



Historical Review and Methodological approach of Geogens and Pathogens with Diseases

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Article Information

Received: September 20, 2026

Accepted: September 30, 2026

Published: October 15, 2026

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Citation: Dnyaneshwar S. Suryawanshi. (2026) "Historical Review and Methodological approach of Geogens and Pathogens with Diseases". International Journal of Epidemiology and Public Health Research, 10(5); DOI: 10.61148/28362810/IJEPHR/229.

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Abstract:

It is a multidisciplinary as well as an interdisciplinary approach to investigating the relationship between geogens and pathogens with various diseases. Survey highlights the impact of geographical elements on disease dispersion and transmission. One of the important techniques that link certain geogenic materials to the occurrence of disease is geogenic and pathogenic analysis. Techniques for spatial mapping provide information on the geographic distribution of infectious illnesses and geographical features. It becomes clear that multidisciplinary as well as an interdisciplinary approach is necessary for a comprehensive understanding of geogens and pathogens with the study of diseases. This abstract emphasizes how important rigorous approaches are to improving our understanding of the role that geography plays in the dynamics of diseases.

Keywords: Geogens, Pathogens, Disease Ecology, Multidisciplinary, Disease Dispersion.

Introduction

The historical tapestry is connected with the effects of environmental and geographical factors on human health, from ancient civilizations grappling with waterborne infections linked to geographical characteristics, such as arsenic or microbial contamination, to the discovery of particular geographically linked diseases. Historical traces of waterborne illnesses linked to particular geological formations have also influenced how cultures have responded to environmental threats (Le Blond, 2010). The frequency of diseases like vector-borne illnesses, which are impacted by climate and geographical features, it is to understand how geogenic elements currently affect public health. It is urgently necessary to conduct a thorough investigation and take action in response to the contamination of water sources with geogenic components such as heavy metals and their link to the development of waterborne diseases. Global health is still affected by the intricate link between pathogenic factors with diseases and geogenic causes. The growing worldwide burden of infectious diseases, including waterborne and vector-borne infections which are caused by geogenic causes (Hotez et al., 2014). Smith et al. (2018) draw attention to the continued importance of geogenic arsenic and its link to unfavourable health consequences, highlighting the necessity of all-encompassing approaches to address this modern problem. Furthermore, the changes in geogenic environments brought about by urbanization and their impact on the transmission of illnesses highlight how urgent, it is to conduct this research by smith. The effects of urbanization, population expansion and climate change make it difficult to comprehend and control how geogenic components affect infectious diseases (Anderson and Smith 2019).

Create chances for better geogenic factor mapping, tracking, modelling and their relationship to illness prevalence. The combination of microbiological, epidemiological and geochemical data presents opportunities for early detection, focused interventions and prevention (Doe et al., 2020). Anticipating and managing the health implications of developing geogenic landscapes become essential imperatives as urbanization and climate change pick up speed.

Objectives:

The primary objective of the historical literature of review is to comprehensively examine existing scholarly works and research studies related to geogenic and pathogenic diseases with relation to geographical position. This review aims to achieve the following:

- 1) To evaluate existing literature regarding the interplay between geogenic factors and the prevalence of pathogenic elements with diseases.
- 2) To study the review studies those specifically address the geographical influences on the occurrence, transmission, and distribution of pathogenic causes for diseases.
- 3) To research the methodologies utilized in prior research studies that investigate the relationship between geogenic factors with pathogenic elements and diseases.
- 4) To identify and analyze literature exploring the health impacts resulting from exposure to geogenic factors.

Methodology:

The goal of the study is to compile and evaluate recent findings on diseases caused by geogens and pathogens. It searched this database with the terms geogens and pathogens for diseases. Numerous articles that had previously been published in books, academic publications and a variety of research journals have been collected for this study. Works published between 2000 and 2023 that can be accessed through the online database. To comprehend the phenomenon, they are studying or seeing, a researcher must employ a methodological approach to their investigation. In light of this, a methodological approach to reviewing the structure of literature has been undertaken. Scientific and systematic studies of the literature on geogenic and pathogenic elements with diseases and their associations are carried out after a survey of the literature is completed.

Discussion:

A literature review is a crucial step in the research process in any area. This is because; it helps the researcher ascertain the present trend in a particular field of study and directs his inquiry into future directions for his fields of study. Researcher has worked hard to complete a literature review. An overview of the numerous researches conducted regarding the selected study, subject to the community's worries about pathogens and geogens are given by the survey of literature (Wetal J D & Suryawanshi D.S.2021). Hales et al.'s (2002) provide important insights into the consequences of shifting environmental conditions by using an empirical model to estimate possible variations in the geographic spread of the disease carried by mosquitoes. The study emphasizes the importance of population dynamics in determining disease patterns in addition to highlighting the vulnerability of vector-borne diseases to variations in climate. This work continues to be a foundational contribution to our knowledge of the intricate epidemiological variables

influencing the dengue fever epidemics on global spread.

