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# Real-world Insights on the Care and Management of Cough: A Physician Survey in India

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## ABSTRACT

**Background and aim:** The lack of comprehensive real-world data from physicians complicates the optimization of cough management strategies. Survey-based studies focusing on physician perspectives are particularly valuable to obtain insights on the management and care of cough in India.

**Methods:** A cross-sectional, observational physician survey administered via a printed version to assess physician treatment patterns and the factors influencing their prescribing decisions, and to know physician perspectives on duration of cough, reasons for prolonged cough, most common type of cough at their clinics. Multiple-choice and rating scale questions were used.

**Results:** Of the 190 physicians invited to complete the survey, 160 responded (120 general physicians and 40 pulmonologists). Cough duration >10 days was reported by 132 (82.5%) respondents and > 20 days by 24 (15%). Eighty-four (52.5%) physicians reported that 10–20% of patients experience the symptoms, such as congestion or cold along with cough. At least one physician identified the following reasons as contributing to the longer duration of cough: allergy, asthma, pollution, chronic obstructive pulmonary disease (COPD), gastroesophageal reflux disease (GERD), treatment non-compliance, COVID-19, smoking, and a history of nasal drip. Most respondents (90%) reported consider the presence of appropriate ingredients for the respective cough type, cooling and soothing effect, rational combination approved by drug authorities when prescribing. Complete relief from cough was reported by 43%, 55%, and 48% of physicians with syrups containing ambroxol + guaifenesin + terbutaline + menthol, levosalbutamol + ambroxol + guaifenesin, and dextromethorphan + chlorpheniramine, respectively. Most respondents preferred 10 mg (122/160) of dextromethorphan for the

effective treatment of cough over higher doses (15 mg, 21/160; 30 mg, 13/160; other doses, 4/160).

**Conclusion:** This survey highlights the diverse and known approaches physicians in India take toward managing cough, emphasizing the importance of personalized treatment strategies and syrups with multi-drug combinations.

***Keywords:*** Physician survey; real-world evidence; cough; ambroxol; guaifenesin; terbutaline; menthol; dextromethorphan

## INTRODUCTION

Cough is one of the most common clinical symptoms leading patients to seek medical care with a prevalence of 9.6% globally and 5–10% in India, affecting individuals of all ages and often indicating an underlying condition or infection. In India, where respiratory diseases and infections are a significant public health concern, cough remains a frequent reason for both primary and secondary healthcare visits. Cough management, however, is a multifaceted challenge, as it can arise from a variety of etiologies such as viral or bacterial infections, chronic respiratory conditions, or environmental factors like pollution. Despite the wide availability of over-the-counter and prescription cough remedies, clinical decision-making regarding the most effective treatment options remains a topic of debate and variation among healthcare providers [1, 2].

In a INDIan Consensus on the mAnagemenT of cOugh at pRimary care setting (INDICATOR), the experts recommend using nonopioid antitussive agents empirically for acute dry cough relief. Oral antihistamines, decongestants, or mucoactive agents in fixed-dose combinations can be considered for cough associated with rhinitis or upper airway cough syndrome. Adequate hydration is crucial for managing productive coughs. Codeine-based preparations should be reserved as a last resort for unexplained chronic coughs after other treatments have failed [1]. For productive cough, the combination of ambroxol, guaiphenesin, and terbutaline is particularly effective. Ambroxol acts as a mucolytic, breaking down mucus to facilitate its expulsion, while guaiphenesin serves as an expectorant, helping to clear mucus from the airways. Terbutaline, a β2-receptor agonist, relaxes the airway muscles, making breathing easier. Clinical studies have shown that this combination significantly reduces cough severity and frequency with minimal side effects [3, 4]. In the case of dry cough, dextromethorphan is commonly used as a cough suppressant. It works by acting on the brain's cough center to reduce the urge to cough. Often, dextromethorphan is combined with other ingredients like phenylephrine, a nasal decongestant, and chlorpheniramine, an antihistamine, to provide comprehensive relief from multiple symptoms associated with colds and allergies. This combination helps in reducing cough frequency and alleviating associated symptoms like nasal congestion and runny nose [5–7]. Managing productive cough in elderly patients requires careful consideration due to the potential for comorbidities and polypharmacy; the combination of ambroxol, guaiphenesin, and levosalbutamol is both effective and safe. Ambroxol and guaiphenesin aid in mucus clearance, while levosalbutamol, a bronchodilator, helps ease breathing by relaxing the airway muscles. Studies indicate that this combination reduces cough severity and improves overall respiratory function with a good safety profile in elderly patients [7, 8]. Levosalbutamol, in particular, has shown a better safety profile compared to racemic salbutamol, especially in pediatric and adult populations. It is effective in managing conditions like asthma and chronic obstructive pulmonary disease (COPD) by relaxing the muscles in the airways, thus improving airflow. Clinical trials have demonstrated that levosalbutamol has fewer side effects, such as tachycardia and hypokalaemia, making it

a safer option for long-term use in both children and adults [9-12].

