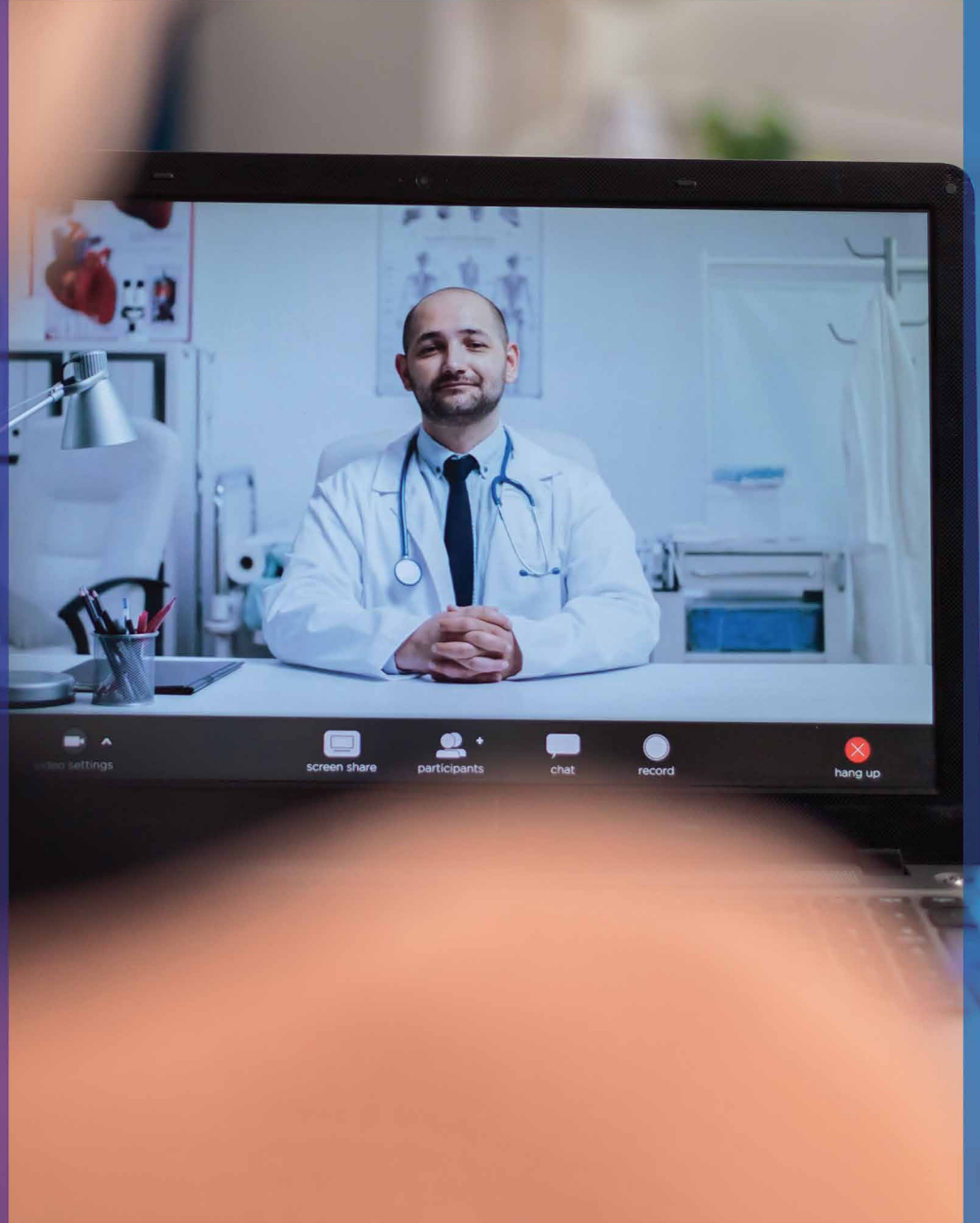




Health and Pharmaceuticals Sectoral Overview

2023



KPMG Turkey

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Preface

Dear stakeholders,

I am pleased to share with you our 'Healthcare and Pharmaceutical Sector Overview' report, which includes our local and global assessments of the healthcare and pharmaceutical industry. The healthcare and pharmaceutical industry in Turkey, being one of the significant sectors, contributes to the country's development through its innovation power, export potential, and employment opportunities, and plays a central role in national health policies and public access to healthcare services. Global health crises, aging populations, the increase in chronic diseases, and technological advancements have rapidly evolved the healthcare and pharmaceutical industry while bringing new challenges in the areas of research and development, production processes, and supply chains. Change has become inevitable for the healthcare and pharmaceutical industry, and embracing this change to produce innovative solutions has become a necessity.

With the pandemic, the role of the industry in national and global health systems has become even more important. During this period, we have seen investments in Turkey in the areas of pharmaceutical production and supply, as well as in biotechnological products and vaccine development. This proactive approach during times of crisis has also proven that the sector has been built on solid foundations.

Our report addresses the opportunities and potential challenges that the pharmaceutical sector in Turkey may face in this challenging environment. It covers a wide range of topics closely related to the sector, from research and development activities to regulations, marketing strategies, and patient-centered approaches. In the healthcare sector, the use of artificial intelligence and big data has the potential to revolutionize many areas, from clinical research to patient monitoring. The development of health technologies, the proliferation of digital health solutions, and the emergence of personalized medication treatments are among the exciting innovations featured in our report. Sustainability and technology in the sector are discussed, and international tax developments that indirectly affect the sector are also evaluated.

We hope that our report, which includes forecasts about the future of the healthcare and pharmaceutical sector and covers significant developments in the industry, will be beneficial for all stakeholders of the healthcare and pharmaceutical sector. I wish you a good read.

Başak Diclehan
KPMG Turkey
Health and Pharmaceutical
Sector Leader,
Partner





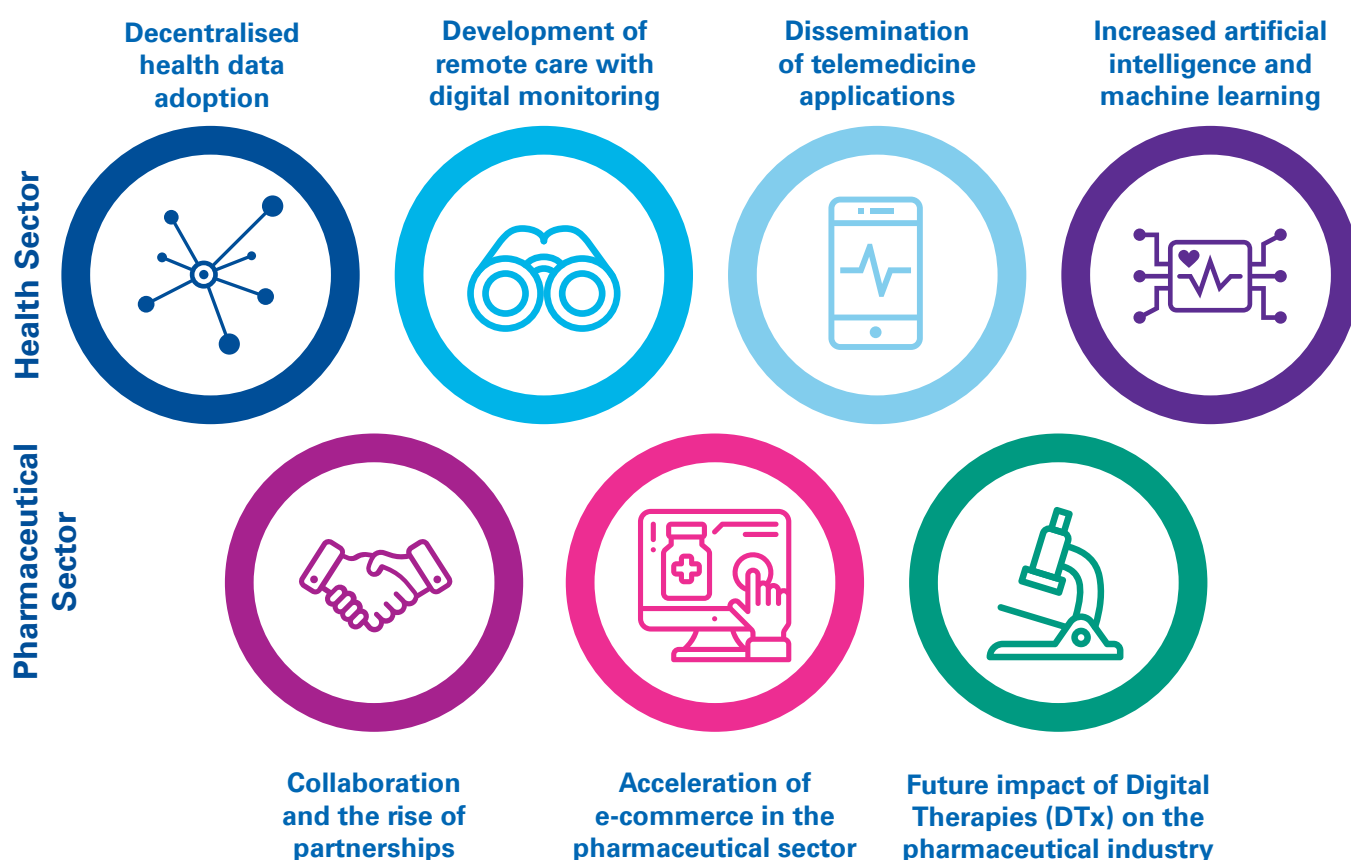
Emerging Trends in the Health and Pharmaceutical Sector

