

Why do children with sinusitis keep getting unnecessary antibiotics?

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Upper respiratory tract infections (URTIs) are a common presentation in primary care, but their predominantly viral etiology often leads to a significant problem: the overuse of antibiotics. This practice fuels antimicrobial resistance, a global health crisis that threatens the efficacy of essential medicines. Understanding prescribing patterns is essential to curbing this trend.

KEY TAKEAWAYS

- **The Pivot:** Antibiotic prescribing for URTIs remains high, particularly in children, despite clear guidelines against routine use.
- **The Data:** Children were 1.30 times (95% CI, 1.03-1.58) more likely to receive antibiotics than adults for URTIs.
- **The Action:** Clinicians must re-evaluate antibiotic prescribing habits for URTIs, especially in pediatric populations, and reinforce patient education on viral illness management.

Antimicrobial resistance (AMR) represents a growing threat to public health, driven in large part by the inappropriate use of antibiotics. Upper respiratory tract infections, including sinusitis, bronchitis, the common cold, and pharyngitis, are frequently viral in origin, yet they consistently account for a substantial proportion of antibiotic prescriptions globally. This disconnect between etiology and treatment choice has profound implications for both individual patient outcomes and the broader public health market.¹

A study published in *J Basic Clin Physiol Pharmacol* in 2020 investigated antibiotic prescribing patterns for URTIs in primary health care centers (PHCCs) in Bangka Tengah, Indonesia. Novan Y.I.P., Primadi, and Mahfudz collected random prescriptions from patients diagnosed with URTIs between January and February 2018. The researchers specifically excluded prescriptions from patients with overlapping diagnoses, such as URTI with concomitant diarrhea or typhoid, to ensure a focused analysis on URTI management. This approach aimed to isolate prescribing decisions for uncomplicated respiratory presentations.¹

The Patient Population and Prescribing Patterns

The study encompassed a substantial dataset, analyzing 1,348 prescriptions for both adults and children diagnosed with URTIs. This two-month snapshot provided a clear picture of real-world prescribing habits in the region. The primary objective was to identify differences in antibiotic prescription profiles between pediatric and adult patients, a demographic distinction often overlooked in broader analyses of antibiotic overuse.¹

The analysis revealed a concerning disparity: children were 1.30 times (95% CI, 1.03-1.58) more likely to receive

antibiotic treatment for URTIs compared to adults. This finding highlights a specific vulnerability within the pediatric population, where viral infections are particularly prevalent. The increased likelihood of antibiotic exposure in children, who often present with self-limiting viral illnesses, contributes disproportionately to the overall burden of antimicrobial resistance.¹

Amoxicillin emerged as the dominant antibiotic choice across both age groups. It was prescribed in 92.3% of cases for children and 78.6% of cases for adults. This widespread reliance on amoxicillin, a broad-spectrum penicillin, suggests a default prescribing habit rather than a targeted approach based on confirmed bacterial etiology. For adults, ciprofloxacin also featured prominently, prescribed in 14.6% of cases, but it was rarely seen in children, accounting for only 0.3% of pediatric prescriptions. This difference likely reflects varying clinical guidelines or perceived risks associated with fluoroquinolones in younger patients.¹

The Problem of Overuse

The study's conclusions unequivocally confirm a major issue of antibiotic overuse in patients presenting with URTIs, with children bearing the brunt of this inappropriate prescribing. This is particularly problematic given that children are inherently more susceptible to viral URTIs. The data suggests that despite the high probability of a viral cause, antibiotics are frequently dispensed, contributing to the selective pressure that drives bacterial resistance.¹

The implications extend beyond individual patient care. Each unnecessary antibiotic prescription contributes to the global pool of resistant bacteria, making future infections harder to treat. This cycle of overuse and resistance demands a concerted effort from healthcare providers, policymakers, and public health initiatives. The Oxford Handbook of Infectious Diseases and Microbiology provides comprehensive guidance on appropriate antimicrobial therapy, which could serve as a valuable resource for clinicians seeking to refine their prescribing practices.

