WHEN OIL BECOMES POISON: THE HIDDEN HEALTH CRISIS IN NIGERIA'S OIL-PRODUCING REGIONS

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ABSTRACT
Reports show that individuals in oil-producing regions in Nigeria consistently face significant risks of sickness, compounded by challenges in accessing sufficient food and medical care. This study implemented a quantitative research method using descriptive statistics to analyze trends and patterns to evaluate health hazards associated with oil spills. Pearson correlation was utilized to determine the strength of the relationship between the variables. Non-probability (purposive) sampling was utilized to choose the study locations, specifically three oil-producing areas in Nigeria: Bayelsa, Rivers, and Delta states. Simple random sampling was utilized to obtain data from participants through closed-ended questionnaires, employing convenience sampling to allow participants to respond at their own pace and voluntarily. We evaluated all survey data using SPSS software. Upon data analysis, the results from the descriptive analysis combined with Pearson correlation show that oil spills create major health problems through respiratory illnesses and water contamination and create shortages of food. The result also showed that during these disasters, medical response measures were limited. It implies that rising events of oil spills lead to more severe environmental disasters of water contamination, which proves to be a significant factor that increases the occurrence of cholera and typhoid while destroying agricultural lands, resulting in food scarcity. Therefore, the study recommended that the Nigerian government enact strict environmental laws with strong accountability systems for corporations in the oil business and individuals within these regions.

Keywords: Oil Spills, Respiratory Diseases, Waterborne Diseases, Food Scarcity, Medical Interventions, Public Health Crisis.
JEL Codes: I1, I3.

1. INTRODUCTION

Oil is one of the fundamental resources upon which the economies of the globe are based. Its importance helps in the effective distribution of energy, trade, and industrial development globally. It has a major effect on developed countries and growing economies in terms of the political environment, social surroundings, and economic framework. Fatiha (2025) observed that many nations depend on oil revenue as their economic foundation and the principal source of national income. However, oil extraction's negative impact on ecosystems, particularly oil

spills, has emerged as a critical issue for countries heavily reliant on their oil resources. In 2022, the International Energy Agency (IEA) reported that oil constituted 31% of global energy demand in 2021, with an average daily consumption of 88 million barrels. Given that oil is crucial for operating transportation systems, generating energy, warming or cooling residences, and powering manufacturing facilities, it is reasonable to assert that oil is the lifeblood of all enterprises and humanity. Marquez, Ovalles, Lopez-Linares, Wang, Robinson, and Reynolds (2025) asserted that the global oil market, valued in trillions of dollars, serves as the nexus for extensive networks of producers and consumers, Hence, fluctuations in oil prices significantly influence inflation and the costs of products and services, exerting a considerable effect on global economic performance (Efayena, Buzugbe, & Olele, 2019).

The primary advantage of oil lies in its economic significance, yet environmental issues are now at the forefront. The primary advantage of oil lies in its economic significance, yet environmental concerns have increasingly gained prominence. Unfortunately, events like the 1989 Exxon petroleum oil disaster, which released 11 million barrels of petroleum oil into Prince William's Sound, Alaska, continue to rank among the most catastrophic events in terms of environmental destruction (National Oceanic and Atmospheric Administration, 2021, Paz Barzola, & Escobar Segovia, 2025). Also, the 2010 BP Deepwater Horizon incident was an oil spill that caused a fiery explosion and catastrophic issues in the Gulf of Mexico. Just recently (in February 2025), Bayelsa State, Nigeria, experienced significant oil spills that impacted the Obololi village in the Southern Ijaw LGA and surrounding areas (Punch, 2025). The incident resulted from a leak at an oil production facility, necessitating the cessation of crude oil production and transportation, as all flow activities were suspended. Due to this issue, surface and groundwater suffered significant pollution that adversely affected marine life and the health of local populations. Extinction of marine life and the general ecosystems, as well as decades of economic, physical, social, psychological, and cultural destruction, were the results of such catastrophic oil spills. Olowu, Ichoku, and Nwosu (2018) asserted in their research that the Niger Delta exemplifies the dichotomy of poverty amidst abundance, being an oil-rich region. This can be ascribed to oil spills disrupting the livelihoods of residents, resulting in widespread poverty.

Oil spills cause extensive destruction to ecosystems and habitats. Such occurrences may reflect issues of oil vandalism and, to a significant extent, a deficiency in adequate regulatory and environmental protection measures necessary to minimize such incidents and prevent oil spills. Accordingly, due to oil spills, marine ecosystems and coastal areas undergo harmful changes, endangering human health in various ways. In addition to lowering water quality for human consumption, the harmful compounds released into the environment by oil spills cause skin problems, gastrointestinal issues, and respiratory problems, posing substantial issues to the local communities living near oil extraction and transportation locations (Feitosa, Menezes, Duarte, Salmito-Vanderley, Carneiro, Azevedo, & Feitosa, 2024). In places where healthcare is scarce, the results of being exposed to crude oil and petroleum products on human health are more severe.

Many African countries, especially in North and West Africa, have a considerable dependence on oil, which enables them to attract investment, promote knowledge transfer, and create global economic opportunities. Niyazbekova, Ivanova, Suleimenova, Yerzhanova, and Berstembayeva (2021) observed that governments and multinational businesses have formed strategic partnerships, leading to a worldwide increase in foreign direct investment following the discovery of oil. Consequently, the oil export sectors of major oil-producing nations like Algeria, Libya, Nigeria, and Angola generate crucial revenue for their national budgets. For Nigeria, the majority of its export earnings come from oil, significantly generating quicker

economic growth by financing infrastructural enhancements, fostering industrial innovation, and generating employment opportunities (The African Development Bank, 2020; Central Bank of Nigeria, 2020). However, the environmental damage brought about by oil-extraction activities in Africa becomes increasingly evident each month.

