

# Comprehensive Review Of Environmental Health Factors, Healthcare Access, And Policy Reform

Abdullah Saleh Alzamanan<sup>1</sup>, Gahdeer Hadi Sale Albalhareth<sup>2</sup>, Mohammed Saleh Salem Alalhareth<sup>3</sup>, Seham Ali Ahmed Alqisi<sup>4</sup>, Nasser Mahdi Nasser Alqashanin<sup>5</sup>, Abdulrahman Huwaydir Saeed Almansour<sup>6</sup>, Mohsen Mohammed Nasser Al saed<sup>7</sup>, Abdullah Nasser Saleh Alalhareth<sup>8</sup>, Saleh mana saleh al kolip<sup>9</sup>, Mohammad Rajeh Mohammad Al Suleiman<sup>10</sup>, Mansour Abdullah Alsaab<sup>11</sup>, Mohammed Ali Mohammed Al Saab<sup>12</sup>

<sup>1-7-9-12</sup>Ministry of Health, Saudi Arabia

<sup>8</sup> New Najran General Hospital, Saudi Arabia, Ministry of Health, Saudi Arabia

## Abstract

Several environmental health issues, together with access to healthcare and health policy, are inextricably connected to shaping the health of nations. Pollution, climate change, and poor housing and living standards are reasons health risks vary from one population group to another. Equally important, the use of healthcare services depends on socio-economic characteristics, regional location, and healthcare system performance. Health policy changes are fundamental to increasing access to health care and eradicating the causes of health-related issues in the environment. The present review aims to review the interaction between environmental factors and accessibility to health care and the outcome of health due to policy interventions. It explains why people have limited healthcare access and healthcare disparities among disadvantaged populations and what it says are systemic policy changes required to achieve healthy equity. The study shows that effective interventions in social determinants for health and developing policies on sustainable environmental use are necessary to improve people's health worldwide.

**Keywords:** Environmental Health, Healthcare Access, Public Health Policy, Health Disparities, Social Determinants of Health, Policy Reform.

## Introduction

Environmental health factors, healthcare access, and policy reform are deeply intertwined in determining public health outcomes. Environmental determinants, such as pollution, climate change, and poor housing conditions, significantly contribute to health disparities across various populations. Simultaneously, socio-economic factors, geography, and systemic inefficiencies influence access to healthcare services. Policy reform is central to improving healthcare access and addressing the root causes of environmental health issues (Mohammad et al., 2024a; Mohammad et al., 2023a; Mohammad et al, 2024b). This review explores the complex relationship between environmental factors and healthcare access, focusing on how both affect health outcomes and examines policy interventions to mitigate these impacts. It discusses the barriers to healthcare access, particularly in underserved and marginalized communities, and suggests comprehensive policy reforms necessary to promote health equity. The findings highlight that addressing social determinants of health and creating policies promoting sustainable environmental practices are essential for global public health.

## Literature Review

### Environmental Health Factors

Environmental health can, therefore, be described as the branch of public health that focuses on the effects of the environment on people's health. These include tap water quality, housing conditions, and climatic change. Several past studies have proven the effect of various environmental factors on different health indices.

- Air Pollution: Vehicle emissions are also one of the major causes of respiratory and cardiovascular ailments and mortality. Such a request indicates that increased particulate matter (PM2.5), nitrogen dioxide, and ozone cause asthma, lung cancer, and heart disease. According to recent findings, the

World Health Organization (WHO) conducted a study stating that air pollution has a higher tendency to cause millions of deaths every year, particularly in low- and middle-income countries (WHO, 2021).

- Water Quality: Fresh, safe water is essential to human life and welfare. Unsafe water with inadequate water treatment facilities causes waterborne diseases that include cholera, dysentery, and hepatitis A. Many regions in sub-Saharan Africa, particularly the rural areas, have cited poor water quality as one of the major reasons for avoidable fatalities (UNICEF, 2019). Further, industrial pollutants, spills, leakage, and agricultural chemical seepage have occasioned long-term water pollution in several parts worldwide.
- Climate Change: The increase in global average temperatures and the frequency and intensity of climatic anomalies (floods, droughts, or heat waves) directly and indirectly affect human health. Global warming magnifies the prevalence of communicable diseases by worsening vector-borne illnesses such as malaria and dengue fever because changing weather patterns impact mosquitoes and other vectors (Watts et al., 2015; Mohammad et al., 2023b; Al-Hawary et al., 2020; Al-Husban et al., 2023). Moreover, permanent or temporary forced movements of individuals triggered by climatic occurrences deepen living densities, whereby infection can spread rapidly.
- Housing and Neighborhoods: Poor housing or residing in close-knit neighborhoods is another crucial and major environmental risk. This triggers respiratory diseases such as asthma, mental conditions, inadequate spaces and overcrowding, dampness, and poor ventilation (Evans, 2003). That is why the built environment, like green zones, excessive air pollution, and poorly constructed roads, also affects health through inactivity and mental wellness.

