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LEADING ARTICLE

Medical geography: Topical approaches and methodological intersections

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Summary

Medical geography is an ancient branch of human geography that has its roots throughout history as ideas and practices. It later developed a scientific methodology that took an applied path by adopting medical data and quantitative analysis to devote its attention towards revealing human health suffering at the spatial level. It has an objective involvement with medicine and a systematic intersection in the contexts of research and study.

The introduction

The objective approach between geography and medicine comes from the existing idea that epidemiology is concerned with studying the characteristics of the pathological phenomenon, while medical geography is concerned with studying the characteristics of the pathological and terrestrial phenomenon on which this phenomenon arises with its natural and human variables, which interact with thecharacteristics of this phenomenon and affect and be affected by it.

The geographical scope of the pathological phenomenon is a component with several dimensions, because the disease is a tangible, tangible and visual phenomenon, and it takes horizontal and vertical dimensions, like other geographical phenomena. Where the horizontal dimension of the disease is represented by its spatial extension, that is, its spread over a specific area of the land that may be small, a residential neighborhood, a village or a city, for example, and here the spread is local or medium in a country or a number of countries, for example, and here the spread is regional or large, where the spread is global.

As for the vertical dimension, it is the shape and characteristics of the pathological phenomenon, such as its demographic characteristics (the age, gender, ethnic, and social structure of those affected), and its interactions (their influence and influence with the existing variables in the horizontal field).

Monitoring pathological phenomena in both dimensions (horizontal or vertical) is not sufficient, as their movement must be monitored over time. The pattern of the disease is not fixed in society, as it is a dynamic phenomenon. Infections with a particular disease may disappear or infection rates may increase, and this change appears to have a greater impact on its horizontal field (spatial distribution).

A disease that was endemic and limited to a small area that may be a country or part of a country in a certain period of time may become an epidemic and spread on a continent or

worldwide level in a later period of time, as happened with cholera, which was endemic in India, its original home, and which turned into an epidemic. It spread globally, and polio, which was spreading worldwide, receded in small places with limited space in some African countries. The spatial movement of the disease over time corresponds in its tracks with many factors of the natural and human geographical environment. Its studies are concerned with monitoring, discovering, classifying, distributing and analyzing the spatial relationships of health and disease phenomena and predicting their future trends through a forward-looking vision of the variables of place and its emerging interactions. It is concerned with studying human health problems in different environments.

The current study aims to:

Extrapolating and defining the concepts of general medical geography, its historical development, research methods and its various branches. A review of its origins and historical development. Determine the entrances and sources of research. A brief reading of its most important branches

First - the concept of medical geography

Medical geography, in its general concept, seeks to pay attention to human health problems in different environments, trying to determine the geographical dimensions of those problems and analyzing their relationships with the environmental fabric. The implications of this concept have been mentioned in the literature in this field since the middle of the twentieth century. May J. defined it as the study of the relationship between pathology factors and geographical factors (natural and human geogens) [1], while Mcglashan defined it: as the study of local variables of environmental conditions that are linked to a causal relationship with the human health condition and counting it as one of the borderline disciplines that lie between geography and medicine, where medical geography uses the concepts, methods and skills of geography to study phenomena related to human health, and Lermonth defined it as the study of the patterns of geographical distribution of human diseases with the aim of interpreting them [2], while Howe defined medical geography as the study of human non-adaptation in the environment with disease factors and Dudley Stamp defined it as a tool for research [3], and Al-Muzaffar defined Medical geography: It is the knowledge that is concerned with the study of local variables and various environmental conditions that are linked to a causal relationship with the state of human health and its problems, and the study of cases of human adaptation against these problems. Rather, it is the area affected by the disease distributed over it [4].

All the definitions mentioned above, even if they differ in the text, are similar in content, as they all emphasized the study of spatial differences in environmental conditions associated with human health. In light of this, the objectives of medical geography can be defined as follows:

- Studying the geographical distribution of various human diseases and determining their spatio-temporal patterns and paths of their spread.
- Studying the geographical distribution of the means of human adaptation against diseases and identifying their patterns.

Analyzing the spatial relationships of phenomena related to human health

- Providing a work guide for planners in the health field by defining the spatial frameworks for pathological phenomena.

This field has been known by several names. It has been called the term Medical Geography, which is the most widely used and circulated term. It has also been called the term Geo medicine and Health Geography. Medicine, on the other hand, so that each serves the other without deviating from either of them beyond the limits of its specialization.

