

Survey of Indigenous Methods for Prevention and Treatment of Respiratory Diseases and Their Prevalence in Western Area, Sierra Leone

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ABSTRACT

Background: Respiratory diseases impose a critical public health burden worldwide, disproportionately impacting low- and middle-income countries (LMICs) where conventional healthcare infrastructure is frequently strained. In Sierra Leone, traditional phytotherapeutic and indigenous healing modalities remain foundational in managing respiratory conditions like cough, coryza (cold), asthma, pneumonia, and tuberculosis. Despite the widespread reliance on these traditional practices, formal scientific documentation detailing their specific community utilization and prevalence remains scarce. This study evaluated the indigenous methods utilized for the prevention and treatment of respiratory tract infections and assessed their prevalence, utilization patterns, and community perceptions within the Western Area of Sierra Leone.

Methods: Utilizing a mixed-methods, descriptive cross-sectional design, field data were gathered from six traditional herbalists and fifty community residents across the Western Area. Data collection comprised an integrated approach involving structured questionnaires, ethnobotanical interviews, direct field observations, and site visits. Quantitative variables were processed using descriptive statistics, reporting absolute frequencies and percentages to synthesize usage patterns.

Results: Demographic profiling showed a predominantly male workforce among the traditional healers (83.3% male vs. 16.7% female), whereas the community cohort displayed a more balanced gender distribution (58.0% male vs. 42.0% female). Ethnobotanical mapping identified a diverse matrix of complex remedies formulated from local flora and natural

products, including brown rice, pure honey, cassava (*Manihot esculenta*) leaves, tamarind (*Tamarindus indica*) leaves, lime, garlic, moringa, and groundnuts. These preparations were actively deployed against both acute upper respiratory tract symptoms and severe lower respiratory conditions. While 100% of surveyed healers asserted the absolute safety and clinical efficacy of their remedies, a striking 88.0% of community respondents reported a primary reliance on these home-based or herbal interventions over conventional hospital-based care during respiratory episodes. This sustained community preference was driven by structural accessibility, financial affordability, deep cultural alignment, and rapid perceived symptomatic relief.

Conclusion: Indigenous medical practices are deeply integrated into the health-seeking behavior of residents in Western Area, Sierra Leone, frequently serving as the primary baseline for respiratory care. Although these remedies enjoy high community trust, rigorous pharmacological validation, toxicity profiling, and dosage standardization are urgently required to safeguard patient health. Establishing collaborative referral frameworks between traditional healers and formal medical channels could optimize national healthcare delivery and ensure the preservation of valuable ethnobotanical knowledge.

Keywords: Indigenous medicine; Phytotherapy; Respiratory tract infections; Traditional healers; Ethnobotany; Sierra Leone.

INTRODUCTION

Respiratory diseases represent an enduring global public health crisis, remaining a leading cause of morbidity and mortality that disproportionately strains healthcare infrastructure in developing countries. By its biological design, the respiratory system exists in a state of continuous, direct exposure to the ambient atmosphere, rendering it uniquely vulnerable to pathogenic microorganisms, toxic particulate matter, biomass combustion, and anthropogenic air pollution. Epidemiological estimations by the World Health Organization suggest that billions of individuals globally are exposed to hazardous indoor and outdoor air pollution, environmental tobacco smoke, and solid fuel emissions, all of which act as primary etiological drivers of acute and chronic pulmonary injury (WHO, 2017).

On a global scale, the clinical spectrum of respiratory disorders—including asthma, chronic obstructive pulmonary disease (COPD), pneumonia, tuberculosis, and acute respiratory tract infections (ARIs)—accounts for millions of premature deaths annually. Chronic lower respiratory diseases consistently rank among the primary drivers

of global mortality, with COPD alone responsible for roughly three million deaths each year (WHO, 2017). Concurrently, acute lower respiratory tract infections remain a leading cause of pediatric mortality, particularly among children under five years of age within low-income settings. Furthermore, seasonal and pandemic influenza variants alongside emergent respiratory pathogens continue to impose substantial economic and operational burdens on public health systems worldwide (Forum of International Respiratory Societies, 2017).

