

Prospects of Integration of Herbal Remedies in the Treatment of Respiratory Tract Infections in Primary Care: A Concise Narrative Review

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Abstract

Background: Respiratory tract infections (RTIs) are among the most frequent reasons for primary care consultation globally and constitute a major driver of antibiotic prescribing, much of which is unnecessary given that most RTIs are viral and self-limiting. Herbal remedies are widely used both in traditional medicine and as licensed phytopharmaceuticals for symptomatic management of RTIs, and their more formal integration into primary care is increasingly discussed as a potential complement to antimicrobial stewardship initiatives.

Content: This concise narrative review integrates evidence from Cochrane systematic reviews, other systematic reviews and meta-analyses, and regulatory and ethnobotanical literature concerning herbal remedies used for RTIs. It focuses on *Pelargonium sidoides*, *Echinacea* species, ivy leaf (*Hedera helix*), honey, and other plant-derived agents. The review evaluates the comparative robustness of trial evidence for individual remedies, examines safety issues including herb–drug interactions, outlines the regulatory frameworks governing herbal products internationally and in Nigeria, and considers the practical constraints and opportunities associated with incorporating evidence-supported remedies into routine primary care.

Summary: The strength and consistency of the evidence base differ across remedies. *Pelargonium sidoides*, ivy leaf, and honey are supported by clinical trial data suggesting modest symptomatic benefit and generally favourable safety profiles. In contrast, evidence for *Echinacea* preparations remains heterogeneous and often inconclusive. Regulatory oversight of herbal products in Nigeria is expanding but continues to display substantial gaps in implementation and enforcement.

Outlook: More systematic integration of herbal remedies into primary care management of RTIs will depend on improved product standardisation, structured clinician training in evidence-based phytotherapy, and additional context-specific clinical trials, particularly within African primary care settings.

Keywords: Herbal Medicine; Respiratory Tract Infections; Primary Care; Integrative Medicine; Phytotherapy.

I. INTRODUCTION

Respiratory tract infections (RTIs) including the common cold, acute bronchitis, sinusitis, pharyngitis, otitis media, and uncomplicated pneumonia are among the most frequent reasons for consultation in primary care worldwide. Adults typically experience two to four upper RTIs annually, and children substantially more, rendering RTIs a major cause of lost productivity due to workplace and school absenteeism and a considerable source of direct and indirect healthcare expenditure.^{1,2}

Despite the fact that most RTIs are viral and self-limiting, they remain one of the leading indications for antibiotic prescribing in primary care.³ Prescribing behaviour is shaped by diagnostic uncertainty, perceived patient expectations, and time constraints during consultations, and it contributes meaningfully to the global burden of antimicrobial resistance (AMR). AMR was associated with an estimated 4.95 million deaths worldwide in 2019.⁴ Reducing inappropriate antibiotic use for self-limiting RTIs is therefore a central objective of antimicrobial stewardship, and safe, effective non-antibiotic options for symptomatic management are of substantial clinical and public health relevance.⁵

Herbal remedies have long been employed within diverse traditional medical systems and, more recently, as standardised, licensed phytopharmaceuticals for the symptomatic relief of RTIs. The World Health Organization (WHO) estimates that a sizeable

proportion of the global population relies on traditional and complementary medicine, including herbal preparations, for primary health care. WHO policy documents advocate for the regulated, evidence-informed integration of such therapies into national health systems, emphasising quality assurance, safety, and effectiveness rather than either uncritical adoption or categorical exclusion.^{1,2}

In Nigeria, herbal remedies are widely used for common conditions, including RTIs, often alongside or in place of conventional treatments. Regulatory initiatives led by the National Agency for Food and Drug Administration and Control (NAFDAC) aim to standardise, register, and monitor herbal products, but current implementation remains incomplete and uneven across product categories.³ This review examines the evidence base for commonly used herbal remedies in RTIs, situates their use within prevailing safety and regulatory frameworks, and explores the prospects and constraints associated with integrating such remedies into primary care practice, with particular attention to the Nigerian context.

II. METHODS

This review adopts a narrative, non-systematic approach. Relevant literature was identified through searches of PubMed, the Cochrane Library, and Google Scholar, using combinations of the terms: herbal medicine, phytotherapy, complementary medicine, respiratory tract infection, common cold, bronchitis, cough, primary care, Nigeria, and regulation. Priority was accorded to Cochrane systematic reviews and other systematic reviews and meta-analyses of randomised controlled trials, where available. These were supplemented by regulatory policy documents, WHO strategy papers, and ethnobotanical surveys pertinent to Nigeria. Given the concise scope and narrative orientation of this review, no formal systematic review methods, critical appraisal tools, or PRISMA-based reporting procedures were employed. The objective is not to provide an exhaustive systematic synthesis but rather to offer primary care clinicians a practice-oriented overview that delineates the current evidence, highlights key safety and regulatory considerations, and identifies areas where further research is required.