Second - the historical development of medical geography

The interest in the relationship between the environment and human health dates back to pre-Christmas times (3000 - 2500 BC). Evidence of this relationship was found in the ruins of the Mesopotamian and Nile Valley civilizations. The Babylonians were aware of their environment and what caused them health problems by describing diseases and explaining Its causes and the preventive measures they were taking against it, and since their country was a crossroads between east and west, north and south, many epidemics reached it, and the depressions of its lands soaked with stagnant and warm water made it endemic to many diseases such as schistosomiasis, ankylostoma and malaria, and in this regard the Sumerians used in Kish They saw sewers of unclean water and stores for collecting it, and they knew the dangers of insects and their role in transmitting diseases [5]. The ancient Egyptians attributed the causes of many diseases to the natural environment and described malaria as an intermittent fever that returns periodically in the same season and that it coincides with the flooding of the Nile. Indian doctors also knew malaria and plague and their relationship to mosquitoes and rats.

Hippocrates believed in the fourth century B.C. that the origin of all diseases is natural factors, and that habits and the social environment have a great influence in the endemic and spread of diseases. Man, which is water, air and space. With these variables, Hippocrates emphasizes the role of natural and human geographical factors in the emergence of disease, and from his observations also the effect of the different seasons on human health. it in studies that appeared later [6].

Arab physicians in different eras emphasized the relationship between the environment and human health. Arabs before Islam linked the various elements of the environment with diseases. They knew the cold and its effect on the body. They knew infectious diseases and treated them by isolating the infected. They also compared diseases with what appears in their environment of familiar variables. For example, they took the name of measles, which they knew from the pebbled ground, i.e. with pebbles, and the Holy Prophet (PBUH) spoke about medicine, health, disease and prevention of infection, where he said (PBUH) in contagion: “If you hear of the plague in a land, do not enter it, and if it falls in a land, do not get out of it, fleeing from it.” " And he (PBUH) said: “Do not enter a country where there is an epidemic.” [7]

In his book Al-Qanunfi al-Tibb, Ibn Sina explained the causes of diseases, the times of their occurrence, the nature of the seasons, the good air, and then the dwellings [8]. Al-Razi's medical works were full of ideas that formed the foundations and principles of what was later known as medical geography [9]. The regional distribution of the disease and stop on many means of disease prevention. The period from the European Renaissance until the seventeenth century witnessed the beginning of the emergence of manuscripts of medical geography. Christopher Columbus's speech in response to the King of Spain, in which he refers to his first trip to the West Indies in 1492, is the first written report of anthropology and medical geography. Beginning in 1642, many studies of the scopes of Macro study deals with the historical geography of disease, tropical medicine, the impact of climate on the prevention

and treatment of chronic diseases, and medical topography, which is concerned with the study of both the surface and topography, and their relationship to the occurrence of diseases and the impact on the health status of the population. Parcelsus presented after Bacot and then Sydnham, very important studies during the mentioned period dealt with the influence of natural environment factors in the emergence of the disease [10].

Geographical studies in this field in the eighteenth and nineteenth centuries were distinguished by their distance from generalities, as research appeared that dealt with some diseases in certain regions of the world that were linked to geographical factors. Where he described snow blindness and how to prevent it. As for the researcher Lomonsov, he also directed his attention to the study of medical geography in a research he presented in 1761. Interest in this field was not limited to geographers, but extended to doctors, especially in Russia, where they devoted chapters on this subject in the studies they presented, such as Shober. In England, James Clark 1788 wrote a book on the effect of climate on the prevention and treatment of chronic diseases. The most important work in the field of medical climatology [11].

Medical geographic trends crystallized when diseases began to be shown on maps and distributed geographically, which increased interest in drawing them since the middle of the nineteenth century. Doctor John Snow 1854 used the map to determine the source of the spread of cholera in a neighborhood of London, and then stop the infection of the disease.

One of the most famous early examples in medical geography, which paved the way for the use of cartographic techniques in later geographical studies. The theoretical foundations of medical geography were affected after the middle of the nineteenth century by the progress of the prevailing philosophical thought at the time. The German Hirsch published in 1854 his book The History and Geography of Disease, which included the study of theoretical aspects of the subject of medical geography. The French Lomard wrote in 1877 in search of the relationship between climate and medicine. The Englishman Davidson also studied the geographical distribution of diseases caused by the climate factor in 1892. It is worth noting that the field of medical geography has received wide attention and witnessed significant development during this period until this subject is now being studied in medical institutes and universities in both Europe and Russia.

