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## **AI Healthcare Technology**

Artificial intelligence (AI) technologies are being applied to healthcare. These technologies have the potential to transform many aspects of patient care, as well as administrative processes within provider, payer and pharmaceutical organizations.

The key categories of AI technology applications involve diagnosis and treatment recommendations, patient engagement and adherence, and administrative activities.

Artificial intelligence healthcare technology simplifies the lives of patients, doctors and hospital administrators by performing tasks that are typically done by humans, but in less time and at a fraction of the cost.

Report - The potential for artificial intelligence in healthcare – Published Future Healthcare Journal

- [www.ncbi.nlm.nih.gov/pmc/articles/PMC6616181/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC6616181/)
- National Center for Biotechnology Information, U.S. National Library of Medicine

## **Biotechnology**

The manipulation (as through genetic engineering) of living organisms or their components to produce useful usually commercial products (such as pest resistant crops, new bacterial strains, or novel pharmaceuticals) also: any of various applications of biological science used in such manipulation.

The emergence of certain key themes in the market is expected to drive growth in this industry to a lucrative extent.

These key themes include regenerative medicine and genetics in diagnostics. Presence of a plethora of companies focusing on the development of regenerative therapies is anticipated to drive sector growth through to 2025. Technological advancements pertaining to the penetration of artificial intelligence in this industry is expected to fuel progress with potential avenues. The companies are engaged in unleashing machine learning in order to understand individual cancer cases, while recommending clinical trials.

Supportive government (and its allied agencies) policies related to synthetic biology is a major growth impacting driver in this sector. Developed economies such as UK and the U.S. are critically monitoring and funding synthetic biology R&D initiatives. For example, in 2010, a six months' review of synthetic biology headed by a panel of expert scientists was enforced by the U.S. President and subsequently conducted a hearing of the Energy and Commerce Committee exclusively concerning synthetic biology.

## **Board Member**

Board member is an elected participant on the board of directors of a corporation or the supervisory committee of an organization. The board of directors of a company is defined as the governing body that is tasked with decisions pertaining to the company's heading.

## **Cannabinoid (CBD)**

Cannabinoids are chemicals found in cannabis. The most notable cannabinoid is the phytocannabinoid tetrahydrocannabinol, the primary psychoactive compound in cannabis. Cannabidiol is another major constituent of the plant. There are at least 113 different cannabinoids isolated from cannabis, exhibiting varied effects.

Cannabidiol (CBD) is a non-psychoactive compound found in both hemp and marijuana, which are two different varieties of the cannabis plant. CBD results from the heating or decarboxylation of cannabidiolic acid and does not provide a high. CBD possesses numerous therapeutic benefits, including anti-inflammatory, analgesic, anti-anxiety and seizure-suppressant properties.

CBD helps in the proper functioning of the endocannabinoid system in case of a disease. It helps in modulating the system and enhancing the endocannabinoid tone, which slows down or stops the disease progression. CBD is available in various forms, including flowers, isolate, concentrates and infusions.

Cannabidiol (CBD) has been segmented into hemp-derived, marijuana-derived and pharmaceutical. Hemp-derived CBD has been further segmented on the basis of product and distribution channel. Based on product, hemp-derived CBD has been segregated into tinctures, topicals, capsules, vape oil/ cartridges, gummies, other edibles, pre-roll/ flower and syrups and dabs. On the basis of distribution channel, hemp-derived CBD has been divided into natural food stores, online, smoke shops, dispensaries, medical companies and others.

### **Cannabis vs. Marijuana**

- People often use the words “cannabis” and “marijuana” interchangeably, but they don’t mean exactly the same thing.
- The word “cannabis” refers to all products derived from the plant *Cannabis sativa*.
- The cannabis plant contains about 540 chemical substances.
- The word “marijuana” refers to parts of or products from the plant *Cannabis sativa* that contain substantial amounts of tetrahydrocannabinol (THC).
- THC is the substance that’s primarily responsible for the effects of marijuana on a person’s mental state.
- Some cannabis plants contain very little THC. Under U.S. law, these plants are considered “industrial hemp” rather than marijuana.
- Cannabinoids are a group of substances found in the cannabis plant.
- The main cannabinoids are THC and cannabidiol (CBD).
- Besides THC and CBD, more than 100 other cannabinoids have been identified.

### **Efficacy**

The ability to produce a desired or intended result.

### **Continuing Education Unit**

CEU stands for Continuing Education Unit. A CEU is a unit of credit equal to 10 hours of participation in an accredited program designed for professionals with certificates or licenses to practice various professions.

### **Dietary Supplement**

A dietary supplement is a manufactured product intended to supplement the diet when taken by mouth as a pill, capsule, tablet, or liquid. A supplement can provide nutrients either extracted from food sources or synthetic, individually or in combination, in order to increase the quantity of their consumption.