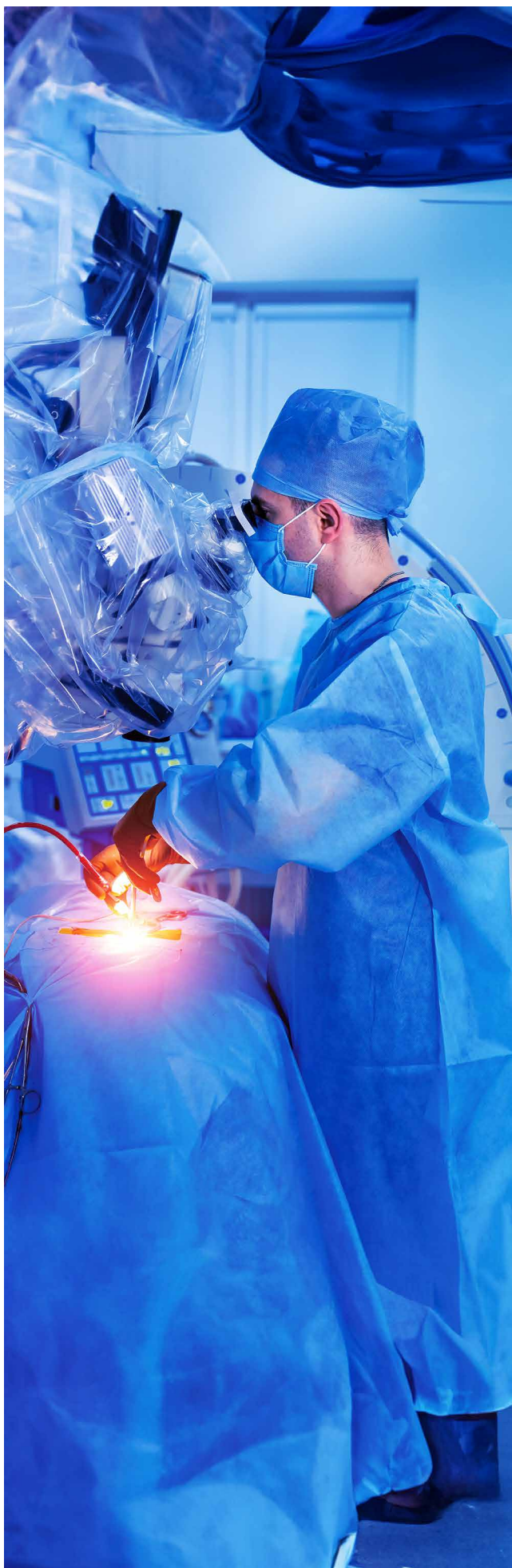
In recent years, the health and pharmaceutical sector has been undergoing a significant transformation with advances in technology, the proliferation of data, the rise of remote care, changing consumer behaviours, the COVID-19 pandemic, and the entry of new players.

As part of this transformation, innovative business models that can add value to both patients and health systems emerge as companies try to adapt to changing market conditions.

In order to remain competitive and meet the needs of patients, pharmaceutical companies are evaluating new ways of working, such as developing innovative partnerships, investing in digital technologies, and focusing on a patient-centred approach.

Another innovation in the health and pharmaceutical sector is the use of digital technologies to improve patient outcomes. Health and pharmaceutical companies require wearable devices and patients to receive care from the comfort of their own homes is investing in telemedicine platforms. Healthcare and pharmaceutical companies can reduce costs while improving patient outcomes by using digital tools to monitor patient health and track treatment progress.





Healthcare sector

Adoption of decentralized health data

One of the prominent trends in the health sector is the change of perspective on the management of health data. As the first example of the transformation of business models in the health industry, we see the transition to a new business model where the centralization of health data is abandoned and decentralized health data is adopted. Individuals and the explosion in health data produced by healthcare organizations creates opportunities for decentralized health data models.

Personal online data repositories (PODS) are emerging as a secure, private, and user-controlled way to store health data from multiple sources. PODS enables individuals to own and manage health data, while allowing healthcare providers to access it in a secure and interoperable way.

Emerging decentralized autonomous organizations (DAOs) also allow virtual communities to collect their data in a pool and democratic control of how data is used. This model creates new opportunities for research, personalized care, and the conversion of data into income.

Development of remote care with digital monitoring

Another trend, remote care, is transforming the way healthcare is delivered and foreshadows that a significant portion of care will be moved out of hospitals in the near future. Virtual care units, wearable and implantable monitors and virtual assistants are emerging as essential technologies that enable remote care. Along with these, web-based or mobile applications are widely used for remote monitoring. For example, diabetics can upload data such as food records, blood glucose levels, and medication information using an app, which can then be reviewed and guided by a nurse.

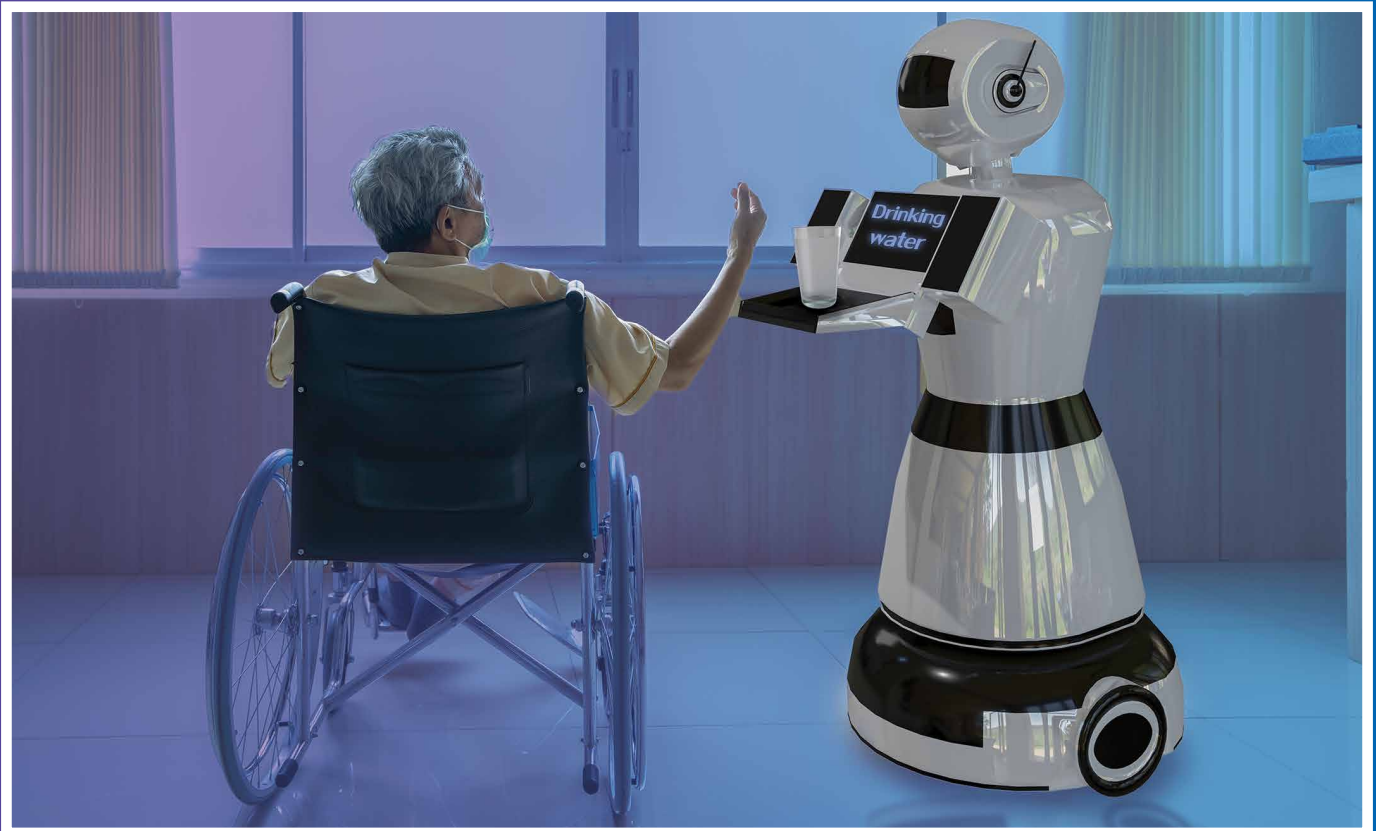
Similarly, devices such as blood pressure monitors, blood glucose meters, and pulse oximeters can send data wirelessly to healthcare providers, allowing them to monitor patients' health in real time. These technologies create opportunities for providers to deliver more efficient and effective care, while improving patients' health outcomes. The rise of virtual and augmented reality tools, digital platforms, and tactile technology are also creating new opportunities for remote maintenance and virtual examinations.

Digital monitoring technologies are used around the world to improve patient care and outcomes. In the United States, for example, the Centres for Medicare & Medicaid Services (CMS) have been expanding the scope of remote patient monitoring services since 2018, leading to greater adoption of digital monitoring technologies by healthcare providers.

The spread of telemedicine applications

Telemedicine and medical consultation, one of the new business models in the healthcare industry that use technology to improve patient care and outcomes, allow treatment to be provided remotely. Telemedicine is a new business model that involves providing medical consultations and treatment remotely using technologies such as video conferencing, messaging, and other digital channels. Individuals have the opportunity to access healthcare services in the comfort of their own homes and receive healthcare services without the need to go to the doctor's office or hospital for a face-to-face consultation.

