



Published in *The Lancet*:

Three decades of performance of the Iranian health system

Significant success in controlling infectious diseases; Serious challenges in non-communicable diseases, especially premature deaths

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published April 6, 2022

<https://en.ddri.ir>

The results of an important study by leading Iranian medical sciences researchers in collaboration with international researchers shows that the Iran's Health Care system, despite severe international sanctions, has made significant achievements especially in controlling the burden of infectious diseases, but it faces health challenges and threats in the field of non-communicable diseases, including cardiovascular disease and premature deaths.

According to the Digestive Diseases Research Institute (DDRI) of Tehran University of Medical Sciences (TUMS) the purpose of this study which examines the performance of the Iranian health system over the past three decades (1990 to 2019) and its results are published in an article entitled, "[Health system performance in Iran: a systematic analysis for the Global Burden of Disease Study 2019](#)," on April 6, 2022, in *The Lancet* is to help guide Iranian health

system policies toward better prioritization in favor of serious challenges in the field of non-communicable diseases, emerging diseases as well as reducing inequalities in the distribution of health indicators in Iran.

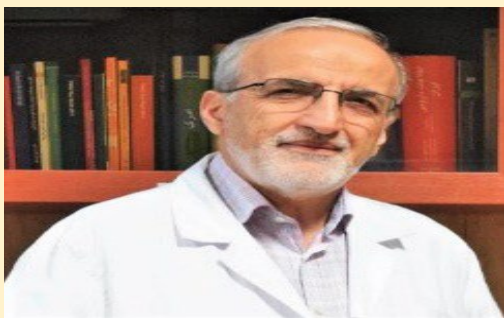
For this purpose, the present study estimated the burden of infectious diseases and non-communicable diseases based on data from The Global Burden of Diseases, Injuries, and Risk Factors Study 2019 as the most comprehensive, systematic, and concerted effort so far that reports life expectancy, mortality, and disability due to 369 causes, and the burden attributable to 87 risk factors at the national and subnational levels in Iran from 1990 to 2019.

The most important historical developments affecting the Iranian health system

According to the study, the Iranian health system, despite several major developments, including the 1979 Islamic Revolution, the Iraq war against Iran (1980–1988) as the longest war in the 20th century, and long-standing international sanctions by the United States and its allies against Iran – while after the end of the war Iran was trying to increase its per capita gross domestic product (GDP) and enter the era of massive investment in infrastructure and economic and social development – implemented policies in the four main areas of “primary, secondary and tertiary care,” “training of specialists and health care providers after the integration of the Ministry of Health with medical education in the 1980s” and “development of medical research” to achieve universal health coverage (UHC). Each of these policies has had significant achievements.

Achievements of the Iranian health system

Increasing the life expectancy in Iran to 78 years



Professor Reza Malekzadeh, Distinguished Professor of Tehran University of Medical Sciences (TUMS) and senior author of this study said, “The findings of the study indicate an increase in life expectancy at birth in Iran – adapted to provincial patterns and gender – has improved significantly and increased from 69 years in 1991 to 78 years in 2019.”

He added, “The life expectancy of Iranian women at present (79.6 years) is higher than men (76.1). Also, during this period, the gap between the highest and lowest life expectancy in the

provinces, from 12.5 years to 8.2 years and the findings of the study indicate an increase in life expectancy in all provinces of Iran.”

Professor Malekzadeh reminded, ”Control of infectious diseases and death rates due to these diseases, decline in age-standardized death rates of almost all causes, the decline of cardiovascular diseases, reduction of injuries and intentional injuries, significant reduction of maternal and neonatal diseases and reduction of injuries transportation has been the most important determining factor in increasing the life expectancy in Iran for the past three decades.”

Development of health care network: from severe reduction of maternal and neonatal disorders to reduction of three important environmental risk factors

One of the most important strategies and factors of Iran’s progress in the goals of the health system has been the development of the primary health care network since 1980, which provided very effective health services throughout the country, especially in deprived areas, and greatly reduced the burden of infectious diseases.



According to **Professor Farshad Farzadfar, Professor of Tehran University of Medical Sciences (TUMS) and first author of this study**, among these important achievements are the reduction of disability-adjusted life-years (DALYs) due to neonatal disorders (81%), maternal disorders (68%), diseases associated with nutritional deficiencies – including iron deficiency and protein deficiency in the diet – (60%), controlling and reducing the three major infectious diseases, (malaria, measles and diphtheria), severe control and reduction of diseases related to unhealthy drinking water, unsafe sanitation, and indoor air pollution due to fossil fuel consumption – following the development of water and sewage network, safe sanitation and of gas supply lines – and also the implementation of the general vaccination program for mumps-measles-rubella and hepatitis B virus infection.