### **Digital Health**

The Digital Health Market includes Technology [Tele-healthcare {Telecare (Activity Monitoring, Remote Medication Management), Telehealth (LTC Monitoring, Video Consultation)}, mHealth {Wearables (BP Monitors, Glucose Meter, Pulse Oximeter, Sleep Apnea Monitors, Neurological Monitors), Apps (Medical, Fitness)}, Digital Health System (EHR, e-prescribing System)], By Component [Hardware, Software, Services],

Rapid technological advancements in healthcare IT such as cloud-based storage system and increasing adoption of smartphones and tablets by healthcare professionals to track and monitor patient health and history is major factor driving the market growth.

Rising developments in healthcare IT along with favorable government regulations has largely encouraged the adoption of various healthcare IT solutions such as electronic medical records, e-prescribing systems, remote patient monitoring, and wearable medical devices. Such factors will boost global market growth.

Rising venture capital funding including private equity and corporate venture capital in the health IT sector will escalate the market growth over the forecast timeframe.

- Increasing use of smartphones, tablets, and other mobile platforms
- Rapidly moving healthcare IT infrastructure in industrialized nations
- Favorable government initiatives in U.S. and European region
- Rising demand for remote patient monitoring services
- Growing venture capital investments

## **Emesis**

Emesis is the medical term for vomiting.

## **Healthcare**

Health care, health-care, or healthcare is the maintenance or improvement of health via the prevention, diagnosis, treatment, recovery, or cure of disease, illness, injury, and other physical and mental impairments in people. Health care is delivered by health professionals in allied health fields.

Healthcare expenditure in U.S. was \$3.2 trillion, which is 2.4 times higher than the global average. This number is expected to increase by 68.0% over the next 10 years, which in turn, is expected to boost healthcare infrastructure and life science analytics.

The key sectors of healthcare industry can be broadly classified into following four sub-segments:

- Health care services and facilities.
- Medical devices, equipment, and hospital supplies manufacturers.
- Medical insurance, medical services and managed care.
- Pharmaceuticals & Related Segments.

## **Hemp**

Hemp, or industrial hemp, is a strain of the Cannabis sativa plant species that is grown specifically for the industrial uses of its derived products. It is one of the fastest growing plants and was one of the first plants to be spun into usable fiber 50,000 years ago.

## **Industry Sectors Market Size**

- |                             |                                |
|-----------------------------|--------------------------------|
| 1. Addiction Treatment      | 10. Health & Medical Insurance |
| 2. AI Healthcare Technology | 11. Healthcare Technology      |
| 3. Biotechnology            | 12. Life Sciences              |
| 4. Cannabis                 | 13. Opioid                     |
| 5. CBD – Cannabinoid        | 14. Pain Management            |
| 6. Dietary Supplements      | 15. Pharmacies & Drug Stores   |
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| 8. ePharmacy                | 17. Telehealth                 |
| 9. Healthcare               | 18. Treatment                  |

## **Addiction Treatment**

The global Addiction Treatment Market is likely to surge at a steady CAGR of 6.0% within the forecast period from 2017 to 2026. In 2016, the addiction treatment market was valued around US\$ 4.0 Bn. This is likely to reach nearly US\$ 7.0 Bn by the end of forecast period. The report proposes that developing

maltreatment of doctor prescribed medications and ideal repayments for smoking end treatment are probably going to prod interest for addiction treatment market soon.

Addiction is an increasing concern all over the globe. As indicated by the National Survey on Drug Use and Health (NSDUH) in 2015, around 15.1 million people turned 18 and above, who were diagnosed with alcohol consumption issues, which included about 9.8 million men. Around 1.3 million individuals got treated in 2015, for AUD at specialized center. Over 16 million individuals in the U.S. are suffering from a sicknesses brought about by smoking. As indicated by CDC study, tobacco use causes almost 6 mn deaths every year. Current patterns demonstrate that tobacco consumption is probably going to cause over 8 million fatalities yearly by 2030.

Addiction treatment manufacturers and buyers of treatment items are concentrating on bringing issues to light among individuals and medication storekeepers about ill-effects of medication misuse and significance of addiction treatment to build the client pool. Additionally, organizations are offering making of ID of potential liquor abusers and utilization of drugs misuse testing to legal implementation offices. Awareness by radio, papers, TV commercials, leaflets have demonstrated to be powerful in taking care of addiction treatment.