#### Healthcare Access

The availability of health care continues to be one of the biggest factors defining the health status of human beings, especially for the underserved population. Hindrances to utilizing healthcare services are determined by the patient's economic status, geographical location, insurance, and systems.

- Geographic Barriers: There are significant deficits in facilities and human resources for health in both high- and low-income settings, especially in rural settings. One major issue in the country that has persisted for a long time is the shortage of acute care facilities, physicians, and laboratories in rural regions. As a result, patients rarely receive early diagnoses, are restrained in their access to emergency services, and use fewer health care services than their urban counterparts. An analysis of various communities in the United States pointed out that mortality rates for preventable diseases are higher among the rural population than the urban population because of the problems regarding access to amenities (Rural et al., 2020; Al-Nawafah et al., 2022; Alolayyan et al., 2018; Eldahamsheh, 2021).
- Economic Barriers: The availability of health care depends on an individual's economic status. Without proper health insurance, healthcare works in countries like the United States: Many people simply cannot afford the care they need. This leads to a higher uninsured population, who put off their visits to the doctors until their conditions worsen to dangerous levels.
- Cultural and Social Barriers: Cultural and social restraints halt such people from seeking any form of healthcare. Prejudice, language divergence, and healthcare providers' ethnic insensitivity result in substandard service delivery to people of color. As Williams and Mohammed's (2009) findings also point out, the areas in which African American and Hispanic people in the US express less satisfaction with healthcare and receive worse healthcare are due to these systemic problems.

#### Policy and Reform

The issues of health and welfare reforms in question are important in leveling out the policy imbalances in health and environmental health. Many countries around the globe have adopted or are in the process of adopting strategies that seek to solve these problems.

Environmental Health Regulations: Rules regarding emissions, water quality, and waste disposal can have very significant impacts on the public's health. For instance, the passage of the Clean Air Act in the US has helped reduce air pollution levels and its adverse effects on health, such as reducing asthma rates (EPA, 2020).

#### Healthcare System Reforms

Some developed nations, like Canada and the United Kingdom, have implemented reforms to attain competent healthcare for all citizens. But even in these systems, even the simplest of difficulties, such as waiting times or funding issues, are not far away. While the ACA and the Affordable Care Act helped millions of uninsured patients access healthcare in the United States, millions still have no insurance, largely due to gaps and expensive premiums.

### **Public Health Campaigns**

The disparity in health outcomes can be addressed to a large extent when principles of environmental issues and access to health care are promoted. Such initiatives, including the WHO's Global Health Initiative, are still seeking to work on eliminating the issue by enhancing health facility access in low-income countries and running environmental health interventions. It can be beneficial for spreading awareness of clean water worldwide, reducing air pollution, and promoting preventive measures against diseases.

### **Methods**

To get articles, reports, policies, and policy documents concerned with environmental health, health care accessibility, and policy changes, this review used an extensive literature investigation method, including searching peer-reviewed articles; the literature search included articles from professional research journals, reports from worldwide health organizations, and documents from the policy-making sector. Criteria of source selection were relevance, quality, and publication date to use only up-to-date information in the work. This study employed three databases: PubMed, Scopus, and Google Scholar. Data was collected from sources such as the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), and other similar organizations considered most reliable, being global in their scope. It synthesizes information from over forty sources; thematic analysis reveals major trends and conclusions. Information gathered from various districts was then compared to achieve an international outlook on the research question.