Within Sierra Leone, the epidemiological burden of respiratory illness is severely pronounced. Actuarial data from the World Health Organization indicate that lung diseases account for approximately 1.41% of total national mortality, reflecting an age-adjusted mortality rate of 48.68 per 100,000 population (WHO, 2017). This systemic vulnerability is compounded by a complex web of socioeconomic and environmental determinants, including pervasive poverty, domestic overcrowding, infrastructural sanitation deficits, reliance on biomass cooking fuels, poor residential ventilation, and uneven access to formal clinical

networks. These risk factors are heavily concentrated in highly dense municipal settings like the Western Area, where rapid, unregulated urbanization and suboptimal housing conditions continuously expose populations to concentrated environmental and infectious hazards.

Despite the institutional presence of conventional, Westernized biomedical services, a vast segment of the Sierra Leonean population relies on traditional medicine and indigenous healing modalities to prevent and manage respiratory symptoms. Deeply rooted in historical and ancestral frameworks, traditional medicine remains an indispensable pillar of healthcare delivery across sub-Saharan Africa. The World Health Organization estimates that roughly 80% of the African population depends either partially or entirely on traditional medicine to satisfy primary healthcare needs (WHO, 2002). Within the Sierra Leonean context, these indigenous systems are highly diverse, encompassing the administration of localized medicinal flora, complex herbal concoctions, spiritual or faith-based interventions, culturally inherited home remedies, massage therapies, and traditional scarification protocols.

Traditional healers and phytotherapeutic

practitioners maintain substantial social influence within local communities, primarily because their services are economically affordable, geographically accessible, and closely aligned with local cultural beliefs. Consequently, patients frequently consult traditional practitioners as their first point of medical contact during an illness episode before considering modern clinical options. Ethnobotanical literature has highlighted the widespread use of plant-based remedies—such as lemon grass, ginger, garlic, honey, lime, tamarind leaves, cassava leaves, and moringa—in treating conditions like cough, coryza, asthma, and pneumonia (Tarawallie et al., 2020; Abbasi et al., 2015). Many of these botanical agents possess documented antimicrobial, anti-inflammatory, and immunomodulatory properties that likely explain their perceived therapeutic value and ability to ease acute respiratory symptoms.

However, while these indigenous treatment methods remain deeply embedded in daily life, there is a critical lack of rigorous scientific documentation regarding their exact community prevalence, specific preparation techniques, clinical efficacy, and safety profiles within Sierra Leone. Furthermore, the dual pressures of

globalization and modernization, alongside an increasing structural dependency on Western pharmaceuticals, pose a significant threat to preserving these indigenous knowledge systems. Without systematic scientific recording and analysis, this valuable oral ethnobotanical heritage risks being lost over generations.

The recent emergence of global respiratory challenges, such as the COVID-19 pandemic, has renewed scientific interest in complementary and alternative medicine. Mapping these community-level indigenous practices is therefore essential—not only to preserve invaluable cultural knowledge but also to provide an empirical baseline for future pharmacological research aimed at identifying novel bioactive therapeutic compounds. To address these gaps, this study systematically surveys the indigenous methods utilized for the prevention and treatment of respiratory illnesses and evaluates their prevalence and utilization patterns among residents in the Western Area of Sierra Leone.

METHODS

Study Design and Setting

This study utilized an observational, descriptive cross-sectional design

incorporating a mixed-methods framework.

The investigation was situated within the Western Area of Sierra Leone, a geographic zone comprising both the Western Area Urban and Western Area Rural districts. As the nation's primary administrative, economic, and most densely populated hub, the Western Area acts as a demographic melting pot hosting a diverse range of ethnic and socio-cultural groups. The region is characterized by rapid, unregulated urbanization, domestic overcrowding, infrastructural vulnerabilities, and pronounced environmental challenges including indoor biomass smoke exposure, dust particulate matter, and ambient air pollution. These systemic factors create an environment highly conducive to the transmission and exacerbation of acute and chronic respiratory tract pathologies.

Study Population and Eligibility Criteria

The target population was divided into two distinct primary cohorts: local community residents and practicing traditional herbalists, both operating and residing within the Western Area.

Inclusion Criteria: Adult community members (aged ≥ 18 years) who had permanently resided within the study area for at least six months and possessed direct

experience or familial knowledge regarding home-based indigenous remedies for respiratory conditions. For the practitioner cohort, individuals were required to be recognized within their communities as active traditional healers or phytotherapeutic practitioners specializing in respiratory illnesses. All participants were required to provide informed consent.

Exclusion Criteria: Individuals under the age of 18, transient or non-resident populations, and anyone unable or unwilling to provide voluntary informed consent were excluded from enrollment.

