

Environmental Degradation, Disease Burden and Government's Healthcare Response in Ogoni Communities, Rivers State, 2015-2025

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Abstract

This study examined the burden of disease arising from environmental degradation and government's response to healthcare provision in Ogoni communities, Rivers State, Nigeria, between 2015 and 2025. Despite the 2011 United Nations Environment Programme assessment and the establishment of the Hydrocarbon Pollution Remediation Project, contamination and ill-health have persisted among the nearly 830,000 residents of Tai, Eleme, Gokana and Khana Local Government Areas. The study was anchored on Environmental Justice Theory and Health Security Theory, which jointly illuminate the distributive, procedural and recognition injustices underlying the crisis and the acute, chronic, systemic and community dimensions of health insecurity it produces. A qualitative case study design was adopted, guided by a constructivist paradigm. Thirty in-depth interviews and four focus group discussions involving twenty-eight participants, comprising 58 respondents purposively and through snowball sampling drawn from community elders, farmers, fishermen, women, health workers, civil society activists and local government officials, generated the primary data, analysed thematically using the six-step framework of Braun and Clarke. Findings showed that oil spills, gas flaring and water pollution have produced a rising burden of respiratory, waterborne and skin diseases, disproportionately affecting children, the elderly, women, farmers and fishermen, while government's healthcare response remained grossly inadequate, marked by poorly equipped health centres, chronic medicine shortages, and financial and geographic

barriers to access. Communities coped through social support networks, traditional medicine and collective advocacy. The study recommends accelerated remediation, strengthened environmental monitoring, expanded access to safe water and healthcare, and institutionalised community engagement in remediation and health governance.

Keywords: *environmental degradation; disease burden; health security; Ogoni communities; government healthcare response*

I. Introduction

Beneath the mangroves and farmland of the Niger Delta lies the crude oil that has brought wealth to the Nigerian state since commercial production began in 1958, a geological blessing that has left the Ogoni communities of Rivers State, comprising Tai, Eleme, Gokana and Khana Local Government Areas, with a complicated legacy (United Nations Environment Programme [UNEP], 2011). Extraction proceeded for more than three decades without meaningful environmental monitoring, a pattern Simon and My (2025) describe as environmental injustice, in which local people bear the toxic effects of extraction while multinational corporations and the Nigerian state capture the benefits. Across the wider Niger Delta, an estimated 13 million barrels of crude oil have been released through over 7,000 spill incidents, mostly from mechanical failure, operational error and pipeline corrosion, creating exposure pathways that continue to affect human health through contaminated soil, groundwater, surface water and air (Ordinioha & Brisibe, 2013). Pipeline vandalism compounds the problem of mechanical failure, and Aroh, Ubong, Eze, Harry, Umo-Otong, and Gobo (2010) documented how spill incidents from both causes have repeatedly set back Nigeria's public health goals in affected communities, a pattern Brisibe and Ordinioha (2013) similarly traced in their own account of crude oil exploration and its environmental and health consequences in the Niger Delta.

Sustained local and international pressure led the Nigerian government to request a comprehensive environmental assessment of Ogoniland from UNEP, whose 2011 report recorded contamination far exceeding earlier estimates: benzene, a known carcinogen, was found in drinking water at levels 900 times above World Health Organisation standards and in soil to a depth of five metres, with an estimated 25 years required to restore groundwater (UNEP, 2011). UNEP recommended emergency drinking water, a detailed public health investigation, and the establishment of what became the Hydrocarbon Pollution Remediation Project (HYPREP). A decade on, however, HYPREP's implementation has been persistently undermined by weak technical capacity, shallow stakeholder engagement, slow emergency response and inadequate hazardous-waste infrastructure, while its failure to consistently use internationally accredited laboratories has left its own quality assurance in doubt (Sam, Zabbey, & Onyena, 2022; Nwankpa, Kuru, & Onwuka, 2025).

The health implications of this unresolved contamination are considerable. Ogoni communities are exposed to aromatic hydrocarbons, including benzene, which the International Agency for Research on Cancer (2018) classifies as a known human carcinogen, and to light linear hydrocarbons that irritate the eyes, skin and lungs, largely through the ingestion, inhalation and dermal contact pathways the Centers for Disease Control and Prevention (2015) identify as the principal routes by which contaminants reach exposed populations (Ordinioha & Brisibe, 2013). Kponee, Chiger, Kakulu, Vorhees and Heiger-Bernays (2015) documented statistically significant associations between contaminated drinking water and neurological, haematological and irritation symptoms in Ogale, while Peters, Eze, Asonye and Nwachukwu (2018) found hazard index values above 1.0 for cassava consumption by children at every site sampled, and carcinogenic risk values exceeding acceptable thresholds throughout Ogoniland. Soil and sediment analyses have reinforced this picture: Happy, Ogwugwa, Kunlere, Ifeoma, Israel and Ezekiel (2018) recorded elevated barium and cadmium concentrations across five