Challenges facing the Iranian health system



Continuous decrease in fertility rate

Despite Iran's significant said achievements in important areas of the health system, especially the control of infectious diseases, the country faces several health threats. Iran's population, which has risen from 58.5 million in 1990 to 84.3 million in 2019 over the past three decades, faces the challenge of reducing fertility and aging.

Professor Farzadfar said, "The fertility rate in Iran has changed under the influence of childbearing policies. Prior to the imposed war (early 1990s), Iran experienced a policy of reduced fertility; but after the end of the war and in the last three decades, it again supported the policy of more fertility. However, despite support for childbearing policy, the overall fertility rate in Iran has been steadily declining from 4.2 births per woman to 1.8 births per woman, leading to concerns about future population aging has been. It's worth reminding that population policies are mostly related to non-health sector and should not include limitation in access to contraceptive measures, which might endanger lives of those women with chronic conditions."



88% increase in deaths due to non-communicable diseases and neglect of strong disease burden control

Iran, like many countries, is currently facing an epidemiological transition, shifting the burden of disease and health risks from infectious, congenital, neonatal and nutritional diseases to non-communicable diseases and concerns about the growth of these diseases.

Professor Farzadfar, the first author of this study said, "All the evidence of the study shows that the health care system in Iran has been quite successful in controlling infectious diseases, maternal disorders and neonatal disorders; but in the field of non-communicable diseases, despite being on the right path to combat these diseases and implementing important reforms such as expanding public health coverage and Health Transformation Plan, has not acted with sufficient strength to control non-communicable diseases."

He referred to the results of a study on non-communicable diseases in Iran and said, "According to the findings, in 2019, 326,508 Iranians died from non-communicable diseases, which compared to three decades ago has increased by 88%."

According to Professor Farzadfar, from 1990 to 2019, although the number of DALYs attributed to all risk factors decreased by 17%, deaths attributable to all risk factors remarkably grew by 44%.



44% increase in DALYs due to non-communicable diseases

The first author of this study added, "During the last three decades, the number of DALYs reached 19.8 million in 2019, of which 78% was due to non-communicable diseases, (compared to 43% in 1990). Also, the number of DALYs due to non-communicable diseases has increased by 44% (from 10 million to more than 15 million years)."

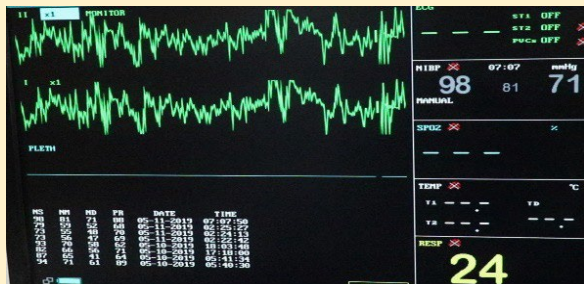
Ischemic heart disease was the leading cause responsible for the age-standardized DALYs rate

Professor Malekzadeh, lead author of the study "Prevention of heart disease and stroke in Iran" and researcher of an international study by announcing that, "Ischemic heart disease was the leading cause responsible for the age-standardized DALYs rate nationally and in all provinces in both 1990 and 2019," and emphasizes, "The leading causes of DALYs were stroke, diabetes, low back pain, and depressive disorders at the national level and in most provinces in 2019, with the largest 30-year change observed in diabetes, a nearly two-fold increase."

An increase in the number of premature deaths: 37% of deaths due to the four main diseases are premature.

One of the most important concerns facing the Iranian health system in the field of non-communicable diseases is premature deaths under 70 years and very premature under 50 years.

Professor Malekzadeh in this field, said, “The number of premature deaths (30–70 years of age) due to the four main non-communicable diseases (cancers, cardiovascular disease, chronic respiratory disease and diabetes) from about 67,000 (53% of deaths due to total non-communicable diseases of all ages) in 1990, it reached 101 000 (37%) in 2019.”



Cardiovascular disease causes half of all premature deaths

He added, “Cardiovascular diseases and myocardial infarction have the highest rank among the causes of premature deaths due to non-communicable diseases in Iran and have been the cause of 55% of premature deaths in 2019.”

The senior author of this study emphasized, “The number of premature deaths in Iran is worrying, while according to Sustainable Development Goals in the health sector the share of premature deaths should reach 11.6% in 2025 in Iran, which may not be attainable with the current trend.”



The importance of controlling risk factors for high prevalence of cardiovascular disease in Iran

He believes that health policymakers should have multidisciplinary approaches to control the high prevalence of risk factors for cardiovascular disease in Iranian adults, including obesity and

overweight (60% prevalence), dyslipidemia (80% prevalence), and hypertension (53% prevalence) in Iranian adults.