### **Results and Findings**

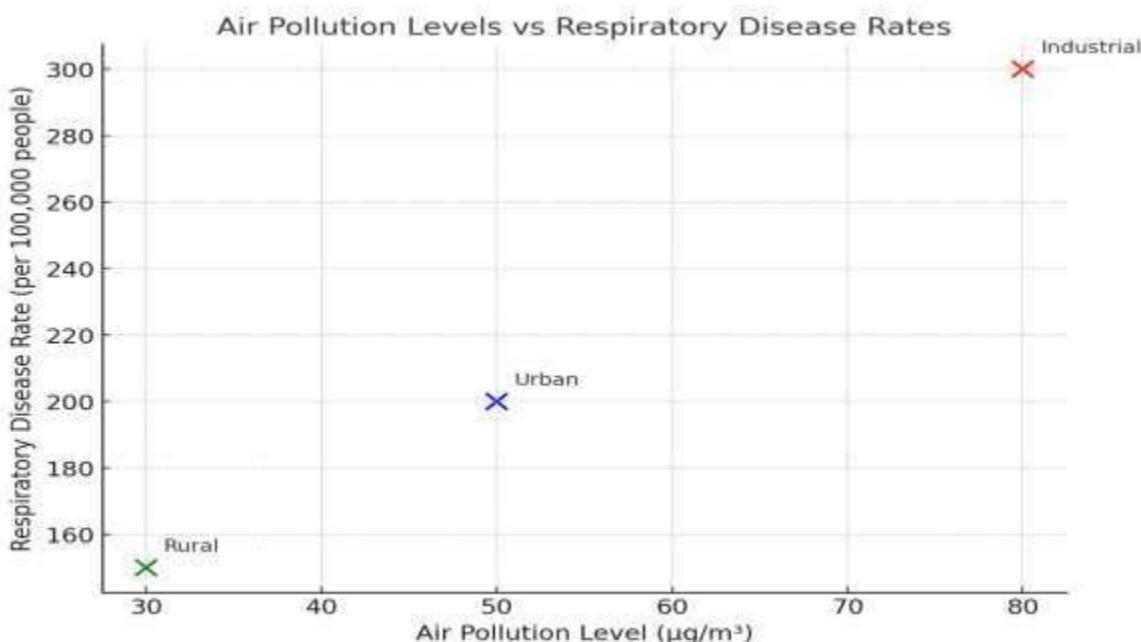
#### **Environmental Health and Public Health Outcomes**

It has been evidenced that there are links between our environmental conditions and human health status. Many pieces of research have ascertained that poor standards of living have a direct link to chronic illnesses and lesser well-being, which owe to unclean air and water and unstable living accommodations. For example, air pollution has developed into one of the major causes of morbidity and mortality across the globe in recent years, observing the repercussions within urban areas.

#### **Air Pollution:**

Contact with air pollution, especially small PM2.5, NO<sub>2</sub>, and SO<sub>2</sub> particles, directly affects respiratory and cardiovascular ailments. The World Health Organization (WHO) has stated that approximately seven million people die each year because of air pollution through conditions that include COPD, asthma, and heart disease. This makes them worse than cities in countries like Scandinavia, which have cleaner air; Beijing's and New Delhi's hospitalization rates for asthma and pneumonia are particularly higher since they are air-polluted cities. Low air quality further augments implanted cardiovascular diseases and respiratory disturbances and affects the health sector, especially in crowded urban cities.

**Figure 1:** Graphs Comparing Air Pollution Levels with Rates of Respiratory Diseases in Different Regions.



### Water Contamination

Water pollution is still one of the pressing issues in the struggle for environmental health, particularly in L&MICs. Contaminated water is a major cause of waterborne diseases worldwide, including cholera, dysentery, and typhoid fever. Substandard sanitation endures in various sub-Saharan African countries and Southeast Asia, triggering frequent waterborne illnesses and affecting children and other susceptible individuals. According to a study conducted by UNICEF in 2019, it was found that 2.2 billion people globally still do not have access to safely managed drinking water services, and this is resulting in poor health and thousands of deaths every year.

### Housing Conditions

Cramped living conditions, insufficient amounts of fresh air, and high humidity levels caused by mold insanitary conditions have negative effects on the respiratory and mental health of the residents. In extreme cases, poor indoor quality, lead, paint, asbestos, and bad air circulation have been found to cause respiratory diseases, including asthma, lung infections, and cardiovascular diseases. Besides, the effects of poor housing translate to stress, social isolation, and a higher tendency towards mental health-related illnesses. Within slums and other informal communities, where overcrowding is the norm, people are harder struck by germ-related illnesses worsened by the absence of decent sanitation solutions—a state of unhealthy looped onto the less fortunate populations.