Telemedicine has become increasingly popular in recent years, especially during the COVID-19 pandemic, when many patients were hesitant to visit healthcare facilities in person. It has been particularly useful for patients with chronic conditions who need regular check-ups or monitoring, and for those living in remote or underserved areas without easy access to medical facilities. Telemedicine offers a variety of opportunities for healthcare providers, including improving efficiency, reducing costs, and providing access to a larger patient pool.



Increase of Artificial Intelligence (AI) and Machine Learning (ML)

In addition to telemedicine and digital monitoring technologies, the use of AI and machine learning is becoming increasingly prevalent in the healthcare industry, particularly in the areas of drug discovery, personalized medicine, and operational efficiency. Artificial intelligence and machine learning are helping to identify drug targets, predict drug efficacy and safety, and optimize clinical studies.

They can also analyse a patient's genetic and clinical data to determine the most effective treatments and improve patient outcomes. Additionally, AI and ML can be used to predict patient demand, optimize staffing levels, and reduce wait times. These technologies will become an integral part of the healthcare industry and create opportunities for businesses that offer artificial intelligence and machine learning-based solutions.



Pharmaceutical Sector

Collaboration and the rise of partnerships

Collaboration and partnerships in the pharmaceutical industry are expected to become increasingly important in the coming years. Pharmaceutical companies can leverage their strengths and expertise to bring new products and services to market by partnering with other organizations. For example, collaborations between pharmaceutical companies and technology firms have led to the development of new digital health solutions, while partnerships with patient advocacy groups have helped ensure that new treatments meet patients' needs.

Under the open innovation model, which involves partnering with external organizations to accelerate drug discovery and development, pharmaceutical companies are now collaborating with external partners to develop new compositions and treatments to improve efficiency and reduce costs in the drug discovery process, finding only their own research and development efforts insufficient to bring new drugs to market. This model has proven successful in the development of COVID-19 vaccines and is likely to become more prevalent in the industry as a whole. Many pharmaceutical companies have also been successful with this model. For example, while GlaxoSmithKline (GSK) collaborated with a small biotech company to develop a new drug for respiratory diseases, AstraZeneca worked with a university to discover a new compound for the treatment of cancer. These partnerships have enabled companies to utilise external expertise and resources, leading to the development of new medicines that would not have been possible through in-house research efforts alone.

Acceleration of e-commerce in the pharmaceutical sector.

Another important transformation is taking place in pharmaceutical e-commerce. E-commerce already has a significant impact on pharmacies and COVID-19 has further accelerated the development of pharmaceutical e-commerce. E-commerce eliminates the need for face-to-face visits to the pharmacy by providing patients with convenient and accessible way to prescriptions that can be delivered directly to their door. Furthermore, e-commerce has the potential to create a more competitive market and lower drug prices. Moreover, patient engagement will be positively impacted by e-commerce.

E-commerce platforms can use digital tools and analytics to provide patients with personalized recommendations and support, which can improve drug adherence and overall health outcomes. As technology continues to advance, the e-commerce industry will continue to evolve and deliver innovative solutions that transform the healthcare industry. Although not yet in Turkey, the pharmaceutical e-commerce industry will improve the patient experience and benefit healthcare providers by offering solutions that speed up patients' access to medicines at a lower cost.

Digital Therapies in the Future (DTx) impact on the pharmaceutical industry

Digital Therapies (DTx), empowered by the latest medical advances, wearable devices, technology platforms, data collection and artificial intelligence-powered real-time analytics, is rapidly changing how pharmaceutical companies and healthcare providers deliver and customize healthcare and close significant gaps. Digital Therapies (DTx) are expected to become globally widespread by 2027 and grow the market volume. The pharmaceutical industry needs to optimise this potential and adapt to new technologies. Furthermore, governments are making DTx more of a focal point for mixed care.

Other examples include the German Federal Ministry of Health and NHS England, which see DTx as an integral part of tomorrow's digital health process. Successful DT examples include companies such as Omada Health, Virta Health, Kai Health® and HelloBetter? DTx offers opportunities to close industry blind spots and underserved areas throughout the disease and create new revenue streams. This is a true win-win scenario for both patients and continued business success. Building a solid digital infrastructure today is essential for the future long-term sustainability of the pharmaceutical industry.



As a result, the healthcare and pharmaceutical industry must embrace transformation to remain competitive in an increasingly complex and dynamic market. Industry trends create opportunities for innovative business models that can provide value to both patients and healthcare systems. Pharmaceutical companies can deliver better outcomes for patients and also drive innovation and growth by embracing new business models, investing in digital technologies, and focusing on collaboration and partnerships.

Decentralized health data, remote care and new participants are transforming the healthcare landscape; Companies that can adapt to these changes will have a competitive advantage in the industry in the coming years.



The Digital Health and Pharmaceutical Age: Digitalization, Wearable Technologies, and Big Data in the Industry

The health and pharmaceutical sector continue to grow with the development of digital technologies in the world. Global health expenditures are expected to reach \$11.3 trillion dollars in 2025, while the pharmaceutical market is expected to reach \$1.5 trillion dollars. The age of digital health and medicine, as well as the growth of the market, has the potential to revolutionize healthcare. Digitalization in the industry offers benefits such as wearable technologies and big data, faster and accurate diagnoses, personalized treatments, and improved quality of life for patients. The most prominent digital health opportunities in the world are listed as follows:

- **Electronic Health Records (EHR):** EHR systems allow patients to store and share their medical information digitally. These systems provide easy access to patients' past treatments, medications, and medical conditions. The use of EHRs helps reduce medical errors, accelerate patients' treatment processes, and improve the overall quality of health care. In the USA, while the use of hospital EHR systems was 9.4% in 2008, this rate increased to 96% in 2017.

- **Telemedicine:** Telemedicine removes the spatial limitations of patients and healthcare professionals by providing remote healthcare services. Thanks to digital technologies, patients can communicate with doctors through video conferences and get their prescriptions online. While the value of the global telemedicine market was 45.5 billion dollars in 2019, it is expected to reach 175.5 billion dollars by 2026.

- **Activity Trackers and Smartwatches:** Activity trackers and smartwatches allow users to track heart rate, sleep quality, step count, and other health data. These devices increase health awareness by helping to guide lifestyle changes.

- **Biosensors and Medical Wearables:** Biosensors and medical wearables provide continuous health monitoring, allowing patients and doctors to access real-time medical data. These technologies help individuals with chronic diseases to better manage their condition and to diagnose diseases quickly thanks to early warning systems. While the market size of wearable devices used for health and fitness monitoring was \$29.6 billion in 2019, this figure is expected to increase to \$84.4 billion by the end of 2023.

- **Data Analytics and Artificial Intelligence:** The healthcare industry is experiencing an exponentially increasing data explosion every second. Each recorded data is combined to form the big data. Today, approximately 30% of the world's data volume is produced by the health sector. In 2025, this volume is expected to increase to 36%. Big data analytics and artificial intelligence play an important role in the healthcare industry.

Analysing large datasets allows for a better understanding of diseases, optimization of treatment processes, and the development of personalized medicine. Artificial intelligence can speed up diagnostic processes, improve disease predictions, and improve the quality of healthcare.

- **Genomic Data and Personalized Medicine:** Genomic data is based on the processing of individual genetic information with big data analytics and artificial intelligence. This information is intended for patients help develop personalized treatment plans and diagnose diseases earlier. Genomic data has great potential in areas such as cancer treatment and management of rare diseases.

- **Augmented Reality (AR) & Virtual Reality (VR) & Metaverse:** AR technology adds digital layers to the real-world environment, allowing the user to have a richer experience. AR technology can be used in many areas in the health sector, such as pre-surgical simulations, medical device use training, and doctors' examination of patients' conditions. For example, a doctor examines the patient's MRI or CT scans using AR technology and thus has a chance to make a more accurate diagnosis. VR technology provides the user with a highly interactive experience in a fully digital world.

VR technology can be used in the health sector in areas such as stress, anxiety, and pain management. For example, a patient can learn to relax and reduce stress using VR technology before surgery. Metaverse, on the other hand, is a term that refers to virtual worlds and is also used in the health sector. The metaverse allows healthcare providers to bring patients together in virtual environments. This can be useful for the delivery of remote health services, especially in pandemic conditions. The metaverse can also be used in areas such as medical education, research, and development. While the market size of virtual reality and augmented reality technologies in the health sector was 2.07 billion in 2019, it is expected to reach 30.7 billion dollars by 2026.

In addition to all digital technology developments in the world, the first three digital technology proposals that can be invested in the near term for health sector companies in Turkey are listed below:

1. Telemedicine: By providing accessible health services for a large part of the population in Turkey, people living in both rural and urban areas can be reached. In addition, telemedicine can play a critical role in situations such as the COVID-19 pandemic. Telemedicine services can be developed in the medium / long-term using AR & VR and Metaverse technologies.

2. Artificial intelligence and Machine Learning: AI-based algorithms can be used in the early diagnosis of diseases and the creation of personalized treatment plans. Furthermore, AI can save time and cost in the analysis of medical imaging and laboratory results. Health sector players in Turkey can achieve better outcomes for patients and improve the overall efficiency of health services by investing in AI and machine learning applications.

3. Wearable health technologies and IoT (Internet of Things): Patients' health status can be better monitored by investing in wearable devices and IoT technologies. These technologies also enable patients to manage their health status and improve healthcare providers' treatment plans by providing personalized health services more effectively.

