, drainage of medical patients
9 3D printing and 3D bioprinting	*Technologies for creating three-dimensional objects, including medical devices and potentially biological tissues or organs*	Weak local ecosystem of suppliers, increased demand for personalized care

1

AI has the potential to transform healthcare in UAE by improving efficiency, reducing cost and enhanced patient engagement [1/3]

Major challenges addressed

1 **High treatment costs**

AI solutions streamline workflows, reduce redundancy, and optimize hospital operations with predictive analytics for better resource allocation

2 **Human resource shortage**

Automation of administrative tasks frees up healthcare professionals to focus on patient care, addressing workforce constraints

3 **Disease burden**

AI improves patient outcomes through early disease detection, personalized treatment, and efficient drug discovery

4 **Accessibility and affordability**

AI enhances healthcare access across emirates and lowers costs for uninsured residents

Key patient and business impacts

1 **Operational efficiency for healthcare providers**

Reduced need for extensive post-surgery care, optimizing bed utilization and allowing for higher patient turnover

2 **Cost reduction**

Fewer errors and reduced readmissions lead to lower operational costs for healthcare providers

3 **Enhanced patient engagement**

AI-driven platforms foster better communication between patients and providers, leading to higher engagement

4 **Improved outcomes**

Enhanced diagnostic accuracy leads to timely and appropriate treatments, improving overall health outcomes

Source(s): Industry reports, Secondary research, Praxis analysis

AI has the potential to transform healthcare in UAE by improving efficiency, reducing cost and enhanced patient engagement [2/3]

Value chain

Patient registration	Diagnostics and imaging	Treatment	Post treatment follow up	Claims / payments

Problem solved

Patient registration	Diagnostics and imaging	Treatment	Post treatment follow up	Claims / payments
• *Manual registration processes leading to long waiting times and data entry errors*	• *Diagnostic errors and delays due to manual analysis* • *Increasing chronic disease burden*	• *Ineffective treatments due to generalized care plans* • *Shortage in healthcare professionals*	• *Poor patient engagement and follow-up leading to complications and non-adherence to care plans*	• *Manual claims processing results in delays and fraud risks* • *Rising healthcare costs due to resource allocation inefficiencies*

Patient impact

Patient registration	Diagnostics and imaging	Treatment	Post treatment follow up	Claims / payments
Automated check-ins / **Reduced wait times**	**Reduced repeat tests** / **Faster diagnostics**	**Precision surgery** / **Faster recovery**	**Automated follow-ups and scheduling**	**Faster claims processing** / **Personalized payment plan**
Less paperwork / **Improved satisfaction**	**Decreased radiologist workload due to AI triaging**	**Lower complication** / **Less human error**	**Continuous virtual care & monitoring**	**Enhanced transparency** / **Error reduction**

Business impact

Patient registration	Diagnostics and imaging	Treatment	Post treatment follow up	Claims / payments
Optimized workforce capacity allocation	**Increased patient throughput**	**Improved patient outcomes**	**Remote health tracking offerings**	**Improved cash flow**
Reduced operation costs	**Lower TAT**	**Enhanced market positioning**	**Subscription-based services**	**Improved fraud detection**

Source(s): Industry reports, Secondary research, Praxis analysis

AI has the potential to transform healthcare in UAE by improving efficiency, reducing cost and enhanced patient engagement [3/3]

Admission time

Patient enters the emergency dept

Conventional approach

Patient is taken for CT scan	Patient's scan is delayed due to numerous urgent cases	Radiologist calls the physicians treating the patients	Emergency physician consults with on-call interventional radiologist	Patient is admitted for appropriate clinical care
+40 minutes	**+100 minutes**	**+40 minutes**	**+10 minutes**	**+30 minutes**

210-220 minutes

Modern approach leveraging AI

Patient is taken for CT scan	AI prioritizes patient's case on radiologist's worklist	AI helps radiologist read patient's CT scan to determine the condition	Emergency physician, radiologist and on-call interventional radiologist are connected	Patient is admitted for appropriate clinical care
+40 minutes	**+10 minutes**	**+5 minutes**	**+2 minutes**	**+30 minutes**

80-90 minutes

Source(s): Industry reports, Secondary research, Praxis analysis

②

Genomics can revolutionize healthcare by providing insights into disease risk and personalized drug selection [1/2]

Major challenges addressed

1 **Lack of preventive healthcare strategies**

Genomic data allows for targeted screening and preventive measures tailored to the genetic profiles of the diversified population, promoting early interventions

2 **Limited genetic diversity data**

Genomics aims to fill this gap with localized genetic information as traditional genomic databases are predominantly European