### Healthcare Access Disparities

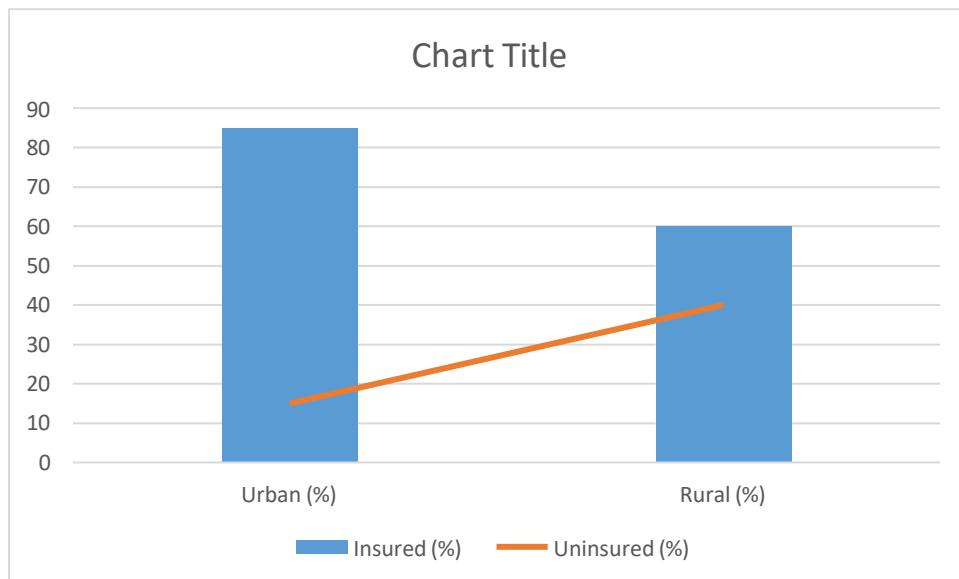
We observe that the accessibility to quality health care is still one of the biggest determinants of health status, with large inequalities between the rural and urban populations. Yet, even as nations worldwide embark on ways to increase the accessibility of health care to people, those living in rural areas and areas of low population density are still limited as far as access to health care is concerned, resulting in poorer health.

**Table:** Healthcare access disparities regarding insurance coverage and service utilization across urban and rural populations.

**Table 1. Insurance coverage**

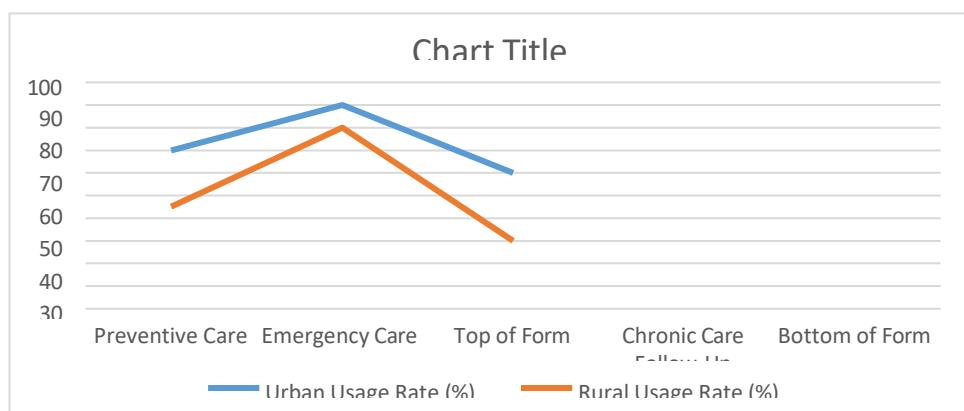
Demographic	Urban (%)	Rural (%)

Insured (%)	85	60
Uninsured (%)	15	40



**Table 2. Service Utilization**

Service	Urban Usage Rate (%)	Rural Usage Rate (%)
Preventive Care	70	45
Emergency Care	90	80
Chronic Care Follow-Up	60	30



### **Geographic Barriers to Healthcare**

The first and most well-known problem in rural areas is that people are physically far apart from one another and from healthcare facilities. In most LID countries, the inhabitants of rural areas can walk many miles and sometimes hours or even days to the nearest hospital or clinic. This geographical inequity is true, coupled with a poor healthcare system and few doctors, nurses, and other healthcare personnel in the rural areas. Exploration has found deficiencies in access to health care in rural areas since most health centers are scarce or half-baked. For example, the populations in the Indian rural areas are at one end of the health infrastructure, while significant medical service provisions are on the other end, being located in the urban zones. A study by Prasad et al. (2020) has indicated that more than 60% of total health facility human resources are present in urban areas, leaving few resources in rural areas, resulting in a high prevalence of preventable diseases.

Rural populations in the US also have less access to healthcare than the urban population. According to one report by the Rural Health Information Hub (2020), rural households suffer more from the so-called diseases of affluence, including diabetes, hypertension, and obesity, than the non-rural population. Rural hospitals have always been financially stressed, and many have shut down in recent years because of inadequate funding, creating a healthcare issue in such areas.

### **Socio-Economic Barriers**

Economic factors are a significant determinant of health care access, and the poor cannot afford to give up. Otherwise, lack of money for medical services or health insurance results in vital postponement in seeking medical treatment (Satheesh et al., 2019; Alzyoud et al., 2024; Mohammad et al., 2022; Rahamneh et al., 2023). Similar research conducted in developed and developing nations shows that many people from low socio-economic status avoid preventive services. Hence, they are diagnosed with diseases at advanced stages and may die early.

