Economics of Medical Equipment

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Book Inbox

Introduction

The global market for a variety of medical engineering products and devices, with its particular appeal, offers great opportunities for researchers, manufacturers, sellers, distributors, and difficult choices for policymakers and decision makers in large countries.

A market in which, in order to succeed, staggering costs are spent on researching and developing new products and reducing production costs, so that the face of human life undergoes certain changes. Today, no country can claim to be self-sufficient in producing all the medical engineering devices and medical equipment it needs.

But the policy of many more developed countries has been to move towards goods with higher technology and quality, in order to achieve higher added value in this way.

The first concern of any country for its society is to ensure the health and safety of the people and to maintain public health in order to promote positive ideas.

Our dear country, Iran, with its potentials and as the third country to cultivate engineers in the world, has an excellent position for the development of this economy and can gain a special place in the world and move towards a sustainable economy, provided that the entire medical engineering community and the government work together for progress.

Chapter One
Health Economics of Iran

Health status of Iran

Iran, as the seventeenth largest economy in the world, is one of the most important countries in the world.

According to Article Twenty ninth of the Iranian Constitution, access to health services and medical care is considered a public right.

Iran, with a population of more than eighty-three million, spends nearly ninety billion dollars annually to maintain and improve public health. Also, the annual medical expenses in Iran are close to thirty billion dollars.

In the health sector, there has been extensive progress in recent years due to the improvement of health and treatment standards, the increase in the number of active personnel in this field in all categories, as well as the updating of equipment and medicines used.

The Ministry of Health, Treatment and Medical Education, as the sole custodian of this issue, is responsible for

formulating policies, creating the required infrastructure and launching the national health network of the country.

In addition to its other duties, the ministry develops standards and quality requirements for medicines and medical equipment required by the country, and oversees their production, import and export.

Health care and treatment costs in Iran strongly include subsidies and government assistance. These subsidies are particularly effective in the import and supply of medicine and medical equipment and have greatly reduced the final treatment costs of patients compared to global per capita. But health and treatment in Iran is not free for the public. To cover this cost gap, health insurance is available.

Currently, between eighty and eighty-five percent of the population of Iran are covered by health insurance.

The four main organizations providing health insurance services in Iran include the Social Security Insurance Organization, the Health Insurance Service, the Imam Khomeini Relief Committee, and the Armed Forces Medical Insurance.

In addition to these four organizations that have the main share in this sector, other organizations and companies also operate in this sector. Among these organizations, we can mention the specialized charities such as Mahak foundation, which supports children with cancer.

Iran has about a thousand active hospitals, most of which are managed by government or government-affiliated organizations.Iran Health Network also includes more than seventeen thousand health centers throughout Iran, which provide health, preventive and primary care services in many rural areas of the country. The management of this huge health care network has been one of the successes and challenges of the country's health system.

With the implementation of the Health Transformation Plan, good progress has been made in the field of health and teatment, including the formation of more than seventy million health records. Also, there are currently two million health ambassadors in the country.

The biggest obstacle in the way of further improvement of the country's health industry has been the existence of sanctions and problems in the general economy of the country last year. With the decrease of Gross Domestic Product (GDP) and increase of inflation, the amount of public spending in all fields and consequently in health, decreased Has found.

This has been accompanied by banking sanctions that prevent the transfer of currency and the purchase of drugs and medical equipment, as well as a shortage of currency in the market, has reduced the volume of imports and, of course, shortages in some areas of pharmaceuticals and medical equipment. In some cases, these shortages have led to a multiple increase in prices and patients turning to the free market and speculators.

Iran has made great strides in the field of health self-sufficiency in the last forty years. From training and education on the needs of the health network to the supply of medicine and medical equipment, the general policy of the system has been to reduce reliance abroad.

For this reason, there are currently more than one hundred drug companies and more than two hundred companies producing medical equipment in the country.

Also, according to statistics, about ninety-six percent of the drugs used and about thirty percent of medical equipment in Iran are domestically produced.

The health industry is a growing industry, because health is a commodity for which human beings are willing to pay large sums of money, and that is why society pays more every year to maintain its health.

With government support and the activation of the people's economic nuclei, prevention costs can be met by creating health systems so that people have less need for doctors and treatment, and preventive care methods find more operational meaning.

Economic Development and Health:

In today's world around us, economic development is the first word of every country. The attention of industrialized and developed countries to the economy is the main foundation of any country. To the extent that the political orientations of each country have become a function of economic diplomacy. We know that one of the most important economic elements is investment.

Investing in different sectors of an economic system reflects the rate of financial growth of that country. Although many elements jeopardize an investment, the key indicator for an investment is the type of planned activity.

Industrialized countries have a detailed investment plan, and in their study areas, they regularly review statistics and data inputs in order to target the best type of investment and the best industry.

And then, with the coordination of the chambers of commerce in that country, they guide member companies towards precise and calculated goals.

Thus, we are less likely to encounter inflation problems or deviations from statistical forecasts in such countries. Of course, all the forces of the country pay special attention to this coordinated system, and it is natural that any political movement in the country is subject to economic diplomacy in this system.

If we want to take a closer look at economic investments in the world, one of the areas of interest of the chambers of economics is health economics. To the extent that the focus of health sector studies has become a hot topic of economic

discussions in the industrialized world. By thinking better in health economics and studying about it, we reach attractive sectors in terms of investment. One of these sectors is the production of medical equipment. The return on investment in this sector has been higher than global standards. Todays, parts of this branch, such as health equipment, according to statistics in 2020 will have a turnover of over 117 billion dollars.

It is interesting to know that the United States of America is one of the first players in these markets, followed by Germany with 1350 companies active in the medical equipment sector.

Looking at the indicators of sustainable economy and continuous development in the three countries of the United States, Germany and China, we realize the high importance of investing in the medical equipment sector, especially during the last thirty years in these countries.

One of the significant points in health economics is production, marketing and consumption poles and special attention of these countries. As the focus of these countries is the Middle East, to the extent that the Middle East is the main goal of marketing and sales in the economy of medical equipment.

And as it was mentioned, the existence of Iran as one of the main countries in the Middle East and the third place of Iran in the production of engineers in the world, can be a good opportunity to employ this educated class in this industry and achieve a dynamic economy. , Provided that economic diplomacy is the country's priority.

But as we know, economic diplomacy has been able to put a country like Germany in a position where no power in the world can boycott it!

Perhaps if we had thought better and the political factions were for the advancement of collective wisdom and if we

pay attention to economic messages of leader , today the great powers would not have thought of sanctioning Iran!

In our dear country Iran, for economic growth in the most important branch of the world economy, which is the economy of medical equipment, reforming the administrative structure of currency transparency in the field of medical equipment, support knowledge-based companies in the field of health, develop private sector entry to produce system reform Pricing, opening export gates should be considered by the government.

One of the sponsors of the production and trade of medical equipment is the Health Economics Commission in the Chamber of Commerce.

This commission is the most important high-ranking position of health organizations, which has the power to negotiate and bargain with senior government officials, including the Minister of Health, on an equal footing.

It is commendable that this effort, which has been emerging by the private sector for several years, should be further supported by the private sector and considered by the government, in order to assist the government in political and economic orientations prioritize national interests over personal interests.

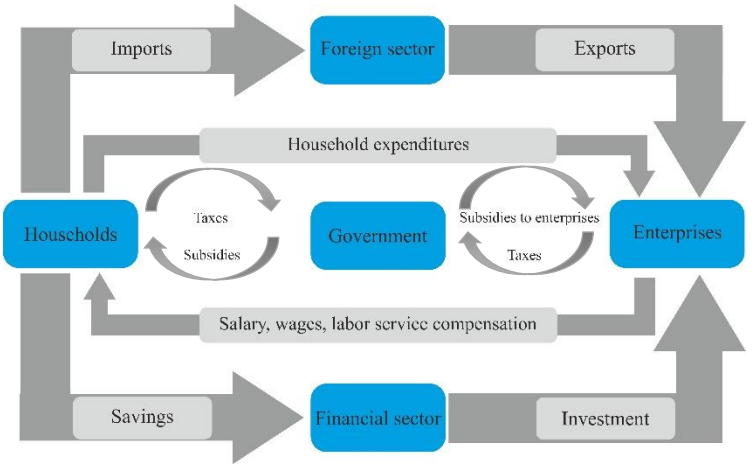
Role of Small Enterprises and Competitive Advantages in the Production of Medical Equipment

According to the statistics provided by the Research Center of the Islamic Consultative Assembly, Iran has been able to create 15.4 million jobs in this sector due to the existence of small enterprises. These employees work in enterprises with a composition of 1 to 4 people. This is while 2.1 million people are working in companies with a capacity of 5 to 9 people and also 1.2 million people are working in companies between 10 to 19 people. In companies 20 to 49, 600,000 people are covered.

Thus, while 19.3 million people work in companies under 50 persons in Iran, only 4.6 million people work in companies over 50 persons.

This statistic shows the importance of creating jobs in companies under 50 persons that the government has paid less attention to.

Iranian Economic Analysis Framework:



Development and support of companies with a capacity of less than fifty people working in the country can help the business environment in Iran. Because now, according to international statistics, Iran is unfortunately ranked 99th out of 140 countries in terms of global competitiveness in The business environment is located.

It is interesting to know that the establishment of medical equipment companies with an average of less than 50 employees is considered as a good fit in this sector. However, the most unfavorable indicators of the business component in recent years are unpredictability and changes in raw material prices and products, the difficulty of financing from banks, the instability of policies and regulations governing business have been defined, but nevertheless a good place to set up medical equipment production units can be imagined. Because ,the advantages of producing medical equipment are: the constant need of the market for the product in any situation, guaranteeing domestic purchase according to the needs of the country, proximity to the consumer market, the possibility of

production with high diversity, using the least facilities, and obtaining the highest efficiency, Inside the country, creating peace and security of society, gaining social status and prestige, exporting to neighboring countries, agility in the production of parts in a small space, updating factory facilities in the country without the need for foreign knowledge, helping sustainable employment, and finally the possibility of achieving higher profits can be mentioned.

Of course, as mentioned, the strategic position of Iran despite the geographical advantages, transit, transportation and high demand of neighbors to buy goods from Iran and with 24 international road borders, 5 rail borders and more than 11 small and large commercial port and also the location of Iran in the path of international transit corridors, have great potential for the development of medical equipment trade in the region.

Iran with its great potentials in the field of science and technology and the first rank in the region and 16th in the world in terms of scientific articles and documents and the rank of biotechnology products, 13th in the world and the first in the region and the fifth country with nanotechnology, has necessary readiness to create poles and medical equipment in the area.

According to studies conducted by the Research Center of the Islamic Consultative Assembly, strategies to improve the country's economic situation have been considered, some of which are as follows: reform the country's banking system, create transparency to eliminate monopolies, facilitate the system of trade licenses and work, reform the tax system, formulate industrial development policy, prioritize production support, redesign programs, deal with sanctions, organize public debt, organize public assets, strengthen proper revenue generation, economic growth, and budgeting process the country, increasing the return and investment capacity of the government, reforming the production system, exchange, and processing of economic data in the country and systems for exchange, processing economic data of the country, reforming the capital market and increasing its role in financing the company, strengthening economic diplomacy to support the country's development goals, controling smuggling, managing the country's imports, improving the performance of state-owned companies, reforming the economic decision-making system.

The Economic Importance of the Medical Engineering Market

The economic importance of this industry is also very evident in all countries that intend to compete economically with each other. The world's four largest economies (the United States, China, Japan, and Germany) are among the largest producers and consumers of medical equipment in the world. China produces and supplies about $ 100 billion a year, and Germany about 34 billion euros a year. It is noteworthy that Germany has exported more than 17 billion euros of its products to other countries.

Due to the importance and strategic nature of these products as well as the high economic returns due to the vast capacities of this industry, large investments are made in it. For example, between 2005 and 2016, the United States alone invested about $ 1.7 billion in the Mexican medical equipment industry.

Banks, financial and credit institutions, investment funds and governments are the most important investors in this industry. However, about 70% of the shares of Johnson

&Janson and more than 80% of the shares of Medtronic are owned by legal entities.

In our country, the production of medical equipment is a priority. Due to the profitability of producing these products in the country, many people have moved towards production. But the vacancy of large and specialized investors is still seen in this direction.

Medical equipment Consumption Market

Iran ranks 35th in the world consumer market for medical equipment. Iran ranks next to Finland in the medical equipment market with about $ 1.5 billion. Iran has about 0.05% of the world's total medical equipment consumer market.