3 **Lack of specialized care**

Precision medicine can provide customized solutions for patients with specific needs, such as those with rare diseases or complex medical conditions

4 **Drainage of medical patients**

Genomics enables effective treatments locally, reducing need for patients to seek care abroad

Key patient and business impacts

1 **Personalized medicine**

Genomic insights lead to tailored treatment options, improving the efficacy of therapies for individual patients

2 **Improved health outcomes**

Access to precision medicine reduces adverse drug reactions and improves the effectiveness of treatments

3 **Economic growth and development**

Genomics fuels the cycle of investment and innovation, leading to new treatments and cures that improve patient well-being, create specialized jobs, and strengthen the UAE's position as a medical tourism destination

4 **Enhanced diagnostic capabilities**

Genomic testing improves diagnostic accuracy and speeds up the identification of diseases, leading to more efficient healthcare delivery

② Genomics can revolutionize healthcare by providing insights into disease risk and personalized drug selection [2/2]

Use cases

Personalized medicine	Oncology (Cancer genomics)	Rare genetic disorders	Pharmacogenomics	Infectious disease genomics	Prenatal and newborn screening

Problem solved

• *Adverse drug reactions, low treatment efficacy in chronic diseases*	• *Difficulty in identifying cancer types, poor response to standard treatments*	• *Delayed or misdiagnosis, lack of effective treatments*	• *Variability in drug metabolism, ineffective dosing strategies, drug-related complications*	• *Challenges in rapid detection and treatment of pathogens, antibiotic resistance*	• *Undetected genetic abnormalities at birth, limited prenatal health data*

Patient impact

Tailored treatments	Early detection	Accurate diagnosis	Optimized drug prescriptions	Faster pathogen detection	Prevention of genetic diseases
Fewer side effects	Higher survival rates	Gene therapy potential	Fewer adverse drug reactions	Cost-efficient care	Improved neonatal health

Business impact

Growth in genetic testing volume	Increases patient throughput	Scientific advancement	Growth of precision medicine portfolios	Demand for rapid diagnostic services	Partnerships with maternity hospitals
Accelerates drug discovery	Lower treatment costs	Demand for genetic testing labs	Demand for genetic consulting	Better outbreak control	Growing prenatal testing

Source(s): Industry reports, Secondary research, Praxis analysis

Telemedicine can enhance efficiency, improve patient satisfaction, and optimize care coordination [1/2]

Major challenges addressed

1 Remote access issues

Limited specialist care in underserved areas; telemedicine provides virtual access

2 Overburdened facilities

High exposure in in-person visits; remote consultations reduce this risk

3 Drainage of medical patients

Telemedicine and virtual consultations provide patients with easier access to specialists thus minimizing travel

4 Continuity gaps in chronic disease management

Regular follow-ups are challenging; telemedicine ensures continuous monitoring

Key patient and business impacts

1 Enhanced patient satisfaction

Increases convenience by allowing home consultations

2 Cost savings

Lowers expenses for patients and providers through reduced travel and overhead

3 Better outcomes

Promotes early interventions and improved chronic care management

4 Enhanced engagement

Fosters proactive patient involvement in health management

Telemedicine can enhance efficiency, improve patient satisfaction, and optimize care coordination [2/2]

