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Review Article

Post-Pheic Covid-19: Evolution, Surveillance, and an Exploratory Thyme Hydrosol Inhalation Proposal

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Abstract

The emergence of new SARS-CoV-2 strains suggests increased transmission of evolved viruses worldwide. Additional efforts are needed to reduce transmission. Over time, immunity wanes due to declining antibody levels and the emergence of highly transmissible variants. In the post-pandemic era, global collaboration is not as well-organized as before. A multilayered protection strategy is required to mitigate the spread and disease. In addition to updated vaccines, other preventive countermeasures should be exploited to reduce transmission and minimize harm. A non-pharmaceutical approach is proposed: decontamination of the respiratory system aimed at eliminating virus particles at the earliest possible stage.

Keywords: SARS-CoV-2; COVID-19; Omicron; variant evolution; pango lineages; vaccine effectiveness; boosters; surveillance; public health policy

Introduction

The COVID-19 pandemic began with the emergence of SARS-CoV-2 in late 2019 and rapidly became a global crisis. The World Health Organization (WHO) declared COVID-19 a Public Health Emergency of International Concern (PHEIC) in January 2020 and subsequently declared a pandemic in March 2020. Public health responses, including movement restrictions, masking, testing, and vaccination, varied by country and over time, shaping the trajectory of waves driven by successive viral lineages. Early waves were associated with variants designated Alpha, Beta, and Gamma, with subsequent waves driven by Delta, and then by Omicron and its numerous sub-lineages. Vaccination campaigns were rapidly developed and deployed, initially prioritizing high-risk populations and gradually expanding to broader segments of the population. Across regions, waning immunity and seasonal factors contributed to ongoing transmission, even as vaccines consistently reduced the risk of severe disease and death. End of Emergency Status and Transition to Routine Surveillance: The WHO Director-General declared the end of the global COVID-19 PHEIC on May 5, 2023. This shift did not signify the elimination of the virus, but rather a transition from an acute global emergency response to the routine integration of COVID-19 management into standard respiratory-disease surveillance and care (1). Surveillance continues to monitor variants, case counts, and vaccine effectiveness through the WHO COVID-19 dashboard and national systems. As surveillance resources are reallocated in some settings, data quality and transparency remain variable, especially in low income or conflict-affected regions. Omicron: Evolution, Transmission, and Clinical Impact Omicron and its sub-lineages have driven substantial global transmission since late 2021, characterized by high transmissibility and a spectrum of clinical outcomes influenced by prior immunity (vaccination or infection). The Omicron lineage has given rise to many descendant lineages and several recombinant forms. Across Omicron lineages, spike protein mutations accumulate substantially relative to the original Wuhan strain, typically tens of mutations in spike and many more across the genome. While Omicron infections can be milder in vaccinated or previously infected individuals, severe disease remains possible, particularly in unvaccinated or high-risk populations [2,3,4.]Nomenclature and Surveillance Considerations: For clarity and consistency with global monitoring, this manuscript adheres to the standard WHO/Pango nomenclature (for example, BA.1, BA.2, BA.4/BA.5, XBB, XBB.1.5, etc.) and uses widely recognized sub-lineages and recombinants. Nonstandard or fictional names that have appeared in some sources (for example, “Stratus” or “Nimbus”) are not used in official risk communications. If such names appear in any source material, they should be clearly labeled as nonofficial or illustrative. Ongoing genomic surveillance complemented by wastewater monitoring and sentinel surveillance remains essential for early detection of emerging variants and for informing public health responses [5]. Global Vaccination Coverage and Equity: Global vaccination coverage shows substantial regional variation. As of 2025, a substantial portion of the world’s population has received at least one vaccine dose, with coverage levels differing markedly by country and region due to access, supply chains, and health-system capacity (4). About 69–70% of the world population received at least one dose, and about 60–63% of the world population is fully vaccinated (4). As of September