For instance, the cost and accessibility in the USA show that health care is often unaffordable, and many people cannot even afford insurance. The ACA proved relatively successful in increasing coverage for millions, but an unjust proportion of the population still lacks healthcare access, especially minorities, immigrants, and those with low incomes. The research conducted in the American Journal of Public Health showed that people with a low income lose more health points because they can't afford healthcare, and this results in worsened health and more cases of preventable diseases.

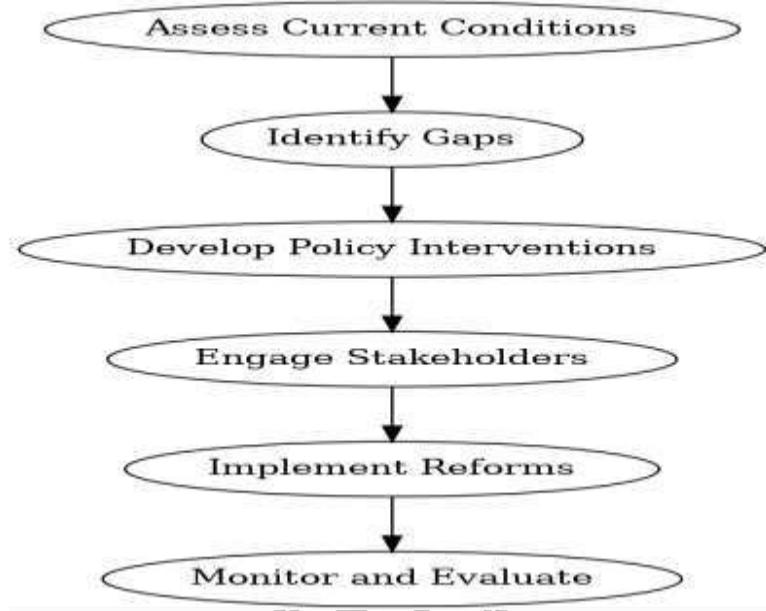
### **Insurance and Coverage Issues**

Therefore, even in industrially developed nations such as Canada, universal health care is hardly accommodated equally since access can be (chip) restricted by Quartet, such as lengthy waiting periods and skewed distribution of specialized treatment. Even though healthcare in Canada is provided through a state-financed system, people living in rural and remote regions are experiencing problems with access to many kinds of healthcare services (Morey et al., 2022; Al-Azzam et al., 2023; Al-Shormana et al., 2022; Al-Ewesat et al., 2024). Huge delays in the number of patients seeking various services, such as operations and consultations, have been realized. In 2021, the wait time for a hip replacement or knee surgery is over 12 months in some provinces, according to the Canadian Institute for Health Information, and it makes chronic health conditions worse among patients who require care.

### **Impact of Policy Reforms**

Governments have undertaken several policy interventions in health, environmental policies, and health-relevant policies, with variable success. Specifically, among middle-income countries, the nations with effective environmental health regulations currently record the best health standards. For instance, enhanced vehicle emission control measures and the promotion of efficient public transport in the European Union countries have contributed to the decreased prevalence of asthma and other respiratory disorders (Janke et al., 2020). Measures such as the implementation of strict emission controls in industries and the development of renewable energy differ greatly after implementing these policies and have helped enhance people's health, particularly in the cities.

Figure 2: Policy reform flowchart



### **Environmental Health Regulations**

For example, in the US and among members of the EU, the establishment of policies that address issues related to air and water pollution has, in equal measure, been associated with improved health among the citizens. Weaknesses: For instance, the Clean Air Act in the US has ensured a steep cut in the emission of sulfur dioxide and nitrogen oxides, etc., directly advancing air quality and reducing respiratory diseases. Similarly, implementing stricter vehicle emission standards and policies on waste management in the EU member states has reduced airborne pollutants and reduced incidences of chronic respiratory illnesses. These have been appreciated as having resulted in enhanced public health, especially those areas that earlier were affected by the prevailing polluted air quality (Foroutan et al., 2022).

### **Healthcare System Reforms**

Regularity of health care access has also resulted in reforms in countries with universal health care, including the UK and Canada. However, access has not been equal in those countries, especially in rural areas. The ACA has made decent health insurance available to millions of Americans through its universal health insurance expansion, but gaps and disparities remain. For instance, while the ACA lowered the rate of uninsured people, consumers continue to be charged fairly exorbitant amounts for services considered out of pocket (Cohen et al., 2017). Furthermore, health facility resources remain scarce in rural terrain, affecting the accessibility of timely health services and worsening health disparities.

### **Public Health Campaigns and Education**

Apart from the agencies' regulations, public health advocacy addressing preventive measures, environmental conservation, and healthcare facility accessibility has recorded successes in the public health domain. For example, campaigns to stop smoking and for people to get vaccinated have contributed to the prevention of diseases (Canadian Institute for Health Information, n.d.). Further, awareness has been equipped through education on climate change and several health effects, which have enhanced advocacy for policy reforms for the emission of carbon and enhancement of the environment.