3
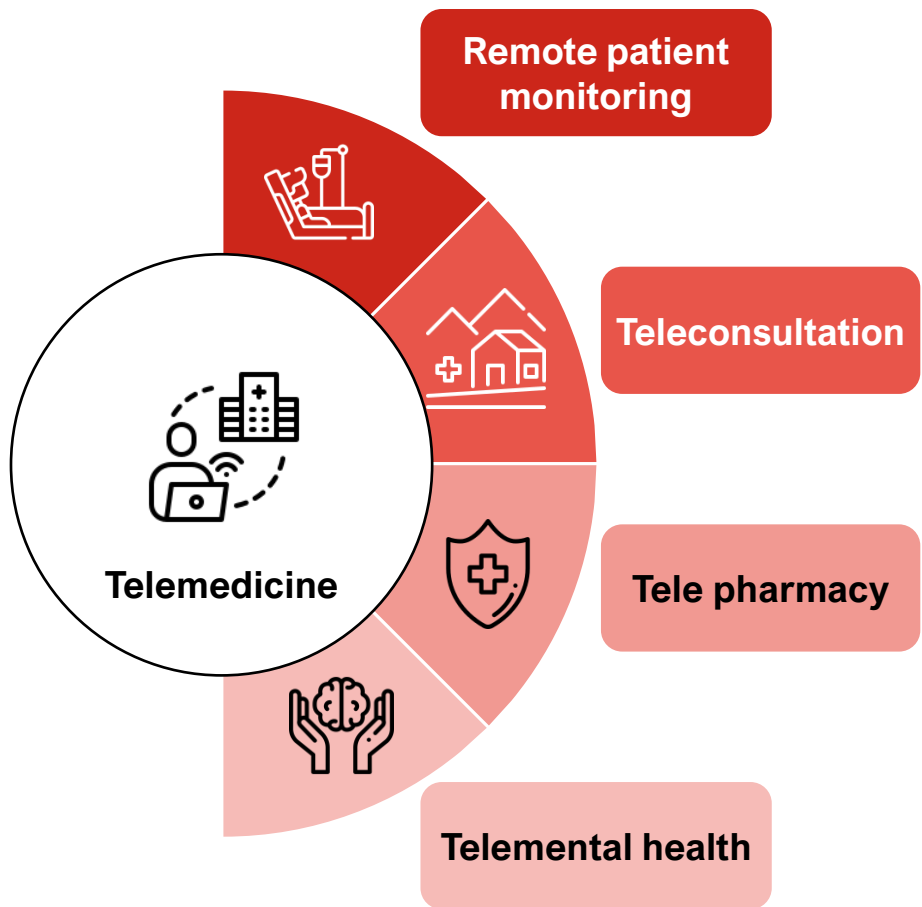
	Problem solved	Patient impact		Business impact	
Remote patient monitoring	• Lack of continuous monitoring for chronic patients	Early detection of health issues	Reduced infection risk	Personalized care plans	Better data analytics
Teleconsultation	• Limited access to specialists due to workforce shortage • Long wait times	Save expenses	Better access to healthcare	Increased user retention	New business models based on innovative pricing options
Tele pharmacy	• Delays in obtaining medications and fragmented care	Convenient medication access	Cost-effectiveness	Streamlines prescription management	New revenue streams
Telemental health	• Stigma and access barriers • Undersupply of healthcare services	Discreet access to care	Increase in accessibility and convenience	Reduces facility costs	Increased patient engagement

Telemedicine

4

Digitally enabled hospitals can enhance efficiency, improve patient satisfaction and optimize care coordination [1/2]

Major challenges addressed	Key patient and business impacts

1 — **Staff shortages**
Digitally enabled hospitals can facilitate collaboration among healthcare professionals, enabling access to specialized expertise regardless of location

1 — **Personalized care**
Data integration allows for tailored treatment approaches based on individual health records, enhancing overall care quality

2 — **Undersupply of healthcare facilities**
Digitalization extends reach making healthcare accessible and affordable

2 — **Timely interventions**
Digital tools enable quicker diagnoses and treatment plans, resulting in better health outcomes and reduced complications

3 — **Inefficient communication**
Digital platforms enhance communication between healthcare providers and patients, reducing misunderstandings and delays in care

3 — **Revenue growth**
Digitally enabled hospitals can offer new services, such as telemedicine and remote monitoring, generating additional income streams
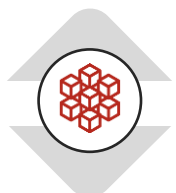
4 — **Data overload and fragmentation**
Digital tools integrate and analyzes patient data, improving access and coordination of care
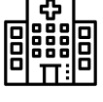
4 — **Enhanced resource allocation**
Automation and data analytics optimize resource allocation and staff productivity, improving overall hospital performance

4 # Digitally enabled hospitals can enhance efficiency, improve patient satisfaction, and optimize care coordination [2/2]

Patient impact

At home registration	Reduced waiting time
Remote access to specialists	Quick diagnosis
Easy access to prescription	Minimized medication error
Seamless and secure payments	Transparent billing process
Remote follow-up care	Continuous virtual care

Patient registration
- **Online platforms and chatbots** for online appointment scheduling
- **EHR integration** for seamless data access across depts

Consultation & diagnosis
- **Telemedicine** platforms for remote consultations
- **AI-driven diagnostic tools** for pre-consultation analysis

Treatment plan & prescription
- **E-prescriptions** and **treatment plans** via patient portals
- AI for **personalized recommendations**

Payment
- **Digital payment gateways** integrated into the OPD system
- **Automated billing** and **insurance claim** management

Follow-up
- **Telehealth** for remote follow-ups and automated patient engagement
- IoT devices for **real-time health monitoring**

Business impact

Lower staffing costs	Increased patient intake
Expanded patient reach	Minimized physical infrastructure
Collaboration with pharmacies	Optimized storage management
Improved cash flow	Streamlined billing process
Addn. revenue from follow-ups	Lower readmission rates

5

Digitally enabled labs can improve efficiency, accuracy, and turnaround times for diagnostic testing [1/2]