2.3 Sample Size and Sampling Strategy

A total sample of 56 key informants was accrued for this investigation, comprising 50 community household respondents and 6 professional traditional herbalists. A multi-stage sampling methodology was used to recruit participants: To select the community cohort, simple random sampling via balloting was first utilized to identify target residential areas. Within these zones, 25 distinct households were selected at random. To ensure balanced intracommunity representation and cross-verify localized remedies, a dual-respondent approach was implemented, whereby two eligible adult members from each selected household were recruited ($n = 50$).

Conversely, the practitioner cohort ($n = 6$) was selected using purposive sampling. These key expert informants were identified through geographic field mapping, recommendations from local community elders, and administrative liaison with the Traditional Healers Association of Sierra Leone, focusing specifically on their active, long-term involvement in treating respiratory disorders.

Data Collection Instruments and Field Protocols

Primary field data were collected through an integrated approach involving four methods: structured questionnaires, ethnobotanical structured interviews, direct field observations, and localized site visits.

Structured Questionnaires: These were administered face-to-face to the 50 community respondents. The instrument was designed to capture precise data on socio-demographic baselines, self-reported histories of recent respiratory illness episodes, specific home-made or botanical remedies used, health-seeking behaviors, and subjective community perceptions regarding the safety, financial accessibility, and clinical efficacy of alternative vs. orthodox treatments.

Ethnobotanical Interviews: Qualitative, structured interviews were conducted with the 6 traditional herbalists.

These targeted dialogues formally documented the vernacular (Krio/indigenous language) nomenclature of medicinal plants, the specific anatomical plant parts utilized (bark, leaves, roots, or seeds), precise extraction and formulation techniques (decoctions, infusions, or syrups), standard administration protocols, therapeutic indications, and perceived outcomes. Field Observations and Site Visits: The principal investigator conducted direct observations and site visits to the practitioners' clinics and immediate community habitats. This step was taken to verify the storage, physical processing, and hygienic frameworks of traditional pharmacy preparation, while contextualizing the local micro-environments and ambient environmental exposures driving respiratory complaints.

Data Management and Statistical Analysis

Prior to formal entry, all primary field records and questionnaires were manually checked for completeness, internal consistency, and logical errors. Quantitative variables derived from the structured community questionnaires were systematically coded, categorized, and entered into an organized electronic database using Microsoft Excel. Descriptive statistics comprising absolute frequencies, percentage distributions, cross-

tabulations, and graphical figures were used to synthesize and present the data.

Qualitative data generated from the open-ended ethnobotanical interviews and observational field notes were processed using manual thematic analysis. Verbatim narratives and procedural descriptions of indigenous recipes were transcribed, grouped into conceptual themes based on botanical taxonomy and therapeutic indications, and integrated narratively to enrich the quantitative findings.

Methodological Rigor, Validity, and Reliability

To ensure internal validity and academic rigor, the data collection instruments were subjected to expert review and structural modification by senior university faculty supervisors to confirm that all items precisely aligned with the study's scientific objectives. To adapt the tool to local linguistic and cultural contexts, technical terminology was translated into Krio during field deployment. The structural reliability of the instruments was enhanced by using a highly standardized question matrix across all community respondents, minimizing inter-interview variability. Furthermore, the survey was pre-tested and piloted among a small sample of individuals possessing demographic profiles

identical to the target population outside the active study zone; data from this pilot phase were excluded from the final analysis.

Ethical Considerations

This study was executed in strict accordance with established international ethical principles governing human subject research. Administrative approval was granted by the Department of Biological Sciences at Fourah Bay College, University of Sierra Leone, alongside community-level clearances from local authorities and traditional healing leaders. Prior to initiating any data collection, the study's background, scope, institutional academic purpose, and voluntary nature were explained to each participant in their preferred local language. Formal, voluntary informed consent was obtained via signature or thumbprint from every respondent prior to enrollment. Participants were explicitly informed of their right to withdraw from the interview process at any stage without consequence or penalty. To guarantee strict data confidentiality and anonymity, no personal identifying information (such as names or specific home addresses) was recorded on the data instruments; instead, all respondents were tracked using unique alphanumeric identification codes. All data were secured in encrypted files used solely for

academic research and publication.

RESULTS

4.3 Research Results

4.3.1 Demographic Data of respondents

The demographic data: sex, age group, educational status of herbalists.