2025, the WHO reported rising cases in 41 countries across the Americas, Africa, Europe, and Southeast Asia in the last 28 days. WHO reported 160699 COVID-19 cases and 1271 deaths in 28 days to 28 September 2025 [4]. This is particularly concerning for high-risk populations, seniors, heart, lung, diabetes, and immunocompromised people. Vaccination and boosting remain key tools for preventing severe illness, hospitalizations, and death, though no vaccine confers complete sterilizing immunity or absolute protection against transmission (1). The emergence of variants with immune-evasive properties reinforces the need for updated vaccines and equitable access to vaccination and therapeutics. Symptoms and Clinical Features of Dominant Lineages: Common presenting symptoms with Omicron and its sub-lineages have included fever or chills, cough, fatigue, sore throat, and congestion or rhinorrhea. Some sub-lineages have been associated with distinct symptom patterns (for example, throat pain or a higher prevalence of fatigue). Post acute sequelae of SARS-CoV-2 infection, or long COVID, remain a concern; current estimates suggest that a minority of infected individuals experience persistent symptoms such as fatigue, dyspnea, myalgias, cognitive difficulties, sleep disturbance, and other organ-specific sequelae. Post-COVID-19 condition has been thoroughly discussed in a published paper [6]. The risk of long COVID appears to have diminished somewhat relative to earlier variants but continues to be clinically relevant, particularly among older adults and those with comorbidities. Data Gaps, Limitations, and Future Directions: The quality and completeness of global data vary, with notable gaps in low-resource and conflict-affected settings. Reported vaccination coverage, case counts, hospitalizations, and long-COVID prevalence may underestimate the true burden due to underreporting, limited testing, and differences in case definitions. Moving forward, strengthening genomic surveillance, improving data integration (clinical, laboratory, and vaccination data), and ensuring equitable access to vaccines and therapeutics will be essential. Ongoing research into vaccine updates, durability of protection, and post-acute sequelae remains a priority.

Conclusion

SARS-CoV-2 has evolved through a series of waves driven by diverse variants, with Omicron and its descendants becoming globally dominant from late 2021 onward. Vaccination and boosters have consistently reduced the risk of severe disease, even as breakthrough infections occur. The end of the global PHEIC in 2023 marks a transition to routine surveillance and integration of COVID-19 management into general respiratory-disease care. Despite progress, the virus continues to circulate widely, with new variants and recombinants arising over time. Global health security requires sustained genomic surveillance, vaccine equity, and preparedness to respond to future waves and potential changes in disease severity.

Proposed Preventive Countermeasure and Early Treatment With Thyme Hydrosol Inhalation

Thymus vulgaris (thyme) is renowned for its potent antimicrobial properties and has long been regarded as a general health enhancer. It contains active constituents such as thymol and carvacrol. Owing to its antiseptic, antibiotic, and antiviral properties, thyme has been used in the treatment of respiratory ailments, anemia, fever, sore throat, and related discomfort. It supports the immune system and cerebral circulation and possesses digestive, carminative, anti-putrefactive, and potential anticancer properties. It can help relieve inflammation and, as an expectorant, aid in the elimination of sputum and mucus from the respiratory tract [7].Initial clinical observations reported that COVID-19 patients experienced significant reductions in fever, dizziness, cough, dyspnea, myalgia, anorexia, and chest pain after one week of thyme syrup taken three times daily [8]. Molecular docking studies have suggested inhibitory activities of thyme constituents against SARS-CoV-2 infection [9, 10]. The concentration of essential oils in hydrosols should not exceed 1%. For inhalation, beginners may start with a low concentration—for example, 10% thyme distillate in 90% water (e.g., 10 mL distillate in 90 mL water). If well tolerated and no adverse signs, allergy occurs, consider a gradual increase toward higher dilutions (for example, up to 50% distillate in 50% water) under medical supervision. Use sparingly; once daily for a few minutes is usually sufficient [7].

Contraindications and cautions:

Thyme is not suitable for everyone, and overdose can cause serious health problems. Individuals allergic to the Lamiaceae (mint) family, including thyme, should discontinue use, as they may experience mucous membrane irritation, skin irritation, and other adverse effects. Thyme should be avoided during pregnancy and lactation, and is not recommended for children under 10 years of age. Thyme essential oils may pose risks to heart health, including discomfort, rapid breathing, seizures, or cardiac arrest, particularly in the context of allergies or high doses. People with coagulation disorders or those using anticoagulants, thyroid disease or hypothyroidism, or undergoing chemotherapy should avoid thyme. Potential adverse effects: Mucous-membrane irritation, skin irritation (in case of dermal contact with oils), bronchospasm or airway irritation in susceptible individuals; rare but serious allergic reactions. The risk may be dose- and concentration-dependent, emphasizing the need for cautious dosing and monitoring [7] These recommendations are based on preclinical results and personal experience and warrant further exploration, fact-checking, clarification, and verification.

Deduction

Thyme hydrosol inhalation as a preventive and early-treatment strategy for COVID-19 is an intriguing but unproven concept yet. Its potential, affordability, and accessibility are attractive, but robust clinical evidence is essential before recommendations can be made for clinical practice. We advocate for well-designed studies to assess efficacy, safety, dosing, and real-world applicability, with careful consideration of safety, ethics, and regulatory standards.

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