III. EVIDENCE BASE FOR COMMONLY USED HERBAL REMEDIES

Pelargonium sidoides

Pelargonium sidoides root extract (commonly marketed as EPs 7630 or Umckaloabo) is among the most extensively investigated herbal interventions for RTIs. Proposed mechanisms of action include antibacterial, antiviral, and immunomodulatory effects, attributed in part to coumarins and polyphenolic constituents.

A Cochrane systematic review synthesising data from randomised controlled trials reported low- to very low-certainty evidence that *P. sidoides* improves symptom scores in acute bronchitis in both adults and children compared with placebo. Evidence for acute sinusitis and the common cold was more limited and less consistent.⁶ Adverse events, predominantly mild gastrointestinal disturbances, occurred more frequently in the *P. sidoides* groups than in placebo groups, but serious adverse events were rare across trials. Within the current evidence landscape, the relative strength of trial data in acute bronchitis positions *P. sidoides* as one of the better-supported herbal options for this indication in primary care, although the modest effect sizes and limitations in trial quality warrant cautious interpretation.

***Echinacea* species**

Preparations derived from *Echinacea purpurea*, *E. angustifolia*, or *E. pallida* are among the most widely used herbal remedies for RTIs. They are commonly promoted for immunomodulatory or immunostimulant effects; however, the clinical evidence is heterogeneous.

A Cochrane review concluded that the overall evidence for *Echinacea* in prevention or treatment of the common cold is weak. The pooled trials suggested small, inconsistent effects that were not deemed clinically meaningful. A major constraint on inference is the substantial variability in *Echinacea* products across studies, including differences in species, plant parts, extraction methods, dosage, and formulation, which limits comparability and generalisability.⁷

A subsequent systematic review and meta-analysis reported some evidence for a modest preventive effect on the incidence of upper RTIs but found no clear reduction in symptom duration. Again, substantial heterogeneity in product standardisation and trial methodology restricted firm conclusions.⁸ Given these inconsistencies and the lack of reproducible, clinically important benefit, *Echinacea* cannot currently be recommended with the same level of confidence as those herbal remedies supported by more coherent and methodologically robust trial data.

Ivy leaf (*Hedera helix*)

Ivy leaf extract is widely used as a non-antibiotic cough remedy in European primary care and has been authorised by the European Medicines Agency as a traditional herbal medicinal product for this indication. Ivy leaf contains saponins that are thought to exert secretolytic effects, mild bronchodilation, and potentially antibacterial activity.

An early systematic review of clinical studies found that ivy leaf preparations, administered alone or in combination with thyme, were associated with reductions in cough frequency and severity. Safety profiles across these studies were consistently favourable, although the methodological quality of trials particularly in terms of randomisation procedures, blinding, and outcome reporting was limited.⁹

A later systematic review, conducted roughly a decade afterward, arrived at comparable conclusions. All included studies reported that ivy leaf extract was effective and safe for cough associated with acute upper RTIs and bronchitis. Three randomised controlled trials documented more rapid reductions in cough severity or frequency compared with placebo; however, the magnitude of these benefits was judged modest, and trial reporting remained suboptimal.¹⁰

Taken together, the evidence supports ivy leaf extract as a reasonably well-substantiated, low-risk option for symptomatic relief of cough in primary care settings. The modest effect sizes and methodological limitations underline the need for better-designed, adequately powered trials but do not materially undermine its status as a plausible non-antibiotic adjunct in RTI management.

Honey

Honey is one of the most accessible, inexpensive, and culturally familiar remedies for respiratory tract infection (RTI)-associated cough, particularly in resource-constrained primary care settings such as many regions of Nigeria. A Cochrane review in children reported that honey probably reduces cough frequency more than no treatment or placebo, with a moderate-certainty effect size similar to that of certain over-the-counter cough suppressants, including dextromethorphan, over short treatment periods of up to three days. The review also found improvements in sleep quality for both children and their caregivers.¹¹ A critical safety qualification is that honey should not be administered to infants under 12 months of age because of the risk of infant botulism; this contraindication is essential in primary care counselling.

Other Plant-Derived Agents

A wider array of plant-derived substances, including constituents of commonly consumed foods and beverages such as ginger, turmeric, citrus, and various teas, has shown in vitro or other non-clinical activity against respiratory viruses.¹² However, for most of these agents, clinical trial data remain sparse or methodologically limited. Reviews of medicinal plants used for common respiratory conditions consistently identify a large set of candidate therapies with plausible antimicrobial, anti-inflammatory, or immunomodulatory properties, yet emphasize that relatively few have advanced from preclinical investigation or observational use to rigorously designed randomized controlled trials.¹³ Ethnobotanical studies in Nigeria corroborate this pattern. For example, a survey in Osun State documented 87 plant species from 39 botanical families used locally to treat cough associated with respiratory illness, with *Crinum jagus* cited most frequently.¹⁴ This finding underscores both the breadth of local herbal practice and the magnitude of the evidentiary gap that remains to be addressed through systematic clinical evaluation.