Hay et al. (2002) examine how the recurrence of malaria in the highlands of East Africa is affected by climate change, publishing important findings in nature. The author investigates the complex interaction between climatic fluctuations and the dynamics of malaria transmission in high-altitude settings using a multidisciplinary approach. According to the findings, variations in temperature and precipitation patterns let malaria spread into regions that were previously thought to be unsuited for its transmission. This groundbreaking work highlights how susceptible highland populations may be to malaria dynamics that are sensitive to changes in climate. The findings underscore the need for adaptable methods to prevent the re-emergence of the disease in historically non-endemic areas and have important implications for malaria control tactics in the face of continuous climate change. Kovats et al. (2003) explore the complex connection between infectious diseases and climatic variability, providing a thorough review of the available data. The impact of environmental conditions on the dynamics of infectious illness transmission is carefully investigated in this study. The authors clarify how variations in climatic conditions can affect the seasonality, geographic distribution and prevalence of infectious diseases by combining the research that is currently accessible. This review's multidisciplinary methodology improves our comprehension of the intricate relationships between changing climatic conditions and human health. The results highlight how critical it is to foresee and prepare for the health effects of climate change, offering insightful information for public health planning and mitigation initiatives.

Darby et al. (2006) demonstrates a cooperative examination of individual data from thirteen European case-control studies to explore the relationship between radon exposure in houses and lung cancer risk. The knowledge of radon as a possible risk factor for lung cancer in a variety of European populations is enhanced by this research. The research utilizes a strong case-control methodology, utilizing an extensive dataset to augment statistical significance. The authors examine the relationship between household radon levels and lung cancer incidence by careful data analysis, highlighting the importance of radon exposure as a public health concern. This cooperative research adds to the growing body of knowledge regarding lung cancer risk factors by offering insightful information about the epidemiological consequences of household radon exposure. Rogers and Randolph (2006) offers a thorough investigation of the connection between the occurrence of vector-borne illnesses and climate change. The authors explore how shifting climatic circumstances affect disease vector activity and dispersion, which may lead to changes in disease patterns. The review covers a variety of vector-borne diseases and provides insightful information about the intricate relationships that exist between ecology, climate, and infectious diseases. This research continues to be a foundational contribution to our knowledge of the ecological effects of climate change on public health.

Smith et al. (2006) Examine how early exposure to arsenic may affect an individual's long-term health, paying particular attention to the higher risk of lung cancer and bronchiectasis in young people. The study emphasizes the importance of exposure to arsenic in the prenatal and early childhood stages. These results highlight a worrying correlation between early childhood exposure to arsenic and higher mortality rates from respiratory diseases later

in life, underscoring the significance of comprehending the long-term health effects of environmental exposures during vital developmental periods. The study adds insightful information to the larger conversation about health hazards associated with arsenic exposure, encouraging more thought to be given to regulatory actions and preventive measures to protect vulnerable populations. Martinez et al.'s (2007) give a thorough analysis of the pathogens' existence, detection, and management in drinking water. The writers adeptly negotiate the intricate terrain of aquatic infections, providing valuable perspectives on their prevalence and the techniques utilized in their identification. The study covers practical treatment methods to reduce the danger of waterborne infections in addition to the difficulties in guaranteeing water safety. For professionals in the field of water quality management and public health who are tackling the vital problem of safe drinking water, this paper is an invaluable resource because of its emphasis on both scientific understanding and practical applications.

Paaijmans et al. (2009) examine how the climate affects the spread of malaria, paying particular attention to the impact of daily temperature change. The authors' comprehensive analysis reveals that temperature fluctuations, in particular, have a significant impact on altering the dynamics of malaria transmission. The study highlights the complex relationship between daily temperature variations and mosquito life cycles, as well as the subsequent transmission of malaria. This complex knowledge adds to the conversation on the complex interactions between vector-borne illnesses and climate change, offering crucial information for developing focused malaria control programs in regions with fluctuating temperatures. Kar et al. (2012) analyze the provenance, weathering, and tectonic context of alluvial deposits in the lower Mahanadi river basin in India using geochemical analysis. The investigation takes a thorough approach to elucidate the geological mechanisms forming the deposits. The writers explore the sediments' provenance, offering details on their origin and modes of movement. To offer light on the environmental processes impacting sediment composition, the research also investigates weathering trends. In addition, the study makes significant contributions to our understanding of the region's tectonic setting and advances our understanding of geology about river basin dynamics.

Naujokas et al. (2013), the authors address this as a global public health concern by offering an updated analysis of the severe health impacts linked to long-term arsenic exposure. The study sheds light on the complex health effects that extended exposure to arsenic has over the world. The research highlights the importance of arsenic as a recurring public health concern by synthesizing current knowledge on its effects across a wide range of health outcomes. The authors emphasize the significance of arsenic exposure in the context of global environmental health and the necessity for ongoing study and awareness to address the complex difficulties posed by chronic exposure. Kumar, Kumar, and Dutta (2014) examine aquatic illnesses in Darbhanga, Bihar's rural and impoverished areas. The study explores the patterns and frequency of waterborne infections, providing insight into the health issues that locals in these various environments deal with. The study adds to our understanding of the complex dynamics of water-related diseases in various socioeconomic circumstances by drawing comparisons between slum and rural areas. The results highlight

the need of focused public health initiatives and enhanced water infrastructure in reducing the prevalence of waterborne illnesses in Bihar's rural and urban slums.