4.3.1.1 Sex of respondents/herbalists

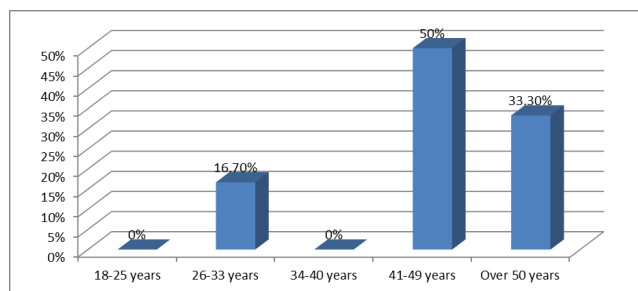
The study sought to determine the sex of herbalists. The findings of the study are presented in table 4.1 below.

Table 4.1: Percentage distribution of herbalists by sex

	Frequency	Percentage
Male	5	83.3
Female	1	16.7
TOTAL	6	100

Table 4.1 above shows that 83.3% of the herbalists are males and 16.7% are females. This distribution is consistent with the statistics of gender distribution in the communities where the study was conducted.

Figure 1: A bar chart showing the percentage distribution of respondents by Age Group



Majority (50%) of the herbalists are between age ranged of 41-49 years follow by 33.3% who are over 50 years old whereas 16.7% reported of age group 26-33 years and non-of them (0%) fall between 18-25 and 34-40 years respectively. This indicates that most of the herbalists randomly selected from the communities fall within the adults age group and they are able to give vivid knowledge or idea on the subject.

4.3.2 Educational status of Herbalists

Table 4.2: percentage distribution of herbalists by educational level

	Frequency	Percentage
Primary school	1	16.7
Secondary school	1	16.7
Technical school	1	16.7
Bachelor's degree	0	0.0
Masters and above	0	0.0
No formal	3	50

education/Others

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TOTAL	6	100
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Table 4.2 indicates the educational status of herbalists, majority (50.0%) reported of not having formal education (others) wherein 16.7% reported of attained primary, secondary and technical school respectively and 0.0% acquired bachelor's degree, masters and above respectively.

4.3.3 Sex of respondents

50 questionnaires were self-administered by the researcher to community people. The study sought to determine their sex. The findings of the study are presented in table 4.3 below.

Table 4.3: Percentage distribution of respondents by sex

	Frequency	Percentage
Male	29	58.0
Female	21	42.0
Total	50	100

Table 4.3 above shows that majority (58.0%) of the respondents are males compared to females (42.0%) in the sample population (n=50). This distribution is consistent with the statistics of gender distribution in the selected communities where the study was conducted.

4.3.4 Age Group of respondents

Respondents were asked to state their age group to determine the influence of their age group in the study. The findings of the study are presented in table 4.4.

Table 4.4: Percentage distribution of respondents by age group

	Frequency	Percentage
18-25	13	26.0
26-33	14	28.0
34-40	10	20.0
41-49	2	4.0
Above 50	11	22.0
Total	50	100

With reference to table 4.4 above, 26.0% of the respondents are between age group 18-25 years, 28.0% are between 26-33 years whereas 20.0% are age group 34-40 years and 22.0% of the respondents are above 50 years.

4.3.5 Educational status

Table 4.5: Percentage distribution of respondents by Educational status

	Frequency	Percentage
Primary school	2	4.0
Secondary school	10	20.0
Technical	14	28.0

school		
Bachelor's degree	17	34.0
Masters and above	1	2.0
Others	6	12.0
TOTAL	50	100

Table 4.5 above shows that majority (34.0%) of the respondents have attained bachelor's degree follow by 28.0% who have acquired technical education wherein 20.0% of the respondents have acquired secondary school education and the least (4.0%) of them reported of attained primary school.

4.4 Indigenous methods and their utility for treatment of respiratory infections

The second objective of this study is to identify indigenous methods and their utility for treatment of respiratory infections. 6 herbalists were recruited and asked to state the different type of methods used to treat respiratory infections. The findings of the study are presented in table 4.6.

Table 4.6: showing the indigenous methods, types of respiratory infection treated and the number of people (average) each herbalist treated per week, month or year.