Oil spills in Nigeria have dire consequences for human health, causing water supply contamination that leads to many health issues, including dermatological ailments, respiratory problems, and gastrointestinal illnesses. Extended exposure to petroleum products presents considerable health risks, with medical practitioners documenting cases of cancer and hepatic diseases in regions recurrently impacted by oil spills (Laffon, Pásaro, & Valdiglesias, 2016; Kuppusamy, Maddela, Megharaj, & Venkateswarlu, 2020; Pal, & Sen, 2024; George, Nawawi, Mohd, & Farah, 2024). The local economies of Nigeria, reliant on fisheries and agriculture, are deteriorating due to oil leaks that have damaged fishing zones and devastated agricultural fields. Tavella, da Silva Júnior, Santos, Miraglia, and Pereira Filho (2025) observed that environmental oil spills result in substantial compensation for impacted individuals, imposing considerable financial responsibilities on the government and oil companies. Moreover, insufficient environmental remediation of oil extraction sites has strained relations among oil sector representatives, governmental agencies, and residents. Therefore, the research assesses the health-related consequences of oil spills while examining both food security and medical intervention response effectiveness within Nigeria's oil-rich areas. The paper follows a specific structure by first giving a comprehensive background to the study and evaluating existing literature to help understand the effects of oil spills on health and the environment. Then, the research methodology was discussed to describe the research design, study population/sample, data collection, data analysis practices, and ethical considerations. The findings and policy-relevant recommendations for mitigating the detrimental effects on impacted communities were addressed in the recommendations and conclusion section while recognising the study's limitations.

Notably, the recent oil spill in Bayelsa State in January 2025, involving thousands of barrels of crude oil, underscores the persistent environmental negligence within the oil industry. With over two million barrels of daily crude oil production, Nigeria makes more than 45% of its GDP from this source (DailyNews, 2012; Edo, Samuel, Jikah, Ekokotu, Ugbune, Oghroro, & Owheruo, 2024; Nduokafor, Ovwighose, & Nwoye, 2024). The economy has grown due to these oil revenues; however, the costs associated with oil production, particularly environmental degradation from recurrent oil spills and associated public health concerns, are significant. Inadequate pipeline infrastructure, characterised by the use of cheap and lightweight components, insufficient security measures, and operational negligence due to theft, vandalism, and corporate irresponsibility, leads to recurrent oil spillage disaster in the Niger region (World Bank, 2019). Oil spills in this region cause considerable environmental damage, negatively affect public health, disrupt livelihoods, and intensify socioeconomic vulnerabilities for millions of Nigerians.

According to NOSDRA, Nigeria encounters approximately 300 occurrences of oil spills a year, predominantly in the Niger Delta region (NOSDRA, 2020). The nation's deteriorating pipeline infrastructure, antiquated technology, and lack of adequate maintenance have exacerbated the likelihood of intentional and unintentional spills. Also, illicit oil operations such as theft of crude oil and damage to pipelines have exacerbated the issue, particularly in light of the reported loss of 150,000 barrels daily (Jatto, 2024). One of the immediate and substantial negative impacts of petroleum spills in Nigeria is the contamination of freshwater supplies. Rivers and streams serve as a consistent source of potable water for numerous local communities in the Niger Delta. In addition to being utilised for agricultural irrigation and

domestic purposes become unsuitable for human consumption due to crude oil impurities such as toluene, benzene, and aromatic hydrocarbon polymers. Nearly all oil spills in the Niger Delta have polluted water bodies, significantly affecting the health of over 13 million individuals reliant on those water supplies (UNEP, 2011). Evidence has been increasing linking contaminated water to numerous health issues, including cholera, dysentery, and typhoid fever, with a rise in waterborne infections in impacted populations (WHO, 2020). Furthermore, oil-contaminated water is linked to chronic diseases such as cancer, liver damage, and kidney failure, as individuals have been identified as being at risk for these ailments due to the prolonged exposure to toxic agents, including benzene, present in the oil (Akinyemi, 2019)

Figure 1; Oil Spillage into Bayelsan Community

Source: The Vanguard, (2025). https://www.vanguardngr.com/2022/05/bayelsa-villagers

A further health issue stemming from Nigeria's oil spills is respiratory diseases among affected populations. Research indicates that individuals residing near spill sites exhibit elevated chronic bronchitis, asthma, and other respiratory ailments (World Health Organisation, 2020). Oil spills exacerbate the general population health problems in the Niger Delta, compounding the significant air pollution caused by gas flaring, which is a predominant source of contamination in the region. The intake of these detrimental compounds greatly contributes to the prevalence of lung disorders and reduced life expectancy for the residents of that region (WHO, 2020). Exposure to these toxic substances impacts susceptible groups, including pregnant women and children, causing problems including premature delivery and poor newborn weight (Akinyemi, 2019). The degradation of biodiversity represents a significant adverse consequence of oil as continuous oil spills are adversely affecting the mangrove forests in the Niger Delta, which are crucial for fish rearing and shoreline stabilisation. Oil contamination has destroyed over 60 per cent of the mangrove forests in the Niger Delta (NCF, 2018), causing the degradation of sensitive ecosystems and undermining local community resilience to issues such as flooding and soil erosion.

Furthermore, oil spills have significant socioeconomic implications. For instance, they significantly impair the agricultural economy, particularly affecting the farming and fishing industries. Local farmers and fishermen experience losses in regions affected by oil extraction activities. Approximately 70 per cent of agricultural lands in the Niger Delta are adversely impacted by oil spills, leading to a decline in crop yields and resulting in food insecurity in the region (NNPC, 2020). Like the fishing business, which significantly contributes to the sustenance and income of numerous coastal towns, oil has polluted aquatic environments, leading to the industry's devastation. The World Bank reports that oil pollution is costing the Niger Delta fishing industry more than $1 billion annually (World Bank, 2019).

Figure 2; The shoreline in Bayelsa State, Nigeria, littered with dead fish as a result of oil spillage

Source: The Nation (2025). https://thenationonlineng.net/why-fishes-died-in-rivers-bayelsa

Many of the areas in oil-producing regions are deeply facing rising unemployment, food shortages and health issues brought on by continuing oil leaks. For the residents, oil spills create an environmental and financial crisis that causes great social suffering and renders the community underdeveloped. Hence, research on the effect of oil spills on the health of Nigerians —especially those in oil-producing regions is relevant. Consequently, the goals of the research are;

1. Assess the effect of oil spills on the prevalence of respiratory and waterborne diseases in Nigeria
2. Examine the effect of oil spills on food scarcity in Nigeria
3. Evaluate the effectiveness of medical interventions in addressing health concerns associated with oil spills in Nigeria.