The United States ranks first in the global medical device market with about $ 170 billion, accounting for about 45% of the global medical device market. In this ranking, Germany is in second place with about 9%, about $ 34 billion. Japan, with about 7.5 percent, is in third place with $ 29 billion, and China, with 7 percent, is on the table of medical equipment consumption with about $ 27 billion.

According to statistics, the consumption of medical equipment in Iran is about $ 1.5 billion, of which the largest consumption of medical equipment needed in Iran is related to "visual diagnostic devices" with an estimated figure of $ 400 million per year. Also, the share of medical equipment

consumption of "medical supplies" is $ 220 million, "orthopedic supplies" is $ 150 million, "patient care equipment" is $ 210 million, "dental supplies" is estimated at $ 200 million and other medical equipment is $ 320 million. .

Iran ranks fourth in the market for medical equipment in the Middle East and Africa with about 12.5% of consumption. The Middle East and Africa medical equipment market is estimated at $ 12 billion.

Saudi Arabia is also the first country in the region in terms of consumption, with 15.5 percent of medical equipment consumption estimated at $ 1.86 billion.

The second place in the consumption of medical equipment in the Middle East and Africa belongs to Israel with 14.7% and the third place in the Consumption of Medical Equipment belongs to the country of South Africa with 13%.

After Iran, the United Arab Emirates is the fifth largest consumer with 11.2 percent, Egypt is sixth with 7 percent consumption, and Kuwait is seventh with 5.2 percent.

Iraq ranks eighth with 3.6 percent consumption,

Morocco ranks ninth with 3.4% consumption, and Jordan is in tenth place with 2.8.

Iran ranks 64th in the world with a share of 0.004% of global medical equipment exports.

Iran is also ranked 36th in the world with a half percent share of medical equipment imports.

Interestingly, the United States, Germany, the Netherlands and China are the largest importers and exporters of medical equipment in the world.

Although the exact statistics of imports and exports of medical equipment in Iran in recent years have not been announced by the Ministry of Health and the government, but according to published global statistics, the amount of exports of medical equipment in Iran is declining and imports of medical equipment It has had an upward trend. As a result, the trade balance in this sector is negative.

The situation of Iran in the field of export and import of medical equipment is such that according to official international statistics, the most dollar exports of Iran to the Czech Republic and the largest dollar volume of Iranian imports from the Netherlands. But unofficial statistics show the highest Shows exports of medical equipment to Afghanistan, Iraq and Turkmenistan.

Also, the volume of official exports of medical equipment from Iran to about 40 countries shows $ 24 million.

An official international report released by the South Korean Health Industry Promotion Agency in the second half of 2019 states that imports from the Netherlands to Iran are estimated at $ 220 million. Interestingly, in this report, the share of Iran's imports in the field of medical equipment from the United Arab Emirates is about $ 70 million. In this statistics, imports from China show about $ 90 million.

It is necessary to explain that the existence of traditional methods of purchasing goods by Iran's neighbors in the field of medical equipment and inaccuracy and attention in controlling the country's borders for import and export of medical equipment goods cause large differences in official statistics outside Iran with unofficial statistics announced in Has entered Iran. However, despite the multi-year activities of the Medical Equipment Export Office located in the General Office of Medical Equipment of the Ministry of Health, these problems are being solved.

Although in previous years the average annual growth of numerical medical expenses was about 8%, in recent years this number has been declining. And this is while the share of medical expenses in the public sector is decreasing every year and the share of medical expenses in the private sector is increasing.

Chapter Two
Review of the World Medical Equipment Market

World Medical Equipment Market

The medical equipment industry, with all its charms, is one of the sectors that is considered by different countries. This industry has always undergone fundamental changes due to its connection with medicine and innovation. The efforts of the great powers to acquire and maintain this industry as their economic support and to pay attention to health and hygiene in their countries are becoming more and more vital.

The presence of China, the United States and Germany, Japan and the Netherlands as the five main players in this industry has always been accompanied by the introduction of new technologies to maintain the current situation.

For more information, we will evaluate these five countries so that we can be informed about the positive points of their activities.

USA Medical Equipment Market

The global medical equipment market offers tremendous opportunities for USA manufacturers, as well as significant challenges for government policymakers seeking to support USA export competition in overseas markets. The USA $ 170 billion market is subject to the four elements of production, consumption, export and import.

Creating new and sustainable export opportunities for American companies, which requires concerted efforts to remove or reduce barriers to market access, helps American companies gain a larger share of the global import market.

Encouraging and development of the USA-based healthcare industry is critical to the economic future of the United States. That is why medical technology is one of the priorities of the national export plan.

Despite the uncertain economic conditions in major markets around the world, large and small players in the USA medical device industry are adapting to companies in the medical device industry to ensure this growing market, and companies are optimistic to the future. In the face of unequal international economic growth, these medical equipment companies and regulatory systems are constantly changing and creating new opportunities for the development of their activities.

Predictions made in the United States based on factors such as the patient's expected needs at the time of illness, unwanted propensity for disease due to machine and erroneous lifestyles, prevention costs, regulatory developments and other social factors, such as international health projects, economic performance In this section, the trend of import level of health goods, size and performance of medical products is estimated based on the current size and conditions. Also, the domestic production sector,

national health care development programs and foreign exchange issues are considered by health industry economists.

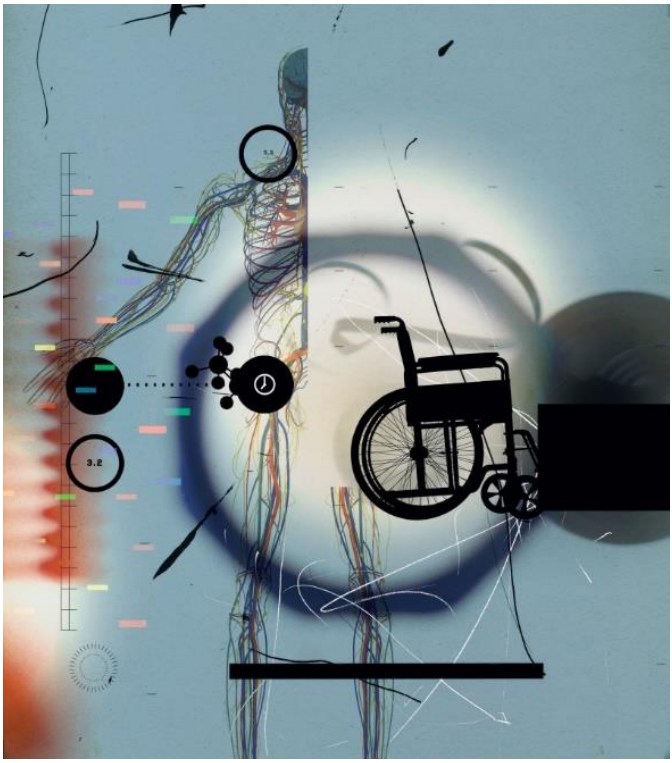
Life expectancy is constantly growing in many countries due to significant advances in science and technology, including in the healthcare industry. As a result, the growing number of older people promises further growth in demand for medical equipment.

Examining these statistics and the growing trend of aging in the world and the aging population in developing economies, has now led to new strategies for the treatment of aging diseases and health care in this regard is more and more practical.

An aging population around the world, along with a long life expectancy, is creating a steady demand for medical equipment. As health care for the elderly in markets around the world is regularly provided by the government or

subsidies, home health care has become even more important due to the greater efficiency of related technologies and careful review of health care budgets.

In overviewing the general view of industry and competitiveness in the United States, it is observed that USA medical device companies have received a great deal of attention worldwide for their innovation and production of high-tech products. In medical device companies, investment in medical device research and development has more than doubled in recent decades, and invest in domestic reasearch and development has more than doubled the average for all USA manufacturers.



The USA medical equipment industry is diverse, producing a wide range of products for diagnosing and treating patients, from the simplest equipment to the most sophisticated medical products.

The USA medical equipment industry is known for producing high quality products using advanced technology resulting from significant investment in research and development.

In particular, over the past decade, the USA medical equipment industry has experienced unprecedented advances in innovative and advanced technologies, leading to the birth of new therapies for the growth of the entire healthcare industry worldwide.

The largest USA medical equipment companies are:

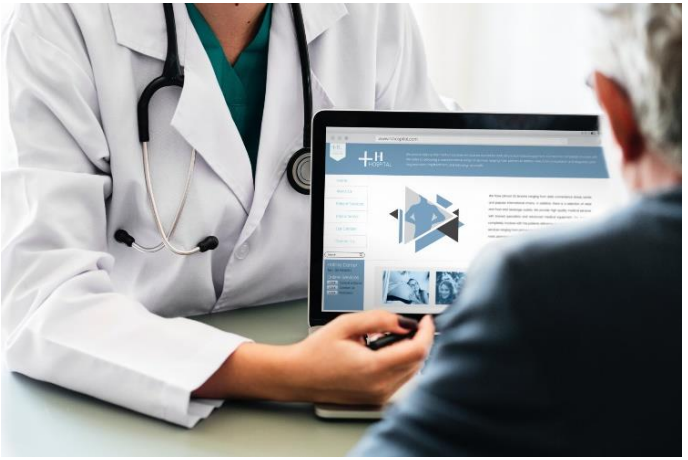
Betcon Dickinson, Beckman coulter, Baxter, GE healthcare technologies, Boston Scientific, St. jude Medtronic, Johnson & Johnson

The United States is home to 141 prestigious medical schools and colleges, and approximately 400 large teaching hospitals and health systems, many of which are among the best in the world.

Many of these academic institutes collaborate to produce new medical technologies for medical equipment companies.

In addition to being the world leader in medical device manufacturing, the United States is the largest consumer of medical equipment.

The large USA medical equipment market is estimated at more than $ 170 billion in 2020, and USA medical equipment exports in 2020 are estimated at about 45 percent and imports at 55 percent.



Over the past decade, the value of imported medical equipment has steadily increased and gradually reduced the previous trade surplus.

Most imports are lower-tech products, such as medical consumables such as gloves and surgical instruments.

Continuous changes in business patterns have led to Germany, China and Mexico becoming significant exporters of high-tech medical equipment to the United States.

The USA medical device industry is expected to remain highly competitive globally, as it is part of these national characteristics that bring new and innovative technologies to market.

The medical device industry is increasingly embracing globalization, and a growing number of multinational corporations are seeking markets around the world.

These companies are focusing more on international sales and joint ventures.

German Medical Equipment Market

Germany is one of the main game-battalion in medical equipment in the world. As a medical equipment exporter, it plays a major role in the export of medical equipment to the European region.

With less than 4% of China, or 83 million people, Germany has a € 400 billion healthcare market. The country is a special phenomenon in the health industry, with seven million employees in the health care sector, 2,000 hospitals, treatment centers and administration, and five hundred thousand hospital beds.

Despite the compulsory insurance in Germany, in this country public health insurance, with 112 companies, covers seventy-one million people.

Private insurance, with 44 companies, covers nine million people. The country has 17 million retirees living under supervision of these insurances.

German public and private hospitals are scattered throughout in 16 states of the country, and it is interesting to note that the largest urban hospital group in Germany is Vivantes for Health GmbH in Berlin, with more than 100 hospitals and a total of about 5,500 hospital beds.

The issue of aging is of great importance in the future of the health sector in Germany. According to the German Aging Association statistics, by 2035 the number of people over 65 in Germany will reach 24 million, or about 30% of the German population.

Chronic and long-term illnesses also account for about 80% of health care costs, or € 200 billion in healthcare costs in Germany. In recent years, however, the number of people with diabetes has risen to about 7.5 million.

Like many other industries, the healthcare sector is changing rapidly due to new technology. These changes depend on new raw materials, new methods of production, digitization and interaction.

Many healthcare units in Germany are still attractive. One of the most attractive sectors is medical equipment with a share of 34 billion euros. In this section, 55% is related to first aid, 42% is related to medical equipment and 3% is related to dressing equipment.

Of the 34 billion euros in medical equipment consumed in Germany, about 30 billion euros are produced in Germany, of which about 17 billion euros are exported.

Despite the competitive health industry in Germany, the country still has significant imports in this area. The import of German medical technology is more than 15 billion euros per year.

In fact, 32 percent of these imports come from the European Union, about 30 percent from the United States, about 19 percent from Asia, about 14 percent from other European countries, about 4 percent from South and Central America, and about one percent from the Middle East.

Meanwhile, the demand for innovative medical technology solutions continues to grow in Germany, so that they can take fundamental steps towards greater human health and contribute to human longevity.