Major challenges addressed	Key patient and business impacts

1 **Slow turnaround times**

Automation and streamlined workflows speed up test processing and reporting, enhancing operational efficiency

2 **Ineffective treatments**

Advanced diagnostics can help identify the most effective treatments for specific patients, reducing the use of ineffective therapies

3 **Inconsistent quality of testing**

Digital systems enable standardized protocols and automated quality control, improving accuracy and reliability in test results

4 **Challenges in data management**

Advanced data analytics tools enhance data management and interpretation, facilitating timely insights for healthcare providers

1 **Faster results and enhanced accuracy**

Reduced turnaround times and errors lead to quicker diagnoses and treatment decisions, improving patient outcomes

2 **Greater accessibility**

Enhanced access to lab services via telehealth and home testing options improves convenience for patients

3 **Operational efficiency and reduced cost**

Streamlined processes and automation reduce labor costs and enhance overall lab productivity

4 **Better compliance and reporting**

Digital labs enhance compliance with regulatory standards through automated reporting and data management, reducing legal risks and improving operational credibility

Source(s): Industry reports, Secondary research, Praxis analysis

Digitally enabled labs can improve efficiency, accuracy, and turnaround times for diagnostic testing [2/2]

5

	Sample acquisition	Preparation and processing	Analysis and interpretation	Reporting	Quality control
Conventional approach	• **Manual collection** prone to errors • Physical transport without live tracking	• **Inconsistent manual processes** • Limited automation and integration	• **Variability in interpretation** • **Slow analysis with minimal AI**	• **Delays from manual review** • Slow reporting with **unlinked systems**	• Manual audits with late **error detection** • Processes **limiting scaling up**

	Sample acquisition	Preparation and processing	Analysis and interpretation	Reporting	Quality control
Modern approach	• **IoT / RFID** tracking **reducing errors** • **Faster handling** and sample flow	• **Automation** improving efficiency • **AI workflows** reducing delays	• **Lower TAT** and **higher accuracy** • ML minimizing manual reviews	• **Automated reporting** • **Digital integration** improving data flow	• Real-time AI checks ensuring quality • **Fewer errors, faster corrections**

Business impact	Increased sample capacity	Cost savings	Improved throughput	Workforce optimization	Lower diagnostics TAT	Minimized expert dependency	Faster report generation	Improved patient and clinician **turnaround**	Minimized downtime	Lower compliance costs
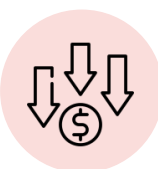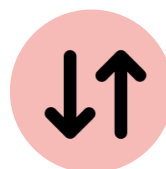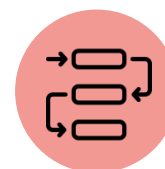
Source(s): Industry reports, Secondary research, Praxis analysis

6

Insurtech solutions can improve efficiency, affordability, and accessibility of health insurance [1/2]

Major challenges addressed	Key patient and business impacts

1 — **Complex claims processing**

Insurtech automates claims processing, reducing manual errors and expediting the settlement process

1 — **Personalized insurance solutions**

Data analytics enable tailored and transparent insurance products that meet specific customer needs, enhancing overall care

2 — **Expensive insurance**

Insurtech can help reduce the cost of health insurance by streamlining processes and improving risk assessment

2 — **Improved customer satisfaction**

Streamlined processes and faster claims resolution lead to improved satisfaction among policyholders and lower CAC

3 — **Inadequate risk assessment**

AI and data analytics improve underwriting accuracy, helping insurers to better evaluate risks and set premiums mapping to health data

3 — **Enhanced risk management**

Better data analytics lead to more accurate risk assessments, resulting in more sustainable pricing strategies

4 — **High operational costs**

Digital solutions streamline data collection and management, allowing better resource allocation

4 — **Improved margins**

Reduced processing times and errors lead to lower operational costs and enhanced productivity; with improved margins due to fewer claims

Insurtech solutions can improve efficiency, affordability, and accessibility of health insurance [2/2]

6

Value chain	Risk assessment & prevention	Product development & policy design	Distribution & onboarding	Claims processing & management	Customer service & engagement	Health monitoring & management
Problem solved	• Limited incentives for healthy behavior and incomplete patient data	• Rigid, one-size-fits-all insurance policies	• Complex paperwork and accessibility issues -> discouraging adoption	• Slow claims settlement and high fraud risks	• Limited engagement beyond renewals and claims	• Inefficient care coordination for chronic conditions
Patient impact	Personalized affordable premiums / Proactive health management	On-demand coverage and flexible plans / Specialized policies for chronic conditions	Fast onboarding using digital channels / Penetration to underserved areas	Faster claims, transparent processing / Cashless hospital admissions	24/7 support and virtual consultations / Telemedicine integration	Continuous health tracking / Improved adherence to treatment plans
Business impact	Fewer claims and better margins / Expansion via usage-based models	Targeted products with better insights / Rapid adaptation to trends	Low customer acquisition costs / Wider reach with mobile-first strategies	Lower operational costs / Minimized fraud risks	Improved customer retention / Enhanced brand loyalty	Fewer hospital readmissions / Strong insurer-provider partnerships