IV. SAFETY, QUALITY, AND REGULATORY CONSIDERATIONS

Variability in product quality and lack of standardization constitute a major obstacle to the systematic incorporation of herbal remedies into primary care. Differences in plant material, extraction methods, formulation, and dosage can render preparations that are nominally the same herb meaningfully distinct in pharmacological terms. As a consequence, clinical trial findings based on a particular standardized extract cannot be assumed to apply to other preparations marketed under the same name, and this limits both the interpretability of the evidence base and the reliability of routine clinical use.

Herb-drug interactions present an additional, clinically significant safety concern. A systematic review has shown that some herbal products can alter the pharmacokinetics of concomitantly administered conventional medicines, primarily through induction or inhibition of cytochrome P450 enzymes and modulation of drug transporters.⁵ The clinical implications of such interactions vary according to the specific herb, dose, formulation, and co-administered medication. Primary care clinicians who recommend or permit the use of herbal remedies should therefore routinely elicit information about concurrent herbal intake, with particular attention to patients receiving drugs with a narrow therapeutic index, such as anticoagulants. They should also consider the possibility that an observed change in a patient's response to a regular medication may reflect herb-related interaction rather than a new disease process.

In Nigeria, a National Policy on Traditional Medicine and existing National Agency for Food and Drug Administration and Control (NAFDAC) requirements for registration and Good Manufacturing Practice of herbal products provide a formal regulatory framework. Nonetheless, survey data from pharmacology stakeholders suggest uneven implementation. In one survey, only about one-quarter of respondents believed that herbal medicines were predominantly sold by licensed practitioners, whereas the majority reported that they are mainly distributed by unlicensed vendors operating outside formal regulatory oversight.³ Recent initiatives, including efforts to strengthen legislative support for NAFDAC's regulation of herbal products, indicate movement towards more effective control. However, consistent enforcement, robust post-marketing surveillance, and strengthened pharmacovigilance are still required if herbal remedies are to be integrated safely into primary care.

V. PROSPECTS AND BARRIERS TO INTEGRATION IN PRIMARY CARE

The principal rationale for integrating evidence-supported herbal remedies into primary care management of RTIs relates to antimicrobial stewardship. Because most RTIs are viral and self-limiting, safe and moderately effective symptomatic alternatives may help decrease inappropriate antibiotic prescribing and attenuate patient-driven demand for antibiotics.⁴ This could reduce individual-level harms from unnecessary antibiotic exposure and contribute to limiting the broader public health burden of antimicrobial resistance. The World Health Organization's traditional medicine strategy offers a general framework for such integration, emphasising regulatory structures, evidence generation, and health-worker training as prerequisites for incorporation of traditional therapies into formal health systems, rather than advocating uncritical adoption.^{1,2}

In Nigeria and comparable low- and middle-income settings, the widespread availability, cultural embeddedness, and relative affordability of herbal remedies create a practical opportunity for primary care-based symptomatic management of RTIs.^{3,14} These features may expand access to low-cost, low-risk symptomatic care where health system capacity and antibiotic stewardship programmes remain underdeveloped. At the same time, several persistent barriers temper this potential. There is limited locally conducted clinical trial evidence for many remedies in common community use; product quality and standardization are highly variable across both traditional preparations and commercial formulations; primary care providers often receive minimal formal training in evidence-based phytotherapy or herb–drug interaction assessment; and reliance on self-managed herbal treatment may delay appropriate conventional care in RTIs with bacterial, complicated, or atypical presentations.^{3,5} Against this backdrop, a cautious, evidence-graded approach is warranted. Remedies with comparatively robust trial support, such as *Pelargonium sidoides*, ivy leaf, and honey, should be distinguished from those with weaker or inconsistent findings, such as many *Echinacea* preparations, rather than treating ‘herbal medicine’ as a homogeneous category of either uniformly efficacious or uniformly unproven therapies.

VI. IMPLICATIONS FOR PRACTICE AND POLICY

Implications for Clinical Practice

Primary care clinicians need familiarity with the relative strength and limitations of the evidence for commonly encountered herbal remedies to provide patients with accurate, non-dismissive information about likely benefits and harms. Counselling should emphasize that these products are intended for modest symptomatic relief rather than cure or prevention, and should include clear safety guidance, such as the contraindication of honey in infants younger than 12 months. Routine clinical assessment should incorporate questions about ongoing herbal use, particularly for patients receiving medications with narrow therapeutic indices. In addition, clinicians should maintain vigilance for warning signs—such as sustained high fever, dyspnoea, or symptom duration exceeding the expected course of a self-limiting RTI—that indicate the need for conventional clinical evaluation rather than continued reliance on herbal self-management.