While clinical trials offer valuable data on the efficacy and safety of medications under controlled conditions, real-world evidence (RWE) derived from routine clinical practice provides a deeper understanding of how treatments perform in actual patient populations. This is especially critical in resource-constrained settings like India, where treatment decisions are often shaped by various contextual factors, including patient demographics, comorbidities, and access to healthcare. Real-world insights, particularly from physicians, are essential to identify gaps between evidence from controlled trials and the outcomes observed in everyday clinical practice. These insights help inform treatment guidelines, improve patient outcomes, and guide the development of more effective therapeutic strategies [13].

Several studies emphasize the growing importance of RWE, particularly when evaluating the safety, tolerability, and efficacy of treatments in heterogeneous populations that are not typically represented in clinical trials. For instance, in a study on the treatment of cough, it was found that real-world treatment preferences often differ from those recommended in clinical guidelines, which may be due to practical constraints or the physician's clinical experience [13]. Additionally, research indicates that physician-reported outcomes, such as the assessment of treatment effectiveness and adverse events, are crucial for understanding the broader impact of medications beyond clinical trial data [8]. An Indian Environmental Medical Association position paper further underscores the importance of physician input in treatment decision-making, revealing that real-world physician experiences can identify gaps in treatment efficacy that are not always apparent in clinical trials; the real-world approach plays a critical role in assessing the long-term effects of cough medications, particularly in managing chronic conditions like asthma and COPD [14]. Furthermore, Kumar, et al. highlighted how real-world physician surveys in India have been instrumental in capturing treatment patterns for acute cough, providing insights into regional differences and preferences that are not always reflected in global clinical studies [8, 15].

In India, the lack of comprehensive real-world data from physicians complicates the optimization of cough management strategies. Survey-based studies focusing on physician perspectives are particularly valuable as they provide insights into real-world practices, treatment choices, and the factors influencing clinical decision-making in diverse patient populations. The findings from such surveys can inform future guidelines and enhance the overall management of cough, ensuring that treatments align with the needs and preferences of both physicians and patients.

This article aims to present the findings of a physician survey conducted across India, shedding light on real-world practices in the care and management of cough. The survey not only captures physician preferences regarding cough management but also explores the factors influencing these decisions in routine clinical practice.

## MATERIALS & METHODS

### *Survey design and recruitment*

The primary objective of this cross-sectional, observational survey designed to gather real-world insights into the care and management of cough from physicians in India. The survey aimed to assess physician treatment patterns, preferences for cough management, and the factors influencing their prescribing decisions. Secondary objectives were to know physician perspectives on duration of cough, reasons for prolonged cough, most common type of cough at their clinics.

To ensure the survey was aligned with the principles outlined in the FDA's 2023 guidance on patient-focused drug development, a panel of experts was consulted to identify the key domains most

relevant to the care and management of cough [16]. A purposive sampling technique was used to select participants, ensuring a broad spectrum of physicians with different levels of expertise and from various geographic regions of India. Eligible participants included licensed physicians who actively manage patients with respiratory symptoms, such as general practitioners, pulmonologists, and specialists in internal medicine, pediatrics, and family medicine.

***Survey administration and data collection***

The survey was administered between August 2024 and December 2024 via a printed version and a copy of the questionnaire is included in the Supplementary Information. Physicians provided their consent by voluntarily agreeing to participate in the survey, ensuring anonymity throughout the process. Their responses were based on their clinical experience and professional judgment, without reference to specific patient data or clinical records.