Ogoni communities with moderate to high ecological risk, while Ejeomo and Inengite (2025) further characterised the extent of hydrocarbon-impacted soils in the region. These findings, several co-authored by Rivers State University scholars, corroborate what Ogoni residents have long reported and give empirical weight to community claims of a worsening disease burden. Government's role in this crisis extends beyond remediation to the direct provision of healthcare services capable of managing the resulting illness burden. Yet accounts of the health system serving Ogoni communities point to chronic underinvestment: inadequately staffed and equipped primary health centres, irregular medicine supply, and limited capacity to respond to pollution-related disease (Nkem, Devine, Ogaji, & Topp, 2024). The Hydrocarbon Pollution Remediation Project (2024) reports isolated interventions, including a planned oncology unit at the Ogoni Specialist Centre and medical outreach reaching several thousand patients (BusinessDay, 2025), but such efforts remain modest relative to the scale of need across a population of nearly 830,000 people. A fresh health assessment covering 4,000 residents, undertaken by the International Agency for Research on Cancer in partnership with HYPREP and the World Health Organisation, is under way, though its findings are not due until several years after the present study period closes (Naku, 2026), leaving a substantial evidence gap that this study's own primary data help to fill in the interim.

The decade between 2015 and 2025 is analytically significant because it spans the formal commencement of HYPREP's clean-up mandate and a sustained period during which new spills, legal settlements and continuing contamination coexisted with official claims of progress (Sam et al., 2022). UNEP (2011) found benzene in groundwater at levels up to 999 times the safety limit; ten years later, residents continue to draw from the same wells, farm the same contaminated land, and breathe air carrying volatile chemical emissions, and UNEP's (2023) own progress report on environmental restoration in Ogoniland concedes that measurable improvement has been slow and uneven, a persistence that constitutes both an environmental sustainability problem and a direct threat to health security.

The central problem this study addresses is the disconnect between the scale of remediation investment and institutional promises on one hand, and the continuing reality of disease and inadequate healthcare on the other. Bureaucratic gridlock, limited capacity, weak stakeholder engagement, slow emergency response and an absence of internationally accredited laboratory verification have all been documented within HYPREP's operations (Sam et al., 2022), while public trust in the clean-up process remains limited (Nwankpa et al., 2025). Meanwhile, the specific question of how government has responded, or failed to respond, to the healthcare needs created by this contamination has received comparatively little systematic attention, even as chronic exposure continues to generate a disease burden that communities and health workers alike describe as worsening rather than improving.

This study therefore examines the relationship between environmental degradation and health security in Ogoni communities from 2015 to 2025, pursued through two objectives: to assess the burden of disease arising from environmental degradation in Ogoni communities, and to discuss government's reaction to healthcare provision for the Ogoni communities. Investigating these questions matters because Ogoni communities require credible evidence of their environmental and health situation to advocate effectively for their rights, because policymakers and HYPREP require clear evidence of what is failing and why in order to redesign interventions, and because the international community that supported the UNEP process needs to know whether it has produced measurable benefit for the people it was meant to protect. The two objectives are guided, respectively, by the questions of how environmental degradation has shaped the disease burden of Ogoni residents and how effective government's response has been in providing healthcare services to Ogoni communities, and by the corresponding assumptions that environmental degradation is associated with an increased disease burden in Ogoni communities and that government's healthcare provision has a bearing

on health security in the area. Taken together, these two objectives isolate the point at which environmental harm becomes lived illness and the point at which the state either mitigates or compounds that harm through the health system it provides, making them the two dimensions of the wider environmental-health nexus most directly within government's power to address in the near term, even as slower structural remediation of the underlying contamination continues.

II. Theoretical Framework

Environmental Justice Theory

Environmental Justice Theory emerged from the work of grassroots communities in the United States objecting to the concentration of toxic facilities in communities of colour and low-income areas, with Bullard (1990) establishing environmental justice as the right to equal protection under environmental and public health law. Schlosberg (2007) identifies three interlocking pillars: distributive justice, concerning who bears the costs of environmental degradation and who receives its benefits; procedural justice, concerning fair and inclusive decision-making; and recognition justice, concerning whether the identities, knowledge systems and perspectives of affected communities are respected within environmental governance, later scholarship adding capabilities justice and intergenerational justice as further dimensions. Applied to Ogoni communities, these pillars expose profound and continuing injustice. Distributive injustice is evident in the concentration of toxic effects of oil extraction on Ogoni land while multinational corporations and the Nigerian state capture the benefits (Simon & My, 2025), compounded by a temporal dimension in which contamination documented by UNEP (2011) will affect generations not yet born, since heavy metals in Ogoni soils become progressively more bioavailable over time (Iwegbue, 2011). Procedural injustice runs through the history of extraction, from the colonial legal framework that placed mineral ownership in state rather than community hands (Boele, Fabig, & Wheeler, 2001) to the persistently weak community participation documented within HYPREP itself (Sam et al., 2022; Nwankpa et al., 2025). Recognition injustice appears in the systematic marginalisation of community knowledge and experience, with health concerns acknowledged largely when validated by external scientific studies rather than treated as credible in their own right (Kponee et al., 2015). Environmental Justice Theory was selected for this study because the Ogoni crisis is, at its core, a justice question: why Ogoni communities bear the negative effects of extraction while enjoying little benefit, why remediation promises remain unmet, and why community voice continues to be marginalised in decisions affecting their health and environment. The theory has proven applicable in comparable extractive settings elsewhere (Bebbington & Bury, 2009) and provides criteria for judging whether interventions meaningfully address underlying injustice or merely sustain it, while linking Ogoni's local experience to the broader global pattern in which the benefits of resource extraction accrue to distant corporations and consumers while the costs fall on communities with limited power to resist (Simon & My, 2025).