One of the most prominent features of the eighteenth and nineteenth centuries in the history of medical geography is the emergence of studies that adopted scientific experimental methods, and it also created abundant scientific material that is a historical background for this subject that most contemporary researchers in this field refer to. The study in medical geography was neglected after that, and the reason for reviving interest in studying it again was the presence of two factors together [12]:

1. The first factor is the outbreak of the First World War and the accompanying migrations between the different countries of the world, and these migrations led to the transmission of disease infection from endemic areas to new areas or vice versa, as immigrants contracted diseases that they had not known before in their homeland. Most of the Hindus who came to Europe died of tuberculosis, and Europeans in the Far East were decimated by malaria.
2. The second factor arose due to the progress in means of transportation after the First World War, which led to the approximation of time distances between the countries of the world. By ships and planes, viruses were also transmitted with infected people

from one region to another, such as the influenza virus, which bears the names of the regions from which it was transmitted, such as the Asian or Spanish flu.

These two factors have led to a return of interest in the studies of medical geography again in many countries of the world, where hundreds of books, articles, research and studies have appeared in the field of geographical distribution of diseases. In fact, the twentieth century represents the beginning of the actual development of the rationale for medical geography. The field then entered the field of application using quantitative and mathematical methods. Interest in this field expanded in the (former) Soviet Union, the United States of America and some European countries. In the Soviet Union, this field witnessed rapid development, and there are many indicators showing the extent of the Soviets' interest through research. And conferences and committees that were formed for this purpose. In the field of research and studies, Kholpin presented a study in which he described the health reality in the cities of Volka and the Urals. Zabolotny presented a study on plague disease in India, Mongolia and China, which included basic rules in medical geography. Medical geography and cartographic representation played an important role in that as well.

The studies directed towards field work in the forties and fifties of the twentieth century, and research focused on endemic diseases appeared. These studies helped solve many problems in the medical field, especially with regard to the transmission of insects to various diseases. On the other hand, these studies benefited from the accumulation of medical scientific material and kept pace with the development in applied sciences. Such as life sciences and chemistry. Interest in this field continued in both the Soviet Union and the United States in an unprecedented way. The Soviets considered medical geography as a border branch between geography and medicine. A committee was formed for medical geography in the Soviet Geographical Society in 1954. They also devoted chapters in the Journal of Medical Abstracts to this subject in 1957, an atlas was issued that explains the objectives and operations of medical geography for health workers, and presents two hundred years of interest in this field. In the United States, this field has received its great share of attention as well. A department for Roma has been developed.

Third - research methods in medical geography

Medical geography adheres to the general geography approach in terms of classification, distribution and analysis. Many studies have appeared that followed the two main general geography approaches, which are the regional approach and the fundamentalist approach, and it has special curricula like other branches of geography. Researchers in medical geography, such as Pyle and Philips, distinguished a number of approaches and approaches that were followed by different studies, as follows:[13]

1. Disease Ecology Approach: It is one of the first approaches in medical geography adopted by many studies. It is concerned with studying the relationship between disease and environmental variables. Mai has focused on it in many of his works since the beginning of the fifties of the last century.
2. The medical cartography curriculum: It is also one of the old curricula, and attention has been paid to it since the end of the eighteenth century, when maps were used to illustrate the distribution and spread of diseases.
3. Approach Associative Analysis: It appeared in the sixties of the last century and was mainly concerned with analyzing the main risk factors for a particular disease, and measuring the statistical correlations of the disease at certain geographical levels.

4. Disease Diffusion Approach: It appeared in the seventies of the twentieth century. He was interested in studying the spread of diseases and used mathematical models of spread. This approach included three elements: time, place and disease. One of the most prominent of those who worked with this approach was Peter Hagget, who applied it in his research on the spread of epidemic measles in Cornwall County in Britain in the year.
5. Simulation & Modeling Approach: In this approach, models are formed for the special relationships between the variables of the environment and the phenomenon pathological.
6. Health care approach: It is one of the modern approaches, and its importance has increased with the increasing integration and interest of geographers in health planning and the proper distribution of health services spatially.
7. Behavioral approach: This approach is concerned with the reciprocal relationship between the environment and behavior and its effects in the health dimension. The environment affects human behavior and directs it, just as human behavior leads to changes in the geographical environment.

Research methods in medical geography have evolved from the descriptive method to the method of quantitative analysis based on measurement and the adoption of mathematical laws and analytical statistics. With this transformation and development, it has become a branch of applied geography, and its role is no longer limited to description or explanation, but rather to diagnosis. evaluation, monitoring and implementation.

Today, it contributes to assisting specialists in proposing effective preventive plans and providing curative solutions to limit the spread of diseases among the population. It would provide skills to solve medical problems. Geographical evidence or geographical proof can be taken, and therefore it is also appropriate to ask a specialist in this field to provide evidence or evidence. The proof, and that by simply applying geographical methods and concepts in the study of diseases and identifying and discovering the environmental factors that help the emergence of these diseases in one place and not others, and then suggesting or trying to develop appropriate preventive programs that lead to the development of health aspects in the place and that would make geography Medical is an applied branch of geography. And that with the tendency towards quantitative analysis, medical geography is more useful if it is a tool for demonstration, and the geographer will have a role in working with medical specialists to reform the environment and create better conditions suitable for human health.