The study's methodology, while robust in its data collection from multiple PHCCs, inherently reflects local prescribing practices in Bangka Tengah, Indonesia. Generalizing these precise percentages to other regions requires caution, as healthcare systems, patient expectations, and local guidelines vary significantly. But the core finding of disproportionate pediatric antibiotic use for URTIs is a pattern observed globally, suggesting the underlying drivers may be universal.¹ The researchers did not examine the specific reasons behind the prescribing decisions. Factors such as diagnostic uncertainty, patient or parental pressure for a 'quick fix,' lack of time for thorough patient education, or a perceived need to prevent secondary bacterial infections could all contribute. Understanding these behavioral and systemic factors is critical for designing effective interventions. Without this deeper insight, interventions risk missing the mark.¹

The study also did not differentiate between specific types of URTIs beyond the broad categories. While sinusitis and pharyngitis were included, the precise breakdown of antibiotic use for each specific diagnosis was not provided. This granularity could offer further insights into which specific URTI presentations are most prone to inappropriate antibiotic prescribing. For instance, distinguishing between acute bacterial sinusitis and viral rhinosinusitis is a common clinical challenge that often leads to antibiotic overprescription.

Still, the sheer volume of prescriptions analyzed, 1,348 over two months, lends considerable weight to the findings regarding the overall trend. The consistent pattern of amoxicillin as the primary choice for both children and adults points to a standardized, perhaps even rote, approach to URTI management. This suggests that educational initiatives focusing on the viral nature of most URTIs and the limited role of antibiotics could have a significant impact.¹

The study's focus on primary health care centers is also a strength, as these are often the first point of contact for

URTI patients and where the majority of antibiotic prescriptions for these conditions originate. Interventions targeting PHCC clinicians could therefore yield substantial reductions in antibiotic overuse. The findings highlight the urgent need for collaborative intervention strategies to decrease unnecessary antibiotic prescriptions, particularly in pediatric populations.¹

The study did not evaluate the clinical outcomes of these antibiotic prescriptions. Whether the antibiotics provided any benefit, or if patients recovered spontaneously as expected with viral infections, remains unaddressed. This absence of outcome data means the study cannot directly quantify the harm of unnecessary antibiotics in terms of adverse drug reactions or direct patient morbidity, but the contribution to AMR is an undeniable systemic harm.¹

The lack of follow-up data on patients also means the study cannot assess the long-term impact of these prescribing patterns on individual patient health or the development of resistance within the local community. A more comprehensive study would ideally track patients to observe resolution of symptoms, incidence of complications, and subsequent re-presentations for similar infections. This would provide a more complete picture of the clinical utility, or lack thereof, of these antibiotic prescriptions.¹

The study was limited to a specific region in Indonesia. While the problem of antibiotic overuse for URIs is global, the specific context of healthcare access, patient education levels, and regulatory oversight in Bangka Tengah may influence the observed patterns. Future research could explore these contextual factors more deeply to understand how they shape prescribing behavior.¹

The study period of two months, while yielding a large number of prescriptions, might not capture seasonal variations in URTI incidence or prescribing practices. Respiratory viruses often have distinct seasonal peaks, and prescribing habits might shift during periods of high prevalence. A longer study duration could provide a more representative annual picture of antibiotic use.¹

The researchers did not investigate the specific diagnostic criteria used by clinicians for URIs. The accuracy of the initial diagnosis, particularly in distinguishing between viral and bacterial etiologies, directly impacts the appropriateness of antibiotic prescribing. Variability in diagnostic practices among PHCCs could contribute to the observed overuse.¹

The study's findings support the need for collaborative intervention to decrease unnecessary prescription of antibiotics in Bangka Tengah. This call to action is not unique to Indonesia; it resonates with global efforts to combat AMR. The next step involves developing and implementing targeted educational programs for clinicians, alongside public awareness campaigns for patients, to shift the prevailing culture of antibiotic demand and supply for viral illnesses.¹