Health Security Theory

Health Security Theory developed from global public health discourse in the 1990s and early 2000s, with the World Health Organisation (2007) defining health security as protection of populations from acute and chronic health threats. The theory identifies four interconnected dimensions relevant to this study: protection from acute health threats, requiring rapid response to sudden events such as oil spills; management of chronic health risks, requiring continuous surveillance of cumulative long-term exposures; health systems strengthening, ensuring health services are available, accessible, affordable and capable of addressing both acute and chronic pollution-related illness; and community resilience, recognising the importance of local

knowledge and capacity in protecting health (Rushton & Youde, 2015). The theory further attends to social determinants of health, acknowledging that poverty, food insecurity and economic exclusion shape population vulnerability to health threats (Commission on Social Determinants of Health, 2008). Applied to Ogoni communities, each dimension reveals a distinct form of health insecurity. Protection from acute threats is weak, communities remaining exposed to recurring oil spills without effective emergency response mechanisms. Chronic risk management is similarly inadequate: UNEP (2011) documented benzene in groundwater at up to 999 times the safety limit, yet systematic health monitoring of long-term exposure remains largely absent. Health systems strengthening is compromised by the economic exclusion that environmental degradation itself produces, since destroyed livelihoods reduce households' capacity to pay for care even as the same degradation raises their need for it (Nkem et al., 2024). Community resilience, by contrast, is visible in the advocacy, mutual support and pursuit of legal redress through which Ogoni communities have continued to assert their rights despite institutional failure (Igwe, 2025). Health Security Theory was selected because the Ogoni crisis is fundamentally a health security crisis, combining acute risk from ongoing spills with chronic risk from decades of cumulative exposure, and because its attention to social determinants allows this study to connect health outcomes to the economic marginalisation documented by Nkem et al. (2024) rather than treating disease burden as a purely biomedical matter. Read together with Environmental Justice Theory, it supplies the analytical basis for objective one, the burden of disease produced by environmental degradation, and objective two, the adequacy of government's response in healthcare provision, since health systems strengthening is itself one of the theory's four constitutive dimensions.

III. Conceptual Review

a. Environmental Degradation

Environmental degradation, used interchangeably in this study with environmental crisis, describes a situation in which the natural environment has deteriorated to the point of posing serious risk to human health, ecological integrity and socioeconomic wellbeing. Foster (2002) frames environmental crisis as a fundamentally social phenomenon rooted in how societies organise production, consumption and their relationship with nature, a view that challenges explanations centred on population pressure and instead points to property relations, state policy and global economic forces. The concept gained prominence following Carson's (1962) documentation of the ecological and health impacts of pesticides, and the Club of Rome's warning that continued industrial growth would exceed the carrying capacity of the earth's ecosystems (Meadows, Meadows, Randers, & Behrens, 1972).

Eckersley (2004) distinguishes environmental crises by their complexity, persistence and trans-temporal reach, arising from the interaction of biological, chemical, physical, social, economic and political factors across different scales. Persistence is especially relevant to Ogoni communities, since heavy metals in oil-contaminated soils continue to change chemical form and become more bioavailable long after active extraction has ceased, meaning the environmental challenge continues to worsen even where production has stopped (Iwegbue, 2011). The concept has been widely applied to extractive industry contexts, where contamination of land and water, destruction of ecosystems and the generation of transgenerational health risk are common features (Bebbington & Bury, 2009), with the Niger Delta among the most extensively documented cases, described by Watts (2004) as a landscape of "petro-violence" in which the advantages of extraction flow to the state and corporations while the disadvantages fall on politically weaker communities. Assessing the resulting health risk conventionally proceeds through the four steps the National Research Council (2009) sets out, hazard identification, dose-response assessment, exposure assessment and risk

characterisation, a sequence that underlies the hazard-index and carcinogenic-risk findings Peters et al. (2018) report for Ogoniland.