The global addiction treatment market is classified based on distribution channel, treatment type, geography, treatment centered, and drug type. As far as treatment type is concerned, the tobacco/nicotine addiction treatment segment is anticipated to rule the global market and is relied upon to proceed sustain its lead in the future years as well, trailed by the segment of narcotic addiction treatment. Growth in sale of nicotine gum in growing nations is probably going to push the segment demand. Nicotine gum is rapidly acting, moderately affordable, and can be taken anytime. These aspects are estimated to fuel the segment growth.

On the basis of geography, North America, in 2016 represented a leading share of the entire addiction treatment market. This is because of surge in the quantity of smokers in the U.S. has increased concerns with respect health issues for the passive smokers as well as active smokers. Asia Pacific market is anticipated to gain impetus in the span of forthcoming years. This is estimated to produce significant income in the coming years. Activities by regional governments to accomplish independence in production of pharmaceuticals and other incentives regarding the making of generics in the nations, for example, South Africa, Saudi Arabia, and Brazil are going to support the Middle East and Africa and Latin America market.

## **AI Healthcare**

The global artificial intelligence in healthcare market size is expected to \$31.3 billion by 2025, growing at a CAGR of 41.5% over a forecast period, according to a new report by Grand View Research, Inc.

One of the world's highest-growth industries, the AI sector was valued at about \$600 million in 2014 and is projected to reach a \$150 billion by 2026.

The rising demand to reduce healthcare costs, increasing adoption of precision medicine, growing importance of big data in healthcare, and declining hardware costs are some factors propelling adoption of AI technology in healthcare industry. Moreover, rise in potential applications of AI-based tools in medical care and growth in venture capital investments are anticipated to aid growth over the forecast period.

## **Biotechnology**

The global biotechnology market size was valued at \$449.06 billion in 2019 and is expected to reach \$727.1 billion by 2025, at a CAGR of 7.4%.

Biotechnology is the broad area of biology, involving living systems and organisms to develop or make products. Depending on the tools and applications, it often overlaps with related scientific fields.

## **Cannabis United States**

The U.S. cannabis market size was valued at \$11.3 billion in 2018 and total legal sales of cannabis in current legal states are projected to grow at a compound annual growth rate (CAGR) of 14% over the next six years, to reach nearly \$30 billion by 2025.

Cannabis, or marijuana, is very commonly used in the U.S. by cosmetic, pharmaceutical, and food and beverage industries. The market has been witnessing exponential growth despite its quasi-legal status and companies are striving to keep up with its growing demand and frequent legal changes pertaining to each state in the country.

The marijuana market has grown significantly over the past few years as more states have legalized it. As of 2019, 33 U.S. states and the District of Columbia have legalized marijuana for medical, recreational, or both purposes. This has encouraged an influx of business startups, which has further helped in collectively driving the market.

- Annual sales of medical cannabis are projected to grow at a 17% CAGR through 2025, to an estimated \$13.1 billion by 2025; adult-use sales are projected to grow at a 16% CAGR, to \$16.6 billion
- An estimated 38.4 million U.S. adults consume cannabis at least once annually, from either a legal or illicit source
- 36% of cannabis consumers report using cannabis daily, and 59% use cannabis at least once a week
- People between the ages of 25 and 44 comprise 45% of cannabis consumers

## **Cannabis Global**

The global legal marijuana market is valued at \$17.7 billion in 2019 and is expected to reach \$73.6 billion by 2027, according to a new report published by Grand View Research, Inc. It is anticipated to expand at a CAGR of 18.1% during the forecast period. Increasing legalization of cannabis for medical as well as adult-use is expected to promote growth.

On the basis of type, the medical segment held the leading revenue share of 71.0% in 2019, owing to the growing adoption of cannabis as a pharmaceutical product for treating severe medical conditions, such as cancer, arthritis, and Parkinson's disease and Alzheimer's disease among other neurological conditions. Moreover, increasing need for pain management therapies along with growing disease burden of chronic pain among elders is expected to boost the product demand.

## **CBD United States**

With hemp-derived CBD gaining in popularity – in line with health, wellness, and anti-pharma trends – and product availability and variety increasing, the CBD market was \$5 billion in 2019 and projected to grow globally to \$23.7 billion through 2025.

Hemp-derived CBD finds its application in various sectors such as pharmaceuticals, personal care and cosmetics, nutraceuticals, and food and beverages. The demand for CBD-infused personal care and cosmetics products is rising owing to its anti-inflammatory, anti-aging, and antioxidant properties. Numerous skincare and cosmetic brands are involved in the production of hemp-derived CBD product.

Increasing awareness about the therapeutic benefits of cannabidiol has influenced people to buy CBD based products, irrespective of their cost. Mainstream retailers are now focusing on selling CBD-based products, as these have a higher profit margin. Various health and wellness retailers such as CVS Health, Rite Aid, and Walgreens Boots Alliance have decided to sell CBD-based products. Moreover, CVS Health is planning to sell CBD topicals through its 800 stores, and Walgreens Boots Alliance is planning to sell CBD containing topicals in 1500 of its stores in the U.S.