Although digital transformation offers many opportunities both in the world and in Turkey, there are challenges to be overcome for the health and pharmaceutical sector:

• **Misalignment of actors:** Healthcare is delivered through complex ecosystems of providers such as hospital networks, primary and secondary care practices, as well as public and private payers, manufacturers in the life sciences sector, and most importantly, consumers and citizens. The interests of these actors are not always aligned, and consumers in particular often make decisions without full information and advice from their healthcare providers.



• **Weak markets:** Healthcare markets operate differently from other sectors. Consumers are protected from market constraints by price signals through a complex set of regulations and payer mechanisms. Payers, on the other hand, manage the growth in health expenditure through access and eligibility policies and other mechanisms such as how services are reimbursed. These regulatory and contractual responses to weak markets limit the speed, diffusion and sustainability of innovation and transformation efforts in health systems.

• **Payment for activity, not for value:** Financing and reimbursement systems use access and eligibility criteria to determine which services are to be reimbursed or prospectively commissioned. Certainty and stability in these mechanisms are important for markets to function effectively and efficiently. It also has the negative effect of creating rigidity in the range of services offered by providers and can restrict providers' agility and responsiveness. As a result, changes in the way services are funded can be a powerful driver for transformation in healthcare.

• **Accountability:** Despite a shared commitment to placing consumers at the centre of care, meaningful accountability for medium- and long-term care outcomes remains challenging for healthcare providers, the key reason for this is that payment models incentivize treatment rather than prevention or more efficient, lower-cost models of care.

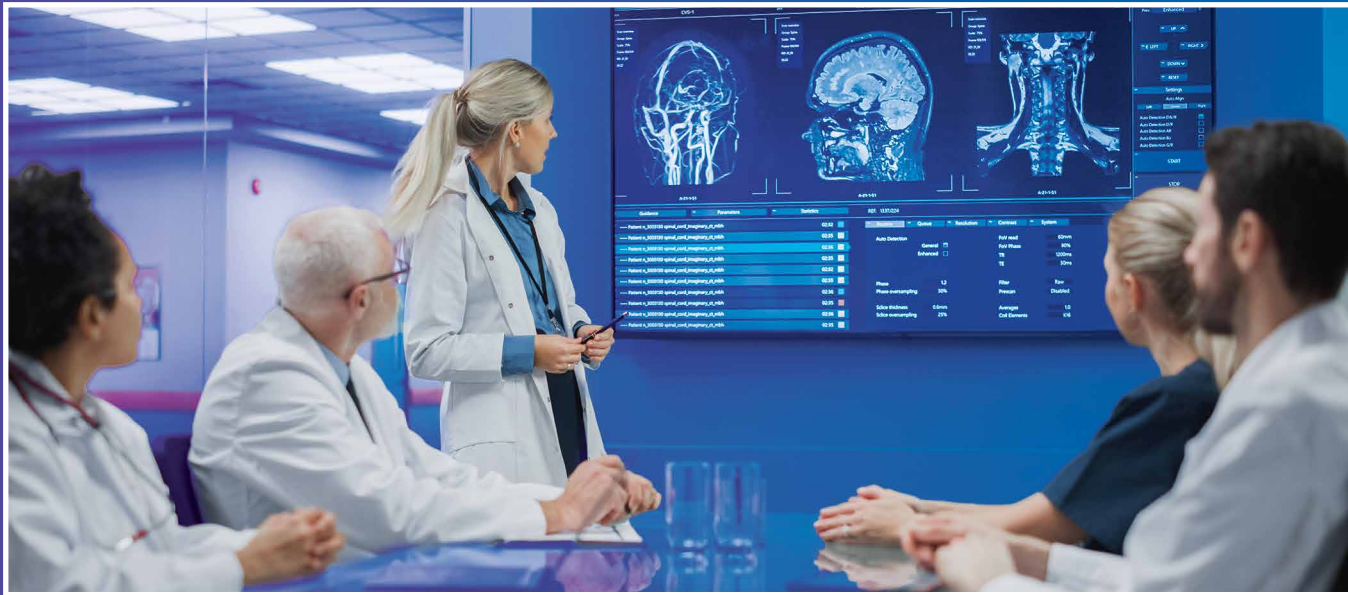


To meet these challenges, digitally enabled transformation in healthcare requires bringing together various elements to achieve new levels of value and continuous innovation. It offers tools, methods and recommendations to transform healthcare for a new era of services, results and return on investment, focusing on the following eight main capabilities to create the right strategy and roadmap for the digital transformation of the healthcare and pharmaceutical industry:

1. The future will be data-driven and unified.
2. Service innovation needs will evolve.
3. The health consumer will be at the centre of services.
4. There will be seamless interactions between evolving ecosystems.
5. Solutions to supply chain obstacles will be found.
6. A modern mindset will emerge among leaders and the workforce.
7. A new age of game-changing technology will emerge.
8. Innovative partnerships will add real value.

The need for speed in health, medicine and treatment services after global pandemics and disasters, and the need for psychological support experienced by people in remote / hybrid working models, have made the digitalization of the healthcare sector in the world more critical than other sectors and gained great momentum. In Turkey, the digital health information infrastructure transformation initiated by the Ministry of Health 10 years ago plays a locomotive role in the transformation of the sector. Creating rich ecosystems, especially with startups in the healthcare field, so that corporate players of the healthcare industry can offer new business models will increase the value and inclusiveness of the services offered to patients.

As KPMG, we believe that with the development of big data and artificial intelligence, wearable and swallowable technologies, AR/VR - Metaverse supported remote treatment and examination services, innovative digital health services will become more widespread in the coming years and will become an indispensable part of our lives.





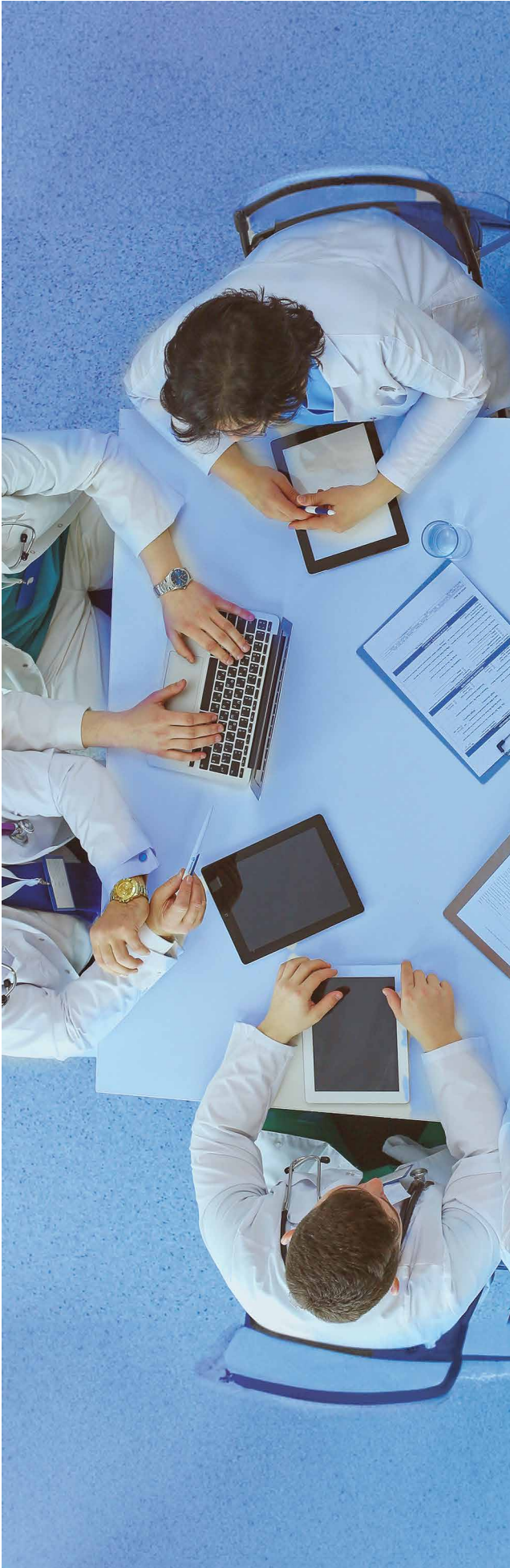
Possible Effects of International Tax Developments on the Health and Pharmaceutical Sector

The health and pharmaceutical sector is among the sectors where changes in business models, especially after the pandemic, are taking place, destructive technologies are used effectively, and their use is always increasing.

Innovative business models that can add value to patients and health systems continue to develop in the sector. These business models are based on patient satisfaction. Changing business models and increasing use of technology also cause significant changes in the supply and value chains of companies operating in the sector.

It will be useful to evaluate the financial and tax effects of these changes as well as the benefits that different business models that emerge with digitalization in the sector will add to the patient experience. Especially today, when international tax developments are closely monitored, it should be analysed how companies operating in the health and pharmaceutical sectors will be affected by these practices.





What are International Tax Developments?

The most debated issue in the international tax arena in recent years is undoubtedly how the digital economy should be taxed. As in the health and pharmaceutical industry, there is digitalization in many sectors, and the “fight” has emerged from how the digital economy should be taxed by countries and has come to life as the OECD/G20 Base Erosion and Profit Shifting Project (BEPS). BEPS studies started in 2013 and final reports consisting of 15 action plans were published in 2015.

BEPS, which emerged due to the digitalization of the economy, was not successful in solving the cause of the exit at the first stage. As a result of the unilateral measures taken by the countries due to their desire to tax the digital economy, the OECD had to carry out additional studies. As a result, the OECD published a 2-column solution mechanism Declaration on 8 October 2021, which was adopted by the inclusive framework member countries, including Turkey, and proposed to solve the taxation problems arising from the digitalization of the economy.