The survey consisted of questions designed to gather both cough and its treatment-related insights from physicians. Symptom-related questions explored whether physicians had observed any changes in the duration of cough in their patients, potential causes for prolonged cough, and the percentage of patients who experience additional symptoms such as congestion or cold along with their cough. Treatment-related questions focused on the physicians' approach to prescribing cough syrups, including the key attributes they consider when selecting a cough syrup, and their assessment of the effectiveness of various formulations; physicians were asked to rate the effectiveness of cough syrups containing specific combinations, such as ambroxol + guaiphenesin + terbutaline + menthol, levosalbutamol + ambroxol + guaiphenesin, and dextromethorphan + chlorpheniramine, on a scale from 1 to 5 (with 1 being no relief and 5 being complete relief). additionally, physicians were asked about their preferred strength of dextromethorphan for effective cough treatment and the reasons for their preference.

## STATISTICAL ANALYSIS

Responses were collected and analyzed using descriptive statistics via Microsoft Excel. Since not all the respondents answered all questions, data is expressed as frequencies and percentages of the total number who answered a particular question. For multiple-choice questions, responses were analyzed by calculating aggregate counts and percentages; the total number of responses and the percentage of physicians selecting each option were reported. Physicians who did not report/recall a value/response for a given question or reported an illogical value were excluded from the analysis.

## RESULT

A total of 190 physicians from India were invited to complete the survey between August 2024 and December 2024. Of these, 160 physicians responded, including 120 general physicians and 40 pulmonologists. Of the respondents, 152 fully completed the survey and 8 provided partial responses, resulting in a 95% response rate. Most of the respondents (~90%) worked only in private sector only.

***Duration and type of cough***

In total, 156 out of 160 (97.5%) physicians responded to a survey question regarding the 'duration of cough'. Cough duration was reported as lasting more than 10 days by 132 respondents (82.5%), and more than 20 days by an additional 24 respondents (15%). Of the 160 physicians, 140 (87.5%) responded to a survey question regarding the 'most common type of cough,' with dry cough reported by 76 of 160 respondents (47.5%) and productive cough reported by 64 of 160 respondents (40%). In response to a question 'What percentage of patients suffer from symptoms like congestion or cold along with cough?', 28/160 (17.5%) reported that 5–10% of patients suffer from

symptoms like congestion or cold along with cough, 84 (52.5%) reported that 10–20% of patients experience these symptoms, and 38 (30%) reported that more than 20% of patients suffer from congestion or cold in addition to cough.

***Reasons for prolonged cough duration***

At least one physician identified the following reasons as contributing to the longer duration of cough: allergy, asthma, pollution, COPD, gastroesophageal reflux disease (GERD), treatment non-compliance, COVID-19, smoking, and a history of nasal drip (**Figure 1**).

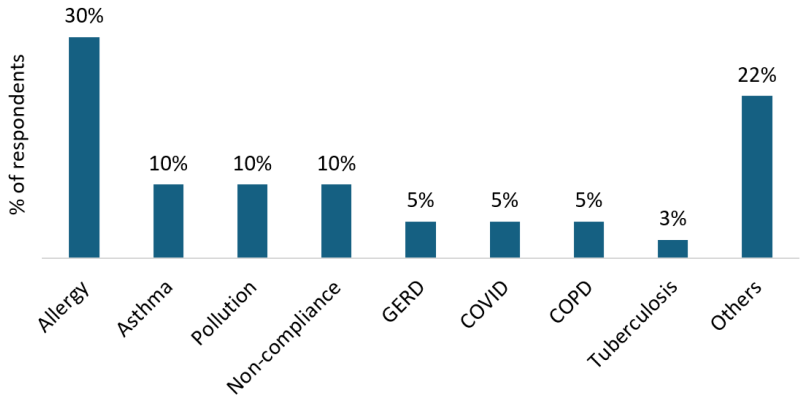


**Figure 1. Perceived reasons for the longer duration of cough**
**COPD, chronic obstructive pulmonary disease; COVID, Coronavirus Disease; GERD, gastroesophageal reflux disease.**