## **CBD Global**

The global CBD cannabidiol market was \$4.6 billion in 2018 and is expected to reach \$22 billion at a CAGR of 125.58% during the forecast period, 2016-2026.

Rising awareness regarding health benefits relating to cannabidiol consumption is expected to fuel the CBD market growth. Growing demand for cannabidiol owing to its healing properties for pharmaceutical formulations is expected to support the market during the forecast period. Composition of CBD in skincare products such as cleansers, moisturizers and creams, sunscreens, oils, and serums has boosted the demand rate to the peak. Effectiveness and anti-aging properties for all skin types, comprising acne-prone skin and sensitive, is expected to propel the demand for cannabidiol in cosmetic products and skincare. Emergence of new applications for CBD such as serums and lip balms will also trigger the growth of the global market.

## **Dietary Supplements**

The global dietary supplements market size was estimated at \$123.28 billion in 2019 and is projected to expand at a CAGR of 8.2% to reach \$230.73 billion by 2027. Factors, such as rising health concerns and the changing lifestyles and dietary habits are driving the product demand. North America emerged as the largest market for dietary supplements in 2019.

Positive outlook toward sports nutrition market is also among major driving factors. Increase in the number of global sports events encourage athletes to focus on physical strength. A rise in the number of sports complexes and gymnasiums is also expected to drive the demand for dietary supplements.

Rapid urbanization and rise in disposable income along with growing awareness regarding health issues are the factors expected to propel the market growth over the forecast period. Favorable outlook toward medical nutrition on account of rising prevalence of cardiovascular diseases and the number of weight management programs is expected to propel the demand for dietary supplements in the forthcoming years.

## **Digital Health**

Digital Health Market size was valued at \$86.4 billion in 2018 and is expected to witness approximately 29.6% CAGR from 2019 to 2025 and is projected to reach \$504 billion.

Digital health is the convergence of digital technologies with health, healthcare, living, and society to enhance the efficiency of healthcare delivery and make medicine more personalized and precise.

Rapid technological advancements in healthcare IT such as cloud-based storage system and increasing adoption of smartphones and tablets by healthcare professionals to track and monitor patient health and history is major factor driving the market growth.

Rising developments in healthcare IT along with favorable government regulations has largely encouraged the adoption of various healthcare IT solutions such as electronic medical records, e-prescribing systems, remote patient monitoring, and wearable medical devices. Such factors will boost global market growth.

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## **ePharmacy**

The global ePharmacy market size was valued at \$49 billion in 2018 and is projected to reach \$177 billion by 2026.

Increased internet penetration across the world, improved healthcare infrastructure, rapid aging of the population, and increasing awareness pertaining to ecommerce amongst users are some of the factors propelling growth. Shift in consumer behavior with an increased demand for convenience is also one of the key factors contributing to the market growth. Furthermore, rising adoption of ecommerce and digital technologies in healthcare sector is expected to propel growth.

## **Healthcare**

The National healthcare spending is projected to grow to \$3.6 trillion in 2019, up 4% from \$3.5 trillion in 2018, according to new predictions from Fitch Solutions. The analysis predicts U.S. pharmaceutical spending will grow 2.5% to \$370.7 billion.

The global healthcare market reached a value of nearly \$8 trillion in 2018, having grown at a compound annual growth rate (CAGR) of 7.3% since 2014, and is expected to grow at a CAGR of 8.9% to nearly \$11 trillion by 2022.

Growth in the historic period resulted from the rapid growth in the elderly population, strong economic growth in emerging markets, decline in oil prices, and health insurance reforms globally. Factors that negatively affected growth in the historic period were low healthcare access, shortages

Going forward, faster economic growth, technological developments and the increasing prevalence of diseases due to rising busy and sedentary lifestyles will drive the growth

## **Health and Medical Insurance**

The Health & Medical Insurance industry market size in the United States was \$1 trillion in 2019 and projected to reach \$1.1 trillion in 2020. The global health insurance market was valued at \$3 Trillion in 2018, and is estimated to reach \$4,475 trillion by 2026, registering a CAGR of 4.4% from 2019 to 2026.

Health insurance provides the policyholders with financial coverage for medical expenses, including the routine of health examinations, unforeseen illnesses or injuries, inpatient & outpatient surgery, specialist referral visits, and prescription medications of insured people. health insurance provides compensation for such medical expenses that may incur, owing to sickness or injury to the insured people in exchange for a monthly premium or a payroll tax to provide the Health benefits.