2. LITERATURE REVIEW

2.1 Theoretical Review

Environmental Justice Theory

The Environmental Justice Theory emerged in the 1980s and was developed by Robert Bullard, Paul Mohai, and Bunyan Bryant. The authors highlighted that marginalized communities and impoverished individuals endure an unequal cost of environmental hazards due to economic and political disparities. The Environmental Justice Theory originated from the wider environmental justice movement, which seeks to rectify the inequities in environmental hazards primarily impacting marginalized communities. This study demonstrates that oil firms are accountable for persistent oil spills and continuous gas flaring, leading to environmental degradation via pollution. As a result, they consistently erode residential communities. Kodiya, Modu, Ishaq, Yusuf, Wakili, Dayyabu, and Babangida (2025) contend that the Niger Delta has seen substantial water and air pollution due to oil finding, resulting in a rise in cholera and typhoid cases. The research conducted by Thakkar, Thakker, Gupta, Jadav, Tanwar, Pau, and Tolba (2024) confirms that chemical-water discharge pollution hinders community access to clean water, hence threatening their life and sanitary living conditions. The thesis illustrates how businesses evade responsibility for the enduring health effects and economic ramifications of oil pollution. The authorities prioritize decisions that benefit petroleum companies, neglecting the delivery of crucial medical services and waste management programs for vulnerable areas.

Epidemiological Transition Theory

The epidemiological transition theory was proposed by Abdel Omran in 1971; it elucidates alterations in disease patterns in developing countries. Prior to the Age of Degenerative and Man-Made Diseases, the author delineated three principal transitional phases: the Age of Pestilence and Famine, succeeded by the Age of Receding Pandemics. The author contends that exposure to environmental factors and socioeconomic conditions disrupts the continuity of changes in life expectancy patterns. It indicates that the persistent environmental damage resulting from oil spills leads to infectious illnesses. Research conducted by UNEP (2011) indicates that those residing near areas affected by oil spills suffer from gastrointestinal and respiratory issues. Asthma, waterborne illnesses, bronchitis, and environmental deterioration are evident due to oil spills, constituting a regression in public health. Such disasters cause production decrease, leading to extensive malnutrition and famine due to soil degradation, resulting in pollution of fishing waters and agricultural lands. Thattantavide and Kumar (2024) observe that communities engaged in fishing and agriculture who experience oil spills face persistent food shortages, compelling them to acquire pricier imported food products instead of locally cultivated alternatives.

2.2 Conceptual Literature

Oil Spills

The Nigerian economy heavily depends on oil revenue, which serves as the principal financial source for creating its yearly budget. It constitutes more than 80% of foreign exchange earnings and 50% of its GDP (Chijioke & Olisah, 2023). However, the release of these petroleum liquids into natural environments constitutes oil spills disasters, particularly in coastal waters. This has been attributed to operational errors, unlawful activities, or pipeline vandalism and failures. Environmental and public health challenges resulting from oil spills represent critical concerns in Nigeria, especially in the Niger Delta, the nation's primary oil-producing area. Oil spills occurred repeatedly in the Niger Delta region, home to most of Nigeria's petroleum reserves, causing extensive environmental damage, a decline in biodiversity, and long-term health problems for the local population. In 2020 alone, the Nigerian National Petroleum Corporation recorded 2,000 oil spills, noting that oil spills originate from pipeline breaches, equipment malfunctions, theft, and inadequacies in the operational procedures of oil firms. In 2008 and 2009, the Bodo community in Rivers State saw its most devastating oil spill, releasing significant amount of crude oil. The environmental catastrophe resulted in considerable ecological destruction, presenting serious health hazards to the affected population (Human Rights Watch, 2012).

Oil spills lead to the destruction of mangrove forests, wetlands, and other habitats that sustain biodiversity, according to the Niger Delta Development Commission (2018). The persistent consequences of petroleum contamination impede agricultural output, forcing individuals to vacate their communities and diminishing their food production capabilities. Multiple studies demonstrate that exposure to petroleum hydrocarbons from oil spills causes many chronic conditions, including cancer, respiratory diseases, and neurological issues (Ossai, Hamid, Aboudi-Mana, & Hassan, 2024). Research by Ordinioha & Sawyer (2010) examined the effects of the May 2000 major crude oil pipeline rupture at Nembe in Bayelsa State, Nigeria, by assessing resident health symptoms connected to crude oil exposure. The investigators conducted an extensive retrospective cohort analysis through questionnaire administration using focus group interviews. The research revealed that while exposure to crude oil mists and vapours is associated with minor, transient health effects, the inverse is true with catastrophic oil spills. Consequently, the quality of life for people living in affected areas is negatively

affected by the frequent occurrence of oil spills, which lead to increased skin rashes, irritations of the eyes, and other dermatological illnesses.

Oil Spill-Related Health Issues

Communities in the Niger Delta experience hazardous exposure to poisons and pollutants due to the persistent occurrence of oil spills, resulting in contamination that causes several health issues. These scenarios increase the incidence of bronchitis, asthma, chronic obstructive pulmonary disease (COPD), and waterborne diseases, including cholera and dysentery. Norris Sandler Pratt Stenzel Stewart Jackson and Engel (2025) emphasized that oil spill emissions release hazardous compounds such as toluene, benzene, and xylene, adversely impacting air conditions. Therefore, extended exposure to these hazardous chemicals leads to respiratory discomfort upon inhalation. The study by Ezekwe, Onwudiegwu, and Uzoekwe (2025) affirmed that communities in the Niger Delta have reported an increased incidence of asthma and other respiratory ailments due to persistent exposure of residents to hazardous vapors emitted during oil combustion and spill. The local healthcare facilities are usually under significant strain due to rising respiratory disease cases. Simultaneously, insufficient resources and infrastructure limit their ability to manage medical emergencies, resulting in subpar health outcomes. Further, the adverse impacts of oil spills on water quality significantly affect the prevalence of waterborne infections, contaminating rivers and streams of drinking, fishing, and the like. It fosters a pathogenic milieu for bacterial, viral, and parasitic organisms, precipitating epidemics of diseases such as cholera, typhoid fever, and dysentery, affecting human beings and animals (Shekhar, Khosya, Sharma, Thakur, Mahajan, Kumar, & Sharma 2025).