***Management of cough***

In response to the question 'Which attributes do you consider while prescribing cough syrup?', most respondents (144/160, 90%) reported considering the following attributes when prescribing cough syrup: the presence of appropriate ingredients for the respective cough type, cooling and soothing effect, rational combination approved by drug authorities, viscosity of the syrup, and taste. Only eight physicians (5%) reported considering the presence of appropriate ingredients for the respective cough type, four (2.5%) reported considering the cooling and soothing effect, and four (2.5%) reported considering the taste of the syrup. Physician-reported effectiveness of different cough syrup combinations is presented in **Figure 2**. Complete relief from cough was reported by 43%, 55%, and 48% of physicians with syrups containing ambroxol + guaifenesin + terbutaline + menthol, levosalbutamol + ambroxol + guaifenesin, and dextromethorphan + chlorpheniramine, respectively. Most respondents preferred 10 mg (122/160, 76.3%) of dextromethorphan over 15 mg (21/160, 13.2%), 30 mg (13/160, 7.9%), or other doses (4/160, 2.6%) for the effective treatment of cough (2/40 physicians did not recall their responses; **Figure 3**). Most physicians preferred 10 mg of dextromethorphan for the effective management of cough due to its optimal dose and Drugs Controller General of India (DCGI) recommendation, effective cough suppression, safety, and patient compliance, as well as its ability to avoid side effects like palpitations and drowsiness.

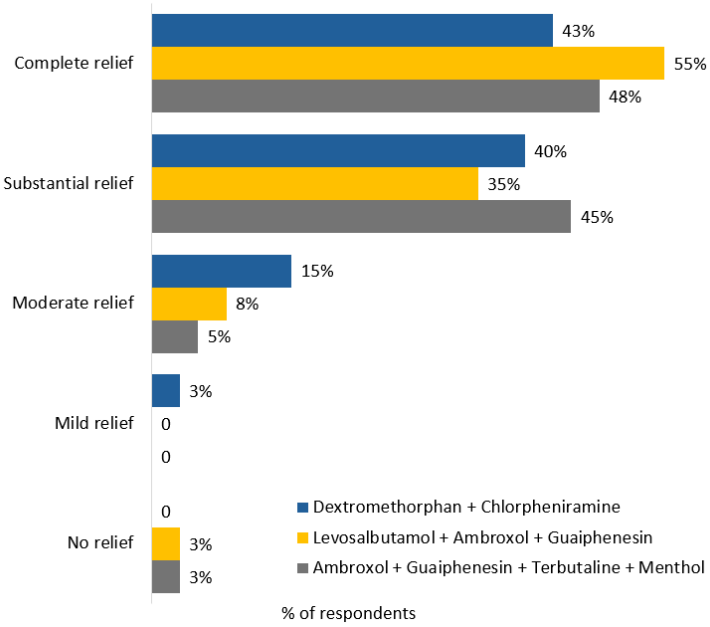


**Figure 2. Physician-reported effectiveness of different cough syrup combination**

Physicians rated the cough relief on a scale of 1 to 5, with 1 being no relief and 5 being complete relief.

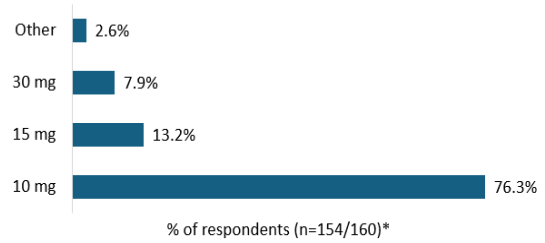


**Figure 3. Preferred strength of dextromethorphan for the effective management of cough**
***6/160 physicians did not recall their responses.**

## DISCUSSION

This survey provides valuable real-world insights into the management of cough from the perspective of physicians practicing in India. As demonstrated in the findings, the survey revealed a growing concern among physicians about the increasing duration of cough in their patients, suggesting the need for more effective, tailored treatments. Additionally, the study highlighted the importance of considering patient compliance, safety, and effectiveness when prescribing cough treatments. Notably, physicians expressed a preference for certain syrup combinations, like ambroxol + guaiphenesin + terbutaline + menthol, which were deemed most effective in providing relief from cough, while also minimizing adverse effects. These findings underscore the significance of real-world data in guiding treatment decisions and refining clinical practice, particularly in the context of heterogeneous patient populations that may not always be adequately represented in controlled clinical trials. Clinical studies have shown that this combination of ambroxol, guaiphenesin, and terbutaline significantly reduces the severity and frequency of productive cough with minimal side effects [3, 4]. The Indian Environmental Medical Association has strongly recommended that cough formulations containing short-acting bronchodilators like terbutaline or levosalbutamol are potentially beneficial for managing chronic bronchitis with productive cough; these agents not only induce bronchodilation but also reduce mucus viscosity, facilitating its clearance in conjunction with mucoactive agents. Also, recommended that terbutaline and levosalbutamol have been observed to enhance mucociliary clearance without notable impact on bronchial hyper-responsiveness reflex unlike salbutamol [14].