Methods		Types of respiratory infection treated		No. of people (average) treated per week, month or year.
Patched rice + doves +honey and made into syrup	brown benni + sugar	Cold, cough, asthma		2-3
Root Catap, leaves enough and (cassava) leaves	named tamarind pepper kasada	Cough, cold, pneumonia		5-6
Pounded groundnut honey +lime made into syrup	raw +	Cold, cough, TB, pneumonia, asthma		2-4
Four to four leaves (dada) chew for adults and boiled for little children		Asthma, chest in-drawing /hiccups, cold, cough		8-9
Lime root & lime alligator garlic pepper mix with moringa	pepper+ &dry	Cold, cough, dry cough, TB		2-5
Aveit boiled and mix with salt	leaves	Cough, cold, TB		2-6

Table 4.6 above shows a clear picture of the methods used by each herbalist wherein they further shows the types of respiratory infections

treated and the number of people (average) each herbalist treated per week, month or year.

4.4.1 Effectiveness and safety of indigenous methods

The researcher further probes if the aforementioned methods are effective and safe. All the 6 herbalists responded in affirmative that the indigenous methods are effective and safe.

Table 4.7 showing the Effectiveness and safety of indigenous methods

	Frequency	Percentage
Yes	6	100
No	0	0
TOTAL	6	100

4.5 The prevalence of the indigenous methods in the Western Area population, Sierra Leone.

The third objective of this study is to determine the prevalence of these indigenous methods in the Western Area population, Sierra Leone.

4.5.1 Respondents views on respiratory infection in the past 6 months

Respondents were asked to state whether they have had a cold, running nose, or cough or any respiratory infection in the past 6 months. The findings of the study are presented in table 4.8 below.

	Frequency	Percentage
Yes	50	100
No	0	0
TOTAL	50	100

Table 4.8 shows that all the selected participants have been affected by respiratory infections.

4.5.1 Respondents visited hospital when infected by respiratory infection

The respondents were further asked to state whether they visited hospital when they are infected with respiratory infections. The findings of the study are presented in table 4.9 below.

Table 4.9 showing Respondents visited hospital when affected by respiratory infection

	Frequency	Percentage
Yes	6	12.0
No	44	88.0
Total	50	100

In relation to hospital visit when respondents infected with respiratory infections, 88.0% responded in negative and 12.0% responded in affirmative.

4.5.2 The prevalence of the indigenous methods in the Western Area population

50 participants were selected in different

communities within Western Area (Rural and Urban). Out of which 44(88.0%) of them preferred to use herbals or home remedies when ill and they were asked to state the herbal (plant base) or home remedies that they used to treat respiratory infections when they got infected or ill. The findings of the study are presented in table 4.10 below.

Table 4.10 showing the prevalence of the indigenous methods in the Western Area population

Herbal home remedy	/	Disease or infection	Frequency	Percentage
Moringa + ginger + hot water	+	Cold	3	6.8
Hot water and black mint + lime		Cold, cough, sore throat	4	9.1
Moringa + ginger	+	Sneezing and cold	3	6.8
Shea butter + ginger + metalathor + hot water	+	Running nose & cough, sneezing	4	9.1
Lemon grass tea + inhale Chinese water or hot water +	+	Running nose, sneezing, cold, cough	5	11.4

Chinese water				
Pepper soup & ginger		Cold, cough	3	6.8
Hot water + garlic		Cold / common cold	3	6.8
Lime with diamint (black mint)		Fresh cold (common cold), sneeze	5	11.4
Hot water + mint and inhaled		Cold, cough, sneezing	2	4.5
Honey & bitter cola syrup		Cold, cough, running nose, sneezing	1	2.3
Hot water bath & mint on the body & drink pepper soup with sour mint		Cold, cough	2	4.5
Garlic + Lime & honey		Cough & cold	3	6.8
Lemon grass + lime		Sneezing and cough	1	2.3

juice			
Lemon	Cold, cough	1	2.3
grass	+		
moringa			
Black mint	Cold, cough	2	4.5
+ ginger+			
garlic	+		
lime			
Garlic and	Cough	1	2.3
milk			
Pepper	+	1	2.3
lime	+		
Maggie			
Total		44	100

When respondents were asked to state the type of herbals (plant base) or home remedies used to treat respiratory infections, majority (11.4%) affirmed the use of Lemon grass tea + inhale Chinese water or hot water + Chinese water also Lime with diamint (black mint) to treat Fresh cold (common cold), sneeze, running nose, cough, 9.1% reported of using Hot water and black mint + lime as well as Shea butter + ginger + metalathor+ hot water for treating Running nose & cough, sneezing, Cold and sore throat respectively. 6.8% reported the use of Moringa + ginger + hot water to treat Cold; Moringa + ginger to treat Sneezing and cold.