Oil spills result in health issues beyond respiratory ailments and waterborne diseases. Cancer constitutes an additional health challenge arising from oil spills, as crude oil contains benzene chemicals that elevate the risk of leukaemia and various other cancer types with prolonged exposure (Akuru, Nwachoko, Tetam, Jamabo, Amadi, & Peter-Osah, 2025). Research indicates that people residing in the Niger Delta experience elevated cancer incidence rates compared to individuals living outside oil-producing regions (WHO, 2023). Additionally, imminent health issues stemming from reproductive dysfunction arise directly from oil spills, as exposure to crude oil pollutants results in fetal loss, birth abnormalities, and reproductive complications. According to studies conducted by Kanu and Iwunze (2024), pregnant women and infants residing in areas affected by oil spills die from drinking contaminated water. Research conducted by Oghenetega, Okunlola, Godson, Morhason-Bello, & Ojengbede (2022) shows how maternal health suffers due to oil pollution exposure in the Niger Delta region of Nigeria. The study comprised 1720 pregnant women aged 18–45 years using interviewer-administered questionnaires and medical records from less than 17 weeks of their gestation period - pregnancy to childbirth. The study results showed that women residing in highly exposed locations faced higher risks of premature caesarean sections, postpartum haemorrhage, and premature rupture of membranes compared to those in less exposed areas. Families and communities are impacted by these reproductive health difficulties, which impact the total birth rate.

The hazardous compounds in crude oil affect the neurological system, which in turn causes symptoms like memory loss and cognitive decline. Hence, neurological issues are more common among oil spill survivors compared to those in unaffected regions. Also, dermatological issues often stem from direct contact with oil-contaminated water and soil. Residents often suffer from dermatitis, rashes, and different dermatological conditions, exacerbated by limited access to clean water and medical care. Elezieanya (2024) report that over 40% of individuals in villages affected by oil spills in the Niger Delta suffer from

dermatological health problems. In addition, areas hit hard by oil spills often struggle with mental health difficulties. Residents battle with psychological distress resulting from economic losses, population displacement, and ecological devastation due to oil spills. Idoko, Delunzu, and Ugochukwu (2025) assert that people living in oil-producing regions suffer from sadness, anxiety, and post-traumatic stress disorder.

Food Scarcity

Oil leak disasters in Nigeria's petroleum-producing regions adversely affect agricultural operations, resulting in nationwide food accessibility issues. Oil spills severely damage food sources, especially in regions like Niger Delta, which mostly rely on agriculture and fishing for their livelihood. This catastrophe increases fish prices as food and agriculture businesses alter their sourcing tactics as a means of adjustment. The unforeseen price increases threaten a consumer's capacity to obtain food (Ogunbadejo & Ojo 2023). According to the United Nations Environment Programme (UNEP, 2011), oil contamination rendered over 70% of agricultural land in the Niger Delta unproductive. The contamination degrades the land and eradicates vegetation, preventing farmers from cultivating essential crops such as cassava, maize, and yam. Oil spills significantly impact agricultural systems by contaminating water sources required for irrigation. The agricultural plantations of the Niger Delta rely on freshwater reserves for irrigation; however, oil spills compromise these water systems, rendering them unusable. The diminished water supply for agriculture leads to unsuccessful crop yields and food scarcity. Furthermore, the critical protein supply from local fisheries is significantly compromised due to oil spills as the pollution of water bodies leads to the destruction of fish habitats, diminishing seafood availability, and exacerbating food scarcity for residents.

The food supply of Nigeria, which relies on certain agricultural output from the Niger Delta and other oil-producing regions, is adversely affected by oil spills. Reduced agricultural yields and livestock production in these regions have resulted in inadequate local food supply and increased prices of agricultural produce. Over the years, farmers in the Niger Delta have received little to no governmental support and insurance for recovery from oil spills affecting their farms. These continuous oil spills present a persistent challenge, perpetuating food shortages and economic difficulties. For instance, the scarcity of pure water for farming has rendered food production unsustainable in the long term, impacting Nigerians' health and wellness, as well as the economic stability of oil-producing regions.

Medical Responses

The importance of optimal health for individual and economic prosperity is paramount, as it affects the total quality of human well-being. Therefore, the healthcare sector of any nation necessitates consistent improvement and prompt resolution of oil spill situations (Ogala, 2024). Effective medical interventions are required to manage environmental catastrophes caused by short-term and long-term harmful exposure to oil spill chemicals. The benzene and toluene carcinogens in crude oil cause skin reactions, nausea, headaches, and respiratory problems, and emergency healthcare providers must respond quickly to such symptoms to prevent health complications. According to Neale, Cairns, Gardiner, McCarthy, and Perkins (2024), the medical team should be handy and effective enough to remove oil residue and administer counter-toxic chemical therapies quickly to undertake detoxification and decontamination. Also, activated charcoal therapy is needed to address toxicity caused by ingestion, while chelation therapy is used to treat heavy metal poisoning (Khan, Tehseen, Ali, Ali, Fatima, Khaliq, & Tahir, 2025). These fundamental procedures lessen the most serious dangers to human health from oil spills. Therefore, areas hit by oil spills must prioritize long-term medical interventions, as reports show that people living in locations where contaminated soil and water

from oil spills are present suffer from health problems, including cancer, reproductive troubles, and neurological diseases (The World Health Organisation, 2023). Hence, effective healthcare in affected areas should include screenings and continuous monitoring of health to detect possible chronic diseases in their early stages.