In Ogoni communities specifically, environmental degradation extends beyond contamination to encompass socioeconomic and health dimensions: UNEP (2011) recorded contamination at unprecedented levels, and this baseline has been reinforced by subsequent documentation of the health consequences that follow when hydrocarbon and heavy-metal exposure pathways remain open for years after the initial spill (Ordinioha & Brisibe, 2013; Nriagu, Udofia, Ekong, & Ebuk, 2016). For this study, environmental degradation is operationalised as the cumulative impact of hydrocarbon pollution, heavy-metal contamination and water-system degradation resulting from more than six decades of oil extraction in Ogoni communities, the driver against which disease burden and government's healthcare response are examined.

b. Health Security

Health security builds on the World Health Organisation's (1948) foundational understanding of health as complete physical, mental and social wellbeing, extended by the World Health Organisation (2007) to denote protection of populations from acute and chronic health threats. The concept originated in discourse on infectious disease outbreaks and bioterrorism but has broadened to recognise environmental degradation, climate change and chronic pollution as core threats to population health security (Aldis, 2008; Rushton & Youde, 2015). This broader conception is the more useful one for Ogoni communities, where the dominant health crisis involves long-term cumulative exposure rather than discrete emergency outbreaks.

Health security comprises interconnected dimensions: protection from acute threats requiring rapid emergency response; management of chronic risk requiring sustained surveillance and monitoring; health systems strengthening, ensuring that services are available, accessible, affordable and capable of addressing both acute and chronic pollution-related conditions; and community resilience, the capacity of communities to safeguard their own wellbeing when institutional protection is absent (Rushton & Youde, 2015; Nkem et al., 2024). The concept also incorporates social determinants of health, recognising that poverty, food insecurity and economic exclusion shape vulnerability to health threats independently of direct environmental exposure (Commission on Social Determinants of Health, 2008).

Within this framework, health systems strengthening is the dimension most directly implicated in government's reaction to healthcare provision, since it requires not merely the existence of health facilities but their capacity to respond to the specific disease patterns that environmental contamination produces. Where this dimension is weak, as documented across Ogoni communities, the burden created by environmental degradation compounds rather than being absorbed by the health system, leaving affected populations to rely on the community-level resilience that the theory identifies as the residual, and often the only, form of protection available to them.

IV. Research Methodology

The study adopted a qualitative case study design, appropriate for examining complex social phenomena within their natural setting through sustained engagement with community members, traditional leaders, health workers and other stakeholders. The "case" is the Ogoni people of Rivers State, bounded temporally to 2015-2025, a period reflecting the commencement of HYPREP's clean-up mandate following the 2011 UNEP assessment. The study was underpinned by a constructivist paradigm, which recognises that knowledge is socially produced and that the lived reality of environmental degradation and health insecurity in Ogoni communities differs across individuals and groups, an orientation suited to capturing multiple, situated perspectives rather than a single objective measurement.

The study was conducted across the four Local Government Areas that constitute Ogoniland, namely Khana, Gokana, Tai and Eleme, an area of approximately 1,000 square kilometres that UNEP (2011) characterised as an extreme case of environmental degradation resulting from decades of oil spills, gas flaring and inadequate remediation. Within each Local Government Area, two to three communities were purposively selected on the basis of the history and severity of environmental degradation, proximity to oil exploration and production activity, diversity of livelihood (agriculture and fishing), and accessibility and safety, ensuring representation across varying degrees of environmental impact and across riverine, freshwater swamp forest and upland ecological contexts.

The target population comprised adult residents aged 18 years and above with a minimum of five years' residence, ensuring participants had first-hand exposure to environmental change and were positioned to comment meaningfully on conditions over time. The population encompassed community elders and traditional leaders, farmers and fisherfolk, women engaged in domestic water collection and food preparation, youths, health workers and community health practitioners, civil society and environmental activists, and local government officials, spread across all four Local Government Areas to reflect varying levels of environmental degradation, healthcare access and socioeconomic circumstance.

Purposive sampling, incorporating maximum variation across geographic location, gender, age, occupation, length of residence and degree of involvement in environmental and health issues, was the primary sampling technique, supplemented by snowball sampling to reach less accessible participants such as spill-affected residents and health workers. Sample size was determined by data saturation rather than a fixed target, consistent with comparable qualitative studies in the Niger Delta. The study ultimately comprised 30 in-depth interviews across the four Local Government Areas and four focus group discussions involving 28 participants, for a total of 58 respondents, drawn from community elders, farmers, fishermen, women, health workers, civil society activists, youth representatives and local government officials.

Primary data were generated through in-depth semi-structured interviews lasting 45-90 minutes, conducted in English or Pidgin English at venues of participants' choosing, and four focus group discussions of approximately 90 minutes each, bringing together women farmers, youths, community elders, and health workers respectively. Both instruments were organised around six thematic areas: perceptions of environmental change since 2015, health experiences and concerns, livelihood impacts, access to healthcare services, coping strategies and resilience, and perceptions of remediation and government response. All sessions were audio-recorded with informed consent and transcribed verbatim, with secondary data drawn from the UNEP (2011, 2023) assessments, HYPREP (2024) reports, government policy documents and relevant academic literature used to triangulate and contextualise the primary findings.