7

Digital therapeutics focuses on personalize care, improving patient engagement and treatment outcomes [1/2]

Major challenges addressed	Key patient and business impacts

1 **Rising healthcare costs**

High costs from chronic disease care; DTx reduces expenses by promoting remote and preventive care

2 **Chronic disease burden**

High rates of diabetes and heart disease require consistent care; DTx provides remote monitoring and personalized support

3 **Poor treatment adherence**

Many struggle with following treatment plans; DTx uses reminders and interactive tools to boost compliance

4 **Limited mental health access**

Mental health resources are scarce, especially in remote areas; DTx enables remote, scalable support

1 **Increased access to care**

By offering mobile-based health solutions, DTx extend healthcare access to underserved populations

2 **Improved health outcomes**

DTx solutions include reminders, behavioral nudges, and progress tracking, increasing adherence to treatments and improving health outcomes

3 **Reduced hospital admissions**

Remote monitoring and timely interventions lead to fewer hospital visits, cutting costs for both healthcare providers and patients

4 **Data-driven insights for providers**

Real-time patient data helps providers make informed decisions and optimize treatment plans, benefiting clinical workflows

7 Digital therapeutics focuses on personalize care, improving patient engagement and treatment outcomes [2/2]

Use cases

Chronic disease management	Behavioral and mental health	Preventive care and wellness	Respiratory health	Musculoskeletal and rehabilitation	Substance use and addiction recovery

Problem solved

Chronic disease management	Behavioral and mental health	Preventive care and wellness	Respiratory health	Musculoskeletal and rehabilitation	Substance use and addiction recovery
• Poor treatment adherence, lack of personalization	• Limited access to mental health professionals	• Late diagnosis, lack of proactive care	• Poor monitoring for respiratory diseases post COVID-19	• Lack of continuous support for rehabilitation	• Lack of continuous care and real-time relapse prevention

Patient impact

Better disease control	Continuous therapy	Early detection	Improved monitoring	Faster recovery	Ongoing support
Fewer complications	Symptom relief	Healthier lifestyles for aging population	Fewer emergencies	Pain relief	Fewer relapses

Business impact

Lower readmissions	Scalable care solutions	Driving revenue using value-based streams	Fewer hospital visits	Increased patient satisfaction	Enhanced treatment outcomes
Patient retention and loyalty	Enhanced workforce efficiency	Increased patient engagement	Data-driven decision making	Enhanced patient adherence	Reduced need for in-person care

Source(s): Industry reports, Secondary research, Praxis analysis

8

Robotic surgery can enhance surgical precision, reduce trauma, and improve patient outcomes [1/2]

Major challenges addressed

1 Workforce shortage of skilled surgeons

Robotic systems assist less experienced surgeons in performing complex procedures, increasing surgical capacity

2 Drainage of medical patients

Telemedicine and virtual consultations provide patients with easier access to specialists thus minimizing travel

3 Limited precision in complex surgeries

Robotic systems provide ultra-precise movements, improving surgical accuracy and outcomes
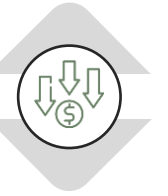
4 Long recovery times

Smaller incisions and precise operations reduce recovery time and postoperative pain

Key patient and business impacts

1 Improved patient outcomes

Greater precision reduces complications, enhancing patient recovery and satisfaction

2 Increased efficiency

Faster procedures and recoveries allow hospitals to treat more patients, improving operational efficiency

3 Boost in medical tourism

Advanced robotic surgeries attract international patients, driving medical tourism growth

4 Cost savings

Though expensive upfront, fewer complications and shorter hospital stays lead to long-term savings for healthcare providers