And because of this, the cost of medical technology in Germany has reached around forty billion euros. There is an opportunity for Germany to have a better perspective on the export of German medical equipment, despite the small and medium-sized companies operating in the medical engineering sector. All the recent efforts in the field of export of German medical equipment have led to the growth of more than ten percent of the domestic medical equipment industry in Germany.

As you know, Germany is known as one of the main exporters of medical technologies. Most of these exports are to the United States, China, the Netherlands, France, Italy, the United Kingdom and Switzerland, respectively.

In the medical equipment industry in Germany, there are about 1350 active manufacturing companies and also 210,000 employees in this sector, which on average each company has more than twenty active employees or in other words 15% of the employees of each company are active in the field of medical technology. About nine percent of these companies' turnover is devoted to research and development. From a global perspective, Germany is the

second largest patent holder of medical technology after the United States.

In general, the nature of small and medium-sized companies producing German medical equipment is based on cooperation with universities and scientific centers. This strategy has been able to generate research projects in the field of medical equipment in Germany.

Government support for joint programs between universities and industrial centers and companies has been able to contribute to the growth and development of this industry in recent years.

Many joint projects are coordinated by medical technology organizations and clusters with centralized management and project management staff.

Germany has more than 30 clusters of innovations in medical technology, which aim to achieve continuous innovation in research and development as well as production in collaboration with companies, hospitals, universities and other research institutes.

International companies serving the German market are required to comply with the requirements of German and European safety and health law.

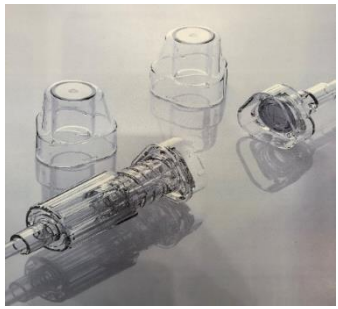
Germany-specific regulations (MPG) in addition to the European Medical Apparatus (MDD) guidelines and medical apparatus (MDR) regulations must be followed.

Manufacturers of medical devices are required to comply with European Union (EU) law for all devices manufactured for specific medical purposes.

The CE mark can be applied to the device after the announcement of the selection.

Medical devices, unlike medicine, are not approved by government agencies. Rather, they are controlled by informed reference that have been legally registered and approved by standard authorities.

There are about 60 declared reference throughout Europe, with the main headquarters of its 10 main institutions in Germany.



German international medical equipment manufacturers face national healthcare and reimbursement systems after approval for the European market.

In Germany, manufacturers are facedat frist with a system that is primarily recognized by statutory health insurance and to a lesser extent by private health insurance.

In fact, legal and private health insurance is co-financed by the insured persons, their employer, the state pension fund, etc. through premiums (paid). While most EU countries have a DRG system for the inpatient department.

In this way, a number of different institutions, financing and repayment systems are operating in the 27 member countries of the union.

Innovation and cooperation with national health systems will greatly affect their absorption in new technologies and the commercialization of new products. The German hospital system is particularly compatible in terms of product safety requirements and the availability of immediate and innovative refunds.

Germany's DRG system allows any CE-certified medical device to be reimbursed under existing procedures and their DRG codes (unless prohibited in certain cases). While the German authorities are enforcing only one ban on inpatient wards, the reimbursement of a new outpatient technology is subject to approval for each product.

In Germany, pilot health care projects are expanding every day. The most important of these projects are remote treatment, electronic prescriptions and electronic instructions for physicians.

The widespread use of electronic health cards is one of the most important projects in Germany.

The e-health card can store medication plan data, emergency data, and physical readiness data, and it is possible for the patient to access their personal data outside the office.

German medical technology clusters play a key role in the innovation environment in German technology. These clusters operate with more than 30 networks of specialized clusters focusing on medical technology.

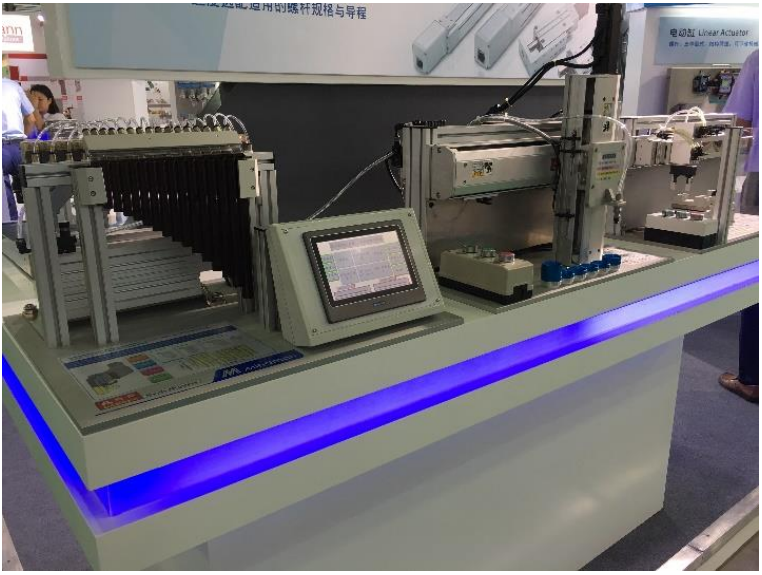
The main goals of these technology clusters are to help companies, hospitals, universities and other research institutes to communicate more, to strive for continuous innovation in research and development and to support it, to help finance joint research and development projects, to create common facilities, and the organization of educational programs.

Construction and innovation clusters can also be found in many parts of Germany. About one hundred medical technology companies, 1250 companies manufacturing medical devices and products, 30 clusters of medical equipment technology, 426 specialized university institutes, 33 university hospitals, in addition to government grants for production, research and development, have been able to make develop trade in the medical equipment industry.

China Medical Equipment Market

China's medical equipment market is one of China's booming economic sectors.

According to unofficial statistics, the total volume of China's medical equipment market is over 100 billion euros in 2020. The average growth rate in recent years has been between 20 and 25 percent.



The top five segments of China's medical equipment market include medical imaging, laboratory diagnostics, consumables, cardiovascular devices and orthopedic devices, which together account for about 54% of the total medical equipment market in China.

More than 16,000 medical device manufacturers are registered in China, about 90% of which are small and

medium-sized companies. The focus of most companies is on the production of Class II and Class I devices.

According to official statistics, of these 16,000 medical device manufacturers, 2,000 companies have export licenses.

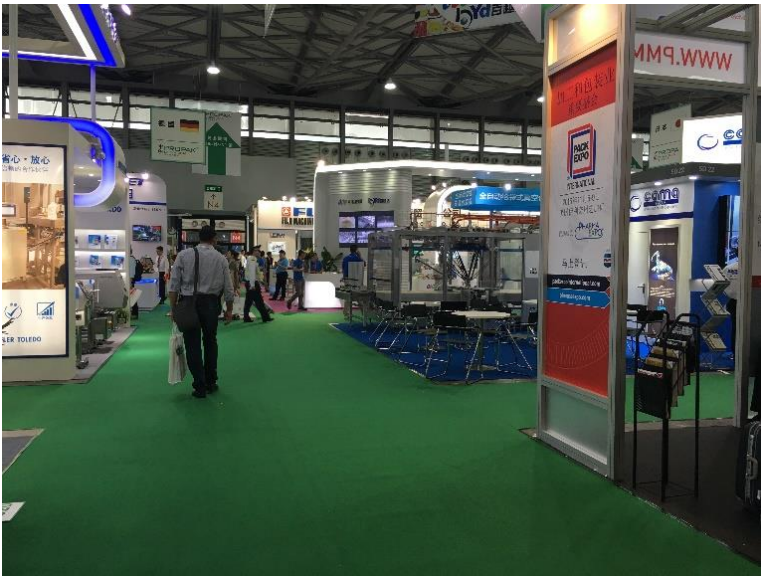
In China, 80% of medical equipment is produced in one of the following three regions:

-Pearl River Delta (Shenzhen / Southern China)

-Yangtze River Delta (Shanghai / East China)

-Beijing - Tianjin - Bohai (northern China)

In general, the power and all the focus of Chinese medical device manufacturers is the mass production and marketing of medical devices, which have relatively little research and development.



The advanced medical research and development equipment market in China is dominated by large multinational countries.

For example, the advanced market for MRI (magnetic resonance imaging) equipment from a Chinese perspective is dominated by foreign companies, as well as 90% of the market share to Siemens (Germany), General Electric (USA), Philips (Netherlands), Canon (Japan) Is awarded. The remaining 10% of the market is filled by local companies such as Neusoft (China).

For more example, more than 95% of the pacemaker market is dominated by Sciention (USA).

In this and other markets, China has begun supporting domestic medical companies and entrepreneurs. As a result, Chinese companies have grown better in recent years under government support.

In general, Chinese competitors in the Chinese market, as a general sales strategy, rely heavily on their efficiency and focus first on capturing the vast market of Medium-downward hospitals hospitals. This policy is pursued with greater capacity in research and development in the Chinese market, until foreign companies have a significant foreign exchange capital to sell goods in China, and then try to reach the market of high-end hospitals.

However, according to the China Health Industry Investment Research Report, there are four general weaknesses in the domestic medical equipment industry:

1. Focus on low-cost bidding strategies in combination with a lack of strategic marketing, which leads to poor production volume and thus limited research and development.
2. Lack of movable system in medical equipment technology to offer new products, lack of all long-term investment in training and development of customers.
3. Defects in detail and complexity when producing advanced products.
4. Weakness in safety, efficiency and performance management of the medical device (compared to international competitors)

Although the growth of the medical equipment market seems to be increasing, the poor quality of Chinese products is the main challenge that the Chinese government is seeking to address.

According to statistics, the total value of medical equipment imports to China annually amounted to over 15 billion euros from all countries.

The European Union exports a total of 4 billion medical devices a year to China.

Only four countries annually (Belgium, France, Germany, Italy) export a total of € 2.5 billion worth of medical equipment to China.

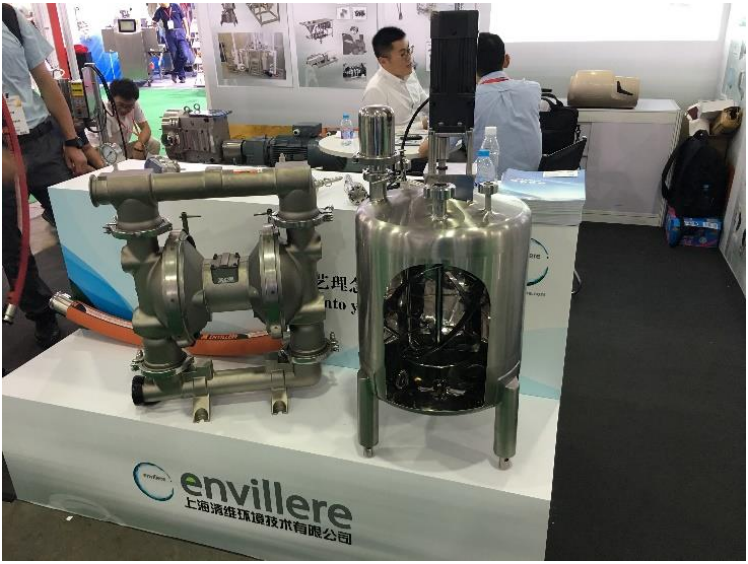
Manufacturers of Chinese medical equipment typically produce a variety of general hospital products, but high-tech products are imported from the United States.

As mentioned, there are more than 16,000 medical device manufacturers in China. The following are the ten largest medical device manufacturers in China:

Lepu Technology, Glory Medical, Dian Diagnostics, Runda Medical, Mindray, Microport, Medocal System, Yuwell, Wego, Shinva

According to official Chinese government statistics, American companies control about 70 percent of medical equipment sales in China's major public hospitals. Thus, there is still considerable potential for American companies

interested in entering or expanding into China's growing market.



China is one of the most promising health markets for US exports in terms of size and long-term growth potential.

Rising per capita income, an aging population, greater access to health care, and recent regulatory reforms are among the main factors driving the attractiveness of the Chinese market for American companies. However, there are significant challenges for American companies in this market.

The Chinese government has focused on "health care" as one of its priority areas.

Therefore, China intends to produce imported goods in its country by acquiring indigenous innovations and upgrading technology. Following this, the NMPA was established in the last two years.

This section, the newly established National Bureau of Medical Products, known as the NMPA, is slightly different from the previous section, the former China Food and Drug Administration (CFDA).

The NMPA is a government agency responsible for regulating devices and drugs and testing, evaluating, and providing administrative approval to medical and pharmaceutical equipment.