Trustworthiness was addressed following Lincoln and Guba's (1985) criteria of credibility, transferability, dependability and confirmability, achieved through prolonged field engagement, triangulation across data sources and participant groups, member checking, peer debriefing with research supervisors, thick description, an audit trail of research decisions, and sustained reflexivity regarding the researcher's own positionality. Instrument reliability was strengthened through pilot testing with three to five members of an Ogoni community outside the main study, standardised interview procedures, interviewer training, and a reflexive field journal documenting decisions and emerging interpretations throughout data collection.

Data were analysed using thematic analysis following the six-step framework of Braun and Clarke (2006): familiarisation with transcripts and field notes, generation of initial codes through inductive coding, searching for themes, reviewing themes for coherence and distinctiveness, defining and naming themes, and producing the final analytic narrative, supported by NVivo software for coding and retrieval. Analysis was informed by a social exclusion lens attentive to how environmental degradation intersects with economic

marginalisation to compound health insecurity, with ethical safeguards including pseudonymisation, accurate and undistorted reporting, and active attention to negative cases that did not fit emerging themes.

V. Data Presentation

A total of 58 participants took part in the study across the four Local Government Areas of Ogoniland, comprising 30 in-depth interview respondents and 28 focus group discussion participants. Table 1 presents the consolidated demographic and participant profile of the sample.

Table 1: Demographic and Participant Profile of Respondents (N=58)

Variable	Category	Number	Percentage (%)
Local Government Area (n=30, IDI)	Khana	8	26.7
	Gokana	8	26.7
	Tai	7	23.3
	Eleme	7	23.3
Gender (n=30, IDI)	Male	18	60.0
	Female	12	40.0
Age Group (n=30, IDI)	18-30 years	5	16.7
	31-45 years	10	33.3
	46-60 years	9	30.0
	61 years and above	6	20.0
Occupation* (n=30, IDI)	Traditional Rulers/Elders	8	26.7
	Farmers	7	23.3
	Fishermen	6	20.0
	Health Workers	5	16.7
	Civil Society Activists	4	13.3
	Youth Representatives	3	10.0
	Local Government Officials	3	10.0
	Others (traders, teachers)	4	13.3
FGD Composition (n=28)	Women Farmers	7	25.0
	Youth	8	28.6
	Community Elders	6	21.4
	Health Workers	7	25.0
Total Study Participants	In-depth Interviews	30	51.7
	Focus Group Discussions	28	48.3
	Overall Total	58	100.0

Source; Field survey, 2025

The 58 study participants were drawn in comparable numbers from each of the four Local Government Areas that constitute Ogoniland, with a slightly higher concentration in Khana and Gokana, the two areas most severely affected by oil spills and gas flaring during the study period. The sample skewed male (60%) among in-depth interview participants, reflecting the greater public visibility of men in community leadership and occupational roles such as farming and fishing, while women were nonetheless well represented both individually and through the dedicated women farmers' focus group, given their central role in water collection, food preparation and childcare. Age distribution favoured the 31-60 age bracket, comprising 63.3% of interview participants, ensuring that most respondents had lived through the full 2015-2025 study period and could speak with authority to changes in their environment and health over that decade, while the inclusion of elders aged 61 and above and youth representatives in their

twenties enabled the study to capture intergenerational perspectives on a crisis whose effects unfold across decades.

Occupationally, the sample was anchored by traditional rulers and elders, farmers and fishermen, whose livelihoods place them in direct daily contact with the land and water most affected by contamination, complemented by health workers able to offer professional clinical corroboration of community-reported symptoms, and by civil society activists and local government officials able to speak to governance and remediation dynamics. This composition, together with the focus group discussions bringing together women farmers, youth, community elders and health workers, ensured that the data captured both individually lived experience and collectively negotiated community perspectives on the two objectives examined in this article: the disease burden produced by environmental degradation, and the adequacy of government's response in healthcare provision.

VI. Data Analysis

Objective 1: Disease Burden Arising from Environmental Degradation

Participants across all four Local Government Areas consistently described environmental changes since 2015, with oil spills, gas flaring, water pollution and air pollution identified as the dominant issues, and health workers independently corroborated the resulting deterioration in the health conditions they treat.

"Many oil spills have occurred in our community before, the pipelines are old and they burst often, once the oil spills our farmland is lost and our rivers are polluted, the smell is horrible and we are unable to breathe well, even the HYPREP clean up has not prevented oil spills."

Elder, FGD, Gokana LGA

"I have served over 15 years in this health centre, and in the last 10 years, I have noticed the environment getting worse and worse and the health issues that we are facing are the result of this. Water is not clean, the air is polluted and the soil is contaminated; changes in the environment translate into changes in health issues, and we see this every day in our facility."

Health Worker, KII, Eleme LGA

Gas flaring emerged as a particular concern for air quality and respiratory health, generating some of the most emotionally charged testimony in the study.

"The government has failed to prevent the burning of the gas flares, and we inhale the harmful smoke of these flares daily, it's impacting our health; children are getting asthma, adults are getting respiratory diseases, the oil companies are destroying our environment, they are killing us slowly."