Implications for Policymakers

Regulatory bodies, including NAFDAC, should give priority to closing gaps in the implementation of licensing, labelling, and Good Manufacturing Practice standards for herbal products and to enhancing post-marketing pharmacovigilance for preparations in common use. Health authorities and academic institutions could facilitate locally relevant clinical trials of herbal remedies already widely adopted in communities, especially those identified in Nigerian ethnobotanical surveys, so that extensive traditional knowledge is supported by a commensurate evidence base. Incorporating structured teaching on evidence-based phytotherapy, including graded appraisal of the evidence for specific remedies, into primary care and family medicine training programmes would help ensure that clinicians are equipped to guide patients through an area of care in which many are already engaged outside formal healthcare structures.

VII. CONCLUSION

A subset of herbal remedies, notably *Pelargonium sidoides*, ivy leaf extract, and honey, is supported by moderate-quality evidence indicating modest symptomatic benefit in RTIs and generally favourable safety profiles, whereas evidence for other commonly used preparations, such as *Echinacea*, remains inconsistent. Their judicious use as adjuncts to, rather than substitutes for, appropriate clinical assessment may contribute to antimicrobial stewardship by providing evidence-informed alternatives to antibiotics in self-limiting infections. Realising this potential, particularly in Nigeria, will depend on more effective regulation and product standardization, enhanced clinician training, and expanded local clinical research that builds on the country's substantial ethnobotanical knowledge base.

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Author Contributions

The authors conceived the review, conducted the literature search, drafted the manuscript, and approved the final version for submission.

Conflict of Interest

The author declares there is no conflict of interest

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Ethical Approval

Not applicable; this is a narrative review of previously published literature.

Data Availability Statement

No new data were generated or analysed in this review; all sources are cited and publicly available.

REFERENCES

- [1]. World Health Organization. WHO Global Report on Traditional and Complementary Medicine 2019. Geneva: World Health Organization; 2019.
- [2]. World Health Organization. WHO Traditional Medicine Strategy 2014–2023. Geneva: World Health Organization; 2013.
- [3]. Awodele O, Amagon KI, Wannang NN, Aguiyi JC. Traditional medicine policy and regulation in Nigeria: an index of herbal medicine safety. *Curr Drug Saf.* 2014;9(1):16-22.
- [4]. Antimicrobial Resistance Collaborators. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. *Lancet.* 2022;399(10325):629-655.
- [5]. Izzo AA, Ernst E. Interactions between herbal medicines and prescribed drugs: an updated systematic review. *Drugs.* 2009;69(13):1777-1798.
- [6]. Timmer A, Günther J, Motschall E, Rücker G, Antes G, Kern WV. Pelargonium sidoides extract for treating acute respiratory tract infections. *Cochrane Database Syst Rev.* 2013;(10):CD006323.
- [7]. Karsch-Völkl M, Barrett B, Kiefer D, Bauer R, Ardjomand-Woelkart K, Linde K. Echinacea for preventing and treating the common cold. *Cochrane Database Syst Rev.* 2014;(2):CD000530.
- [8]. David S, Cunningham R. Echinacea for the prevention and treatment of upper respiratory tract infections: a systematic review and meta-analysis. *Complement Ther Med.* 2019;44:18-26.
- [9]. Holzinger F, Chenot JF. Systematic review of clinical trials assessing the effectiveness of ivy leaf (*Hedera helix*) for acute upper respiratory tract infections. *Evid Based Complement Alternat Med.* 2011; 2011:382789.
- [10]. Sierocinski E, Holzinger F, Chenot JF. Ivy leaf (*Hedera helix*) for acute upper respiratory tract infections: an updated systematic review. *Eur J Clin Pharmacol.* 2021;77(8):1113-1122.
- [11]. Oduwole O, Udoh EE, Oyo-Ita A, Meremikwu MM. Honey for acute cough in children. *Cochrane Database Syst Rev.* 2018;(4):CD007094.
- [12]. Umeoguaju FU, Ephraim-Emmanuel BC, Patrick-Iwuanyanwu KC, Zelikoff JT, Orisakwe OE. Plant-derived food grade substances (PDFGS) active against respiratory viruses: a systematic review of non-clinical studies. *Front Nutr.* 2021;8:606782.
- [13]. Oriola AO, Oyedemi AO. Plant-derived natural products as lead agents against common respiratory diseases. *Molecules.* 2022;27(10):3054.
- [14]. Lawal IO, Olufade II, Rafiu BO, Aremu AO. Ethnobotanical survey of plants used for treating cough associated with respiratory conditions in Ede South Local Government Area of Osun State, Nigeria. *Plants (Basel).* 2020;9(5):647.