With the formation of this organization, the requirements and registration methods for the Chinese market have become meaningful, easier and faster in order to issue internal licenses for innovative purposes and in connection with medical equipment, without changing the previous processes. However, significant austerity measures have been taken to support domestic production of medical equipment entering the Chinese market.

Although registering an imported product in the field of medical equipment in China requires one to three years of time-consuming process and high costs, but setting tariffs and special costs for the import of goods such as the initial registration costs according to the risk class, the cost of renewing the initial registration every five years, the cost of domestic representation, the cost of translation, and the cost of clinical trials are some of these difficult cases under the new rules.

Medical equipment imported into China requires an NMPA registration process to be registered or notified before it can be sold or distributed in the Chinese market.

Clinical trials may also be required for medical devices. If the products pass clinical trials, the company must send its application package to the NMPA. The NMPA conducts an administrative and technical review of the program and, after evaluating its eligibility, issues a certificate allowing the company to sell its products legally in China for five years.

Although China is one of the largest markets for medical equipment in the world, there is still much room for improvement. Because previous trends (urbanization, increase in chronic diseases, etc.) continue to strengthen demand.

Overall, health care reform, population growth, aging, the epidemic of chronic diseases, new regulations, and increased public investment in expanding health coverage continue to drive China's medical device market.

The Chinese medical equipment market, depending on the specific product type and the main competitors of medical equipment, which usually includes EU countries, especially Germany as well as Japan, has led the government's current policy to support and encourage innovation in medical devices within China.

Some Chinese medical equipment manufacturers, such as Shenzhen Mindri, Edan Instrument and Shandong Shinwa, produce high quality products and begin to compete with foreign suppliers in intermediate to high level distributions.

China is one of the world's largest exporters of medical equipment.

As mentioned, with about $ 15 billion in exports per year, the country has the largest exports in the field of general medical equipment.

It should be noted that the main goals of China's current policy to improve the health care system are:

- Expand health coverage throughout the country

- Strengthening the primary health care system

- Poverty alleviation (in specific rural areas)

- Creating a healthy overall environment

- Strengthen innovation and research

Dutch Medical Equipment Market

The Netherlands is one of the five most important and influential countries in the medical equipment market in the world.

The Netherlands is one of the largest exporters of medical equipment in the world. It is one of the leading countries in the medical equipment industry with about $ 15 billion annually in medical equipment.

The healthcare system in the Netherlands faces several challenges.

An aging population and higher health expectations will have a significant impact on health care policy and public spending in the coming years.

Cost-saving measures through technical advances and innovations in medical equipment are well received by the country. In addition, there is a tendency for this country to downsize medical devices.

Medical software, telemedicine, e-health are still parts of the Netherlands with strong market potential.

Health information technology is at an early stage and there are many opportunities in the informatic and life sciences sectors in the Netherlands.

The Dutch know that by investing in health information technology they can make significant savings in the health sector.

Because not continuing to invest in health information technology will cause more costs. Because health care spending is currently 18% of the country's GDP in 2020. While this figure can be reduced to 5.3% of GDP by intelligently using IT tools and paying attention to costs.

Therefore, the annual savings of $ 3.2 billion as a result of effective use of IT tools is an affordable and reasonable expectation in this country. Also, with the growth of this process, hospitalization and death of patients is reduced by 50%.

According to what was said educating people about the use of IT tools is a priority for the Netherlands.

With the use of medical equipment based on electronic health and the use of prevention methods, diseases are reduced and methods of treatment and care of the patient at home are expanded.

Despite the import of medical equipment imported from the United States and the presence of the headquarters of NuVasive, Stryker Euroe, Medtronik in the Netherlands, it can be said that companies operating in the field of medical equipment with the support of the Dutch government have made good progress.

Some of the successful medical equipment companies in the Netherlands are:

Essilor International, DePuy, F. Hoffmann-La Roch, GE Medis, Siemens Healthcare, Philips Medical, Leyden, KPN

The Netherlands has taken key steps to support domestic production of medical equipment.

All medical devices and equipment used in the Netherlands must be registered with the CIBG-Farmatec according to the relevant hazard class. Depending on the type of hazard class, clinical trials, registration of medical device names, goods declaration, labeling conditions and medical device instructions, they must be declared and registered in at least two Dutch languages.

Japan Medical Equipment Market

The Japanese medical equipment and supplies market is still one of the largest in the world. According to the latest official figures from the Ministry of Health, Labor and Welfare (MHLW), Japan's annual pharmaceutical production and medical equipment market is estimated at $ 30 billion.

This market is largely dependent on imports, especially of complex medical equipment. Demand for advanced medical technology is expected to increase in Japan. Because of its demographic characteristics, Japan is facing rapid aging and relatively affluent elderly people in this context, have higher expectations for improving the quality of life in the coming years.

Japan is the largest exporter of medical goods and equipment to Japan.

The United States accounted for about 67 percent of Japan's medical equipment market with about $ 15 billion in exports.

Among them, all kinds of complex medical devices, all kinds of catheters and all kinds of orthopedic implants are some of the items that can be seen in the export of the United States to Japan.

The main product categories of medical equipment produced in Japan are: diagnostic imaging equipment, medical and surgical equipment, systems of measuring and monitoring biological phenomena, home medical equipment, dialyzers and endoscopes.

Meanwhile, Japanese medical equipment companies have been able to maintain a high market share in these product segments.

As the top Japanese medical equipment companies in terms of sales are:

Olympus Medical system, NRPIO, Terumo Fukuda Denshi, Nihon Koden, Hitachi Medico

A study on the demands of the health sector and medical equipment in Japan shows that due to the aging population and the increase in the number of patients with chronic diseases and lifestyle in Japan, the demand for medical devices and equipment that relieve pain, or compensate for lost functions in the body, or in other words improve the quality of life, has been constantly growing.

As the number of patients receiving out-of-hospital and sanatorium health care increases, the need for home care devices, technologies, and products related to health information technology is expected to increase.

Medical devices and equipment that use artificial intelligence (AI) systems, such as diagnostic imaging and medical support, will see increasing demand and market opportunities.

Due to all these cases, the highest demand has been registered in the preventive care sector in Japan.

Global Competitive landscape and Issues

Competitive perspectives and issues related to medical equipment countries in the world are very complex and accompanied by specific consumer market policies.

These policies are constantly changing and changing according to the conditions of the day.

Large companies formulate regulatory policies based on target markets. These policies are derived from a careful study of markets on a regional and local basis.

Establishment in the region and establishment of bases for production or distribution varies according to the conditions of countries and continents.

The global medical equipment industry is highly concentrated. It may be hard to believe, but the top 15 companies in the world have managed to capture about 60% of global sales, and interestingly, American companies have been able to dominate the market more.

But the interesting thing is that eight of these companies are based in the Netherlands.

Research, development and distribution, to better understand the situation of these companies should be considered by researchers in our country.

One of the interesting policies of these companies is that the global medical equipment companies have reduced their activities in the advanced industrial markets in order to approach higher growth in emerging markets.

Medtronic company, for example, has shrunk in the United States and Europe, shifting its international headquarters to global production and expanding trade in emerging markets such as Singapore.

With increasing access to health by developing countries, global health costs are currently fluctuating widely, with annual health costs set at between $ 1,000 and $ 7,000 per person per year.

With the development of emerging markets, the World Health Organization forecasts a significant increase in the global market for medical equipment and devices, but it is estimated that more than 70% of complex devices imported to developing countries due to lack of capacity, do not act completely.

World pricing models are constantly changing. With the increase in population and consequently the aging in the world and the increasing pressure on health care systems, in fact, paying attention to price instead of gradual improvement causes the need for value-added products and high technology.

Research and development activities in developed countries are excluded from parent companies due to high costs and are outsourced in other countries at lower costs.

In this type of operation, universities and non-educational institutions have been formed in different countries to help meet the goals of large companies in the field of research and development. Because the costs of these institutions are much lower than the parent companies in developed countries.

Research laboratories, especially in developing countries, can provide competitive services to large companies in the form of outsourcing.

By changing the place of production from developed companies to less developed countries or developing countries, the cost of medical equipment goods can be managed lower and more rationally.

It is easier to sell and supply branded products in the medical equipment industry in less developed countries, and if produced in these countries, the cost of shipping and distributing goods will be much lower.

For small industries that operate in the field of medical equipment, marketing and sales costs within the company are not economical. Therefore, it is better for these companies to use private companies that operate exclusively in the field of marketing and sales of medical equipment. Of course, this varies depending on the type of

companies and producing countries. Because in some countries, due to protectionist policies within their own country, sales intermediaries have been eliminated or are being eliminated.

Regulatory Processes and Product Approval of Medical Equipment

As you know, all medical devices and equipment for commercialization and supply in any consumer market, need to comply with strict legal regulations and obtain certain standard licenses.

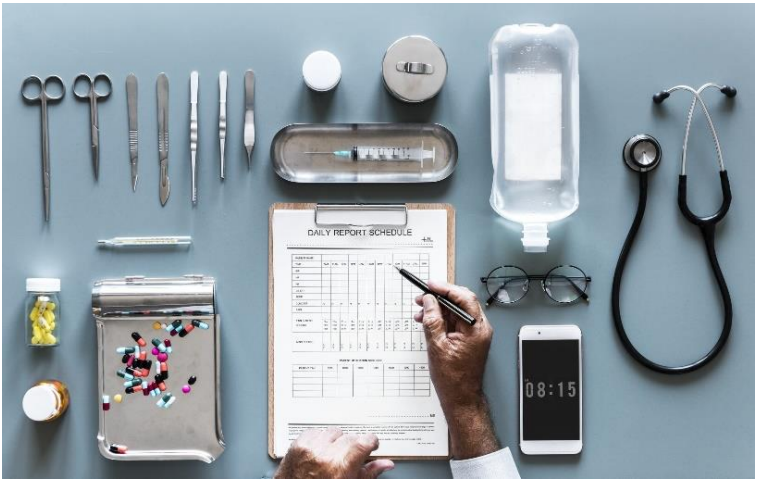
Medical device companies are only responsible for quality control, application and provision of essential product requirements such as labeling, packaging and after-sales service monitoring.

Therefore, regulatory assurance of product quality and devices made in medical equipment companies, product efficiency in terms of production, sale and distribution is done by other distributors.

In European Union (EU) countries, manufacturers evaluate each product with a notified body, an independent body recognized by a reputable member company, to be evaluated in accordance with EU medical device guidelines.

Thus, once certified, the manufacturer may, as required, label the products with the CE mark required for distribution and sale in the European Union.

In the United States, the Food and Drug Administration (FDA) approves and authorizes the production and supply of any medical device. These approval processes vary greatly depending on the product and the device of the medical.



But what is very important and can be examined is the fact that the European Union has a competitive advantage when entering the market more quickly.

Because the average time for approval of a medical device after it is notified to the desired centers is usually 21 months in the United States. In a comparison, the approval period in the EU is 7 months.

Also, the process of scientific approval, monitoring, safety assessment and effectiveness of the device or medical device, or in other words, pre-market approval for marketing is usually 54 months in the United States. While this is done in the EU for 11 months.

In addition, product manufacturing processes such as:ISO standards,ISO 13485, ISO 10993, ISO 14971 standards guarantee the quality of medical device production.

Chapter Three
Iran and the Demand for Medical Equipment

General Market of Medical Equipment in Iran

Due to its large market for medical equipment, Iran has always been one of the most interesting markets for the import of medical equipment in the world and is considered by European countries, especially the Netherlands, Germany, France, as well as China, India and Turkey.

The world market of medical equipment includes about 500,000 types of medical devices and devices, about half of which are used in Iran.

Statistics also show that most of these medical devices and devices are imported and most of them are imported from China, India, the Netherlands, Germany and France.

It is interesting to know that more than 80% of laboratory devices are purchased through imports in the country. These devices are defined in global statistics of over 30,000.

The total market for medical equipment in the world in 2020 is about $ 400 billion. While this market in Iran is estimated at $ 1.7 billion.

The growth of the medical equipment and devices market in the world is estimated at about 6% annually. While global statistical experts estimate that about 9% for Iran.

Although continuous and heavy investments are made by the Iranian government for prevention and treatment, but the private sector is also looking for various projects. These private projects are mostly around health tourism, because there is a lot of potential in this sector in Iran.

Although the presence of infectious diseases always creates a greater financial burden on governments, especially the government of Iran, but this in itself creates mobility and opportunities for economic actors in the field of health, to be able to further develop their business. Experts and researchers in the meantime will play an important role in

the emergence of new products in the field of medicine and medical equipment, provided that the speed of operation and commercialization of medical equipment products be more and the product will be marketed at the required time.