Health insurance provides coverage to quick suffering diseases with a minimum premium amount. Various governments across the globe provide subsidies for people who cannot afford to pay the premium for health insurance. However, some public health insurance providers do not cover expensive diseases such as cancer and dental recovery. Increase in the prevalence of chronic diseases such as cardiovascular disease, cancer and diabetes boost the growth of the global health insurance market. In addition, the major factor that drives the growth of the market includes rise in Health expenses.

## **Healthcare Technology**

Global Healthcare Information Technology (HCIT) Market Size was at USD 125 Billion in 2015, and is Estimated to Reach USD \$297 Billion by 2022, With a CAGR of 13.2%.

Healthcare technology refers to any IT tools or software designed to boost hospital and administrative productivity, give new insights into medicines and treatments, or improve the overall quality of care provided. Today's healthcare industry is a \$2 trillion behemoth at a crossroads.

## **Life Sciences**

The life science analytics market was \$19.3 billion in 2019 and is projected to reach \$33.2 billion by 2024, at a CAGR of 11.5% during the forecast period.

With advanced analytics, healthcare institutes can derive clinically meaningful outcomes through investigational mining of electronic patient records. This will aid in identifying medical inaccuracies in the database to offer cost-effective treatments to patients while reducing wastage of resources

Growth in this market is mainly driven by technological advancements, big data in the life science industry, growing adoption of analytics solutions in clinical trials, increasing adoption of analytics for sales and marketing applications, the need for improved data standardization, increasing prevalence of chronic diseases, growing pressure to curb healthcare spending, and the need for improved patient outcomes.



Life Sciences include companies in the fields of biotechnology, pharmaceuticals, biomedical technologies, life systems technologies, nutraceuticals, cosmeceuticals, food processing, environmental, biomedical devices, and organizations and institutions that devote the majority of their efforts in the various stages of research, development, technology transfer and commercialization. More generally Life Sciences' are defined as all sciences that have to do with 'organisms', like plants, animals and human beings.

Increase in penetration of analytics in life sciences owing to growing demand for analytics-driven decision making and rise in number of collaborations has also contributed to market growth. Growing awareness about the impact of digitalization in the value chain of various pharmaceutical, medical devices, and research centers is also expected to drive growth over the forecast period.

Increasing adoption of analytical solutions for various applications in pharma companies such as clinical trials, sales and marketing, and risk management is further expected to boost the market. Usage of big data in this sector is expected to increase owing to rising need to reduce healthcare expenditure and maintain standardization in various internal processes, while also accommodating variation in regulatory needs.

Across the globe, healthcare professionals and key players are undertaking efforts to provide high-quality services at low costs with minimum medical errors. Growth in government spending in the healthcare sector is responsible for ongoing developments in the industry.

In 2015, healthcare expenditure in U.S. was USD 3.2 trillion, which is 2.4 times higher than the global average. This number is expected to increase by 68.0% over the next 10 years, which in turn, is expected to boost healthcare infrastructure and life science analytics.

Increase in demand for real-time monitoring among various end users such as medical device and pharmaceutical companies as well as research centers will create new opportunities for analytics to gain insightful clinical outcomes.

## **Opioid**

The global opioids market size was valued at \$25.4 billion in 2018 and is projected to reach \$29.8 billion by 2023. Increasing prevalence of diseases that cause chronic pain, such as cancer, postsurgical pain, lower back pain, fibromyalgia, and arthritis, is driving the market.

The global opioids market growth is driven by alarming increase in incidence of orthopedic diseases & chronic pain. Furthermore, rise in disposable income and surge in global geriatric population are expected to propel the growth of the global opioids market.

Opioids are naturally occurring, synthetic or semi-synthetic compound that bind to opioid receptors and activate them. These receptors are present throughout the central nervous system of the human body and block the pain signals sent from the brain to the other parts of the body and release larger amounts of dopamine in the body. Opioids reduce the intensity of pain and are generally safe when taken as prescribed by the healthcare professional for shorter duration. Opioids are majorly used to treat pain associated with rheumatic diseases, cancer, anxiety or sleep disorders, and severe pain related to coughing & diarrhea. Since opioids effectively relieves chronic pain, the risk of addiction is high in the individuals. Although opioids serve as a cost-effective solution for patients suffering from low back pain, cancer pain, and others, its addictive nature has led to drug misuse. Opioid consumption can have major side effects including confusion, drowsiness, constipation, nausea, slowed breathing, and euphoria. .

Once extensively stigmatized, medical marijuana is now projected as the possible antidote to the epidemic that has led to two-thirds of deaths annually in U.S. Recent studies have observed a substantial decrease in both overdose deaths and drug abuse from prescription painkillers in states where marijuana has been legalized. Pharma and biotech companies believe that medical marijuana products will become the prevailing opioid substitute for chronic pain management and provide a wide variety of other beneficial therapies.