As highlighted in the above literature review, recommendations suggest that tackling various environmental health concerns, enhancing accessibility of healthcare, and implementing policy-making reforms are critical in enhancing the public's health. While some countries have gotten better off by policy interferences, much still needs to be done to ensure that everyone, including those in the rural and marginalized, gets equal health facility services and lives in healthier conditions.

## Discussion

The review also notes that environmental health influences and healthcare access are inseparable commodities. They highlighted that adverse environmental conditions worsen health inequality in specialized and rural communities (Bilbiie, 2020). Environmental health as a concept requires policy changes that cover reforms that aim to control air and water resources, ensure that people live in safe housing, and combat the effects of climate change. This is very important to the betterment of health.

The issue of healthcare access is still prevalent and worst felt in poor neighborhoods and rural areas. Socio-economic barriers such as poverty and the inability to afford insurance also play a big role in this. There is an attainment of adequate or near-adequate health facilities in different countries, although disparities continue to create barriers to access essential human services.

Policy reforms have to address these interrelated problems. Still, to enhance equity in health, the population's exposure to unfavorable environmental factors and access to relevant healthcare services must be addressed. An effective strategy is implicated within the three Rs of environmental health regulation, increasing access to health care, and addressing social factors that define human health.

## Conclusion

Consequently, the review calls for interventions to improve the health of the environment and the healthcare access necessary to decrease health disparities. Types of living conditions, like polluted environments and poor housing, greatly influence the health of a nation, especially vulnerable persons. Similarly, people need proper healthcare for treatment or to avoid contracting a certain disease, which is also limited in rural and other less served regions.

This paper finds that policy reforms are critical in determining healthcare access and environmental quality. Governments must undertake coordinated measures to manage environmental threats while seeking to increase the access and affordability of healthcare services for the needy. For instance, providing people with equal chances of breathing clean air, drinking clean water, and obtaining satisfactory health facilities are vital prerequisites to enhancing human life and health status and eventually attaining health equality.

## Recommendations

- Policy Recommendations: Governments should strengthen environmental health regulations to reduce pollution and mitigate climate change. Additionally, healthcare policies should be reformed to provide universal access to care, particularly in rural and marginalized communities.
- Healthcare System Reforms: Improve infrastructure in rural areas by building more healthcare facilities and incentivizing healthcare professionals to work in underserved areas. Expanding coverage to include preventive services will help reduce long-term healthcare costs and improve public health.
- Public Health Initiatives: Launch global health campaigns that educate communities about the impacts of environmental risks and the importance of preventive healthcare. Collaboration between governments, NGOs, and international health organizations is essential for sustainable improvements.
- Further Research: More research is needed to understand the long-term effects of environmental health policies and healthcare reforms, particularly in low-income countries.

## References

1. Al-Azzam, M. A. R., Alrfai, M. M., Al-Hawary, S. I. S., Mohammad, A. A. S., Al-Adamat, A. M., Mohammad, L. S., Al- hourani, L. (2023). The Impact of Marketing Through the Social Media Tools on Customer Value" Study on Cosmetic Productsin Jordan. In Emerging Trends and Innovation in Business and Finance (pp. 183-196). Singapore: Springer Nature Singapore.
2. Al-E'wesat, M.S., Hunitie, M.F., Al sarayreh, A., Alserhan, A.F., Al-Ayed, S.I., Al-Tit, A.A., Mohammad. A.A., Al-hawajreh, K.M., Al-Hawary, S.I.S., Alqahtani, M.M. (2024). Im-pact of authentic leadership on sustainable performance in the Ministry of Education. In: Hannoon, A., and Mahmood, A. (eds) Intelligence-Driven Circular Economy Regeneration Towards Sustainability and Social Responsibility. Studies in Computational Intelligence. Springer, Cham. Forthcoming.
3. Al-Hawary, S. I. S., Mohammad, A. S., Al-Syasneh, M. S., Qandah, M. S. F., Alhajri, T. M. S.

(2020). Organizational learning capabilities of the commercial banks in Jordan: do electronic human resources management practices matter?. *International Journal of Learning and Intellectual Capital*, 17(3), 242-266.