Civil Society Activist, KII, Khana LGA

"Many patients come to us with respiratory issues and they come with cough, difficulty in breathing, chest pain. Many are children and elderly people; we ask them about their environment and they say that the gas flaring occurs daily in our community and the problem of breathing has become an endemic problem. It's not just seasonal, it's constant, and we believe it is directly linked to the gas flaring problem."

Health Worker, KII, Gokana LGA

"Children are more susceptible to air pollution due to several factors, including their developing bodies, which are more susceptible to toxins; their faster breathing rate means they inhale more pollution per body weight; and they spend more time outdoors playing, and therefore are exposed to more pollution. This is evident in our facility, as the elderly and children are our busiest patients for respiratory complaints."

Health Worker, KII, Khana LGA

"I started breathing issues since 2018, most of the time I have to cough and sometimes I can't breathe, the doctors say it's due to pollution from the gas flaring, the young children are the ones who are being affected the most, I have seen and heard from many people in my community who are facing the same problem."

Participant, FGD, Gokana LGA

"When we treat a patient with respiratory symptoms, we ask about his or her environment and where he or she is exposed to gas flaring, where he or she is exposed to oil spills, and we notice that many of our patients return with recurrent respiratory symptoms; they are going back to the same polluted environment, and they are getting ill again and again."

Health Worker, KII, Tai LGA

Water pollution produced an equally consistent pattern, with women, who bear primary responsibility for household water collection, describing both the physical and economic cost of contamination, and health workers confirming both the clinical burden this creates and its uneven distribution by gender.

"Our water sources have been polluted with oil; the streams we once drank have become polluted; the water we drink now has a smell of oil and makes us sick; we have to purchase water from vendors and this is cost-prohibitive for us; sometimes we don't have a choice but to drink the contaminated water."

Female Participant, FGD, Tai LGA

"Waterborne diseases are among our challenges because we have been seeing a lot of typhoid, diarrhoea and cholera cases regularly and during investigation, the source of infection is found to be water from polluted sources, many of the families are not able to afford clean water, so they are taking water from the river and the streams which are contaminated with oil; the result is recurrent waterborne diseases, especially among children, which is a public health crisis."

Health Worker, KII, Khana LGA

"My children have been frequently ill with typhoid fever and it is due to the water we drink. I am worried every day that my children will get ill due to the water we drink. We have no option but to use whatever water is available."

Female Participant, FGD, Khana LGA

"Water borne diseases are a major health problem; we have regularly observed typhoid, diarrhoea and cholera, even outside the rainy season when water sources are flooded and contaminate easily. When we do test water samples from the community, we are finding bacteria and other pathogens in these water sources, which is a serious health problem."

Health Worker, KII, Khana LGA

"We see women who suffer from water borne diseases as they are responsible for fetching water and when they catch the disease, they take care of the sick children. Water contamination affects not only women's physical health but her mental health and well being as well."

Health Worker, KII, Eleme LGA

Beyond respiratory and waterborne illness, participants across all four Local Government Areas voiced sustained anxiety about long-term chronic effects, including cancer and infertility, which they attributed to prolonged exposure though without access to formal epidemiological confirmation, while health workers noted a disease pattern that was chronic and recurrent rather than episodic, with patients returning repeatedly to the same polluted environment and, predictably, the same symptoms. The gas flaring participants identified as the principal driver of respiratory illness routinely exceeds the particulate matter thresholds the

World Health Organisation (2021) sets as safe for sustained human exposure, while spatial analysis by Egbom et al. (2023) similarly links land-cover change across Ogoniland to elevated malaria prevalence, suggesting that environmental disruption is compounding the community's infectious as well as non-communicable disease burden. Children and the elderly emerged consistently as the most affected groups, alongside farmers and fishermen whose occupations place them in direct daily contact with contaminated land and water, and women, whose responsibility for water collection and care of sick children compounds their own exposure with the burden of caregiving.

Objective 2: Government's Reaction to Healthcare Provision

Participants described government's healthcare response as consistently inadequate across infrastructure, medicine supply and geographic accessibility, a pattern corroborated across all four Local Government Areas and largely uncontested even by those most sympathetic to HYPREP's remediation efforts.

"The health center here has no electricity, no running water, and no medicines, and the nurses come when they can, they can do nothing! They have to travel to Port Harcourt for proper treatment."

Mother, FGD, Khana LGA

"They constructed a health center but it has no drugs, no equipment or personnel. There's a building and that's it."

Elder, FGD, Gokana LGA

"If you visit the health centre, they are not getting any drugs there; you have to go to the pharmacy and collect them yourself, that is why people die because they can't afford the drugs."

Female Traders, FGD, Eleme LGA

The consequences of this inadequacy were reported to fall most heavily on women, children and the elderly, a pattern health worker confirmed from direct clinical experience.

"The health consequences are borne especially by women who are responsible for caring for ill children, as well as on the mental health and well-being of women and children."