## **Pain Management**

The Global Pain Management Drugs Market was \$58 billion in 2016 and projected to reach \$77 billion by 2023. It is anticipated to register a CAGR of 4% during the forecast period, 2017-2023.

Pain is a distressing sensory and emotional feeling, which occurs due to tissue damage or illness. In addition, various diseases, such as multiple sclerosis, osteoarthritis, stomach ulcer, chronic arthritis, fibromyalgia, diabetic neuropathy, and cancer can cause pain. The duration of pain varies from short term known as acute pain to long term referred as chronic pain. Acute pain is a sudden onset of pain, whereas chronic pain occurs due to aging conditions of bone & joints, nerve damage, or injury. The management of pain involves reduction or treatment of pain using a particular set of drugs. Various drugs are available which provide pain relief through a variety of physiological mechanism, such as by targeting the nociceptors.

## **Pharmacies & Drug Stores**

The market size, measured by revenue, of the Pharmacies & Drug Stores industry is \$318 billion in 2020.

The Pharmacies and Drug Stores industry is comprised of operators that retail a range of prescription and over-the-counter medications, health and beauty items, toiletries and consumable goods directly to consumers on a walk-in basis. The rise in the number of individuals aged 65 and over, in tandem with increases in spending on prescription medication, is expected to lead to revenue growth.

## **SaaS – Software as a service**

The global software as a service (SaaS) market for business applications was \$44.4 billion in 2017 and projected to grow to a total \$94.9 at a compound annual growth rate (CAGR) of 16.4% from 2017 to 2022.

Software as a service is a software licensing and delivery model in which software is licensed on a subscription basis and is centrally hosted. It is sometimes referred to as "on-demand software", and was formerly referred to as "software plus services"

## **Telemedicine**

The global telemedicine market was estimated to be \$41.4 billion in 2019 and is expected to reach \$155.1 billion by 2027, expanding at a CAGR of 15.1% over the forecast period.

- Increasing incidences of chronic conditions and rising demand for self-care medicines are the key factors driving the market.
- The software telemedicine segment is expected to witness significant growth over the forecast period.
- Integration of Artificial Intelligence (AI) are the key factors driving the market growth over the forecast period.

Telemedicine solutions hold great opportunity as they help in improving clinical management, reduce variations in diagnosis, and make effective care delivery by enhancing quality and access to healthcare services.

Sudden global outbreak of corona virus is expected to boost the usage of telemedicine as these solutions help caregivers to communicate effectively with their patients during pandemic and provide better solutions to their health concerns. Owing to social distancing implemented by various countries around the world, virtual care delivery is stepping up as an effective solution for safe and better communication. The WHO mentioned telemedicine as one of the essential services in the policy to respond to the COVID-19 emergency.

Increased pressure to improve quality of care and reduce burden on medical professionals is expected to boost the adoption of telemedicine over the forecast period. Telemedicine is considered as the most versatile technology available to deliver health education, health information, and health care at a

distance. Through various technologies, advanced patient centered care and increased access to remote locations has become possible.

### **Delivery Model Insights**

Web/mobile based delivery model is expected to witness significant growth in coming years as it offers direct access to care delivery solutions. This segment is further categorized into telephonic and visualized access to the care. Telephonic care delivery dominated the market owing to its benefits such as cost-effectiveness and ease of operation. In addition, rising smartphone penetration and disposable income are augmenting the segment growth.

On the other hand, increasing awareness among users regarding telemedicine, introduction of technologically advanced solutions, and penetration of cloud-based solutions are anticipated to boost the adoption of visualized care delivery solution in coming years. Rising need for immediate medical assistance to patients located in remote locations is fueling the adoption of video conferencing telemedicine solutions.

### **Impact Investing**

Impact investing refers to investments "made into companies, organizations, and funds with the intention to generate a measurable, beneficial social or environmental impact alongside a financial return". Impact investments provide capital to address social and/or environmental issues.

### **Medical Marijuana Registry**

Data registries typically focus on patients who share a common reason for needing health care.

- Example: California Registry Database – California Department of Public Health's (CDPH) Medical Marijuana Identification Card Program (MMICP)
- The California Department of Public Health's (CDPH) Medical Marijuana Identification Card Program (MMICP) was established to create a state-authorized medical marijuana identification card (MMIC), along with a registry database for verification of qualified patients and their primary caregivers. Participation by patients and primary caregivers in this MMICP is voluntary. The MMICP web-based registry allows law enforcement and the public to verify the validity of a qualified patient or primary caregiver's MMICP as authorization to possess, grow, transport, and/or use medical marijuana within California.