Forth- Branches of medical geography

Medical geography is distinguished from the rest of the other branches of geography by the abundance of its branches. This is due to its borderline nature and the diversity of its scientific material, which is not limited to studying disease only, but is concerned with all elements of the environment associated with disease. This was reflected in the methodology of medical geographical research, whose contexts varied from one branch to another of those branches. In general, medical geography is divided into two main branches. They are the geography of diseases and the geography of health care, and these two branches are divided in turn into several branches and agencies:

1. **Geography of endemic diseases.**

This branch is concerned with studying endemic diseases through their geographical distribution, identifying their foci and analyzing the factors influencing them. Infection of the disease continuously or intermittently from causes, vectors, and an appropriate environmental medium, and Pavloveskiy 1933 dealt with it in his theory (natural foci of transitional disease breeding) and emphasized that disease breeding centers require specific geographical conditions of climate elements, soil, surface sections, water, plants and disease endemism In degrees, the disease may be hyperendemic if the infections occur throughout the year, and the disease may be endemic if the infections occur over a period of more than six months. An epidemic if the number of infections increases suddenly and within a short period.[14]

2. **Geography of epidemiological diseases**

The geography of epidemiological diseases is concerned with defining epidemic diseases and determining the locations of their foci in the world and the paths of their spread and seasons of spread [15]. The study of Bark 1942, which dealt with the geographical distribution and the influence of climate on the spread of plague, cholera, and smallpox epidemics in the United States, and the study of Kwofie 1976, which included a spatial analysis of cholera in West Africa, taking advantage of the applications of the spatial diffusion theory, as well as the study of Cliff and Ord on the spread Temporal analysis of the measles epidemic in southwest England, in which the researchers used advanced statistical methods [16].

3. **Urban medical geography**

This branch of the branches of medical geography devotes its attention to revealing the suffering that urban residents are exposed to regarding the types of diseases, their endemic and spread, and the factors that contribute to their emergence, as well as studying the nature of the capabilities intended for prevention and control of them. Tenth, when medical geographic research concerned with cities appeared, and it included many descriptive notes on the factors that lead to the emergence, but scientific analytical studies appeared after the middle of the twentieth century. In the city, Dever 1972 published a research on the relationship of housing to disease in the city, and he also published another research in which he studied the ecological structure of the city and its relationship to disease [1]. Mead focused on the role of the urban environment when studying heart disease in the southern United States in 1979-1980 [17].

4. **Geography of regional diseases**

This section deals with the study of diseases at the level of countries or regions through their geographical distribution and the discovery of the factors leading to their emergence and spread. Several studies appeared in this field, such as the study of McKinly 1930, in which he dealt with the regional distributions of diseases and determined that there are diseases arising from tropical climatic effects and others arising from Moderate climatic effects. Simmons (1940 and 1950) presented research on diseases in Africa and parts of Asia and the Pacific region, and he had shown the regional variation in the origin of the disease. Learmont (1961) also studied a research titled ((Medical Geography in India)) in which he dealt with all the diseases prevalent in India, emphasizing On the hotspots of diseases and the entrances to their spread, as well as the regional health level in India [18].

5. Medical ecology

This section is concerned with the study of all natural and human causes of diseases and the discovery of ways to confront and reduce them. He classified the various factors that work on the emergence of the disease, and he classified the factors into two categories, which are pathological factors, pathogens, and geographical factors, Geogens. Among his other studies was a research entitled ((The Ecology of Malaria)) 1961, and in 1968 Lermonth wrote an article entitled ((Medical Ecology))[13].

6. Geography of health facilities

Health facilities mean the total health services provided to the population, and the geography of health facilities is a relatively recent branch of medical geography that has arisen and developed since the sixties of the last century. Three well-served, moderate and unserved regions as well as the study presented by Shannon and Spurlock on the relationship between human health problems and the use of health facilities as a spatial model in southeastern Washington [13].

7- **Other branches of medical geography**

Other branches emerged and dealt with topics in medical geography, such as the topic of medical topography, where studies appeared that dealt with the effect of altitude on the spread of some diseases, such as the study presented by Roundy on the risks of diseases in the highlands of Ethiopia on the population. And studies appeared that focused on the economic aspects, as this aspect focused on the impact of diseases on the productivity of the individual and the role of health prevention in economic development. Studies also appeared that focused on war accidents and their effects on the spread of diseases within what is known as military medical geography [4].

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