Health Worker, KII, Eleme LGA

"The government is not protecting us, it allows the oil companies to destroy our environment and does nothing, they are more concerned about the interests of the oil companies than that of our people, we need the government to take action to protect us."

Female Participant, FGD, Tai LGA

"We are directly experiencing the effects of the government's inaction and we see patients suffering from preventable diseases every day but we can only treat the symptoms not the cause, we feel frustrated because we can only treat the patients and not the cause; the government needs to do more."

Health Worker, KII, Tai LGA

Confronted with this institutional gap, communities described falling back on informal, self-organised coping mechanisms rather than the formal health system.

"My family supports me when I am ill, they give me money for medicine or they take me to the hospital, I have to help myself and my family because the Government won't help me."

Fisherman, FGD, Khana LGA

"We use herbs, it's what our ancestors did, and there are some leaves and roots which help, it's not perfect, but it helps."

Elder, FGD, Tai LGA

A recurring frustration voiced by health workers themselves was the gap between what they could observe clinically and what they were empowered to change structurally: patients returned repeatedly with preventable, pollution-related conditions that treatment alone could not resolve without corresponding environmental and infrastructural intervention. Financial and geographic barriers compounded this gap, with households required to travel to Port Harcourt for care unavailable locally, or to purchase medicines from private pharmacies at prices many could not sustain, leaving social support networks, traditional medicine and collective advocacy as the community's principal, and largely self-financed, response to a healthcare need that government's own provision has not met.

VII. Discussion of Findings

Disease Burden and Environmental Degradation

The finding that respiratory, waterborne and skin conditions have risen consistently across all four Local Government Areas since 2015 confirms the disease burden that both Environmental Justice Theory and Health Security Theory would predict from unresolved contamination of this severity. Read through Health Security Theory, the persistence of this burden reflects a clear failure of two of the theory's four dimensions: protection from acute threats, since recurring spills continue without effective emergency response, and management of chronic risk, since UNEP's (2011) documentation of benzene at levels up to 999 times the safety limit has not been matched by systematic long-term health surveillance (Rushton & Youde, 2015). The professional corroboration health workers provided, moving the evidence from subjective community perception to clinical observation, strengthens confidence that the association between exposure and illness is not merely perceived but materially present, consistent with the quantitative associations Kponee et al. (2015) and Peters et al. (2018) established for water and food exposure pathways respectively.

The disproportionate burden borne by children, the elderly, women, farmers and fishermen is best explained through Environmental Justice Theory's distributive dimension: those least responsible for, and least able to benefit from, oil extraction are precisely those bearing its health costs, a pattern consistent with the concentration of toxic effects on Ogoni land while corporate and state actors capture the economic benefit (Simon & My, 2025). The cyclical nature of illness that health workers described, in which patients return repeatedly to the same polluted environment and predictably the same symptoms, illustrates the limits of a medical-only response and reinforces both theories' shared insistence that health protection cannot be separated from environmental remediation; treating symptoms without addressing exposure leaves the underlying injustice, and the underlying health insecurity, fully intact. This is consistent with Fentiman and Zabbey's (2015) finding that environmental degradation and cultural erosion are intertwined in Ogoniland, since the destruction of farming and fishing livelihoods documented in this study compounds physical illness with the chronic stress of eroded livelihoods and intergenerational knowledge, widening the disease burden beyond its purely biomedical dimensions.

The gendered pattern identified in this study, women bearing disproportionate exposure through water collection while simultaneously absorbing the caregiving burden when their children fall ill, extends Environmental Justice Theory's distributive dimension into the household itself: environmental injustice is not only a matter of which communities bear pollution's costs relative to which corporations capture its benefits, but also of which household members within an affected community absorb the resulting labour and risk. This finding is consistent with the wider documentation of gendered vulnerability to environmental degradation in oil-producing communities (Nkem et al., 2024) and suggests that interventions addressing disease burden in Ogoni communities cannot be gender-neutral if they are to reach those most exposed.

Government's Reaction to Healthcare Provision

The grossly inadequate state of healthcare infrastructure documented across Khana, Gokana, Tai and Eleme, health centres without electricity, running water, medicine or adequate personnel, represents a direct failure of health systems strengthening, the third dimension of Health Security Theory, and demonstrates that the state has not translated its stated remediation commitments into the health-system capacity required to manage the very disease burden its own contamination has produced (Rushton & Youde, 2015). Read through Environmental Justice Theory, this failure compounds procedural and recognition injustice already evident in remediation governance: communities are not only excluded from decisions over how their environment is cleaned up, but also left without the institutional means to manage the health consequences of that exclusion, reinforcing the sense, voiced directly by participants, that government is more responsive to the interests of oil companies than to the wellbeing of the communities it is meant to serve.