### **Office of Addiction Services and Supports – New York State**

The Office of Addiction Services and Supports (OASAS) oversees one of the nation's largest addiction services systems with approximately 1,600 prevention, treatment and recovery programs. OASAS chemical dependence treatment programs have an average daily enrollment of nearly 100,000 people and serve approximately 234,000 individuals every year. This includes the direct operation of 12 Addiction Treatment Centers, which serve around 8,000 persons per year. OASAS is the single designated state agency responsible for the coordination of state-federal relations in the area of addiction services. Our mission is to improve the lives of New Yorkers by leading a comprehensive premier system of addiction services for prevention, treatment, and recovery.

Our vision is a future where New York State is alcohol-safe and free from chemical dependence and compulsive gambling.

### **Office of Mental Health – New York State**

New York State has a large, multi-faceted mental health system that serves more than 700,000 individuals each year. The Office of Mental Health (OMH) operates psychiatric centers across the State. OMH also regulates, certifies and oversees more than 4,500 programs, operated by local governments and nonprofit agencies. These programs include various inpatient and outpatient programs, emergency, community support, residential and family care programs.

## **Pain Management**

Pain is a distressing sensory and emotional feeling, which occurs due to tissue damage or illness. In addition, various diseases, such as multiple sclerosis, osteoarthritis, stomach ulcer, chronic arthritis, fibromyalgia, diabetic neuropathy, and cancer can cause pain. The duration of pain varies from short term known as acute pain to long term referred as chronic pain. Acute pain is a sudden onset of pain, whereas chronic pain occurs due to aging conditions of bone & joints, nerve damage, or injury. The management of pain involves reduction or treatment of pain using a particular set of drugs. Various drugs are available which provide pain relief through a variety of physiological mechanism, such as by targeting the nociceptors.

## **Pharmacy Benefit Manager**

PBMs are third-party administrators that provide healthcare management and administration services to insurance companies, Medicare Part D plans, state government employee plans, and corporations.

Pharmacy benefit manager (PBM) In the United States, a pharmacy benefit manager (PBM) is a third-party administrator of prescription drug programs for commercial health plans, self-insured employer plans, Medicare Part D plans, the Federal Employees Health Benefits Program, and state government employee plans. According to the American Pharmacists Association, "PBMs are primarily responsible for developing and maintaining the formulary, contracting with pharmacies, negotiating discounts and rebates with drug manufacturers, and processing and paying prescription drug claims. For the most part, they work with self-insured companies and government programs striving to maintain or reduce the pharmacy expenditures of the plan while concurrently trying to improve health care outcomes." PBMs operate inside of integrated healthcare systems (e.g., Kaiser Permanente or Veterans Health Administration), as part of retail pharmacies (e.g., CVS Pharmacy or Rite-Aid), and as part of insurance companies (e.g., UnitedHealth Group).

As of 2016, PBMs managed pharmacy benefits for 266 million Americans. In 2017, the largest PBMs had higher revenue than the largest pharmaceutical manufacturers, indicating their increasingly large role in healthcare in the United States. However, in 2016 there were fewer than 30 major PBM companies in this category in the US, and three major PBMs (Express Scripts, CVS Health, and OptumRx of UnitedHealth Group) comprise 78% of the market and cover 180 million enrollees.

## **Pharmacoeconomics**

Pharmacoeconomics refers to the scientific discipline that compares the value of one pharmaceutical drug or drug therapy to another. It is a sub-discipline of health economics. A pharmacoeconomic study evaluates the cost (expressed in monetary terms) and effects (expressed in terms of monetary value, efficacy or enhanced quality of life) of a pharmaceutical product. Pharmacoeconomic studies serve to guide optimal healthcare resource allocation, in a standardized and scientifically grounded manner.

## **Prescribe**

To write or give medical prescriptions. Prescribes (of a medical practitioner) advise and authorize the use of (a medicine or treatment) for someone, especially in writing.

## **Public Benefits Corporation Delaware**

On August 1, 2013, the Delaware legislature added a potentially important new subchapter to the General Corporation Law, allowing corporations to elect to be formed as, or convert to, a public benefit corporation (PBC) (Subchapter XV of Chapter 1, Title 8 of the Delaware Code). What are the requirements for becoming a PBC? And why would a corporation choose to become one?

Background (for Non-Delaware PBCs)

Traditionally, directors of corporations have had a fiduciary duty to maximize stockholder value in making decisions. However, PBCs, or social purpose corporations as they are known in some jurisdictions, permit a corporation's directors to also take into account the social purposes of their actions. PBCs are typically

required to pursue a general public benefit and make available to the public an annual report measuring their performance in meeting their social goals.