Source(s): Industry reports, Secondary research, Praxis analysis

8 Robotic surgery can enhance surgical precision, reduce trauma, and improve patient outcomes [2/2]

Therapeutic area	Problems solved
Cardiothoracic	• *Scarcity of highly skilled surgeons for complex procedures*
Gynecology	• *Limited access to specialized gynecological surgeries* • *Higher complication rates in open surgeries*
Urology	• *Complex surgeries with precision demands*
Colorectal	• *High risk of infection in traditional surgery*
Orthopaedic	• *Growing demand for joint replacements due to aging population*
Neurological	• *Need for precision in delicate brain surgeries* • *High-risk nature of traditional techniques*
Ophthalmic surgery	• *Growing demand for precise vision correction surgeries* • *Risk of errors in traditional methods*
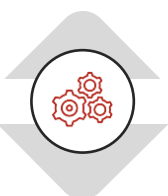
Patient impact			Business impact	
Reduced surgical trauma	Accelerated recovery time	Reduced treatment costs	Center of excellence	High-value cases attracted
Minimized scarring	Reduced pain	Same day discharge	Insured younger patients targeted	Reduced operative time
Less blood loss	Reduced complications	Improved patient outcomes	Expanded patient reach	Decreased open surgery time
Reduced infection risk	Accelerated recovery time	Precise resection	Reduced doctor fatigue	Lower wound infection rate
Improved accuracy	Reduced complications	Precise alignment	Elderly hesitant patient attracted	Improved patient confidence
Enhanced precision	Reduced surgical trauma	Minimal invasiveness	Optimized OR time	Complex cases attracted
Improved accuracy	Minimized human error	Quicker healing	Faster surgeries increasing intake	Lower readmission rates

9

3D printing and 3D bioprinting can enable the creation of customized medical devices, implants and surgical models [1/2]

Major challenges addressed	Key patient and business impacts
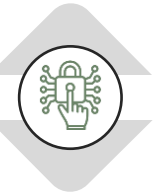
1 **Weak local ecosystem of supplier**
Smart digital manufacturing technology reduces import reliance and boost domestic manufacturing output
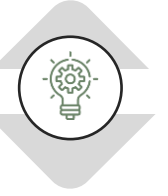
2 **Surgical planning**
Provides detailed anatomical models, improving pre-surgical preparation and reducing operation times

3 **Customization**
3D printing enables patient-specific implants and prosthetics, enhancing fit and functionality

4 **Tissue engineering**
Addresses organ transplant shortages through the potential creation of tissues and organs on demand

1 **Improved access to prosthetics**
Quick and affordable prosthetic solutions benefit underserved patients

2 **Accelerated innovation**
Faster product development cycles lead to quicker market introduction of new devices

3 **Cost efficiency**
In-house production of devices lowers costs for healthcare providers

4 **Better patient outcomes**
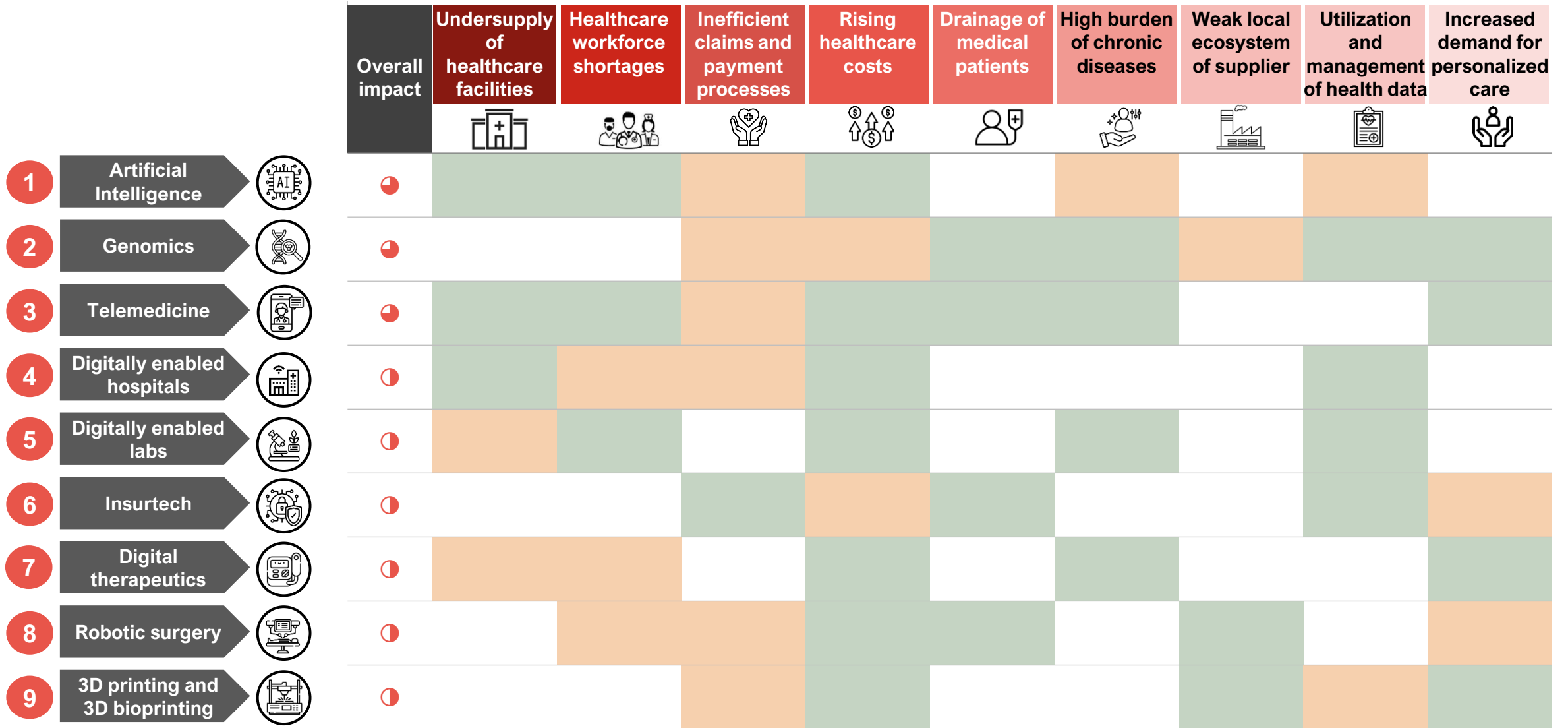Customized implants and surgical models reduce errors and recovery time