Increased burden of chronic obstructive pulmonary disease



Professor Mohsen Naghavi, Professor of Health Metric Science at the Institute for Health Metrics and Evaluation (IHME) at the University of Washington and first author of this study, points to the increase in chronic obstructive pulmonary disease in Iran over the past last three decades and says, "The age-standardized DALYs rate 517 per 100,000 and asthma accounted for –7 % and –56 % change in DALY rates, respectively."

The most common deadly cancers in Iran

He also added, "The age-standardized death rate due to cancer in Iran also showed a mixed, fluctuating pattern. According to the findings of this study, cancers of the stomach, lung, colon, and prostate are in the top ranks of cancer deaths in 2019."



Progression of disease risk factors towards metabolic factors

One of the major challenges facing the Iranian health system is changing the pattern all-cause burden attributable to risk factors to metabolic risk factors over the past three decades.

Professor Malekzadeh, Distinguished Professor of Tehran University of Medical Sciences (TUMS) and senior author of this study said, "We estimate that 31.7% of total DALYs due to non-communicable diseases were attributable to at least one risk factor in 2019, including 22.0% to

metabolic risk factors, 17% to behavioral factors and 9.3% to environmental and occupational ones.”

He adds, “The tendency to unhealthy eating behaviors, overeating, inactivity, overweight, and obesity are among the reasons for changing the pattern of lost years of Iranian life due to all risk factors for non-communicable diseases, to metabolic risk factors.”

Professor Malekzadeh emphasizes, “In return, the use of newer and healthier dietary patterns to reduce the consumption of trans fats a decreasing trend in smoking and bans on tobacco usage in public places and workspaces, ease of access to metabolic risk screening programs in the context of the primary health care system and Health Transformation Plan, can help control the shift in the pattern of non-communicable disease risk factors to metabolic factors.”



110% increase in deaths the attributed to air pollution in Tehran province

Particulate matter pollution is one of the main environmental risk factors and has major effects on the health status of communities. One of the major challenges facing the Iranian health system is increasing the burden of diseases related to air pollution.

According to Professor Malekzadeh, one of the major challenges facing the Iranian health system is increasing the burden of diseases related to air pollution. Ambient particulate matter pollution was the fifth leading contributor to DALYs (138,000 years) and deaths (5,000) in Tehran province, which has a large population in 2019.

He added, “Ambient particulate matter demonstrated a 47% and 110% increase in the attributable DALYs and deaths, respectively, in the past 30 years in this province.”

This study considers the reduction of the significant share of adverse effects of air pollution in the economy and health of Iran to require more accurate implementation of legal measures and continuous and accurate analysis of environmental data.

198% increase in the DALY rate of HIV/AIDS and sexually transmitted diseases over the past three decades

Despite the decrease in the burden of infectious diseases in Iran over the past three decades, the health system of this country is currently facing an increase in the burden of HIV/AIDS and sexually transmitted diseases.

Professor Naghavi, the first author of this study said, “The DALY rate of HIV/AIDS and sexually transmitted diseases have increased by 198% in Iran over the past three decades and has increased in most provinces of Iran. Among infectious, maternal, neonatal and nutritional injuries and diseases, HIV/AIDS was the 29th-ranked cause of age-standardized DALY rate in 1990 (5.4 per 100,000). However, by 2019, it had climbed to the 6th rank with 69 per 100,000 an almost 13-fold increase. The highest increases were in Sistan and Baluchestan, Lorestan and Hormozgan with 23, 20, and 18 times, respectively.”

According to Professor Naghavi, due to the social stigma of HIV/AIDS in Iran, its burden has been significantly underestimated and its control measures have not been sufficiently considered, while the pattern of high-risk behaviors and insufficient understanding of the ratio this danger still exists in the population of Iran.

Increase the burden of mental disorders substance use disorders

He added: “The findings of the present study also show that the Iranian health system is facing an increase in the burden of age-standardized DALYs in 2019 due to mental disorders (2,300 per 100,000) and substance use disorders (400 per 100,000). Each has risen 1.8 % and 20%, respectively, over the past three decades.”

The first author of this study said, “The share of these disorders in the total DALYs has increased by 194%. Also, depressive disorders (890.3 per 100,000), anxiety disorders (695.8 per 100,000), and bipolar disorder (175.8 per 100,000) were the top mental conditions based on the age-standardized DALYs rate in 2019 in Iran. The most common mental disorders are related to depressive disorders with a significant increase of 104% in the DALYs number. At the subnational level, Fars province always had the greatest age-standardized DALY rate of mental disorders, while East Azarbayejan had the lowest rate in most of the study period.”