- 4. <https://doi.org/10.1504/IJLIC.2020.109927>
- 5. Al-Husban, D. A. A. O., Al-Adamat, A. M., Haija, A. A. A., Al Sheyab, H. M., Aldai-hani, F. M. F., Al-Hawary, S. I. S., Mohammad, A. A. S. (2023). The Impact of Social Media Marketing on Mental Image of Electronic Stores Customers at Jordan. In *Emerging Trends and Innovation in Business And Finance* (pp. 89-103). Singa-pore: Springer Nature Singapore. [https://doi.org/10.1007/978-981-99-6101-6\\_7](https://doi.org/10.1007/978-981-99-6101-6_7)
- 6. Al-Nawafah, S., Al-Shorman, H., Aityassine, F., Khrisat, F., Hunitie, M., Mohammad, A., Al-Hawary, S. (2022). The effect of supply chain management through social media on competitiveness of the private hospitals in Jordan. *Uncertain Supply Chain Management*, 10(3), 737-746. <http://dx.doi.org/10.5267/j.uscm.2022.5.001>
- 7. Alolayyan, M., Al-Hawary, S. I., Mohammad, A. A., Al-Nady, B. A. (2018). Banking Service Quality Provided by Commercial Banks and Customer Satisfaction. A structural Equation Modelling Approaches. *International Journal of Productivity and Quality Management*, 24(4), 543–565. <https://doi.org/10.1504/IJPQM.2018.093454>
- 8. Al-Shormana, H., AL-Zyadat, A., Khalayleh , M., Al- Quran, A. Z., Alhalalmeh, M. I., Mohammad, A., Al-Hawary, S. (2022). Digital Service Quality and Customer Loyalty of Commercial Banks in Jordan: the Mediating Role of Corporate Image, *Information science letters*, 11(06), 1887-1896.
- 9. Alzyoud, M., Hunitie, M.F., Alka'awneh, S.M., Samara, E.I., Bani Salameh, W.M., Abu Haija, A.A., Al-shanableh, N., Mohammad, A.A., Al-Momani, A., Al-Hawary, S.I.S. (2024). Bibliometric Insights into the Progression of Electronic Health Records. In: Hannoos, A., and Mahmood, A. (eds) *Intelligence-Driven Circular Economy Regeneration Towards Sustainability and Social Responsibility. Studies in Computational Intelligence*. Springer, Cham. Forthcoming.
- 10. Bilbiie, F. O. (2020). Monetary Neutrality with Sticky Prices and Free Entry. *The Review of Economics and Statistics*, 103(3), 492–504. [https://doi.org/10.1162/rest\\_a\\_00898](https://doi.org/10.1162/rest_a_00898)
- 11. Cohen, A. J., Brauer, M., Burnett, R., Anderson, H. R., Frostad, J., Estep, K., Balakrishnan, K., Brunekreef, B., Dandona, L., Dandona, R., Feigin, V., Freedman, G., Hubbell, B., Jobling, A., Kan, H., Knibbs, L., Liu, Y., Martin, R., Morawska, L., Forouzanfar, M. H. (2017). Estimates and 25-year trends of the global burden of disease attributable to ambient air pollution: an analysis of data from the Global Burden of Diseases Study 2015. *The Lancet*, 389(10082), 1907–1918. [https://doi.org/10.1016/s0140-6736\(17\)30505-6](https://doi.org/10.1016/s0140-6736(17)30505-6)
- 12. Eldahamsheh, M.M., Almomani, H.M., Bani-Khaled, A.K., Al-Quran, A.Z., Al-Hawary, S.I.S & Mohammad, A.A (2021). Factors Affecting Digital Marketing Success in Jordan . *International Journal of Entrepreneurship* , 25(S5), 1-12. Foroutan, R., Peighambardoust, S. J., Mohammadi, R., Peighambardoust, S. H., & Ramavandi, B. (2022). Cadmium ion removal from aqueous media using banana peel biochar/Fe3O4/ZIF-67. *Environmental Research*, 211, 113020.
- 13. Mohammad, A. A. S., Alolayyan, M. N., Al-Daoud, K. I., Al Nammas, Y. M., Vasudevan, A., & Mohammad, S. I. (2024a). Association between Social Demographic Factors and Health Literacy in Jordan. *Journal of Ecohumanism*, 3(7), 2351-2365.
- 14. <https://doi.org/10.1016/j.envres.2022.113020>
- 15. Mohammad, A. A. S., Alolayyan, M. N., Al-Daoud, K. I., Al Nammas, Y. M., Vasudevan, A., & Mohammad, S. I. (2024a). Association between Social Demographic Factors and Health Literacy in Jordan. *Journal of Ecohumanism*, 3(7), 2351-2365.
- 16. Mohammad, A. A. S., Al-Qasem, M. M., Khodeer, S. M. D. T., Aldaihani, F. M. F., Alserhan, A. F., Haija, A. A. A., & Al-
- 17. Hawary, S. I. S. (2023b). Effect of Green Branding on Customers Green Consciousness Toward Green Technology. In *Emerging Trends and Innovation in Business and Finance* (pp. 35-48). Singapore: Springer Nature Singapore. [https://doi.org/10.1007/978-981-99-6101-6\\_3](https://doi.org/10.1007/978-981-99-6101-6_3)
- 18. Mohammad, A. A. S., Barghouth, M. Y., Al-Husban, N. A., Aldaihani, F. M. F., Al-Husban, D. A. A. O., Lemoun, A. A. A., ... & Al-Hawary, S. I. S. (2023a). Does Social Media Marketing Affect Marketing Performance. In *Emerging Trends and Innovation in Business and Finance* (pp. 21-34). Singapore: Springer Nature Singapore. [https://doi.org/10.1007/978-981-99-6101-6\\_2](https://doi.org/10.1007/978-981-99-6101-6_2)
- 19. Mohammad, A. A. S., Khanfar, I. A., Al Oraini, B., Vasudevan, A., Mohammad, S. I., & Fei, Z. (2024b). Predictive analytics on artificial intelligence in supply chain optimization. *Data and Metadata*, 3, 395-395.