3D printing and 3D bioprinting can enable the creation of customized medical devices, implants and surgical models [2/2]

9

Use cases

| Implants | Prosthetics | Anatomical replicas | Organ, tissue & cell printing |

Problem solved

Poor compatibility of standard implants, Increased complications due to improper implant placement

Limited customization, delays in obtaining custom prosthetics

Insufficient realistic training tools for medical professionals, difficulty in explaining complex procedures to patients

Difficulty in repairing or replacing damaged tissues/organs, Lack of suitable models for drug testing

Patient impact

| Reduced surgical time | Faster recovery | Customization options | Lower TAT | Better surgical planning | Reduced surgical errors | Low transplant wait times | Reduced rejection risk |
| Improved fit | Fewer invasive procedures | Fewer manual adjustments | Improved usability | Increased success rates | Doctor skill enhancement | Reduced donor organ need | Long-term cost savings |

Business impact

| Cust. implant demand | Opex reduction | Competitive pricing | Accelerated innovation | Demand in edu. & training | Medical institute tieups | Growth in regenerative medicine & organ replacement market |
| Partnerships with orthopedic & dental clinics | | Scalable offerings | Better patient retention | AR / VR integration | Surg. rehearsal services | Biotech / pharma partnerships |

AI, Genomics, and Telemedicine are expected to have highest impact

	Overall impact	Undersupply of healthcare facilities	Healthcare workforce shortages	Inefficient claims and payment processes	Rising healthcare costs	Drainage of medical patients	High burden of chronic diseases	Weak local ecosystem of supplier	Utilization and management of health data	Increased demand for personalized care
1 Artificial Intelligence										
2 Genomics										
3 Telemedicine										
4 Digitally enabled hospitals										
5 Digitally enabled labs										
6 Insurtech										
7 Digital therapeutics										
8 Robotic surgery										
9 3D printing and 3D bioprinting										

Level of impact

Major impact — Minor impact

Low ──────► High

04

About us

We are Asia's fastest growing NexGen management consulting firm

Who we are and what we do

PRAXIS
GLOBAL ALLIANCE

GrowRevenue

Accelerate revenue growth

GrowPerformance

Enable organizations to perform better

GrowValue

Enable organizations deliver superior returns

GrowSustainably

Enable organizations to seamlessly incorporate ESG principles

How we do it better: 'Praxis Stack'