Children are more likely to get URTI of viral origin, but they receive high percentage of antibiotic therapy. Novan Y I P, J Basic Clin Physiol PharmacolThe study did not analyze the cost implications of this antibiotic overuse, either for the healthcare system or for individual patients. Unnecessary prescriptions incur costs for the drugs themselves, potential side effects, and contribute to the broader economic burden of AMR. Quantifying these costs could provide an additional impetus for change.¹

The specific types of URIs included in the study (sinusitis, bronchitis, common cold, and pharyngitis) represent a broad spectrum of conditions, many of which are overwhelmingly viral. The inclusion of bronchitis, for example, which is rarely bacterial in adults and even less so in children, likely inflates the overall antibiotic prescription rate for viral conditions. This broad categorization, while reflecting real-world diagnostic labels, makes it harder to pinpoint specific areas of diagnostic misjudgment.¹

The study did not assess the availability of rapid diagnostic tests for bacterial infections, such as rapid strep tests for pharyngitis, which could significantly reduce empirical antibiotic prescribing. The absence of such tools in PHCCs could contribute to a higher reliance on clinical judgment alone, leading to more frequent antibiotic use in ambiguous cases. This highlights a potential area for infrastructure improvement.¹

The study's findings are a stark reminder that despite decades of awareness campaigns and guideline development, the problem of antibiotic overuse for URTIs persists. The disproportionate impact on children, who are less likely to benefit from these drugs and more likely to develop resistance, demands immediate attention. Future research should focus on implementing and evaluating interventions designed to change prescribing behavior at the point of care.¹

Where it falls short

The study provides a clear snapshot of prescribing patterns but does not offer insights into the reasons behind these patterns. It does not explore clinician knowledge, patient expectations, or the influence of local guidelines. This limits the ability to design targeted interventions effectively.¹

The data is also limited to a specific region in Indonesia, which may not be fully generalizable to other healthcare systems with different cultural contexts, regulatory environments, or access to diagnostic tools. While the problem of URTI antibiotic overuse is global, the specific drivers and magnitudes can vary.¹

The study also lacks information on the severity of the URTIs or the presence of any red flag symptoms that might genuinely warrant antibiotic consideration. Without this clinical context, it is difficult to ascertain if any of the prescriptions, however few, were indeed appropriate for a bacterial complication.¹

CLINICAL IMPLICATIONS

The data from Bangka Tengah offers a stark reminder that the battle against antimicrobial resistance is far from over, particularly in primary care. Clinicians, especially those managing pediatric patients, must internalize that most upper respiratory tract infections are viral. Prescribing an antibiotic for a child with a common cold or viral sinusitis does not help the child; it only contributes to a larger public health crisis.

The pervasive use of amoxicillin for URTIs, seen in 92.3% of children and 78.6% of adults, points to a deeply ingrained prescribing habit. This suggests that simply knowing the guidelines is not enough. We need to address the underlying pressures: diagnostic uncertainty, time constraints in busy clinics, and patient or parental expectations. A quick consultation and a prescription for amoxicillin might seem efficient, but it is clinically negligent in the vast majority of these cases.

For general practitioners, this means a renewed focus on patient education. Explaining the self-limiting nature of viral infections, managing symptoms with analgesics and decongestants, and outlining when to return for re-evaluation are far more effective than an unnecessary antibiotic. This requires time, a commodity often in short supply, but it is a critical investment in public health.

The disproportionate prescribing in children is particularly concerning. Children are not miniature adults; their immune systems are still developing, and their exposure to unnecessary antibiotics can have long-term consequences, including altering their microbiome. We must challenge the assumption that 'something must be done' when a child presents with a cough or runny nose, especially when that 'something' is an antibiotic for a viral illness.

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REFERENCES

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