Additionally, oil spills cause displacement, livelihood disruption, and community fragmentation, which in turn causes severe psychological suffering and emotional trauma. Thus, effective medical treatments focus on mental health care. People who have experienced oil spills require professional help for mental health issues like depression, and post-traumatic stress disorder (PTSD). According to studies conducted by Kerketta and Annot (2025) and Barneche, Dupont-Jarrett, and Nichol-Peters (2025), having access to mental health therapies improves community well-being after oil-spill disasters. However, effective medical responses are lacking in Nigeria's oil-producing regions because of a lack of trained healthcare workers, inadequate medical facilities, limited funding, and government negligence and corruption. The capacity of medical facilities in the Niger Delta to address the health needs of the local population affected by the oil spill is reduced by around 60% due to equipment inadequacies based on statistics from the Nigerian Ministry of Health (Premium Times, 2023).

2.3 Empirical Review

Ezeh, Onyema, Obi, and Moneke (2024) examined the influence of oil spillage on people living in Nigerian oil-producing areas. The authors highlighted that the occurrence of oil spills in Nigerian oil-producing regions affects the residents negatively, making it essential to understand the incident patterns from selected Niger Delta communities. A systematic review was conducted, which identified 22 studies through a literature search and confirmed that sabotage generated 87% of oil spills, while corroded pipeline leakage yielded 62%, and equipment failure generated 45%; other causes were operational failures and mystery spills. The study uncovered how unemployment, poverty, discrimination, and ineffective action by government regulatory agencies create conditions that lead to oil pipeline sabotage and vandalism. In conclusion, residents of oil-rich communities confront direct and indirect oil spill exposures, which disrupt their existence and cause social, health, and environmental problems.

Rusiecki, Denic-Roberts, Thomas, Collen, Christenbury, and Engel (2022) investigated chronic respiratory problems in oil spill responders. Medical encounter data was collected over 8 years, which corresponded to pre-spill and post-spill incidences. The researchers performed Cox Hazards regressions to obtain adjusted hazard ratios for incident respiratory condition symptoms occurring between a specific period for two responder groups: those exposed to crude oil spills versus unexposed responders. The research findings demonstrated that responders who experienced crude oil exposure displayed significant health risks when compared to those not exposed. Those who inhaled crude oil showed higher risks of all types of sinusitis, chronic obstructive pulmonary disease (COPD), dyspnoea, and respiratory anomalies. With symptoms of dyspnoea and chronic respiratory condition class, the study also revealed a future risk for asthma and reactive airway illnesses. The research established that contact with oil spills resulted in more significant risks of long-term respiratory conditions.

Owolabi (2025) observed that oil spills resulting in fire incidents are perpetrated by organized criminals who employ sabotage to extract petroleum from energy facilities such as NNPC and Shell. These illicit activities are indicative of a rising trend that encompasses the drilling site attacks via explosive methods. On the other hand, Dzirutwe (2023) conducted a study revealing that hazardous substances from oil spills and gas flaring are evidenced and detrimental in all analysed environmental and human specimens from oil-rich areas. The pervasive poisons inflicted burns, induced respiratory problems, and elevated cancer risks among inhabitants. The

government and oil companies always fail to take proper actions to prevent the growing contamination of soil and water, which leads to worsened local health issues.

Osuagwu and Olaifa (2018) investigated the link between fish output and oil leaks in Nigeria, using Dara spanning from 1981 through 2015 through an estimable Cobb Douglas function. Research outcomes demonstrated that oil activities that result in spillage reduce fish yields, hence leading to seafood scarcity and depletion of significant food nutrients. Echeta, Mirikweh, Chima, and Osuagwu (2024) researched the effects of oil spills in food shortage conditions on women and young adults living in Imo state, Nigeria. Data collection took place among the key members of the state's oil-producing host communities and achieved its stated objectives through the use of well-developed questionnaire formats. Results show that illegal petroleum operations and spillage cause environmental pollution to farmlands and tropical aquatic environments, leading to crop losses and environmental destruction.

3. METHODOLOGY AND DATA

The main theoretical foundation for this research is the environmental justice theory since it best explains the interwoven relationships between environmental degradation, public health crises, and economic imbalances in order to investigate the subject matter. The theory establishes that minorities from neglected regions where oil resources exist tend to face environmental harm while lacking appropriate healthcare or legal safety (Figueroa, 2022). The selection of the study regions in Bayelsa and Rivers and Delta States fits the key elements of the theory because these states represent 70% of Nigeria's oil contaminations and demonstrate significant environmental deprivation (Premium Times, 2021). This study evaluates life-threatening health inequalities between these states while assessing the quality of medical treatment their populations can access during such disasters.

The study employed purposive sampling as its most suitable method to collect direct community experience data about the effects of oil spills on residents, especially in areas known for frequent oil spills. Employing purposive sampling allowed the researchers to obtain an extensive opportunity to examine the health and environmental conditions. However, this method is not without limitations; it includes selection bias and establishes restricted universality by leaving out less impacted zones. Simple random sampling was implemented to gather data from participants using carefully designed questionnaires. The questionnaire consisted of easy-to-understand closed-ended statements that adopted a 5-point Likert scale, from Very High Extent to Very Low Extent. They were utilised since they allowed for uniformity in responses while eliminating bias. Utilizing simple random sampling gave room for each individual to obtain an equal opportunity to be chosen, as it removed personal preference or any form of partiality. Nevertheless, the implementation of simple random sampling proved both labour-intensive, and resource-consuming. Convenience sampling was considered in the data collection process, allowing individuals to answer the questionnaire at their own pace and voluntarily. However, convenience sampling leads to potential biases that might have affected the accuracy of the data since available subjects formed the majority of survey participants (Chandler, & Shapiro, 2016). The study instrument was pilot-tested among a small group of persons from rather comparable regions to ensure its validity and dependability. In light of feedback gathered from the preliminary test, the questionnaire was modified to make it more relevant to the research and comprehensible. Skilled enumerators were employed to distribute and monitor the questionnaire-filling process within specific neighbourhoods and locations. The selected enumerators contributed their professional knowledge of the local languages to help participants understand the questionnaire where necessary.

The methodologies of the study are strongly linked to the theoretical framework of environmental justice in several ways. The research adopted quantitative analytical methods, regions were selected through purposive sampling, and simple random sampling was implemented to select participants to minimize bias. Thus, it maintains respect for environmental justice principles by preventing any discriminatory data gathering against specific groups amongst exposed residents. Voluntary participants accessed the questionnaire through convenience sampling. This approach meets Environmental Justice principles by ensuring that exposed communities have their needs properly reflected.