The OECD study, called the two-column solution, consists of Column 1 and Column 2.

Column 1

Column 1 consists of Amount A and Amount B. Although Column 1 actually targets the digital economy, it has become covering all sectors due to the digitalization of all sectors or its targeting. All Multinational Groups operating in the health and pharmaceutical sector and included in the scope shall pay Amount A to the relevant country administrations by allocating it to the countries (source country) from which they generate income, which shall be calculated according to certain rules under Column 1.

Amount A

Multinational enterprises with a global turnover of EUR 20 billion and a pre-tax profitability of more than 10% will be covered by Amount A due to their revenues. Groups falling within the scope of Amount A may be taxed in the source countries. The countries where the Group generates income of 1 million Euro and above will be determined as the source country. Once the source countries have been identified, 25% of the Group's portion (exceeding 10%) of pre-tax profit will be distributed to the respective countries using an income-based distribution key.

Amount A is expected to enter into force through a Multilateral Agreement. If there is an agreement between the parties, Amount A is expected to enter into force in 2024. Necessary coordination will be ensured between the entry into force of Amount A and the abolition of digital service tax and other similar unilateral practices on all companies. The pharmaceutical and health sector is included in the coverage. A Group headquartered in Turkey and operating in the sector with a consolidated turnover of over 20 billion is not considered to be present as of now.

However, it is possible that health and pharmaceutical companies operating in Turkey as a subsidiary of a Group with a consolidated turnover of over 20 billion will be affected by Amount A. As it is known, in order to sell medicines in Turkey, it is necessary to establish a Company in Turkey and complete the licensing studies. In addition, it is against the law to sell drugs that should be sold in pharmacies in Turkey through an e-commerce platform, and therefore, selling drugs from abroad to Turkey within the scope of e-commerce does not seem to be a possible issue. Therefore, since the pharmaceutical industry is subject to regulation and is an already established company in Turkey; Since in the application of Column 1 Amount A, the deduction of the income already earned by the relevant subsidiary in Turkey from the income falling to Turkey as Amount A should also be taken into account; It is thought that the impact of Amount A application on the pharmaceutical industry will be less than other sectors. In the health sector, since the essence of the services that can be provided with technologies such as wearable technology/ artificial intelligence is digitalization, it makes sense to evaluate it within the scope of Amount A.

In summary, it is necessary to follow the developments for the subsidiaries of the large Groups operating in Turkey and to draw a roadmap of what will be done for compliance after the Amount A enters into force.

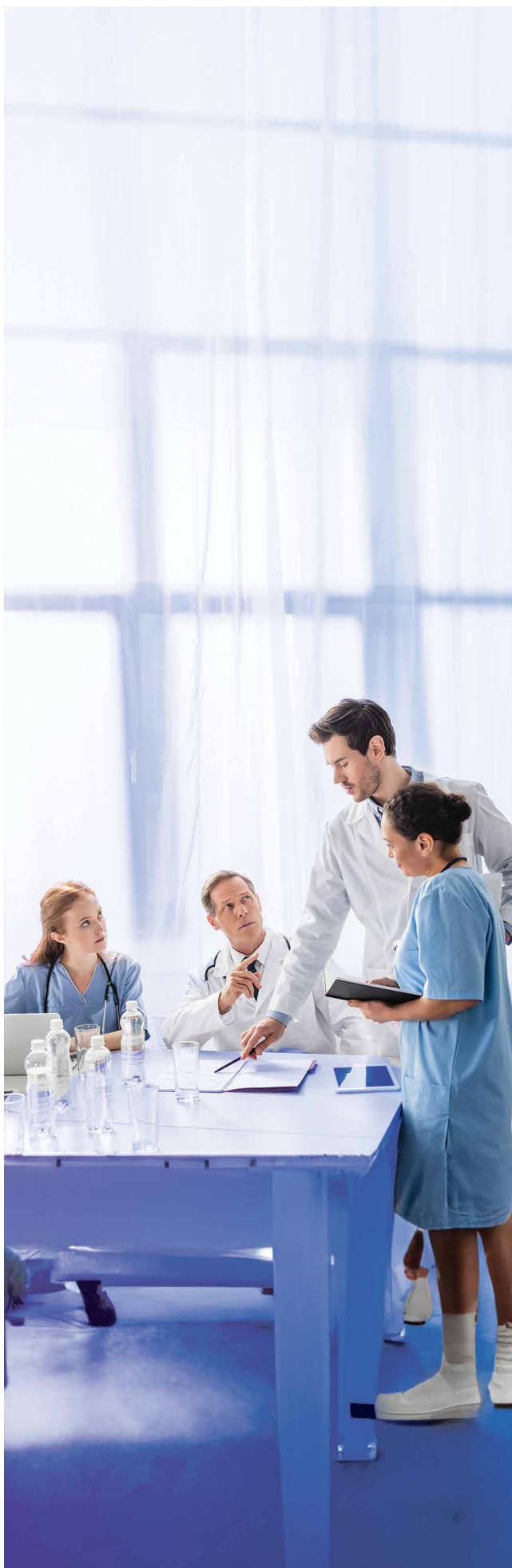
Amount B

For the implementation of Amount B, there is no income or profitability limit as in Amount A. Amount B is not subject to any scope limitations, as it refers to a more specific activity and revenues from that activity. Amount B represents the amount that multinational companies can obtain and tax from core marketing and distribution activities in the countries in which they operate for all sectors.

Accordingly, it is aimed to define which transactions will be qualified as basic marketing/distribution activities and to apply the simplified method proposed by the Model in determining the arm's length price for these activities. In the event that Amount B enters into force in Turkey, distribution companies operating in the health and pharmaceutical sector, especially in the pharmaceutical sector, sales, and marketing activities", it may be possible that the transfer pricing method and profit margin to be applied by these companies in Turkey will be determined in advance.

In the first draft studies of the OECD, although the pharmaceutical sector was not specifically excluded from Amount B, it was stated that distributors engaged in regulatory activities in a country could not be considered as operating at a basic level. This meant that no company licensing drugs could benefit from Amount B. In the light of the latest regulations, the said disclosure has changed, and the relevant companies can also be considered as distributors engaged in basic activities. In summary, it will be possible for health and pharmaceutical companies engaged in basic distribution and marketing activities operating in Turkey to determine their transfer pricing methods and profit margins according to the OECD report.





Column 2: Global Minimum Corporate Tax

The “Model Rules on Global Minimum Tax” for Column 2, the second pillar of the two-legged approach carried out within the scope of BEPS, was published by the OECD on 20 December 2021.

The rules introduced by Column 2 cover multinational corporations (MNCs) with a consolidated turnover of over 750 million and require the relevant MNCs to be subject to a minimum level of taxation. Accordingly, 15% effective corporate tax will be applied to multinational companies with an annual revenue of more than 750 million Euros.

The purpose of the implementation of Column 2 is to complete the effective tax rate of the Group in each country with an effective tax burden of 15%. In order to achieve this, two intersecting global anti-avoidance rules (GloBE rules) and two complementary rules have been envisaged. The Income Inclusion Rule (IRR) and the Under Tax Payment Rule (UTPR) are rules used as buffers for each other; Subject to Tax Rule (STTR) and Domestic Top Up Tax are supplementary rules; Subject to Tax Rule (STTR) and Domestic Top Up Tax are complementary rules. As a basic rule, it is recommended to apply the Income Inclusion Rule (IRR). Accordingly, a company's if the profit is effectively taxed below 15% in the country where it is located, the tax administration of the country where the parent company (ultimate parent entity), intermediate parent company (intermediate parent entity) or partially owned parent entity is resident shall collect the tax difference. In this case, the right to additional taxation passes to the residence jurisdiction. However, countries can also ensure that taxation is made in the source country by applying local complementary taxes.

In addition, in order to take into account, the investments made in countries and to support the systems that encourage investment, in the calculations, the “substance-based exemption for main activities” (substance-based in carve-out) has been excluded from the base to which additional tax will be applied. Accordingly, the amount to be calculated at the rate of 8% of the value of the tangible assets and 10% of the wages of the employees will be exempted from globe income.

In line with the agreement of the Inclusive Framework members dated October 8, 2021, it was aimed to complete the studies upon the entry into force of the IIR and STTR rules on January 1, 2023, and the UTPR rule on January 1, 2024.

As a matter of fact, the most important development in this regard was the agreement of the European Union (EU) member states on the EU Column 2 Directive on 16 December 2022. This shows that EU Member States will implement the relevant Directive by 31 December 2023. South Korea was also the first country to add model rules regarding Column 2 to its domestic legislation. IRR and UTPR will be valid from 2024.

In summary, it would not be wrong to state that GloBe rules, which are sufficient for other countries even if implemented by a single country, will be included in the legislation of some countries by the end of 2023.

Turkey's implementation of Column 2 rules is expected. Many Groups operating in the health and pharmaceutical sector are expected to fall within the scope of Column 2. In general, it is possible to divide the application in the sector into two; Companies operating in Turkey, whose head office is in Turkey and Companies operating in Turkey with headquarters outside Türkiye.