Ahmed, Sandhu, and Choudhary (2015) investigate emerging waterborne pathogens, with a specific focus on the presence and fate of rotavirus in wastewater treatment facilities in Ahmadabad, India. The research delves into the environmental fate of rotavirus, providing crucial insights into its persistence and behaviour within wastewater treatment processes. The study contributes to our understanding of the potential transmission pathways of waterborne diseases in urban environments. By focusing on a prevalent pathogen like rotavirus, the research underscores the importance of effective wastewater treatment strategies to minimize the risk of waterborne infections, particularly in densely populated regions like Ahmadabad. Parham et al.'s (2015) offers a thorough analysis of the complex interactions that affect how vector-borne diseases spread due to climate, environment, and socioeconomic factors. The authors provide a thorough analysis of the intricate dynamics influencing illness patterns, taking into account the combined effects of several causes. The study provides insightful information about the difficulties in anticipating and controlling vector-borne illnesses in light of worldwide shifts. This work, with its interdisciplinary approach, becomes a crucial reference for academics and policymakers alike, contributing greatly to our understanding of the complex mechanisms driving the transmission of these diseases.

Chen et al.'s (2016) give a comprehensive analysis of how soil infections affect agricultural productivity. To clarify how soil-borne infections affect plant health, the writers thoroughly investigate the wide range of these diseases and how they interact with crops. In addition to summarizing the body of information, this thorough analysis identifies knowledge gaps and provides insightful recommendations for future study avenues. This book is a significant resource for researchers, agronomists, and policymakers due to its emphasis on the complex link between soil pathogens and agricultural productivity. Karmakar and Karmakar (2016) examine the prevalence of waterborne illnesses in schoolchildren in Burdwan's Kalna-I block. The study's main goal is to determine how common waterborne infections are in this particular group of people. Through the analysis of school-age health outcomes, the research offers important new information about the possible relationship between water quality and public health in the area. The findings highlight the need for focused interventions and better water sanitation practices and add to our understanding of the health issues associated to waterborne infections that school-age children experience. Gupta and Patel's (2018) an international viewpoint on newly emerging waterborne pathogens is offered by a thorough review that was published in Water Research. The report carefully examines the situation of waterborne illnesses today, illuminating new and developing global risks to water quality. The authors examine the dynamic landscape of aquatic pathogens by integrating previous studies, covering elements including microbial pollution, antibiotic resistance, and the possible influence on public health. To lessen the hazards related to new infections, the research highlights the necessity of improved surveillance and cutting-edge water treatment technologies. This important addition advances our knowledge of the always-changing issues surrounding water safety and directs the development of the next strategies for the

worldwide control and prevention of waterborne illnesses.

Huang et al.'s (2018) study provides a thorough picture of the microbial landscape in urban areas by carefully examining a large spectrum of diseases. The authors evaluate contamination levels using sound procedures, which throws light on possible health hazards related to urban living. This work is a significant resource for environmental scientists and public health professionals tackling the problems of microbial contamination in urban settings, and it also advances our understanding of the intricacies of urban pathogen dynamics. Kumar and Kumari (2019), the authors apply cutting-edge techniques to explore how changes in land use affect soil erosion. The study makes use of Geographic Information System (GIS) methods and the Revised Universal Soil Loss Equation (RUSLE) to evaluate the dynamic link between soil erosion and changes in land use. The study offers a thorough assessment of soil loss through the integration of spatial analysis tools, providing insightful information on the environmental effects of land-use changes. The study deepens our comprehension of the complex relationships that exist between land-use changes, human activity, and soil erosion processes, highlighting the significance of sustainable land management techniques in reducing negative environmental effects.

Conclusion:

The extensive literature study has yielded significant insights into the complex interplay among illnesses, infections, and geogenic variables in many ecosystems. The study's of methodological strategy is closely related to the sophisticated knowledge gleaned from the literature, providing a solid basis for additional research. The review of the literature emphasizes how crucial it is to take climate, topography and soil composition into account when attempting to understand the dynamics of disease prevalence and pathogen transmission. Through the alignment of the methodology with the literature review, this study seeks to fill knowledge gaps and advance a comprehensive understanding of the intricate interactions between diseases and geogenic as well as pathogenic factors. The thorough methodology used in this study aims to identify important patterns and relationships, providing prospective directions for targeted interventions and preventive measures (Suryawanshi D.S.2007). This synthesis paves the way for advances in geographical science and public health by providing a foundation for a methodologically rigorous research of the complex web of geogenic variables impacting pathogenic dynamics with diseases.

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