Data analysis was conducted using descriptive statistics, which present responses as percentages, mean scores, and standard deviations. A 3.0 mean value was established as the acceptance threshold using a 5-point rating scale. Hence, a mean score equal to 3.0 or above 3.0 demonstrates weak or insignificant impacts, while scores below 3.0 indicate substantial or sufficient effects on the examined factors. Also, Pearson correlation analysis served to establish both the level of correlation strength and the directional relationship between oil spill occurrences and dependent variables (health risks, food scarcity, and medical intervention effectiveness). Pearson correlation was appropriate because it went beyond observing trends and transformed pattern description into quantifiable proof of the environmental pollution-health crisis. Also, it allowed for the enhancement of the study's reliability by validating statistical oil spill effects with supported measurement parameters. Notably, all aspects of the study's design and execution were guided by ethical principles. Consequently, we made sure that everyone who took part in the study understood its purpose, their part in it, the relevance of keeping their information private, and their right to remain anonymous. There were no forced participation requirements, and individuals were free to withdraw from the study at any moment without facing any negative effects.

4. RESULTS AND DISCUSSION ON FINDINGS

Pearson Correlation Analysis

Correlations

		Oil Spills	Respiratory and Waterborne Disease	Food Scarcity	Medical Interventions
Oil Spills	Pearson Correlation	1	.752	.646	.826
	Sig. (2-tailed)		.000	.000	.000
***. Correlation is significant at the 0.01 level (2-tailed).*					
**. Correlation is significant at the 0.05 level (2-tailed).*					

Source: Field survey (2025)

The results show a powerful positive link (r = .752, p = .000) between oil spills and respiratory and waterborne diseases, demonstrating that more oil spills cause substantial health problems. The data demonstrates a significant relationship between oil spills and food scarcity because their correlation is very strong (r = .646) with a zero percent probability level (p = .000). Additionally, a very strong connection (r = .826, p = .000) exists between oil spills and medical intervention requirements, this implies that increased oil spill events lead to dramatic growth in medical service needs; however, this is lacking in the surveyed regions. Overall, the statistical analysis proves that oil spills maintain significant relationships with each of these variables because all correlation results demonstrate a p-value of .000.

Descriptive Statistics

The table presents participants' viewpoints regarding the effects oil spills on health risks, food scarcity, and medical intervention effectiveness. A mean value evaluation method was used to

determine the threshold where the acceptability score was 3.0 (derived by adding the total number of variables - 1, 2, 3, 4, and 5 divided by 5).

Descriptive Statistics of Study Variables

	VHE	VLE	ME	LE	HE	Mean	SD
The effect of oil spills on the prevalence of respiratory and waterborne diseases							
I experience frequent respiratory issues such as coughing, wheezing, or shortness of breath due to exposure to oil spills	48.5%	8.0%	8.5%	8.5%	26.5%	2.57	1.729
Waterborne diseases such as cholera and typhoid have increased in my community due to oil contamination of water sources	57.0%	6.5%	6.0%	1.0%	29.5%	2.40	1.785
The air quality in my area has significantly deteriorated due to gas flaring and oil spills	52.5%	9.5%	9.0%	8.0%	21.0%	2.35	1.647
I have had to seek medical attention for respiratory or waterborne diseases more frequently since oil spills became common in my community	55.0%	7.5%	7.5%	7.5%	22.5%	2.35	1.686
My household struggles to access clean and safe drinking water due to oil pollution	91.0%	0.0%	0.0%	0.0%	9.0%	1.36	1.148
Overall						**11.03**	**7.995**
The effect of oil spills on food scarcity							
Oil spills have reduced the availability of fish and other seafood, leading to food shortages in my community	71.5%	3.0%	2.5%	5.0%	18.0%	1.95	1.603
Farmlands in my area have been destroyed by oil pollution, reducing agricultural productivity	46.5%	6.0%	12.0%	10.0%	25.5%	2.62	1.706
The cost of food has increased in my community due to the impact of oil spills on farming and fishing	57.5%	9.0%	7.5%	6.0%	20.0%	2.22	1.629
I have had to rely on imported or processed foods due to the decline in local food production caused by oil spills	49.0%	6.0%	9.5%	8.0%	27.5%	2.59	1.746
My family has experienced food insecurity due to the effects of oil pollution on our primary food sources	80.5%	3.0%	1.5%	2.0%	13.0%	1.64	1.396
Overall						**11.02**	**8.08**
The effectiveness of medical interventions in addressing health concerns associated with oil spills							
The local healthcare facilities in my area are adequately equipped to handle health issues caused by oil spills	0.0%	95.5%	3.0%	0.0%	1.5%	2.07	.400
Government and oil companies provide sufficient medical support to communities affected by oil pollution	0.0%	90.0%	1.0%	8.5%	0.5%	2.20	.599
We receive medical treatment or awareness programs specifically addressing health risks associated with oil spills	0.0%	92.0%	2.0%	4.5%	1.5%	2.16	.559
Emergency medical response to oil-related health issues in my community is timely and effective	0.0%	89.5%	0.0%	10.0%	0.5%	2.22	.633
Government interventions are always prompt to provide healthcare solutions for those affected by oil spills	0.0%	88.5%	0.0%	10.5%	1.0%	2.24	.674
Overall						**10.89**	**2.905**

Source: Field survey (2025)

Criteria: High Extent (HE) = 0.00 – 1.00; Low Extent (LE) = 1.01 – 2.00; Very High Extent (VHE) = 2.01 – 3.00; Very Low Extent (VLE) = 3.01 – 4.00; Moderate Extent (ME) = 4.01 – 5.00.