4.5.3 Effectiveness of herbal or home remedy against respiratory infections

44 of the respondents who responded in negative that they did not visited the hospital when infected or affected by respiratory infections were further asked to state whether the herbal or home remedy was effective against respiratory infections. All the 44 responded in affirmative that the herbals or home remedies are effective.

Table 4.11 showing the respondents views on effectiveness of herbal or home remedy against respiratory infections.

	Frequency	Percentage
Yes	44	100
No	0	0.0
Total	44	100

4.5.4 Reasons stated by respondents who use herbal / home remedies

The researcher probed further and asked respondents to state the reasons why they considered the herbal or home remedy as effective against respiratory infections. The following are reasons given by the respondents who stated that the herbal or home remedy was effective against respiratory infections. The findings of the study are presented in table 4.12 below.

Table 4.12 showing the reasons stated by respondents who use herbal / home remedies

1. Fast relief-it works faster and within 2-3 days the condition get better
2. They help them to sweat and remove the mucus from the nose and chest
3. They help heal faster and reliable when taking correct measurement
4. Most often they completely cure the infection(s)
5. Some provides temporal cure or relief
6. They stop the mucus and reduce the shivering
7. They clear the chest or airway and prevent coughing

4.5.5 Recommend herbals (plant base) or home remedies to cure another person as reported by respondents.

Respondents were asked to state whether recommend herbals (plant base) or home remedies to cure another person. The findings are presented in table 4.13.

Table 4.13 showing respondents' recommendation to herbals (plant base) or home remedies to cure another person.

	Frequency	Percentage
Yes	44	100
No	0	0.0
Total	44	100

Table 4.13 above indicates that all the respondents recommend herbals (plant base) or home remedies to cure another person.

4.5.6 Respondents views on herbals or home remedies over hospital base treatment

Respondents were also asked to state whether they trust the herbals (plant base) or home remedies over hospital base treatment. The findings are presented in table 4.14.

Table 4.13 showing respondents' views on herbals or home remedies over hospital base treatment

	Frequency	Percentage
Yes	38	86.4
No	6	13.6
Total	44	100

The table above shows that 86.4% trust the herbals (plant base) or home remedies over hospital base treatment and 13.6% responded in

negative.

4.5.7 Safety of herbals or home remedies as reported by respondents

Table 4.14 showing the Safety of herbals or home remedies as reported by respondents

	Frequency	Percentage
Yes	42	95.5
No	2	4.5
Total	44	100

When asked whether the herbals or home remedies are safe, 95.5% responded in affirmative wherein 4.5% responded in negative.

4.5.8 Sources of information for learning about herbal or home-made remedies as reported by respondents

Table 4.15 showing the Sources of information about herbal or home-made remedies as reported by respondents

	Frequency	Percentage
Community members or Native people	10	22.7
Family member/ grand parents	20	45.5
Friends	7	15.9
Internet, books & health organizations	5	11.4
Personal discovery	2	4.5
Total	44	100

Majority (45.5%) of the respondents heard about herbal or home-made remedies through family members/ grand-parents follow by 22.7% who reported of hearing it from community members or native people whereas 15.9% heard it on friends and the least (4.5%) said they once got the information from personal discovery.

DISCUSSION

This study investigated the indigenous modalities employed for the prevention and treatment of respiratory tract infections and evaluated their prevalence, utilization patterns, and socio-cultural determinants among residents within the Western Area of Sierra Leone. The empirical findings demonstrate that traditional and alternative medicine remains deeply embedded within the regional healthcare matrix, serving as an active primary resource for local communities. The high baseline reliance on traditional interventions documented here emphasizes the sustained authority of indigenous knowledge systems, even when operating alongside expanding modern conventional medical infrastructure. A central finding of this investigation is the striking prevalence of alternative remedy utilization among community respondents during

respiratory illness episodes. A significant majority of the cohort expressed a clear behavioral preference for home-made or herbal formulations over conventional hospital-based interventions when presenting with symptoms of cough, coryza, asthma, and suspected pneumonia. This high rate of utilization closely mirrors broader epidemiological estimates published by the World Health Organization, which indicate that up to 80% of the population across sub-Saharan Africa depends either partially or entirely on traditional medicine to satisfy primary healthcare demands (WHO, 2002). Within the Sierra Leonean context, this sustained reliance is structurally driven by a complex convergence of socioeconomic barriers and cultural drivers. High conventional medication costs, geographical distances to primary healthcare centers, deep-seated cultural trust in natural healing, and historical personal or familial success with traditional mixtures combine to make alternative options highly attractive. Ethnobotanical mapping of the local therapeutic repertoires identified a diverse array of natural ingredients used to create complex respiratory treatments. Components such as pure honey, garlic (*Allium sativum*), lime (*Citrus aurantiifolia*),