Superior outcomes
- Full stack offering
- Proprietary databases
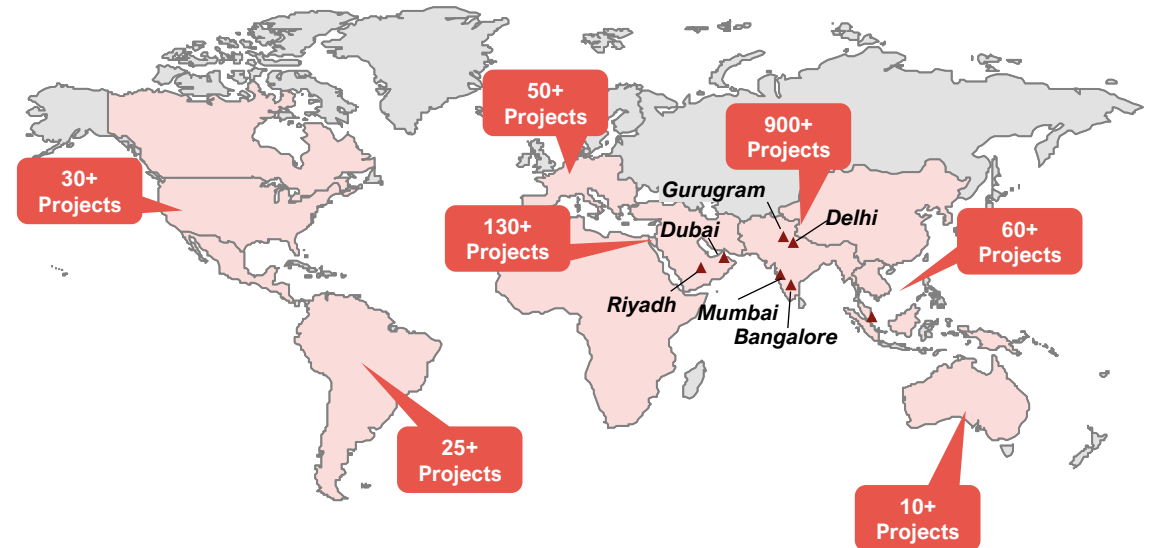- Robust frameworks
- Digital tech first mindset

Practical approach
- Practitioner experience
- Bottom-up on-ground insights

High quality team
- Members from Top-tier institutes
- Operating experience + consulting toolkit

We have a strong footprint globally

- 30+ Projects
- 50+ Projects
- 900+ Projects
- 130+ Projects
- 60+ Projects
- 25+ Projects
- 10+ Projects
- Gurugram
- Delhi
- Dubai
- Riyadh
- Mumbai
- Bangalore

Practices

Financial Services	Consumer and Internet	*Healthcare and Lifesciences*	Technology
Next Gen Industrials	Chem and Agriculture	Mobility Energy and Transportation	Private Capital

What we do for our clients

GrowRevenue

Sales acceleration
Loyalty, sales productivity, key account management, throughput

Go-to-market
Category, exports, adjacencies, value proposition, micromarket full potential

Omni-channel distribution
Online to offline, offline to online, D2C

Customer experience and loyalty
Digital journeys, retail experience

Strategy & business planning
Corporate, BU, geo

GrowPerformance

Metric movement
Retention, returns, cancellation, ….

Playbook creation
Supply, demand, process institutionalization

Cost efficiency
Zero basing, cost reduction

Supply chain optimization
Procurement, global sourcing, process efficiency

GrowValue

M&A and due diligence
CDD, synergies, Post merger integration, ODD, supply chain DD

Sell side: Vendor CDD and Road to IPO
Vendor CDD, DRHP support

Integrity DD /
Forensic DD

Operational DD
Cost levers, supply chain, performance

Future tech readiness
Deep tech & innovation, digital infrastructure modernization

GrowSustainably

ESG due diligence
Reporting and assessment (IFC, NIIFL, SASB etc.)

ESG Value Creation Plan
Net zero transformation, planet positive strategy

Impact assessment
Energy, Decarbonization, Resource usage, Performance metrics

Sustainable supply chains
Sourcing, procurement, logistics, distribution

Circular economy
Product re-designing, Recycling business case, Market validation, Engineering roadmap

Connect with us

We will be happy to share perspectives

Aryaman Tandon
Managing Partner - Healthcare and Lifesciences

E: aryaman.tandon@praxisga.com

For media queries, please contact

Vaishnav Kumar Rai
Manager - Marketing

E: communications@praxisga.com
M: +91 7827944925

www.praxisga.com

New Delhi | Gurugram | Mumbai | Bengaluru | Dubai | Riyadh

The team at

PRAXIS
GLOBAL ALLIANCE

appreciates your time and support

#BuildTogetherWinTogether

New Delhi
Unit 5, Ground Floor, Uppal Plaza M6, District Centre, Jasola -110 025 New Delhi, India

Gurugram
Tower A, 4th Floor, DLF Centre Court, DLF Phase 5, Sector 42, Gurugram-122 002 Haryana, India

Mumbai
112, First floor, Workafella, AK Estate, Goregaon West, Mumbai - 400 062 Maharashtra, India

Bengaluru
2734, Fourth floor, HSR Layout, Sector 1, 27th Main, 16th Cross, Bengaluru - 560 102 Karnataka, India

UAE
Praxian MEA LLC FZ 6th floor, The Meydan Hotel, Nad Al Sheba, Dubai, UAE