According to Professor Naghavi, The trend of substance use is increasing throughout Iran, and the provinces of Hamedan, Tehran, and Sistan and Baluchestan have been leading the way in the years of lost Iranian life due to disability due to diseases related to drug use. Opioid use was the top cause of substance use disorders, with 270,000 estimated DALYs in 2019 and a 146.4% increase.

Concerns about the growing prevalence of mental disorders have increased since the end of the Iraq war against Iran; Examining of the mental health of Iranians shows that the prevalence of mental disorders is relatively high. But according to Professor Naghavi, despite the growing burden of mental disorders and substance use in Iran, access to mental health services has not grown enough. Also, the density of psychiatrists and psychologists has not been optimal.

He emphasizes, “The effectiveness of integrated psychiatric services should be evaluated regularly and systematically, and measures and efforts should be continuously reviewed based on the burden of mental disorders at the national and provincial levels.”



Road injuries are the second-leading cause of DALYs

Professor Naghavi said, “According to the findings of this study, during the last three decades, road injuries climbed to the second rank by DALY rates from 1990 to 2019 (1,302 per 100,000) and caused 21,122 deaths in 2019. Age-standardized rates of DALYs and deaths due to road injuries remarkably decreased by around 60% in this period, with a slightly steeper decline between 2002 and 2015, but without significant change since then. This decrease can be related to the increase in GDP per capita. Over the past three decades Qom, Khorasan Razavi and Zanjan provinces have recorded the highest decrease (70%) in road injuries, while Tehran province has the highest number of new road accidents in 2019 and the lowest decrease in this period.”

According to the first author of the present study, policies to control road traffic injuries in Iran show many shortcomings and the need for more effective measures to reduce its heavy load. The low use of seat belts and helmets, about 75% and 14%, respectively, are the main cause of traffic injuries in Iran. On the other hand, despite the improvement of road infrastructure, the poor quality of domestic vehicles combined with poor driving behaviors continue to contribute to the burden of traffic injuries.

Inequality in the distribution of health services

The findings of the present study also indicate that Iran’s health policies have been somewhat effective in regulating the burden of non-communicable diseases, but equal progress has not been achieved in many sectors and geographical areas and inequality in health development indicators is still observed.



According to **Professor Nizal Sarrafzadegan, Distinguished professor of Isfahan University of Medical Sciences** and one of the authors of this study, said, “Rural Health Insurance (2004) and the Health Transformation Plan (2014) are among Iran’s successful measures to combat health inequalities that require more time, management, and inter-sectoral support.”

She considers continuous measurement and reporting as one of the key steps in reducing inequalities in the distribution of health services and adding, “adequate data are insufficient in this regard. Allocation of resources, equal distribution of education, strengthening of health, nutrition and primary health care infrastructure throughout the country are other necessary measures, and given the burden of the COVID-19 epidemic in the coming years and the impact of sanctions, policies should strengthen health infrastructure.”



Effects of international sanctions on the health of Iranians

According to the Digestive Diseases Research Institute (DDRI) of Tehran University of Medical Sciences (TUMS) Iran’s health system has also been affected by international sanctions over the past 30 years. The 2011 sanctions have had the greatest impact on the health of Iranians, especially deaths from non-communicable diseases.

According to the researchers in the study, the findings show that deaths due to non-communicable diseases have a lower slope in the five years since the sanctions began than in previous periods.

These sanctions have limited the pharmaceutical and non-pharmaceutical resources needed for health care services. The pursuit of national public health coverage (UHC) has declined under the influence of sanctions, and some health policy reforms have been hampered by a lack of budgetary resources.

Among non-communicable diseases, cancers have experienced the most remarkable change in this investigation, due to sanctions against Iran reduced access to advanced drug interventions.

According to the researchers in this study, although sanctions do not directly affect health and medical goods, their impact on financial transactions of services and products has had adverse consequences for the health of Iranian.



The need to prepare for emerging diseases

Researchers in the present study also emphasize that the Iranian health care system, in addition to better managing current challenges and reducing inequalities in health development indicators, should be more prepared to face emerging and epidemic diseases such as Covid-19.

The Health Transformation Plan has led to significant gains in the development of public health, overcrowding in hospital beds, and an increase in intensive care units, and has been effective in better managing and countering the Covid-19 pandemic, but these efforts are insufficient.

Developed and modified primary health care programs, as well as access to and cost-effectiveness of health system goods, achieved by the 2014 Health Transformation Plan, are the cornerstone of the fight against non-communicable diseases.