cassava (*Manihot esculenta*) leaves, tamarind (*Tamarindus indica*) leaves, moringa (*Moringa oleifera*), and high-density pepper blends were consistently highlighted by both household users and expert practitioners. These findings align with similar ethnobotanical and ethnopharmacological inventories conducted across West and East Africa, which document parallel botanical selections for pulmonary complaints (Abbasi et al., 2015). From a biochemical standpoint, many of these plants have been rigorously validated in international laboratory studies to possess broad-spectrum antimicrobial, anti-inflammatory, antioxidant, and immunomodulatory properties. For example, the presence of gingerols in ginger and allicin in garlic offers clear therapeutic actions that justify their community use to ease acute mucous membrane inflammation and combat upper airway pathogens. The natural mucilaginous and demulcent properties of pure honey also provide a plausible mechanistic explanation for the rapid relief of spasmodic and productive coughs reported by participants. A notable socio-cultural pattern observed in this study was the perfect consensus among traditional herbalists regarding the absolute safety and clinical efficacy of their formulations, an evaluation

that was strongly echoed by the community users. This high level of community trust is heavily reinforced by historical continuity and the generational transmission of healing practices. Within traditional African public health frameworks, alternative healers are not merely informal service providers; they are highly respected community authorities who understand the local cultural context of illness (WHO, 2002). Consequently, they are routinely sought out as trusted first-line practitioners during health emergencies long before conventional clinical pathways are considered. The demographic imbalance within the practitioner cohort, which was heavily dominated by male herbalists (83.3%), reflects the traditional patrilineal inheritance patterns that govern alternative medical practices in Sierra Leone. Ancestral phytotherapeutic knowledge is historically guarded and transmitted through specific family lineages, with male elders traditionally occupying leadership roles in community healing networks. Nevertheless, the active involvement of female family members in preparing and administering home remedies demonstrates that foundational healthcare knowledge is shared widely within households, forming a domestic baseline of medical care. The data further show that

immediate family members and community elders serve as the primary sources for transferring this alternative medical knowledge, highlighting the central role of oral tradition. While this oral transmission effectively preserves local culture, it simultaneously creates a major public health vulnerability. As modernization, rapid urbanization, and structural dependency on Western biomedical models accelerate, these informal oral pathways face significant disruption. Without systematic, written scientific documentation, valuable ethnobotanical knowledge risks being permanently lost or distorted over generations. Despite the high community trust and biological plausibility of these alternative remedies, their widespread, unregulated use introduces critical public health challenges. The vast majority of the formulations documented in this field survey have not undergone rigorous chemical characterization, clinical trial evaluation, or systematic toxicity profiling. The complete absence of standardized dosing guidelines and quality control frameworks creates serious risks of accidental poisoning, organ toxicity, or therapeutic failure. This risk is particularly dangerous for high-mortality respiratory conditions like pulmonary

tuberculosis and severe pediatric pneumonia, which demand immediate, targeted antibiotic or antiviral regimens. Treating these severe infections solely with home-made groundnut mixtures or warm leaf decoctions can delay essential clinical diagnoses, accelerate advanced tissue damage, and increase airborne transmission of pathogens within crowded households. This finding aligns with wider literature warning against the unmonitored consumption of herbal remedies in developing economies (Ekor, 2014). Consequently, these findings point to an urgent need to conduct systematic, laboratory-based phytochemical screenings and clinical safety evaluations on the primary respiratory remedies utilized in Sierra Leone. Such scientific investigations are vital to map out specific bio-active compounds, establish safe maximum tolerance levels, and eliminate contaminated preparation methods. Furthermore, establishing formal communication and referral pathways between the Traditional Healers Association and formal primary healthcare providers could greatly improve national healthcare delivery, particularly within underserved, low-income urban settings where conventional clinical resources are constrained. Finally, the systemic disruption

caused by the COVID-19 pandemic clearly illustrated the ongoing relevance of traditional medicine in sub-Saharan Africa. Faced with overwhelmed clinical centers and a lack of access to specialized therapeutics, local populations turned to traditional phytotherapeutic preparations for symptomatic relief and immune support. This surge in interest highlights the value of creating an empirical repository of indigenous health practices, which can serve both to preserve cultural heritage and to provide a baseline for future drug discovery and pharmaceutical manufacturing.