The majority of physicians in this survey (82.5%) reported that cough lasts more than 10 days, with 15% noting durations

extending beyond 20 days. These results align with previous studies, which reported that a significant proportion of patients experience cough lasting more than 10 days, suggesting a high burden of persistent respiratory symptoms in the population [17,18]. Chronic cough lasting ≥8 weeks can significantly affect health-related quality of life, with the situation worsened by difficulties in timely diagnosis and the lack of approved therapies [18]. Furthermore, the predominance of dry cough (47.5%) in this survey is in concordance with the findings of a comprehensive survey conducted among 5,115 individuals in India, which revealed that most participants (57%) experienced a dry cough with minimal sputum production, while 24% had a productive cough characterized by thick mucus and difficulty expectorating [8]. Regarding comorbid symptoms, 52.5% of physicians in our study indicated that 10–20% of their patients experience congestion or cold alongside cough, a result similar to the 20.2% reported by ACHOO survey, who noted that multiple symptoms are frequent in patients presenting with cold or cough [19]. These comparisons underscore the complexity of managing cough, as it often involves multiple symptoms and varying durations, which can influence treatment strategies and outcomes. Additionally, factors contributing to prolonged cough identified by physicians in this survey, such as allergy, asthma, pollution, COPD, GERD, treatment non-compliance, COVID-19, smoking, and post-nasal drip, are consistent with the findings of Bali et al. (2024), who highlighted similar contributors to chronic cough in their systematic literature review evaluating the impact of chronic cough on the health-related quality of life [18].

The majority of physicians (90%) reported prioritizing ingredients appropriate for the respective cough type, the syrup's cooling and soothing effects, its rational combination approved by regulatory authorities, viscosity, and taste when selecting a cough syrup. A recent review highlights the major benefit of cough syrups in alleviating cough is certainly due to the properties of the syrup rather than the active ingredients and discusses the special properties of glycerol in relation to the management of cough [20]. Interestingly, only a small percentage of physicians (5%) indicated that the presence of appropriate ingredients or other factors like taste were significant considerations, which suggests a stronger focus on clinical efficacy and patient comfort. Regarding dextromethorphan dosing, most physicians (76.3%) preferred the 10 mg dose for effective cough management, citing its optimal dose, DCGI approval, and superior safety profile, including fewer side effects such as palpitations and drowsiness at 10 mg. Dextromethorphan is commonly used as an antitussive for managing cough related to acute upper respiratory tract infections. However, limited evidence exists to support its efficacy in this context. A double-blind, stratified, randomized study offers minimal, if any, evidence for the clinically significant antitussive effect of a single 30 mg dose of dextromethorphan in patients with cough [21]. Notably, most physicians in the current survey expressed a preference for the combination of levosalbutamol + ambroxol + guaifenesin syrup, which was deemed most effective in providing relief from cough. INDIan Consensus on the mAnagemenT of cOugh at pRimary care setting (INDICATOR) recommended the use of oral antihistamines, oral decongestants, or mucoactive agents as a part of fixed-dose combinations in cough associated with rhinitis or upper airway cough syndrome for symptomatic relief [2]. Codeine-based treatments should be reserved as a last option for patients with persistent unexplained cough, after other therapeutic approaches have been exhausted. The survey also gathered information on identifying red flag symptoms, the role of non-pharmacologic therapies, management of special populations, and the need for referral to specialized centers [2].

The current survey has some limitations, which should be considered while using and interpreting these results. These include a small sample size, recall bias and the potential for variation in how physicians interpret, and answer questions may influence the accuracy of the responses. Additionally, the use of purposive sampling means the findings may not be fully representative of all physicians in India, especially in underserved areas. The findings may have been influenced by the exclusion of "don't recall" responses for some questions; however, their impact on the results is likely minimal as don't recall responses were infrequent. Finally, the survey did not cover all aspects of cough management, especially for refractory and unexplained chronic cough.

## CONCLUSION

This survey highlights the diverse and known approaches physicians in India take toward managing cough, emphasizing the importance of personalized treatment strategies and syrups with multi-drug combinations. The results emphasize the importance of real-world evidence in shaping effective, patient-centered cough management strategies.

### *Declaration by Authors*

**Ethical Approval:** Not applicable.
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**Conflict of Interest:** No conflicts of interest declared.

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