Development Solution of Medical Engineering Economics in Iran

The structure of work in any country is subject to the current laws of that country. Iran's economy is a state economy and subject to the government system.

In such an economy, more government reform should be considered, and perhaps the best way is to provide solutions for economic development in medical engineering. Therefore, some suggestions in this regard will be announced. It is hoped that the solutions will be considered by Iranian politicians.

Some of these solutions include:

1- Timely and correct supply of currency at a fixed price for the import of raw materials and specialized all costs related to the transfer and conversion of allocated currency and freight.

2- Following up and clarifying the cases and violations of the company and related individuals who have obtained a license from the General Administration and government currency, have imported counterfeit goods, and also introducing them to the State Penitentiary Organization and revoked their license for several years, so that they can not work in the medical field, even by changing the name of the company.

3- Following up and clarifying the violations that have taken place in the defective outsourcing system of the General Administration, as well as its prompt and immediate correction.

4- Establishing joint working groups with real representatives in companies to formulate rules and regulations and, if necessary, amend the current cumbersome administrative regulations.

5- Improving the system and routine of work in the General Directorate of Medical Equipment Production and the cumbersome rules of the unit and the tastes of the experts of the unit.

6- Strengthening the administrative system of the country to help facilitate trade and exports, in order to reduce the preparation time until the delivery of goods in the destination country.

7- Paying attention to foreign policies, so that we can provide suitable economic conditions for the country's economic actors.

8- Paying attention to domestic policies in order not to create economic tensions.

9- Controlling the amount of liquidity of the society and directing it towards production and sustainable employment.

10- Using young, competent, efficient and dynamic managers in order to create new conditions and increase vitality in society.

11- Giving the authorities the courage to make decisions to advance quality goals and use innovative designs.

12- Helping the relationship between industry and university and changing the thinking of university officials in pure-evidence-based with friendship and better communication between craftsmen and academics.

13- Helping to create new technologies in the country and creating non-educational institutions.

14- Helping the officials to scientific and industrial organizations in order to solve the basic problems of the country.

15- Creating scientific nuclei in order to organize the technology-based economy in the country, in a real and operational way.

16- Strengthening private industrial organizations and paying attention to collective wisdom in their policies.

17- Eliminating the supervision of parallel supervisory organizations and institutions in the industry and allowing the movement and industrial development in the country.

18. Reforming tax laws and paying attention to the free global economy.

19- Maintaining the supervisory aspect of the government and not entering the executive departments.

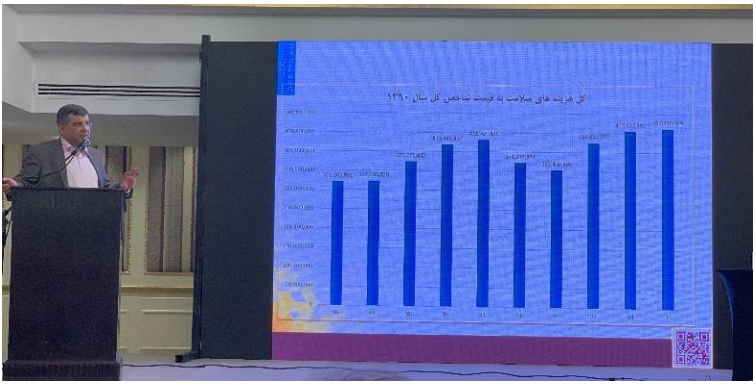
20- Paying attention to the structure of quasi-government companies and reducing the volume of these companies and allowing competition to the private sector.

21- Friendship and empathy of groups and political parties in the country in order to maintain peace and pay attention to collective interests, not individual and partisan.

22- Not paying attention to negative rumors in the country and helping and empathizing in order to build a better Islamic Iran.

Global Demand of Medical Equipment and Government Attention

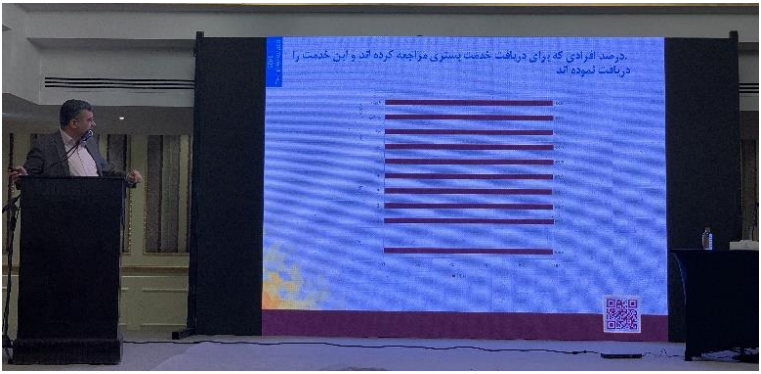
Global demand for medical equipment is being met by increasing costs and activities related to health care, by expanding markets by creating new hospitals and clinics, by creating public health insurance, and by focusing more on health. In addition, global demand must continue to grow due to lifestyle diseases, aging populations in large markets, new and significant emerging markets, and rising global incomes in developing countries. In addition, the global convergence of regulatory standards and requirements should help facilitate global market growth and business opportunities.



Increased competition for developed and reciprocal treatments and cost containment has shifted the focus of the medical device industry to creating added value for payers and patients. In this way, traditional methods of extracting income through investment in research, development and innovation must be improved, so that ultimately the added value in the health sector can move towards growth.

These companies are looking for community-coordinated therapies and healthcare solutions to move towards value-based healthcare with value-based efficiency.

By treating therapies as a comprehensive treatment package, medical device companies can help providers meet their obligations to patients, control costs, and simplify transactions.



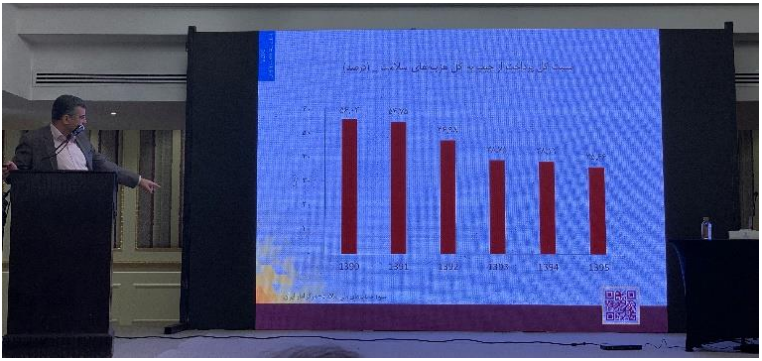
As expected, the United States, the European Union, Japan, and Canada are very large and lucrative export markets for medical devices.

However, these stable and mature markets have relatively low annual growth rates (3to5) percent. To facilitate expansion, medical device companies recognize that they must look to developing countries for future growth. In some cases, demand for medical equipment is growing in double digits compared to larger, slower-growing markets in developed countries.

Significant yet small populations in emerging markets are often growing steadily. These countries are facing an aging population and the growth of lifestyle-related diseases, and

are becoming more aware of the development of health technology.

In addition, many of the so-called "developing" markets have large urban population centers that, as wealth increases, increase their consumption costs, making certain market segments attractive to exporters to these countries. By further examining these developed markets, one can think of emerging markets to finding more export markets.



In order for the medical device industry to fully realize its potential for market development, adopted standards and specific regulations based on risk and quality management must be developed in the direction of international convergence and continue to meet global standards.

To this end, actors in research, development, production, marketing, sales, distribution and after-sales services need to act on the standards of this sector and with the help of the National Standards Organization , should try to seek real development of the industry in terms of standards.

Because the role of the government as a regulator in this sector has usually acted in terms of taste and within the framework of strict and erosive laws.

With all the problems created by the government in creating trade development circles in the medical equipment industry, one of the real needs of the activists in this sector is the need for government assistance in expanding export activities.

Continuous opportunities to expand the export of medical products and devices will be achieved through some key government policies and activities.

Given access to developing countries, the government's share of incentives in this sector will play an important role in the international convergence of regulatory requirements, which could lead to greater market influence in these countries.

In addition, the government's continued focus on reducing and eliminating trade tariffs related to the import of goods in the target markets will be very important and affect the growth of this industry for exporters.

Government assistance in creating export opportunities, through obtaining market information, trade missions and other activities, is important and vital in promoting trade between Iran and other export target countries.

Iran's medical equipment industry needs and expects the government to be active in several areas that create and improve business conditions:

1. To negotiate with the destination countries to reduce or eliminate tariffs on medical devices.

2. Eliminate the regulatory policies of foreign governments, which are inconsistent with international regulatory convergence efforts and may lead to unfair discrimination against industry.

3- Educate medical engineering industrial activists on how to comply with external regulatory requirements.

4. Provide export assistance opportunities similar to those provided by foreign governments for their industries.

5- To provide exporters of medical products and devices with information on the destination export market by training and developing foreign trade affairs and examining export goals.

6- Teach the rules that Iranian companies must follow when exporting medical equipment through the Trade Development Organization.

7- The National Standard Organization of Iran should have special cooperation with exporters in order to develop exports, in order to comply with international standards.

These protections can be in the form of special export certificates.

8- Establishing operational cores in the Ministry of Health, in order to accelerate the coordination and regulatory convergence in the export of medical equipment products and reduce administrative bureaucracy in all government sectors.

9- Contributing to further development in the field of medical equipment industry, as an evolved global industry, so that more actors in this sector can better improve and upgrade their energy towards the development of more innovative medical technology.

10- Facilitating the regulatory requirements at the beginning of the arrival of medical devices in the target export countries of Iran, in order to develop international cooperation.

11- In order to export medical equipment and devices from Iran to the country, diplomatic negotiations should be held to reduce import tariffs on medical goods and special medical equipment, in countries such as India, some Latin American countries and parts of Asia that still have tariffsthat they charge high for some medical products, which reduces the net selling price of medical equipment.

12- Controlling informal exports from the country in order to improve the quality of Iranian goods and realize the real position of Iranian goods in export destination countries.

13. Negotiations to eliminate additional requirements and perform special tests at the points of entry of goods in some countries cause problems, that can be done these tests and

inspections before sending the goods, with the coordination and approval of the export destination in Iran to save costs and time for the exporter.

14. Improving the conditions of international payments through the implementation of economic diplomacy.

15- Improving the conditions and facilities for purchasing Iranian goods for export-target countries, by providing international financing to buyers of Iranian goods.

16. Efforts to regulate convergence in order to amend the rules and regulations for the export of medical products and devices and eliminate parallel work in the public sector in order to export more easily at a higher speed.

17. Just as the production and supply of medical products in the country by the government is subject to strict laws and a long, complex, unreasonable and expert-oriented administrative bureaucracy, so the laws on the import of medical equipment, the conditions for the import of counterfeit goods and Poor quality should be harder, especially from China and India, which have affected the domestic market.

18. Most manufacturers of medical equipment industry in Iran consist of small and medium-sized companies, which invest most of their capital in research and development, to gradually improve their technology. Most of these companies do not have the resources to conduct complex export market research, and on the other hand, many smaller companies are initially focused on entering the Iranian market, whose exports are stopped before they become profitable in Iran. However, it is more difficult to

enter the domestic market than some foreign markets. Because there are stricter rules in front of them. Therefore, the implementation of international agreements between Iran and the countries targeted for the export of medical equipment, can have a positive impact on the development of Iran's exports in this sector. Provided that in the preparation of these agreements, the assistance of associations and export unions in the field of medical equipment and medical engineering is used.

19. Development of cooperation and establishment of joint production companies in the target countries, through the presence of Iranian companies specializing in the construction of medical equipment factories in order to promote bilateral cooperation and use of special financing to develop science and technology for technical and engineering companies. Active in Iran who have good experience in this field. Like the Iranian company Niamesh, which has already built more than one hundred factories producing medical equipment in Iran. And this it has created the technical knowledge of establishing a medical equipment factory in Iran in a practical way.

20- Development of regional trade agreements between Iran and the target countries of export, in order to facilitate the import of goods and provide special support, in order to develop methods of exporting goods, providing financial resources, facilitating the transfer of goods. The agreement could eliminate medical device import tariffs, support increased regulatory coherence among member states, and increase transparency on product refunds and pricing, which would ultimately lead to faster approval of medical

equipment, which would benefit Iranian companies will be to gain reliable export partners.

Internal Production for Medical Equipment

The expansion of health care and the improvement of medical conditions in the country have led to an increase in the consumption of medical engineering devices and medical equipment in the field of using more up-to-date equipment and using more standard equipment than before.