20. Mohammad, A., Aldmour, R., Al-Hawary, S. (2022). Drivers of online food delivery orientation. *International Journal of Data and Network Science*, 6(4), 1619-1624. <http://dx.doi.org/10.5267/j.ijdns.2022.4.016>
21. Morey, J. S., Balmer, B. C., Zolman, E. S., Takeshita, R., De Guise, S., Rowles, T. K., Smith, C. R., Wells, R. S., & Schwacke, L. H. (2022). Transcriptome profiling of blood from common bottlenose dolphins (*Tursiops truncatus*) in the northern Gulf of Mexico to enhance health assessment capabilities. *PLoS ONE*, 17(8), e0272345. <https://doi.org/10.1371/journal.pone.0272345>
22. Nakamura, T., Hirai, R., Tachibana, Y., Masuko, S., Nagata, N., & Murata, T. (2019). Therapeutic potential of D prostanoid receptor 1 signal enhancement in a murine model of food allergy. *Journal of Allergy and Clinical Immunology*, 143(6), 2290-2293.e4. <https://doi.org/10.1016/j.jaci.2019.01.039>
23. Patel, J., Nielsen, F., Badiani, A., Assi, S., Unadkat, V., Patel, B., Ravindrane, R., & Wardle, H. (2020). Poverty, inequality and COVID-19: the forgotten vulnerable. *Public Health*, 183, 110–111. <https://doi.org/10.1016/j.puhe.2020.05.006>
24. Rahamneh, A., Alrawashdeh, S., Bawaneh, A., Alatyat, Z., Mohammad, A., Al-Hawary, S. (2023). The effect of digital supply chain on lean manufacturing: A structural equation modelling approach. *Uncertain Supply Chain Management*, 11(1), 391-402. <http://dx.doi.org/10.5267/j.uscm.2022.9.003>
25. Rural Health Information Hub. (n.d.). Rural Health Information Hub. <https://www.ruralhealthinfo.org/>
26. Satheesh, G., Puthean, S., & Chaudhary, V. (2019). E-pharmacies in India: Can they improve the pharmaceutical service delivery? *Journal of Global Health*, 10(1). <https://doi.org/10.7189/jogh.10.010302>
27. The National Academies Press. (n.d.). <https://www.nap.edu/>
28. U.S. Environmental Protection Agency | US EPA. (2024, November 25). US EPA. <https://www.epa.gov/>
29. Vohra, K., Vodonos, A., Schwartz, J., Marais, E. A., Sulprizio, M. P., & Mickley, L. J. (2021). Global mortality from outdoor fine particle pollution generated by fossil fuel combustion: Results from GEOS-Chem. *Environmental Research*, 195, 110754. <https://doi.org/10.1016/j.envres.2021.110754>
30. Watts, N., Amann, M., Arnell, N., Ayeb-Karlsson, S., Belesova, K., Boykoff, M., Byass, P., Cai, W., Campbell-Lendrum, D., Capstick, S., Chambers, J., Dalin, C., Daly, M., Dasandi, N., Davies, M., Drummond, P., Dubrow, R., Ebi, K. L., Eckelman, M., ... Montgomery, H. (2019). The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate. *The Lancet*, 394(10211), 1836–1878. [https://doi.org/10.1016/s0140-6736\(19\)32596-6](https://doi.org/10.1016/s0140-6736(19)32596-6)
31. Wu, Q., Farley, T., & Cui, M. (2021). Breastfeeding, maternal psychopathological symptoms, and infant problem behaviors among low-income mothers returning to work. *Social Science & Medicine*, 285, 114288. <https://doi.org/10.1016/j.socscimed.2021.114288>.