The financial and geographic barriers reported, needing to travel to Port Harcourt for basic treatment, or purchase medicines privately at prohibitive cost, confirm Health Security Theory's attention to social determinants of health, since economic exclusion produced by environmental degradation itself limits households' capacity to access the very care that degradation makes more necessary (Nkem et al., 2024). That communities have responded by falling back on social support networks, traditional medicine and collective advocacy is properly read not as evidence of institutional adequacy but as a demonstration of the community resilience that Health Security Theory identifies as its fourth dimension, a form of protection communities have had to generate for themselves precisely because government's own healthcare response has not been forthcoming.

The frustration health workers themselves expressed, treating symptoms daily while remaining powerless to address the environmental causes that produce them, illustrates a structural mismatch between where responsibility for health security formally sits and where the capacity to discharge that responsibility actually resides. Under Health Security Theory, health systems strengthening is meant to function alongside, not as a substitute for, upstream protection from acute and chronic environmental threats; in Ogoni communities the reverse has effectively occurred, with an under-resourced health system left to absorb, without support, the consequences of environmental protection failures that lie entirely outside its control. Closing this gap, this study's findings suggest, requires treating environmental remediation and health system investment as a single governance obligation rather than as two separately administered programmes.

VIII. Key Findings

- i. Respiratory disease, driven principally by gas flaring, has become an endemic rather than seasonal condition across Ogoni communities, with children and the elderly the most frequently affected patient groups reported by health workers.
- ii. Waterborne diseases, particularly typhoid, diarrhoea and cholera, recur consistently where households are unable to afford alternatives to visibly oil-contaminated water sources, disproportionately affecting women and children.
- iii. Health workers independently corroborate community-reported disease patterns and describe a cyclical relationship between continued environmental exposure and recurrent illness that treatment alone cannot resolve.
- iv. Long-term fears of cancer and infertility are widespread across all four Local Government Areas, reflecting deep anxiety about chronic exposure even in the absence of formal clinical confirmation.

- v. Government's healthcare provision remains grossly inadequate, marked by health centres lacking electricity, water, medicine and personnel, forcing households to travel to Port Harcourt or purchase medicine privately at prohibitive cost.
- vi. In the continued absence of an adequate formal health response, communities rely on social support networks, traditional medicine and collective advocacy as their principal, self-financed source of health protection.

IX. Conclusion

This study set out to assess the burden of disease arising from environmental degradation in Ogoni communities and to examine government's reaction to healthcare provision between 2015 and 2025. The evidence assembled from 30 in-depth interviews and four focus group discussions, corroborated consistently by health workers across all four Local Government Areas, demonstrates that environmental degradation has produced a substantial and rising disease burden, dominated by respiratory illness linked to gas flaring and waterborne disease linked to oil-contaminated water sources, with children, the elderly, women, farmers and fishermen disproportionately affected.

The study further establishes that government's response in healthcare provision has not kept pace with this burden. Health infrastructure across the four Local Government Areas remains poorly equipped, medicine supply is unreliable, and financial and geographic barriers continue to restrict access, leaving communities to rely substantially on their own social and cultural resources for protection. Read jointly through Environmental Justice Theory and Health Security Theory, these findings confirm that the Ogoni crisis is simultaneously a matter of distributive, procedural and recognition injustice and a failure across the acute, chronic, systemic and community dimensions of health security, with government's healthcare response representing one of the clearest points at which state responsibility for both dimensions currently falls short.

The study concludes that sustainable improvement in health security for Ogoni communities requires an integrated response that pairs accelerated, verifiable environmental remediation with a corresponding strengthening of the health system's capacity to serve the population most exposed to its consequences, since neither environmental cleanup nor healthcare investment alone is sufficient to reverse a decade of compounding harm.

X. Recommendations

Based on the findings of this study, the following recommendations are made:

- i. The Federal Government, through HYPREP and other relevant environmental agencies, should accelerate the remediation of contaminated land, rivers, creeks and groundwater across all affected Ogoni communities, with cleanup verified against internationally accepted standards, such as those the United States Environmental Protection Agency (2012) sets out for citizen-verifiable remedial action, by accredited laboratories rather than HYPREP's own unverified assessments, paired with the restoration of degraded agricultural and aquatic ecosystems on which affected livelihoods depend (Zabbey, Sam, & Onyebuchi, 2017), since continued exposure is the principal driver of the disease burden this study documents.
- ii. Government should strengthen environmental monitoring and enforcement of regulatory compliance by oil and gas companies operating in Ogoni communities, including regular environmental audits and an independent oversight body empowered to sanction violations, addressing the structural conflict of interest inherent in joint venture arrangements between the state and the companies it is meant to regulate.
- iii. Government should expand access to safe drinking water and functioning healthcare services by investing in potable water infrastructure, upgrading and adequately staffing and stocking primary health centres, training health workers specifically in the recognition and

management of pollution-related disease, and establishing systematic health surveillance to track chronic exposure effects that current provision does not capture.

iv. HYPREP and government agencies should institutionalise meaningful community engagement in remediation and health governance through community oversight committees, regular consultation, and transparent public reporting of remediation progress, budgets and results, recognising that the trust required for sustainable health security cannot be established while communities remain excluded from decisions over their own environment and healthcare.

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