This, along with rising exchange rates and sanctions problems, has created a supply-side demand gap. That is why the demand for domestic production is growing.

Iran is one of the few countries in the region that has an industrial infrastructure for the production of many medical engineering devices, especially medical consumables. These infrastructures include available raw materials, cheap energy, as well as craftsmen with the experience and knowledge required for this type of production. It is possible in the country to start production and meet part of the country's needs by using machinery, raw materials and local technical knowledge created by engineering companies such as Niamesh Company.

According to the general market trend and available statistics, the return on production capital, taking into account the depreciation of capital in this industry, is about two to three years. This return on investment puts this sector in the category of quick-return industries.

Given the country's great need and greater reliance on imports compared to drug distribution, the production of medical equipment could be a way for investors to survive the embargo.

However, more than 70% (rial value) of medical equipment consumed in the country is still imported. Equipment that many of them can be conceivable not only for domestic consumption, but also for export.

Accordingly, the registration rate of manufacturing companies in this sector has increased. In many cases, small and large investors from other industries are also entering the industry.

Of course, the most important and fundamental point in any investment in Iran and the world is to have expert advisors, carefully study the market and formulate a plan of economic justification based on facts, in order to build what a country desires.

In the meantime, it is sometimes seen that investors, instead of having new ideas and initiatives in creating innovation and new technology, seek to produce old equipment or copy the products of other domestic manufacturers, and since most of these people, only seek their own profit, produce low-quality goods and also they cause problems for domestic production and the name "Made in Iran".

Emphasis on Relying on Internal Capabilities

In the current economic climate, the cost of importing goods has increased significantly, and it is natural that investors in any market tend to produce. In a market such as the market for medical equipment, which is related to public health, over the past few decades, attention to the category of production has led to an increase in the number of manufacturers.

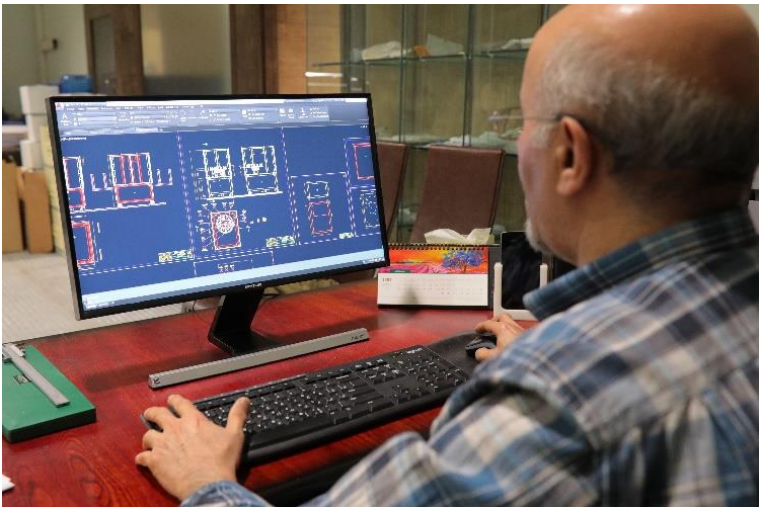
In the meantime, it is not bad to look more and deeper into the health market in Iran so that we can have a better analysis of the market for medical equipment in Iran.

Fortunately, the existing infrastructure and capabilities in the country, allow the rapid and cost-effective expansion of the volume, quality and variety of domestic products.

Industrial towns located near the active population centers of the country have the ability to provide the required branches of production. Most of these centers have a dedicated phase of production of drugs and medical equipment, which allows the applicant to produce away from polluting industries. For example, Eshtehard industrial town, as one of the largest industrial hubs in the country, has good specifications for the production of medical equipment.

In this study, on the other hand, polymer raw materials used in consumer equipment are being produced in the country.

The development of oil and petrochemical processing projects, as one of the parent industries, has attracted large investments in the country and today we are self-sufficient in many of these fields. Although some of the more advanced items are still imported or do not justify domestic production, a high percentage of domestic demand can be met without foreign exchange costs.



The supply of production technology, including machinery and technical knowledge, is unfortunately the only point in the production cycle in which trust in domestic capabilities is still not institutionalized. Despite the significant success of investors using in-house solutions, as well as the many financial, logistical, legal and technical problems with using imported services and products, investors have tasteful behaviors for the use of machines which is produced in abroad.

Tasteful behaviors in this category have led to the waste of huge investments in recent years and have involved many investors in issues and problems that actually make them the largest negative advertisers for entry into production.

This is while the required technology and knowledge at all levels are available and presentable in the country.

The use of localized equipment, in addition to lower costs, no exit from the country and freedom from international

transport, both technically and well-done, can be easily traced. The use of services and products of domestic artisans also injects capital in research and development and improvement.

Iran and Neighbors

What is important is that Iran, due to the presence of its neighbors and the bridge between North, South and East and West, which has been active in this trade for many years, can provide good export communications in the field of health products. This is while, as mentioned before, the country's need for domestic production and the possibility of supplying domestic raw materials for production in the country is provided, and in the future, the development of petrochemicals can help in this regard.

It is hoped that the improving trend of the country's health industry, in line with international standards, and the quality of health, preventive and treatment services provided to the honorable people of Iran, will increase even more.

In this way, and relying on the capabilities and skills of domestic scientists and craftsmen, the country's stray capital can enter this industry and help achieve this important.

However, it should be noted that if, according to a comprehensive movement plan, the development of medical engineering products in Iran does not happen, the market will be taken away from Iran.

For example, according to the strategy defined in the UAE 2030 program, there are special programs for the production of medical equipment in this country.

Among the benefits of this project mentioned by the UAE are the two advantages of **"producing medical equipment of a superior production platform, compared to jobs in the world"** and **"the existence and promotion of the innovation ecosystem of this sector and its bright future."**

The country wants to turn Dubai into a regional hub for the medical and pharmaceutical equipment business, with 10 multinational drug and medical equipment distribution companies and 18 medical equipment companies active in the medical equipment trade.

However, at present, the UAE, due to its activities in recent years, has been able to export about $ 150 million a year in medical engineering, with the largest export destination being the United States and, followed by Saudi Arabia.

With more than $ 1 billion a year in imports, the country has good potential for medical equipment production.

Under the agreements, multinational companies are set to produce consumer medical equipment and medical engineering devices and tools directly or under license in the UAE. Because this region of Asia is one of the most promising markets for medical equipment in the world.

Of course, as you know, the growth of health tourism in recent years in the UAE has been significant. The UAE has become the fourth largest market for medical equipment in the Middle East and Africa.

The UAE pays special attention to emerging markets in the medical equipment sector. The existence of countries such as Bangladesh and Indonesia, followed by Malaysia and the Philippines, as potentially developing markets for the possibility of importing medical equipment to those countries, is of paramount importance to the UAE.

In a detailed plan, the UAE also allocates about 2 billion dirhams to the market to re-export through these countries in order to establish beneficial trade laws and incentives.

Existing companies operating in the UAE, including large companies such as: Be Bran, BD, Scolap, Boston Scientific, Canon, Driger, Fujifilm General, Gottingen, Hitachi, Johnson & Johnson, Medtronic, Nihon Kohden, Phillips, Siemens, Schmitz, Stryker, Zimmer Biomet, Novartis, Pfeiffer, Rush, Sanofi, Merck, Glaucosmith Line, Astraznika and Takeda have provided a good business future for the country.

Another country in the region that has had good activities in the field of medical equipment industry in recent years is India.

India, for example, relying on its knowledge, has exported $ 77 million a year in cannulas. Brazil, Turkey, Egypt, Germany and Iran are the top five importers of Indian cannulas, indicating India's dominance in the manufacture of specialized-medical needle and cannula, in the region.

Other countries in the region include Pakistan. Pakistan is one of the largest centers for the production of surgical instruments in the world.

The Pakistani government, for example, has been able to export about $ 350 million worth of medical equipment, 90 percent of which is metal surgical instruments, from the small workshops of the industrial city of Sialkot.

Chapter Four
Medical Equipment Market and Related Industries

Economics, Plastics, Medical Engineering

The market for medical plastics in 2020 was more than $ 24 billion. Meanwhile, fluctuations in oil prices have had a profound effect on the industry's high-consumption plastics, including medical grade PVC, polyethylene and medical grade polypropylene. Also, the high volume of production of plastic medical equipment products in China has led to price changes on plastics with medical applications.

While the demand for these plastics is increasing every day in the world, it is expected that there will be positive growth for this industry in the coming years. So that the supply and demand chain in this type of plastic in the coming years in Iran will undergo fundamental changes.

The market for the production and use of medical grade plastics is one of the most attractive investment sectors in Europe, and this market will be subject to many technical advances in the coming years.

Companies operating in this field in Europe, in order to reach the market and in order to grow the market, have used new strategies in developing new products in this field for the sake of progress, and have allocated a lot of money in sectors of research and development.

High competition in this industry is likely to strengthen consumer purchasing power. Factors such as product quality and cost competitiveness are the most important factors that affect the buyer's financial strength.

High production volumes, combined with the ease and availability of medical plastics, are expected to increase buyers' purchasing power in the next few years.

Of course, the prevalence of infectious diseases and the demand for the purchase of plastic medical equipment have shown the positive growth of purchases.

Countries such as the United States of America, Italy, Spain, France, Germany, the United Kingdom and Iran have had high demand for these plastic products in 2020.

Countries such as the United States of America, Italy, Spain, France, Germany, the United Kingdom and Iran have had high demand for these plastic products in 2020.

The Growth of Plastic Economics in Medical Engineering

In 2020, the medical equipment manufacturing sector, with a 35% revenue return in the world, dedicated to itself a good amount of investment.

Increasing the range of applications of plastics, especially polypropylene, in the production of diagnostic devices, body-compatible devices, disposable medical equipment, biological dressings and finally non-woven textiles, which are widely used in the medical industry, is in high demand.

Polypropylene is expected to see significant growth in the use of medical products due to its light weight, high bacterial and chemical resistance and low cost. This plastic has a wide range of applications in the production of medical disposables. In addition, it can be easily injected in suitable dimensions, if necessary in the form of plastic.

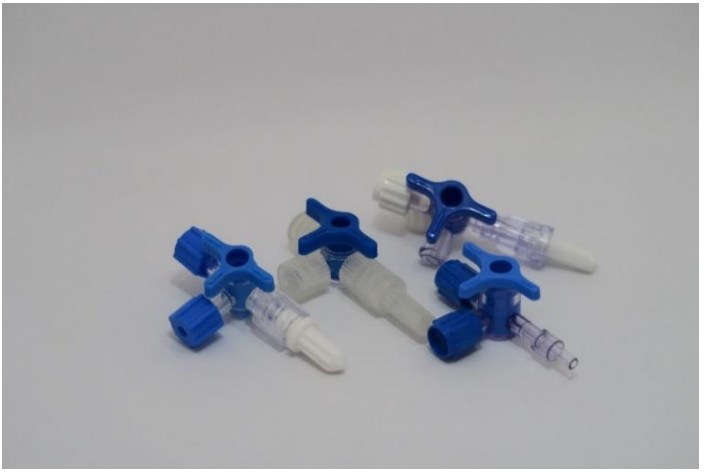
In Europe, medical grade PVC plastics are used to make blood bags.

As you know, the European Pharmacopoeia has approved the use of pvc for this specific purpose, due to its ability to store blood in a safe environment for a long time.

Rising cases of infectious diseases around the world are creating a high demand for medical plastics in medical product applications, such as breathing mask equipment, tests, filters, medical tubes, syringes and medical trays. In addition, increasing the production capacity of these medical products by several companies such as M3, Medtronic and other companies, creates more opportunities for growth and profitability.

In North America, demand for medical equipment is expected to increase significantly in the coming years as per capita health spending increases in the United States.

As it is clear, these consumption activities increase the demand for regional products. In addition to the presence of major US plastics manufacturers such as DuPont, Dow Inc., Celanese, other chemical companies such as Eastman in the USA region are influencing overall market growth over the forecast period.



Increased product demand in pharmaceutical packaging programs and the rapid growth of the pharmaceutical industry in Mexico and Canada are also expected to stimulate regional market growth.