Research Objective One: Assess the effect of oil spills on the prevalence of respiratory and waterborne diseases in Nigeria

The data shows that respiratory and waterborne illnesses prove to be seriously impacted by oil spills throughout Nigeria's oil-producing regions, as 48.5% revealed that they frequently face such problems at very high levels. An additional 26.5% reported facing them at high levels. Exposure to oil contaminants creates breathing difficulties for residents because long-term breathing of toxic air pollutants creates prolonged respiratory diseases, which invariably increase healthcare expenses and decrease the quality of life of residents. The results show that affected communities have experienced substantial waterborne disease growth based on reported cholera and typhoid increases to a very high extent (57.0%) and high extent (29.5%). Diseases present in such conditions demonstrate water source contamination, which reduces water accessibility, leads to more infections, and raises mortality rates, especially among children and the elderly population.

In addition, respondents expressed serious concern about air quality problems stemming from gas flaring and oil spills, as the majority (52.5%) of them assessed these issues to a very high extent. The poor state of air they breathe makes existing respiratory health problems worse and leads to sustained damage of lung tissue while producing more asthma cases and heart problems. A majority of the respondents (55.0%) reported seeking regular medical care for respiratory and waterborne diseases due to the increased occurrence of oil spills in their communities. This implies that oil spills and declining public health status have become stronger, as evidenced by people's increasing demand for medical treatment due to illnesses caused by oil spill pollution. The results revealed that the healthcare institutions in the survey areas face overwhelming conditions, which result in overcrowded facilities, reduced operational efficiency, and limited medical service access. The survey results revealed an alarming statistic: 91.0% of participants reported that their households were unable to obtain adequate, clean, and safe drinking water at a very high level. Nearly all respondents experienced the devastating effects of oil pollution that threatened their access to safe drinking water, indicating an almost complete widespread situation. People without clean water experience both enhanced health hazards and fundamental difficulties in keeping their environment sanitary, with food preparation safety and basic well-being maintenance. Furthermore, the research results show that oil spill contamination is a leading factor in causing respiratory disease and waterborne diseases within Nigeria's oil production areas, as all indicators-maintained scores lower than the 3.0 benchmark. The health crisis from oil contamination throughout the study areas becomes apparent through the standard deviation measurement of 7.995 and the overall mean of 11.03. *Hence, taking into account the outcomes of the descriptive analysis and Pearson correlation, the research reveal that oil spill occurrences are strongly linked to respiratory health problems and waterborne sickness across Nigerian oil-producing areas. These results validate the data and findings of Rusiecki, Denic-Roberts, Thomas, Collen, Christenbury, and Engel (2022), who explored chronic respiratory conditions in oil spill emergency responders. The research established that people who encounter oil spills face a higher risk of acquiring prolonged breathing complications and other diseases. This finding lends credence to the research of Dzirutwe (2023), which found that all human and environmental samples examined from oil-rich regions included harmful compounds originating from gas flaring and oil spills. Burns, respiratory issues, and increased cancer risks were among the effects of the ubiquitous toxins. Local health problems are exacerbated as the government and oil firms consistently do nothing to stop the increasing contamination of water and land through oil spills.*

Research Objective Two: Examine the effect of oil spills on food scarcity in Nigeria

The results show that oil spills heavily impact the food scarcity situation in Nigeria's oil-producing areas by hindering both aquatic food sources and agricultural food supplies. The majority of the survey participants (71.5%) indicated that oil spills caused fish and other seafood shortages to a very high level. This is because the ecological damage caused by oil spills contaminating water bodies leads to extensive problems in fishing activities, which results in food shortages that affect numerous communities. Invariably, the reduction in seafood resources creates two-fold effects because it disrupts both food nutritional values and destroys fishing-based income that maintains certain household stability. The survey revealed that oil pollution seriously impacts agriculture through the destruction of farmlands to the greatest possible extent of damage (46.5%), this issue was stated to a high extent by an additional 25.5% of the respondents. Oil spills across farmlands decrease farming output, which in turn diminishes food availability and worsens nationwide food shortages. The decrease in food production from limited agricultural lands creates increased economic problems in affected communities and the nation for both small-scale and large-scale industries.

The results revealed that food prices have significantly surged to a very high degree because oil spills harm agricultural activities and commercial fishing operations, according to 57.5% of surveyed individuals. The increased food prices reduce the ability of low-income families to buy necessary goods, causing their hunger and malnutrition to worsen. When food production levels decrease locally, households start preferring imported and processed foods, which puts additional pressure on household finances. A vast 49% of the respondents confirmed they use mainly imported and processed foods extensively because of declining homegrown agricultural produce. Using food imported from outside the country drives prices up as it becomes more challenging to find fresh, nutritious food options. Also, around 80.5% of people and families in the surveyed communities experience difficulties in getting enough healthy food to meet their nutritional needs. Food insecurity creates extensive health problems, which cause nutrition deficits as well as weak immune response and delayed physical development among residents. The prolonged exposure to oil spills leads affected populations toward a cycle of financial difficulty and health complications, which will be challenging to overcome. The result shows that all checked indicators show results that are lower than 3.0, indicating severe consequences for food security from oil pollution. The crisis unfolds through contaminated farmlands, leading to productivity losses in farming operations and rising food costs. This is confirmed by an overall mean score of 11.02, accompanied by an 8.08 standard deviation value. *Thus, considering the findings of the descriptive analysis and pearson correlation, it is established that oil spills is strongly linked to food scarcity. It implies that oil spills cause severe food shortages in Nigeria. The research aligns with the findings of Echeta, Mirikweh, Chima, and Osuagwu (2024), who analysed the effects of oil spills and food insecurity on women and youth in Nigeria. Survey participants reported experiencing substantial adverse consequences as a result of oil spills, which included marine habitat destruction, agricultural land destruction, and increased food scarcity.*

Research Objective Three: Evaluate the effectiveness of medical interventions in addressing health concerns associated with oil spills in Nigeria.