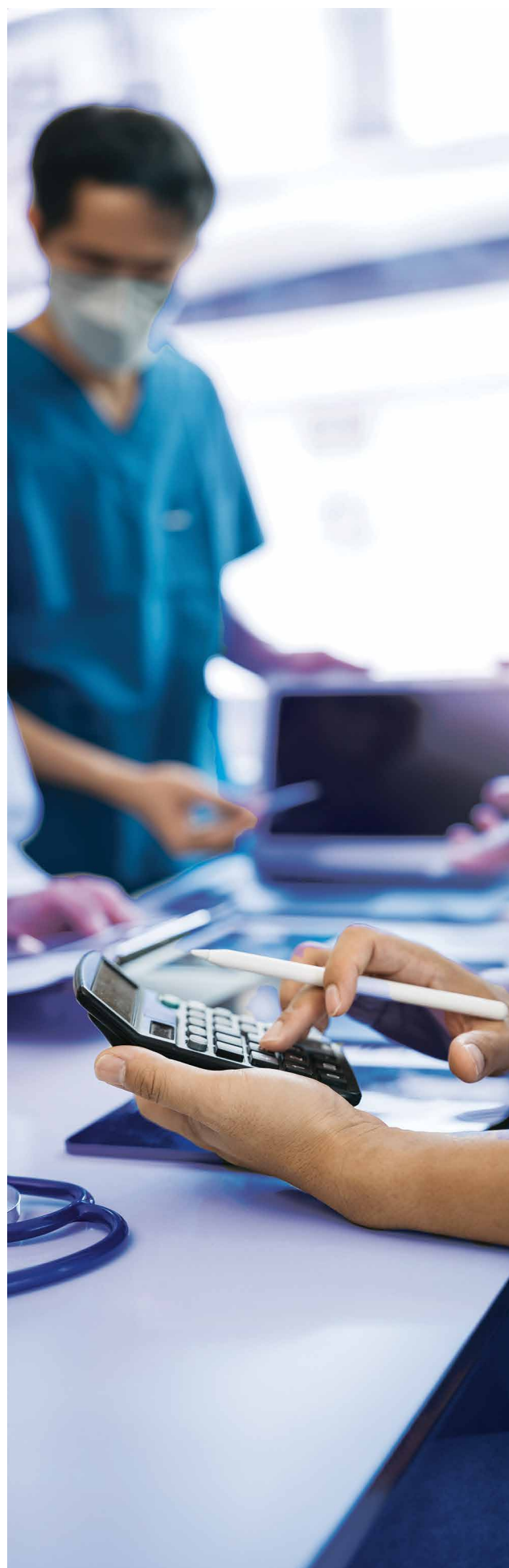
If the Effective Tax Rate (ETR) calculated according to certain rules in the countries where Turkish-based Companies operate is below 15%, it is necessary to calculate the additional tax amount that will complement this rate to 15% and to determine which country and by whom this tax will be paid. Likewise, if the ETR of Turkish affiliates whose headquarters are outside Turkey is below 15%, it should be considered where and when to declare the complementary tax.

When we look at the health and pharmaceutical sector, we see that tax incentives are important in the sector. This situation has a decreasing effect on the effective tax rate. Changes in partnership structures, especially as a result of collaborations in the pharmaceutical sector, company acquisitions and mergers, are also an important issue to be examined within the scope of Column 2. Therefore, we think that companies operating in the healthcare and pharmaceutical sectors will be significantly affected by Column 2 practices. Changes that may occur in tax incentive systems may also affect the sector.

Result

As a result, the health and pharmaceutical sector will be one of the sectors most affected by international tax developments. Amount A as source country under Column 1. Within the scope of Column 1, it is necessary to ensure that Amount A is taxed in Turkey as the source country, and within the scope of Column 2, it is necessary to calculate and follow up the complementary tax for companies whose effective tax rate is below 15 percent due to tax incentives.

It should be noted that tax incentives, which have an important place in the health and pharmaceutical sector, will also have to change and incentive systems that will not affect the effective tax rate will have to be put on the agenda. In the light of international tax developments, we recommend that new investments to be made in the sector be evaluated together with the existing investment environment and existing incentives as well as possible changes.





Sustainability in the Health and Pharmaceutical Sector

In the constitution of the World Health Organization, health is defined not only as the absence of disease or disability, but also as the state of complete physical, mental, and social well-being. In this context, sustainable health; as in every sector, successful results can only be achieved in the health sector if the three environmental, social, and economic pillars are put forward by adopting the principle of transparency.

Many goals have been set to live a healthy life and ensure that people of all ages have access to these standards. As included in the European Union's Sustainable Development Goals, it is planned to greatly reduce the number of human diseases and deaths from hazardous chemicals, air, water, and soil pollution in the management of global health risks by 2030. Because unprecedented amounts of chemicals, paper, plastic, electricity, and water are consumed in the pharmaceutical and health sector and the wastes of these products are generated.

While hospital services, surgical units and laboratories use many drugs and chemicals, they also generate a high rate of effluents. These effluents contain non-domestic wastes such as heavy metals, microbial contaminants, blood and biological samples and radioactive components. Therefore, it is sent directly to water treatment plants due to lack of infrastructure and technology, and then reaches surface and groundwater. The sea, lake, indirectly drinking water, agricultural lands, fauna, and flora are negatively affected. This affects everyone from the lowest to the highest step of the food chain of the ecosystem, causing epidemics and mass deaths.

On the other hand, chemical wastes generated during the production of pharmaceutical companies, water and energy consumption, plastic, and paper use increase at a high rate in parallel with the growth rate of the world population. The pharmaceutical industry is increasing its production capacity day by day. Pollution from production directly affects the environment and biodiversity. However, another critical issue should not be ignored that the pharmaceutical sector has a direct impact on biodiversity. The raw material of the drug is obtained by using natural resources. When the ecosystem chain starts to deteriorate, it is an inevitable result that the flow in the supply chain is negatively affected.

When the actions to be taken in this context are examined, it is necessary to minimize the damage caused by the pharmaceutical sector to the environment and ecosystem by using the right technologies in the developing and changing world. For example, in the health sector, the right treatment technologies that separate the chemical from conventional methods should be used for water and wastewater. Some wastes must be recycled while others must be disposed of. Energy used in the health and pharmaceutical sector should be supplied from renewable sources and electricity and energy efficiency should be ensured. In addition, recycling and reuse principles of paper and plastics used in pharmaceutical companies and health institutions should be adopted. Pharmaceutical companies should be aware of their responsibility to collect expired medicines from consumers.

In all activities carried out under the pharmaceutical and health sector, the protection of the environment, uninterrupted improvement, effective use of natural resources, prevention of pollution, and primarily reducing and separating the generated wastes at their source, while disposing of them with the most accurate methods within the scope of waste classification should form the basis of environmental policies.

While manufacturing companies were among the first to implement the responsibilities of sustainability, service organizations such as the health sector started to adopt sustainability requirements later. As one of the largest service sectors, the health sector has a significant impact on the sustainability performance of the economy and the country as a whole has an effect. The reason for this is that health institutions consume a high amount of energy. The average hospital, for example, uses more total energy than any other commercial building and ranks second after food retailers in terms of energy use per square meter.

On the other hand, because health institutions use large amounts of cleaning chemicals, they lead to the formation of hazardous water wastes. In addition, hazardous chemicals used for anaesthesia can enter the air through ventilation and cause harmful emissions.

Furthermore, health institutions and hospitals are of vital importance to society. Namely, since human relations are at the forefront in health institutions, the employees of the health sector directly affect the society. In addition, the accessibility and intensity of health services is an important phenomenon that has an impact on society and quality of life.

However, effectively implementing sustainability in the health sector brings substantial challenges. The health sector is one of the sectors with complex and rapidly changing dynamics. Also, pharmaceutical and application systems are constantly subjected to change and transformation processes with new techniques and technologies. The management staff of health institutions are simultaneously faced with the pressure to improve cost efficiency, patient safety and service quality. In other words, the sustainability of health services touches many activities at the same time while maintaining the quality of patient care (Tamer, 2020).

Additionally, if the infrastructure of a healthcare facility or hospital is inadequate, that is, due to incompatible and unmaintainable buildings and incompatible design, it can lead to dissatisfaction not only of employees but also of patients and their families. Additionally, physical facilities where health services are provided also play an important role in sustainability processes. When designed in accordance with the hospital concept, the internal environment of the hospital promotes improvement, efficient performance, effective actions, safe behaviour and can improve positive outcomes.

Accordingly, in previous studies, it has been stated that hospital design affects clinical outcomes and personnel performance in health services. Therefore, hospital design is sustainable and should act as a catalyst on the road to recovery. A sustainable structure is easy to maintain and can be functional and qualified in environmental, social and economic areas to adapt to the various interests and needs of all stakeholders. A new and modern approach considers social sustainability and also focuses on patient and employee satisfaction. (Tamer, 2020). Thus, it requires hospital design to consider the needs and preferences of patients and staff. In other words, sustainable hospital buildings should not compromise on the sensitivity and use of material resources required to ensure the health, safety and comfort of users, staff, and patients. In summary, understanding the sustainability requirements and applying the responsibilities it creates in terms of management should now be perceived as a necessity and duty for health institutions.

Global companies operating in the health and pharmaceutical sector attach importance to sustainability and shape their policies accordingly. The table below compares the sustainability practices of Netcare, Pfizer, CVS, McKesson, and Amerisource-Bergen.