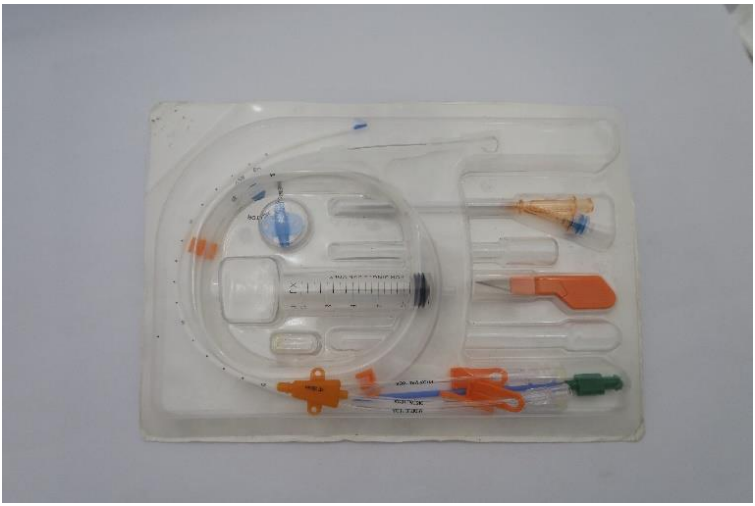
For example, the removal of strict regulations by the Mexican government, which had previously restricted the creation of new production units, has led to the development of new pharmaceutical production facilities for large companies such as Takeda and Astellas in Mexico. This strategy has played an important role in advancing the pharmaceutical and medical equipment industry, which in turn is likely to affect demand for medical plastics in the coming years.

In addition, the incidence of infectious diseases is expected to increase rapidly worldwide, which in turn leads to increased demand for medical equipment. As a result, the growth of market demand for plastics with medical applications has a positive effect.

Economics of Key Companies in the Plastics Industry and Market Share Insights

Companies operating in the market presented the highest level of strategy, along with a diverse product portfolio, which leads to a strong position in the market. New product development as a core growth strategy, adopted by major medical plastics manufacturers such as Solvay S.A., has a major impact on the medical plastics market.

As it turns out, it is observed that, Celanese, Eastman Chemical Company and Dow Inc., as well as companies such as Rochling group, Solvay S.A., and GW Plastics, have expanded their capacity to increase their market share and revenue.



Large companies such as Saint-Govain and Dow Inc. rely on their extensive distribution network to operate their business.

Characteristic of this market is continuity of technological advances to produce specific products for consumption in the medical industry.

These plastic companies are also introducing technologically advanced products to the medical equipment market. For example, Clanese and Dow Inc. have introduced reinforced polyethylene resins, which are marketed under the ELITE brand. Companies such as Eastman Chemical, Solo and Dow Inc. benefit from their extensive distribution network, which helps reduce sales and distribution costs and makes them top players. Some of the leading players in the medical plastic market are:

- Rochling Group
- Nolato AB
- GW Plastics, Inc.
- Saint-Gobain Performance Plastics
- SABIC
- Eastman Chemical Company
- Celanese Corporation
- Dow Inc.
- Solvay S.A.
- Trelleborg Sealing Solutions
- Trunseo S.A.

Of course, it is clear that in our region, the growth of the petrochemical industry in Saudi Arabia and the establishment of new medical equipment factories in this country to convert plastics into higher value-added products, such as disposable medical equipment, will greatly help to the economic prosperity of this sector.

Chapter Five
Health Economics and Innovation and Hygiene Technology

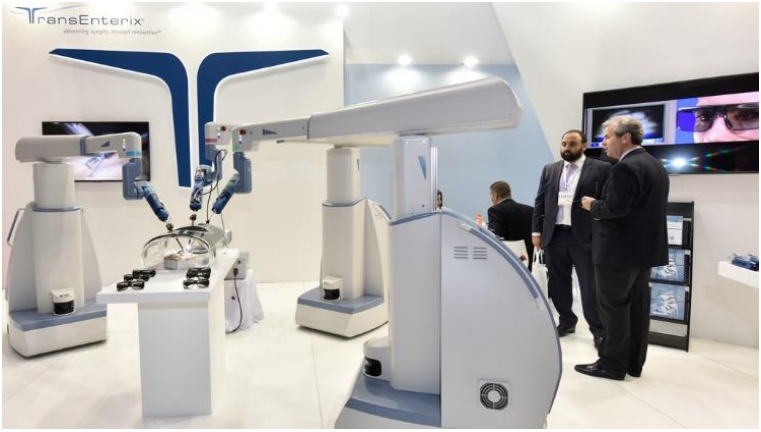
What is medical technology?

Medical technology can be considered any technology that is used to save and improve the quality of life.

The medical technology category includes all medical devices and equipment such as orthopedic, disposable syringes, wheelchairs, body replacement joints, hip and knee joints, and advanced medical systems such as whole body scanners.

The added value of medical technology is that it has a beneficial effect on the patient's quality of life. To the extent that advances in medical technology have a positive effect on prolonging human life and reducing disease and controlling it.

As mentioned before, as far as we know, there are currently more than 500,000 different types of medical devices and equipment.



Health Economics and Innovation

As you know, a wide range of activities are underway to innovate in the hygiene and health sector, especially in the private sector. A number of innovators in the health industry in Iran use technology to increase access to patients more efficiently through telemedicine and to improve access to providers information.

More emphasis on innovation and entrepreneurship in universities will lead to the development of new technologies in various fields, including hygiene and health.

Creating a health platform based on personal hygiene and treatment is one of the most fundamental issues that should happen in Iran by a blockchain in the field of prevention, health and treatment.

It should be noted that if insurance companies and banks do not want to help and cooperate in creating this network, their share of income in the health sector in the coming

years after the creation of such a system will be much lower than today.

The use of health service-based intelligence robots in the care sector needs to be further developed.

Also, applications based on image analysis, for the diagnosis of diseases and prevention in the early stages should be considered by hospitals and medical centers.

The use of existing models for testing and tracking diseases through the digital platform, which currently exists in countries such as the United States, should be further expanded in Iran.

As mentioned, the need to create a health platform, collect patient information, access health data to care for patients in order to reduce medical costs is the current need of Iran.

This health platform helps to plan the production of medicine and medical equipment in Iran so that the need be resolved in real way.

Digital health patterns will create new definitions in various parts of a hospital team, including laboratory, radiology, 3D imaging, and intensive care. In such a way that medical expenses are placed in a value-based chain. This structure will create more satisfaction for patients and treatment centers and will greatly reduce costs.

Vision of Innovation in the Hygiene Industry and Digital Health

The artificial intelligence market in healthcare has reached about $ 2 billion in recent years.

The global market value of digital health technology has exceeded $ 25 billion annually in out-of-hospital settings, and in recent years, 50% of all healthcare industry companies have devote resources to accessing, sharing, and analyzing real-world evidence to use in their organizations.

Meanwhile, 10 percent of blockchain project research in the field of health has reached limited commercial access since the prototype stage.

The global digital health market has generated more than $ 100 billion in revenue annually and is projected to continue to grow at a significant rate of more than 22 percent.

Across the world, health innovation is strengthened mainly by rising costs, changing disease burden, and systemic challenges such as labor weaknesses and a lack of financial

options. However, the innovation process is pursued in a variety of ways around the world due to differences in operational, cultural, and financing environments that affect innovation and ease of market entry.

Iran's position in the digital health market can be attributed to the improvement of hygiene and health infrastructure, increased acceptance of digital technologies, increased costs in the health sector and initiatives used by the Government Association to implement digital technology and health facilities. In addition, the Internet of Things and other computing technologies need the appropriate information and communication technology (ICT) infrastructure that exists in the region and contributes to the growth of the digital health market.

Of course, it should be noted that the main problems in the country's health society today can be related to the public and financial regulatory environment in the public and private sectors.

The emergence of the digital health market has been strengthened by the increasing demand for advanced health services in Iran. As a result, if needed and a detailed plan is implemented, almost more than 70% of the population of Iran has access to digital health care services.

In recent years, due to the availability of digital care services, for more than half of the country's population, wearable items, and accompanying health programs have not yet completely replaced drugs. But they have significantly reduced the need for medicine in Iran.

It should be noted that in order to adopt and adapt the next generation of health technologies, both the application of machine learning to patient data and the investment in the capacity of personal services transmitted through wearable devices still need to be paved by medical engineering.

In creating a health chain in the future health foundation of Iran, medical engineers should make the most impact.

As you know, a wide range of activities are underway to innovate in the health sector, especially in the private sector. A number of innovators in the health industry in Iran are using technology to increasing access to patients more efficiently through telemedicine, to improve access to providers information. More emphasis on innovation and entrepreneurship in universities will lead to new developments and innovations in various fields, including health.

The Main Game-Battalions in the Medical Technology Market

The global market for medical technology is estimated at € 450 billion annually, making it the largest market in the United States, followed by Europe and Japan.

Medtronic is the largest company in the medical technology industry. The company has been very active in this market with sales of nearly 30 billion euros.

The European market, valued at $ 150 billion, is another area of medical technology.

Siemens is the largest European manufacturer with € 17 billion in Germany, followed by Philips with € 15 billion in the Netherlands.

As we know, the budget of European systems is largely financed through payroll taxes and general taxes, and this has become a fairly regular market in terms of price and quality.

Demand is high in the European region as Europe's population ages faster than the world average.

One of the most attractive markets in Europe is the Dutch medical technology market. Based on the annual construction and sales price of this market, it is estimated at 5 billion Euros. The Dutch health care system is one of the best in Europe.

The medical technology market in the Netherlands accounts for a relatively small share of approximately 4% of the European market and 1% of the global market. However, the Dutch medical technology market is among the most advanced in Europe.

Dutch medical technology companies compete with European and global players in national and international markets. The Dutch medical technology market is also expected to grow as a result of other markets.

Global Medical Technology Market's Outlook

The outlook for the global medical technology market is very optimistic. Because the expansion of the global market provides a great opportunity, and technological advances continue to allow new and improved programs to be provided in all treatment modalities. As a result, we are seeing an increasing variety of technology applications being developed and used to treat and support patients in hospitals, nursing homes, and the home environment. The rapid development of these new medical technologies allows the provider and supplier perspective to evolve continuously, both in terms of supply and demand.

New business models and working methods have been introduced that have an impact on how medical technologies are used to treat patients. In addition, new European regulations governing market access for new medical devices (MDR, 2020) and laboratory diagnostics (IVDR, 2022) are expected to affect the medical technology market over the next decade.

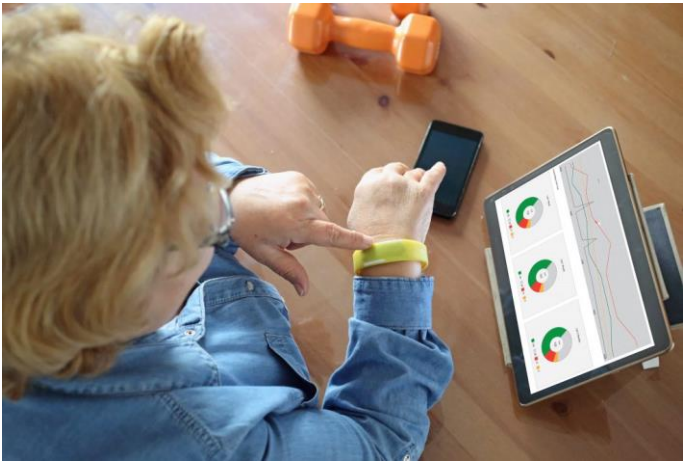
The medical technology sector in the United States and Europe reflects the international climate. because suppliers on both continents cover a wide range of technologies and serve virtually all healthcare sectors.

Due to the evolving patient needs and technological facilities, the dynamics in the medical technology market is constantly changing.

Innovation in this area is rapid, and it is impossible to predict which innovation in medical technology will add to the long-term value of quality of care.

One of the points to consider is that

"In Europe alone, in the Netherlands alone, there are about 700 medical technology suppliers active in the medical innovation market."



And more interestingly, out of this number of companies active in this field, 680 are small and medium companies (SMEs). Large suppliers, however, are often preferred by large hospitals because of their ability to deliver consistent quality in terms of volume and performance.

Given the scope and size of the healthcare industry and technological developments, the prospects for this sector are very broad. For a better understanding, some of them are:

1- Hospitals are gradually shifting from invasive technologies to less invasive technologies that can potentially reduce the duration of treatment and the complexity of the resulting wounds.

2- Large medical devices are becoming increasingly small.

3- There is a constant shift from treatment, and treatment to prevention, especially through the provision of e-health solutions and smart applications.

4- Health care is increasingly personalized and medical technology is more focused on specific diseases.

5- Patient care There is a gradual shift from out-of-home care to in-home care which is helping to advance medical technology.