#### Delaware PBCs

Delaware's PBC statute differs from the traditional model in key aspects. Delaware PBCs are required to state a specific public benefit, which means "a positive effect (or reduction of negative effects) on one or more categories of persons, entities, communities or interests (other than stockholders in their capacities as stockholders) including, but not limited to, effects of an artistic, charitable, cultural, economic, educational, environmental, literary, medical, religious, scientific or technological nature." Such specific benefit must be identified in the charter of the entity. A PBC's name must include the words "public benefit corporation" or the designation "PBC" or "P.B.C." Stockholder notices and stock certificates, if any, must also clearly identify the entity's PBC status.

Subject to the above requirements, Delaware corporations may be formed as, or convert to, PBCs. Prior to converting, established Delaware corporations must obtain the approval of at least 90% of the outstanding shares of each class of stock of such corporation, whether voting or nonvoting, but PBCs need only a 66 2/3% vote to terminate their status.

Unlike the public annual reports typically required of PBCs outside Delaware, a Delaware PBC must provide only its stockholders with a statement regarding the progress of its social goals at least once every two years. PBCs may elect to use a third-party standard or certification to address how they have met their goals, instead of the mandatory third-party certification in other jurisdictions.

Directors of a PBC have a duty to balance the pecuniary interests of the stockholders, the best interests of those materially affected by the PBC's conduct and the specific public benefit identified in the PBC's charter. Delaware addressed the potential liability regarding these duties by allowing only stockholders holding at least 2 percent of the PBC's shares or, if a corporation is publicly traded, at least \$2,000,000 in market value to maintain a derivative lawsuit for breach of such duties. A director will be deemed to have met his or her fiduciary duties if the director acted in a manner that is "informed and disinterested and not such that no person of ordinary, sound judgment would approve." In addition, the PBC charter may include a provision that any disinterested failure to satisfy such duties will not constitute an act or omission not in good faith or a breach of the duty of loyalty.

#### Candidates for PBC Status

PBC status will be attractive to corporations that wish to pursue social good while also seeking profit for their stockholders. Entities without a clearly defined social benefit may not be interested in PBC status. In addition, publicly traded entities, even those with identifiable benefits to the public, may find the 90% stockholder approval threshold in Delaware too high a bar. However, private corporations that see social good as being complementary to, rather than at odds with, stockholder maximization may find PBC status an attractive option.

#### **Qualifying Medical Conditions - Cannabis**

Example: Defined by New Hampshire Department of Health and Human Services

As of August 27, 2017, the list of qualifying medical conditions for the therapeutic use of cannabis is established by law in RSA 126-X:1, IX(a), as follows.

"Qualifying medical condition" means "the presence of:

- (A) Cancer, glaucoma, positive status for human immunodeficiency virus, acquired immune deficiency syndrome, hepatitis C, amyotrophic lateral sclerosis, muscular dystrophy, Crohn's disease, multiple sclerosis, chronic pancreatitis, spinal cord injury or disease, traumatic brain injury, epilepsy, lupus, Parkinson's disease, Alzheimer's disease, ulcerative colitis, Ehlers-Danlos syndrome, or one or more injuries or conditions that has resulted in one or more qualifying

symptoms under subparagraph (B); AND

(B) A severely debilitating or terminal medical condition or its treatment that has produced at least one of the following: elevated intraocular pressure, cachexia, chemotherapy-induced anorexia, wasting syndrome, agitation of Alzheimer's disease, severe pain that has not responded to previously prescribed medication or surgical measures or for which other treatment options produced serious side effects, constant or severe nausea, moderate to severe vomiting, seizures, or severe, persistent muscle spasms;

OR

- "Qualifying medical condition" also means:
  - (A) Moderate to severe chronic pain.
  - (B) Severe pain that has not responded to previously prescribed medication or surgical measures or for which other treatment options produced serious side effects.
  - (C) Moderate or severe post-traumatic stress disorder.

### **Registry Data**

A clinical data registry records information about the health status of patients and the health care they receive over varying periods of time. Information from registries may also be used to compare the performance of healthcare providers with regard to their outcomes and resource use.

### **Software as a service (SaaS)**

Software as a service (SaaS) is a software distribution model in which a third-party provider hosts application and makes them available to customers over the Internet. SaaS is one of three main categories of cloud computing, alongside infrastructure as a service (IaaS) and platform as a service (PaaS).

#### **SaaS Pricing Models**

Customers licensing SaaS products pay for the product on a recurring basis. This provides options for pricing models and because the product is centrally hosted there is additional flexibility for offering product in unique packages.

- Flat-rate pricing is the most basic pricing model for SaaS companies. One price, one product, one set of features—every customer is on the exact same plan.

### **Therapeutic**

The branch of medicine concerned with the treatment of disease and the action of remedial agents.a treatment, therapy, or drug.

Therapeutic treatment is designed to treat an illness or to improve a person's health, rather than to prevent an illness.