Sustainability Governance	Netcare	Pfizer	CVS	McKesson	Amerisource Bergen	Observations
Sustainability Committee: Does the company have a board of directors or a committee at senior management level responsible for making decisions on sustainability issues?						All companies have sustainability committees responsible for formulating and/or approving their sustainability strategy. Some companies have subcommittees or working groups dedicated to priority issues within the sustainability committee. Committee members are responsible for all main tends to represent business functions.
Stakeholder Engagement: Does it describe how the company interacts with its stakeholders?						Companies have established an effective communication mechanism with their stakeholders, listening to their ESG priorities and shaping their actions according to these priorities.
Sustainability Incentives: Are top management fees linked to sustainability goal/performance?						When the sustainability goals are achieved or if the performances are progressing in the direction of achieving the goal, the employees in the senior management receive an incentive based on these criteria. In some organizations, performances are monitored by internal ESG scoring.
Policy and Procedures						Observations
Sustainability Policy						Organizations have sustainability management systems that outline roles, responsibilities, and policies related to sustainability issues. Differences have been observed in the policies in relation to the focal points and the areas where they are concentrated in the sector. Policies are set and approved by the highest governing bodies, usually the Board of Directors.
Water Efficiency Policy						
Energy Efficiency Policy						
Sustainable Procurement Policy						
Environmental Management Systems						
Workplace Health and Safety Policy						
Human Rights Policy						
Anti-Corruption Policy						

The Sustainable Development Goals set by the European Union aim to reduce human diseases and deaths caused by pollution by 2030. The pharmaceutical and health sectors cause water pollution through the production of non-domestic wastes such as heavy metals and microbial pollutants, as well as the use of chemicals, paper, plastic, electricity, and water. In order to minimize the negative effects of these sectors, it is necessary to use renewable energy resources and use solid waste and wastewater treatment methods appropriate to the sector.

Cooperation and stakeholder participation between hospitals, doctors and hospital stakeholders are important to ensure environmental sustainability. Best practices can be shared and common goals in sustainability can be achieved by developing joint projects. At the same time, contribution can be made to the development of environmental policies and regulations by cooperating with relevant institutions and authorities. Based on collective consciousness; Hospitals should prefer environmentally friendly medicines and supply medicines in accordance with the principle of sustainability.

This means using medicines that do not contain chemicals that are harmful to the environment, come in recyclable packaging and are energy-saving. In addition, hospitals, doctors and hospital stakeholders should organize educational programs and awareness campaigns on environmental sustainability. Employees should be made aware of environmental impacts and actively participate in sustainability practices, at the same time, patients and society should be informed and made aware of environmental issues. Hospitals should promote the use of environmentally friendly and sustainable medical supplies. This includes practices such as proper recycling of disposable materials or opting for reusable materials. At the same time, it is important to reduce the consumption of medical supplies and investigate more sustainable alternatives. Overall, sustainable health is crucial to the well-being of individuals and society as a whole. It requires the collaboration of all stakeholders, including healthcare providers, pharmaceutical companies, policy makers and the public.





Environmental Factors in the Health and Pharmaceutical Sector

The health sector and the pharmaceutical industry play a very critical role in human and community health. However, their environmental impact is also very high. Because it is similar in the pharmaceutical and health sector unprecedented amounts of chemicals, paper, plastics, electricity, and water are consumed and the waste of these products is discharged. As stated in the European Green Agreement of the European Union, it is planned to greatly reduce the number of diseases and deaths caused by hazardous chemicals, air, water, and soil pollution in the management of global health risks by 2030 and action plans have been created in this context.

The Sustainable Development Goals set by the European Union aim to reduce human diseases and deaths from pollution by 2030. The pharmaceutical and health sectors cause water pollution through the use of chemicals, paper, plastics, electricity, and water, as well as the production of non-domestic wastes such as heavy metals and microbial pollutants.

It is necessary to use renewable energy sources and to use solid waste and wastewater treatment methods suitable for the sector to minimize the negative effects of these sectors.

In order to achieve environmental sustainability, co-operation and stakeholder engagement between hospitals, doctors and hospital stakeholders is important by developing joint projects, the best sharing of practices and sustainability common goals can be achieved. At the same time, cooperation with relevant institutions and authorities can contribute to the development of environmental policies and regulations. Based on collective consciousness, hospitals should prefer environmentally friendly medicines and supply medicines in accordance with the principle of sustainability. This means the use of energy-saving medicines in recyclable packaging that do not contain environmentally harmful chemicals.

In addition, hospitals, doctors, and hospital stakeholders should organize training programs and awareness campaigns on environmental sustainability.

Raising awareness of employees about environmental impacts and active participation in sustainability practices must be provided. At the same time, patients and the community should also be informed and made aware of environmental issues.

Hospitals should promote the use of environmentally friendly and sustainable medical supplies. This includes applications such as proper recycling of disposable materials or preference for reusable materials. Moreover, it is important to reduce the consumption of medical supplies and to explore more sustainable alternatives.

Overall, sustainable health is crucial to the well-being of individuals and society as a whole. It requires the cooperation of all stakeholders, including healthcare providers, pharmaceutical companies, policy makers, and the public.



Carbon Emission

High amounts of energy are consumed in hospitals, patient care homes, clinics, operating rooms, laboratories, and drug production. When this energy is not supplied from renewable sources, carbon emissions are quite high.

Waste generation

High amounts of solid waste and wastewater are produced in the sector. Due to hygiene, a lot of single-use plastic, textile and paper wastes are generated in the service processes in hospitals, laboratories, and clinics. The use of chemical wastes, plastics, and paper in the production of pharmaceutical companies is increasing in line with the growth rate of the world population.

Hospital services, surgical units and laboratories use many drugs and chemicals and generate significant amounts of wastewater. These effluents contain non-domestic wastes such as heavy metals, microbial contaminants, blood and biological samples, radioactive components. Due to infrastructure deficiencies and technological inadequacies, these wastewaters can directly or indirectly reach surface and groundwater.

Sea, lake, indirectly drinking water, agricultural lands, fauna, and flora are directly affected. This affects everyone from the lowest to the highest step of the ecosystem's food chain.

Water Consumption

In the sector, high amounts of water are consumed due to processes such as drug production, patient care, and hygiene. Especially in periods and areas where water resources are limited, the water need of the sector may create pressure on local resources.

Chemical Contamination

Chemicals used in drug production, patient care and laboratories, drugs that have expired or become waste without use create chemical pollution. These chemicals can mix with water, soil and air and threaten the lives of humans and other living things.

Biodiversity Loss and Deforestation

The production of medicines, health equipment and one-off products requires natural resources to a significant extent.

The basic raw materials of medicines come from nature and the production capacity of the pharmaceutical industry is increasing day by day. This directly affects the environment and biodiversity. The production of plants used as raw materials of some medicines threatens forests.

On the other hand, the pharmaceutical sector is directly affected by the risk of biodiversity loss. Loss of biodiversity will also disrupt the flow of the sector's supply chain. It is possible for the health and pharmaceutical industry to minimize the damage to the environment and ecosystem by using new technologies, optimizing processes and making resource use more efficient.

Designing patient and nursing homes as green buildings will make a significant difference. Advanced treatment technologies that separate the chemical from conventional methods should be used for water and wastewater. When a hospital is designed correctly, the hospital's internal environment can improve recovery, efficient performance, effective actions, safe behaviour, and positive outcomes. In this regard, previous studies have shown that hospital design affects clinical outcomes and staff performance in healthcare services.

As much waste as possible needs to be recycled. The energy needs of the health and pharmaceutical sector should be met from renewable sources. On the other hand, energy efficiency must be ensured. In addition, pharmaceutical companies and healthcare institutions should reduce plastic use and packaging waste as much as possible and recycle and reuse used paper and plastic. It is important to collect expired medicines and recover them with the necessary technologies.

In all activities carried out in the pharmaceutical and health sector, environmental protection, continuous improvement, effective use of natural resources, pollution prevention, primarily reducing and separating wastes at their source, recycling and disposal with the most appropriate methods should form the basis of environmental policies.





Social Sustainability in the Health and Pharmaceutical Sector

While social sustainability in the health and pharmaceutical sector requires corporate responsibility on local communities, it also has the expectation of profitability. A balance must be established between the profitability of medicines and services and their pricing, market access, quality of supply chains, R&D practices, drug development, and careful analysis of these issues is required. Pharmaceutical companies should conduct more R&D studies to understand the sources of new diseases and develop treatment methods. Understanding the origin and mechanisms of the spread of new diseases can help in the development of preventive measures and effective treatment methods.

Disease is a topic studied not only by medicine, but also by the social sciences, and especially by sociology. Healthcare and disease are linked to a complex network of relationships in which individuals and society interact with social, economic, and cultural factors. The sociology of health aims to understand the social origins of disease and the social determinants of health. Social, economic factors affecting health in the society and analysis of environmental factors is of great importance in shaping health policies and services. Factors such as social class, ethnicity, gender, lifestyle, level of education, and social support can affect health outcomes and access to health care. Health sociology aims to develop strategies to understand health inequalities, to ensure that health services are compatible with the principles of social justice and equality, and to improve access to health services. In this way, it is of great importance to consider the field of health sociology for social sustainability in the health and pharmaceutical sector and to focus on social origins. It is a field that covers human rights, diversity and inclusion, health and safety, and social impact. At the same time, maintaining high standards in activities for people and communities is a reputation for risk, as it is important from the point of view of profitability and law.

In the survey conducted by GlobalData with industry professionals, with 133 participants, 49% of the participants identified health and safety issues, and 26% identified human rights issues as the most critical social problems facing the healthcare industry. In terms of health and safety, organizations are obliged to protect their employees, customers, and suppliers from physical and mental threats. There are many steps that can be taken to improve health and safety in companies. First, the response time to customer complaints and requests to minimize health and safety issues and its quality should be improved. In terms of product processes, adherence to the Good Manufacturing Process (GMP), medicines and medical devices must be manufactured in accordance with the highest quality standards. Compliance with quality standards minimizes the risks to customers and ensures that employees are safe during the production phase. In order to properly ensure human rights, it is accepted worldwide that health services are a fundamental right, and in the light of this understanding, local and global regulations have come into force.