4.1 Limitations of the Study

While this research provides valuable baseline data, several limitations must be acknowledged to guide future studies. First, the relatively modest sample size ($n=56$) restricts the immediate statistical generalizability of these findings to the broader national population of Sierra Leone. Second, because data collection relied primarily on self-reported clinical histories, the findings may be subject to recall bias or subjective personal interpretations of symptom severity. Lastly, the lack of immediate access to laboratory screening facilities prevented the direct extraction and validation of the chemical structures of the documented plants. Despite these constraints,

this study establishes an essential empirical baseline regarding alternative respiratory treatments in the Western Area of Sierra Leone, filling a significant gap in the region's public health and ethnobotanical literature.

Conclusion of discussion

This investigation provides important empirical evidence confirming that indigenous medical formulations and home-based phytotherapeutic remedies remain a major, highly active resource for managing respiratory tract conditions within the Western Area of Sierra Leone. Far from being merely a secondary backup option, alternative practices serve as the primary baseline for medical care across diverse socio-demographic and educational backgrounds. The strong, widespread community trust in these remedies is structurally reinforced by their immediate geographical accessibility, financial affordability, rapid perceived symptomatic relief, and deep alignment with regional cultural traditions.

From an ethnobotanical perspective, several of the natural components documented in this study, such as *Zingiber officinale*, *Allium sativum*, *Citrus aurantiifolia*, and pure honey possess well-documented bio-active profiles containing proven antimicrobial, anti-

inflammatory, and antitussive properties. These properties offer a plausible scientific foundation for the positive therapeutic outcomes reported by local users.

However, the widespread use of unstandardized preparations for severe, infectious, or chronic conditions like pulmonary tuberculosis and acute pneumonia introduces critical public health vulnerabilities. Because traditional healing systems operate primarily within an informal, unregulated oral tradition, they typically lack standardized dosage controls, systematic quality control protocols, and formal toxicity profiling. Attempting to treat highly contagious or life-threatening respiratory diseases exclusively with home-prepared mixtures can delay essential clinical diagnoses, increase structural tissue damage, and accelerate community transmission within crowded residential environments.

To protect patient safety and optimize regional healthcare systems, these traditional healing networks must be systematically engaged rather than left unmonitored. Validating and standardizing this rich ethnobotanical knowledge through rigorous scientific evaluation is an essential step toward building an equitable, integrated, and

safe healthcare framework in Sierra Leone.

Based on the empirical insights and public health challenges identified in this study, the following strategic recommendations are proposed:

Rigorous Phytochemical and Toxicological Evaluation: The Ministry of Health and Sanitation (MOHS), in close coordination with academic research laboratories at the University of Sierra Leone, should initiate systematic screening of the primary alternative formulations identified in this study (such as the "Catap" root and complex leaf decoctions). This research is necessary to map out active therapeutic compounds, establish exact safe efficacy limits, and profile potential long-term organ toxicity.

Standardization of Dosages and Quality Assurance: Public health authorities should collaborate with the Traditional Healers Association of Sierra Leone to design simple, uniform guidelines for preparing remedies. This collaborative effort should focus on standardizing fluid measurements, establishing age-specific dosing ranges, and improving baseline hygienic conditions to eliminate microbial contamination during processing and storage.

Cross-Sector Communication and Hospital Referral Frameworks: Formal operational linkages should be established between traditional medical practitioners and modern primary healthcare clinics. Traditional healers should be trained to quickly identify clinical "red-flag" indicators—such as hemoptysis (coughing up blood), chronic night sweats, rapid pediatric chest indrawing, and prolonged high fever—that suggest high-risk conditions like tuberculosis or severe pneumonia, ensuring immediate referral to conventional hospitals.

Conservation of Regional Medicinal Flora: Local environmental agencies and municipal councils should enact sustainable environmental policies to safeguard endangered medicinal plants and local habitats from the pressures of rapid urbanization and deforestation, ensuring the long-term preservation of Sierra Leone's biological resources.

Community-Level Health Literacy Campaigns: Public health teams should deploy culturally sensitive education campaigns that respect traditional heritage while educating community members on the vital importance of seeking modern clinical diagnostics for chronic, non-resolving, or

severe respiratory symptoms.

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