The data shows that healthcare strategies to tackle oil contamination health issues in Nigeria's oil zones have demonstrated minimal positive results. Local healthcare facilities to a very high extent lack appropriate equipment to handle oil spill health issues, according to the assessment of 95.5% of respondents, because less than 1.5% said their facilities function at a high level of readiness. Lack of medical infrastructure, with insufficient personnel and resources, creates an

extreme problem in treating respiratory illnesses and waterborne diseases, among others, that develop due to extended exposure to oil pollution. It leaves individuals without protection, which results in poor health conditions and causes deaths from conditions which could have been prevented. The survey revealed that 90.0% of participants do not get sufficient medical support from the government and oil companies for oil pollution issues, an insignificant number (0.5%) reported high levels of support. This implies that environmental degradation health outcomes remain unresolved because public institutions, along with oil corporations, fail to execute their responsibility to protect human health properly before and after oil spillage. Accordingly, medical assistance is absent from areas dealing with health crises, thus forcing residents to handle their medical challenges without necessary help. This lack of support results in increased health issues for victims, diminishing trust for all stakeholders, including government authorities and corporate entities.

Also, most participants (92.0%) neither received nor were made aware of health treatment programs and medical knowledge about oil spill risks. It clearly shows that public health efforts require immediate attention through education and prevention because they directly determine how effectively people can minimize exposure and handle health risks. The lack of appropriate awareness programming leads people to fail at detecting early indicators of oil-related health issues, which results in delayed treatment with long-term consequences. These regions also lack preventive healthcare programs, starting with community health outreach activities and no-cost medical screenings. The participants evaluated emergency medical responses to oil-related health issues as ineffective to a very high extent as 89.5% of them declared that these responses produced no beneficial outcomes. The minority of participants (0.5%) reported that they received prompt medical assistance as well as efficient medical treatment. Hence, the delays in emergency response systems are a major challenge for affected regions because they do not receive quick healthcare support during health crises from oil spills. Lastly, the data reveals that most respondents (88.5%) reported to a very high extent that government intervention in healthcare solutions for oil spill-related illnesses is not rapid only 1.0% reported these solutions are swift. This clearly reveals that the governments' reactions to medical needs are usually delayed and inadequate. Inadequate funding, bureaucratic delays, and corruption have been attributed to the failure of government interventions, which prolongs the existing health crisis in oil-producing areas. Furthermore, all measured factors have mean scores lower than the 3.0 threshold, thus indicating weak medical response to oil-related health concerns, indicating that healthcare services in Nigeria's oil-producing areas during oil spills are ineffective. The results validate the significant shortage of medical intervention across the study regions, as the overall mean score was 10.89 on average, with a standard deviation of 2.905. *The findings of this study revealed that oil spills are positively correlated to ineffective medical interventions. It means that medical interventions were found to be highly inadequate in addressing oil spill-related health concerns, taking into account the results of the descriptive analysis and Pearson Correlation. These findings corroborate the study of Ezeh et al (2024). The authors associated oil spills with sabotage, pipeline corrosion, leakage, and operational failures through a systematic literature analysis. These spills inevitably disrupt residents' lives and generate social, health, and environmental problems exacerbated by inadequate and unresponsive medical care.*

5. CONCLUSION AND RECOMMENDATIONS

The research outcomes demonstrate how oil spills in Nigeria result in major problems for both health and the environment. The study examined how oil spills affect the frequency of respiratory diseases and waterborne diseases. The research showed that numerous residents face continuous respiratory problems because of the effects of oil pollution as residents experience declining air quality. The contamination of water sources results in more prolonged

outbreaks of cholera and typhoid diseases. The research establishes that oil spills trigger the dual health challenges of respiratory diseases and waterborne infections, resulting in major public health emergencies throughout the affected areas.

The research analyzed food scarcity due to oil spillage across the surveyed region. The results demonstrate how pollution from oil lowers fish quantity and agricultural output, which causes hunger problems. The surveyed population reported witnessing seafood shortages and, major damage to their lands and crops, food price increases, pushing residents to purchase either imported or processed foods. Additionally, surveyed communities that primarily depend on fishing and farming showed high rates of food insecurity after every oil disaster, which prevents them from obtaining reasonably priced nutritious food.

The third research objective assessed the effectiveness of medical intervention in addressing health matters arising from oil pollution incidents. The research shows that regional healthcare facilities in the surveyed states (Rivers, Bayelsa, and Delta) lack the necessary equipment to handle illnesses related to oil spill incidents. Education about oil spills and their impact is limited because the government and oil companies provide minimal support along with few or no awareness programs. The survey revealed a problem with emergency medical help, as numerous participants reported experiencing significantly delayed medical aid during the oil spill crisis. The government provides limited healthcare assistance, thereby denying affected communities' basic medical care.

RECOMMENDATIONS

The Federal Ministry of Environment should implement rigorous environmental standards to prevent oil spills through the enforcement of harsh penalties on oil companies that violate any safety rules; this is to ensure the continuous preservation of the environment.

The Federal Ministry of Health should establish a dedicated health intervention program under federal government administration to handle illnesses resulting from oil spills. It is recommended that the government provide mobile clinics with specialized treatment facilities and free medical checkups to communities affected by oil spills.

The Nigerian National Petroleum Corporation (NNPC) and Oil Regulatory Agencies should mandate Oil companies to set aside funds to clean up spills and revive agricultural and fishing lands, which will protect affected communities from food shortages.

The state and local governments should implement community-level educational programs to focus on oil-related health dangers, pipeline vandalism, and other issues, followed by strategies for protection with quick medical responses.

A comprehensive food assistance initiative should be implemented by the Federal Ministry of Agriculture and Rural Development to ensure actual food distribution alongside financial aid, and farming support initiatives should be implemented to boost households who face food insecurity from oil spill impacts.

The National Assembly and Oil Industry Representatives should develop strong environmental sustainability programs through land restoration initiatives, advanced oil spill cleanup operations, and rigid waste management protocols.

The research faced various constraints which needed to be honestly and accurately recognized. First, the survey used self-reported data through defined options. However, this method could have introduced possible biases through social desirability effects, where participants chose responses that seemed good or that the researchers needed rather than having the room to be expressive in presenting all-factual information. Secondly, the study used simple random sampling to boost generalizability and reduce selection bias; however, convenience sampling during data collection may have resulted in data from only available participants, which could alter the outcomes. While purposive sampling correctly identified communities with frequent oil spills, it could have reduced this study's capacity to make conclusions applicable to an area

with fewer oil spills or less affected by such disasters. The research experienced resource limitations alongside difficulties reaching remote areas, which restricted the variety of participant responses and thus reduced the overall study depth.

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