Nevertheless, the sector is characterised by child labour, disruption of the local population, breaches of personal data, inflationary wages, and lack of citizenship rights.

Additionally, pharmaceutical companies can play an important role in addressing issues such as many communities being underserved due to limited access to advanced healthcare and cutting-edge medicines.

Access to health services and medicines can be affected by many factors, which can lead to inequalities in access to health services. Factors such as income and social status, geographical location and distribution of health infrastructure can contribute to inequitable access to health services. In particular, people living in rural areas, disadvantaged groups and individuals with poor financial situation may face more difficulties in accessing health services. Various strategies can be adopted to address inequalities in access to health services. Increasing the number of health centres and specialists in rural areas is an effective way to facilitate access to health services. At the same time, reducing the cost of health services for individuals with poor financial status can reduce inequalities in access to health services.

The use of new technologies, such as telehealth and digital health solutions, can facilitate remote access to health services and enable health services to reach a wider population. One of the main social goals for pharmaceutical companies is to ensure diversity among participants in clinical trials.



If drug treatments are not tested on people with different health and social status, the likelihood of those people benefiting from the drug decreases, so access to health services for groups exposed to discrimination may be restricted. Many pharmaceutical companies embed the principle of diversity into every aspect of their operations to ensure equal access to all. In addition, another area where healthcare and pharmaceutical companies can provide social benefit is product safety. Using the drugs and devices at the right time, in the right patient, and in the right way has great importance.



Supply chain inadequacies for devices and other medical products should be prevented. For example, the fact that the Covid-19 vaccine is affordable or free and shared quickly has emphasized the importance of fair healthcare.

Despite this, millions of people have suffered in terms of access to vaccines. Ensuring accessibility of medicines and services to all is therefore the highest social priority in the relevant sector. On the other hand, disadvantaged groups, socially and economically disadvantaged groups, may face more difficulties in accessing health services. This may have negative impacts on health outcomes. For example, limited access to health services for low-income individuals may result in health problems being detected at later stages and delayed access to treatment. Equitable health policies are important to reduce inequalities in access to health services.

The design and implementation of these policies can improve the health welfare of the community. For example, special programmes and services can be developed for disadvantaged groups. In addition, the adoption of policies that facilitate access to health services can improve the overall health level of the population. Looking at good practices in the sector, the number of community outreach programmes of pharmaceutical companies is growing rapidly. In addition, data privacy is becoming the norm. As a global good practice, Datwyler, a pharmaceutical company, supports communities living in villages, takes care of regular cleaning and maintenance of new buildings and infrastructure, and offers teaching programmes emphasising water conservation and hygiene.

In the context of employee development and raising community awareness, local and global companies have expressed their commitment to increase the demand for occupations and workplaces that are based on the principles of diversity and inclusion for their employees. In addition, in many public statements about how they support their employees' professional development goals, they tend to provide details about mentoring programmes, training programmes and career development programmes.



Governance in the Health and Pharmaceutical Sector

The health sector, one of the largest service sectors, has a significant impact on the sustainability performance of the economy as a whole. The sector, which has a high environmental impact, directly affects the welfare of the society and the individual. Accessibility and intensity of health services are important indicators of development as well as the quality of life of individuals.

However, effectively implementing sustainability in the health sector poses a unique challenge. This sector is one of the most complex and rapidly changing sectors. In addition, pharmaceutical and administration systems are constantly being replaced and improved with new techniques and technologies.

Managers of health institutions are simultaneously under pressure to improve cost efficiency, patient safety and quality. In other words, the sustainability of health services touches many activities at the same time while maintaining the quality of patient care.

It is important that the institutions in the sector are transparent, accountable, and traceable and establish a governance structure to support sustainability performance. Governance in the healthcare and pharmaceutical sectors refers to the systems, policies, and processes that govern operations, management, and decision-making in these sectors.





Patient safety and quality of care

In an effective governance structure, patient safety and quality of care are key elements. In order to maintain high standards of patient safety and care, regulations, guidelines, and standards that healthcare providers and drug manufacturers must comply with must be established and informed. Governance mechanisms such as clinical guidelines, protocols, and quality assurance programs help ensure that healthcare and pharmaceutical products are safe, effective, and of high quality.

Ethical and transparent decision making

Governance in the healthcare and pharmaceutical sectors should be designed to promote ethical decision-making and transparency. Institutions should establish clear policies and procedures for decision-making processes, conflict of interest management, and disclosure of financial data, sustainability-related information, etc.

Ethical decision-making ensures that healthcare providers and drug manufacturers act in the best interests of patients, avoid conflicts of interest, and maintain transparency in their operations.

Compliance with laws and regulations

Institutions should establish the necessary internal control mechanisms to ensure that their processes are 100% compliant with applicable laws, regulations, and standards. It should also be ensured that industry standards and best practices are followed.

Resource allocation and financial management

Governance mechanisms play a crucial role in resource allocation and financial management in the healthcare and pharmaceutical sectors. This includes budgeting, financial reporting and auditing to ensure that resources are allocated efficiently and effectively, and that financial management is transparent and accountable. Appropriate resource allocation and financial management help provide healthcare services in a cost-effective manner and help pharmaceutical manufacturers operate sustainably and meet their financial obligations.

Risk management

Risk management includes the identification and management of ESG risks and other associated risks, such as patient safety, product quality, financial sustainability, climate, and biodiversity loss. Risk management mechanisms such as risk assessment, monitoring, and mitigation strategies minimize negative impacts by helping to identify and address potential risks before they become significant issues.

Stakeholder engagement

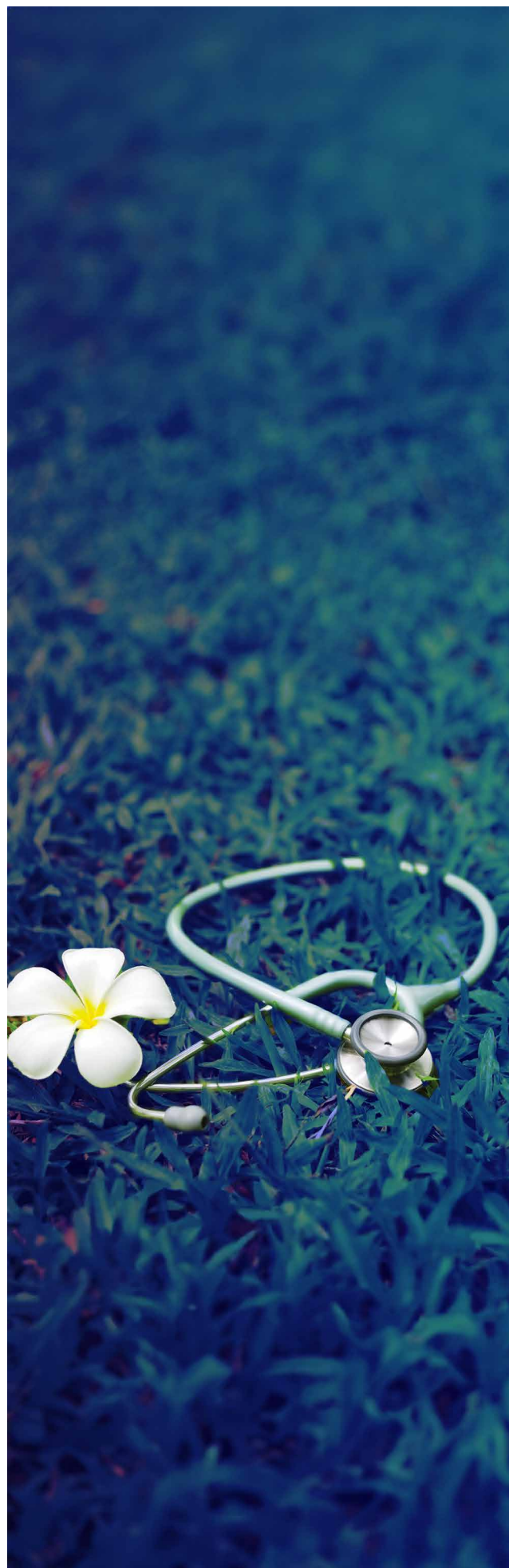
Effective governance involves the participation of stakeholders, including patients, healthcare providers, pharmaceutical manufacturers, regulators, and the public. Stakeholder engagement mechanisms, such as consultations, feedback mechanisms, and participation in decision-making processes, enable diverse perspectives to be considered and priorities to be set in a more inclusive and participatory manner.

Social responsibility

Environmental, social, and economic impacts of health services and drug production and distribution processes should be taken into account and measures should be taken to minimize negative impacts. Social responsibility includes addressing issues such as access to health services, affordability of medicines and fair distribution of health resources

Sustainable Building Management

If the infrastructure of a health institution or hospital is insufficient, that is, its incompatible and unmanageable buildings and inappropriate design not only cause dissatisfaction of employees but also reduce the quality of service. Physical facilities where health services are provided play an important role in the sustainability process. The reason for that is when a hospital is designed correctly, the internal environment of the hospital improves recovery, efficient performance, effective actions, safe behaviour, and positive results. Sustainable hospital buildings should ensure the health, safety and comfort of users, staff, and patients.



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