6- New technologies in patient data sharing, such as wearables and the Internet of Things, are evolving to provide remote care services at home as well as in the clinic or hospital.

7- Large suppliers of medical technology are in a state of gradual change towards customer orientation by offering special service models.

8- The traditional medical technology supply chain is changing rapidly due to advances such as vendor-managed systems, the Internet of Things, and direct sales of medical device manufacturers in the global marketplace.

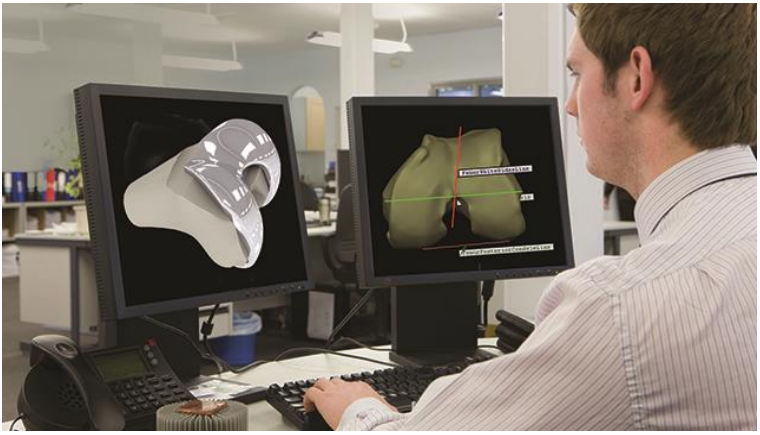
9- Increasing use of smart applications integrated with medical devices to provide instant access to patient data and help improve clinical decision making.

Technology-Based Corporate Economic Policies

Each company uses specific business methods and models to sell and present its product in the field of medical equipment in order to achieve its economic goals.

These business medals help each company to achieve higher added value and to be able to formulate a growing economic path for itself by gaining satisfaction and marketing.

To learn more about this, we will look at business models and examples of customer-oriented models in the medical equipment market and bring up an issue in this regard:



Philips Medical Equipment Company

Philips is one of the companies that operates according to the business model based on platforms.

Philips Medical Devices is looking to use an operating system-based business model to gain market share and value across health care needs.

This software-based business model approach is designed to support the entire ecosystem of patients, partners and interconnected providers. This will not only help Philips achieve quality and cost of patient care, but will also provide the company with new ways to grow. And represents an integrated approach, which can lead to higher profit margins and added value.

Siemens Medical Equipment Company

Siemens medical equipment company has based its business model on managed equipment services.

Siemens medical equipment company uses a business model in which it offers products in a sequence of managed equipment services. Siemens medical equipment company can work closely with a healthcare provider to improve its medical technology and make changes directly with companies that have managed equipment contracts.

These "innovation laboratories" employed by Siemens also stimulate the cooperation of certain areas in hospitals so that they can use this method to have more precise and rational control over the sale of their medical equipment products.

Medtronic Medical Equipment Company

Medtronic is a specialty medical equipment company that has based its business model on moving to healthcare.

Medtronic Medical Equipment Company is another example of a company that is exploring new business models and has always moved towards healthcare.

Supports hospitals with integrated health solutions to reduce care costs and improve quality and efficiency.

But it should be noted that in this route, Medtronic has turned more to health care services. For example, in 2015, in partnership with Diabeter, he founded a clinic to treat type 1 diabetes.

In partnership, the customer-friendly concept of diabetes can be developed to a higher level for more patients in other countries.

This collaboration accelerates access to new technologies for patients and focuses on value-based healthcare (VBHC).

In addition, Medtronic medical equipment company has been instrumental in further advancing communication systems, health-related information technology, expanding access, and potential applications for remote control for patients, thus making health care more comfortable and enjoyable for patients.

Types of Applications of Medical Equipment Technologies in Types of Medical Care

Various types of applications in the field of care based on medical technology are currently being implemented or created in the world.

These technologies have been formed in different parts of care, which according to their type and application in different care, we will discuss in the following to clarify the subject more for you:

1- Preventive Care

Medical technology in preventive care is currently in its infancy. Companies such as Google and Apple, as well as start-ups, create facilitating programs specifically designed to diagnose potential medical problems through algorithms in cell phones and wearables.

"Smart homes" for the elderly and disabled are also used for preventive purposes.

2- Primary Care

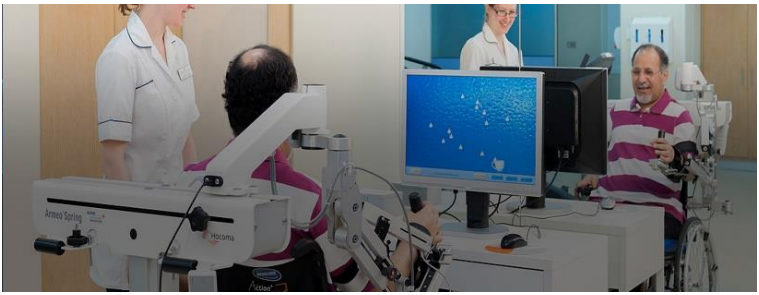
In primary care, medical technologies can be used, for example, in care products such as ostoma and wound management and essential care items for diabetes and other care products distributed through pharmacies and medical specialty stores.

In addition, a major portion of the cost of medical technology in the ophthalmology assistance group is distributed through the ophthalmologist and includes glasses, lenses, and hearing aids used in medical care.

3- Secondary Care

In secondary care, by using medical technology focused on diagnosis and imaging, including laboratory diagnosis, patient monitoring, as well as other medical technologies such as disposable medical equipment, cardiovascular equipment, and variety of implantable medical products in the human body that are used in secondary care, hospitals are the most prominent user of technology

Other applications of medical technology in the secondary care sector include all medical assistance used in rehabilitation care and other medical centers.



4- Excellent Care

University hospitals tend to use the highest level of medical technology and usually work with large suppliers to develop and improve the medical technology used in the expensive devices.

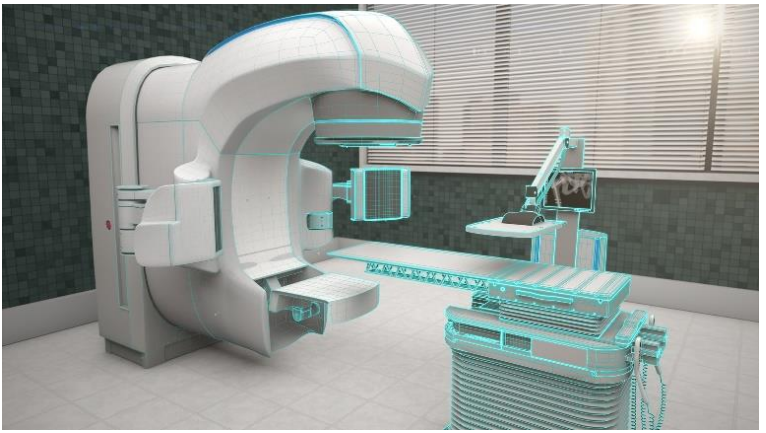
University hospitals tend to use the latest diagnostic and imaging equipment, including laboratory diagnosis and patient monitoring, as well as advanced disposable equipment and technologies.

5- Long-Term Care

In long-term care, medical technology, including respiratory medical equipment, home automation, home remodeling elements, and medical assistance, such as communication or mobility, is used.

Efficiency of Medical Technologies in Cares

Most capital-focused medical technology costs are incurred in hospitals or nursing homes. This is due to the complexity of intra-tissue therapies and the requirements of medical technology as well as the quality of the technology in which it is invested.

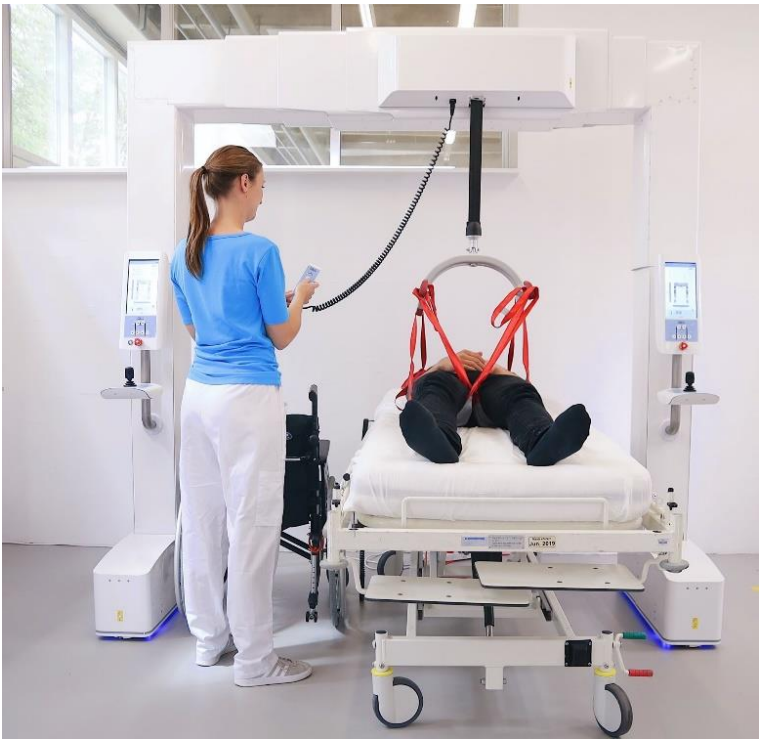


Sophisticated medical technology systems such as MRI and PET scanners are often very expensive and must be operated by trained staff in a hospital.

Thus, most complex medical technology systems exist in academic and public hospitals. In addition, hospitals use high-tech disposable equipment. Because the use of this medical equipment helps in faster treatment.

With the help of new medical technology and more efficient organization of care, different types of treatments and care can be organized outside the hospital environment.

Current technology allows a large amount of medical technology to be used outside the hospital environment without a specialist, which is expected to continue.



Software advances that make it easy to use are increasingly limiting the need for direct knowledge. By investing in digital care, we are closer to the patient and the care becomes more personal for the individual, resulting in higher quality care.

Medical technologies in out-of-school care also include technologies used in nursing homes (VVT), dental care, hearing care, hearing aids and more.

Of course, it seems that large university hospitals prefer these companies to meet their needs due to the quality records and the ability to deliver medical equipment and devices by large companies.

Hospitals usually select a small number of wholesalers or manufacturers as their main suppliers because of the benefits of buying and lowering the purchase price.

However, there seems to be little or no cooperation between hospitals in an international context.

The power to negotiate better prices in order to create cost savings depends more on the supplier's focus on therapeutic or technological properties.

Keywords Used in the Book

AI.....Artifical Intelligence

AWBZ.....Dutch law on special healthcare

CBS……..…...Central Bureau voor de Statistiek(statistics)

COPD…….....Chronic Obstructive Pulmonary Disease

CPAP.....Continuous Positive Airway Pressure

DSRIP.....Delivery System Reform Incentive Payment

EHCI.....…….European Health Consumer Index

EPD.....Dutch healthcare system-electronic Patient records

ENT.....Ear, Nose and Throat

Extramural care.....care outside the hospital

FDA….....Food and Drug Administration

GGD.....Dutch municipal or common health service

GGZ……..…….....mental healthcare

GP.....General practitioner

HTA.....Health Technology Assessment

ICT.....Information and communications Tschnology

Intramural car.....Hospital care

IoT.....Internet ot Things

IT.....Information Technology

IVD.....In Vitro Diagnostics

IVDR.....In Vitro Diagnostics EU Regulation

MDR..... .....Medical Devices EU Regulation

MedTech.....Medical Technology

MI.....Minimally Invasive

OCT.....Optical Coherence Tomography

RFID.....Radio Frequency Identification

ROI.....Return On Investment

SMEs.....Small and Medium Enterprises(<250 FTEs)

TFHC.....Task Force Heealth Care

VBHC.....Valu-Based Health Care

VMI.....Vender-Managed Inventory

VVT.....Dutch nursing homes and home care industry

VWS.....Dutch ministry of Health, welfare and sports

WLZ.....Dutch law on long-term care

WMO.....Dutch law on social support-Municipality-financed health care

ZVW.....Dutch basic health insurance

Resources

Please note that the presentation of the methods and conclusions of this book is based on the experience and personal judgment of the author. Therefore, using the contents of this book in any way, should be done by mentioning the author's name and his approval.

The statistics and information published in this book are taken from official statistics and reports published by the United States, Germany, the Netherlands, China, South Korea and Iran. Otherwise the word has been expressed as "unofficial". All informal statistics has been obtained from knowledgeable experts in those countries.