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Opinion Article

Reimagining Tuberculosis Control through Home-Based Approaches

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DESCRIPTION

Preventive strategies, especially in high-burden regions, are important to breaking the chain of transmission. The cost analysis of a pragmatic cluster-randomized trial designed to evaluate home-based preventive treatment for Tuberculosis (TB), explains on the economic implications of this approach. Preventive treatment for TB primarily targets individuals at high risk of developing the disease, such as household contacts of patients with active TB. Traditional facility-based preventive care can present barriers to access, including travel costs, time constraints, and indirect financial burdens on families. Home-based preventive treatment is a promising alternative that minimizes these barriers while potentially enhancing adherence and reach. Understanding the cost implications of such interventions is pivotal for policy-making and scale up decisions. Home based preventive treatment not only reduces costs for households but also improves cost-effectiveness from a health system perspective. By delivering care directly to patients' homes, the approach addresses logistical and economic challenges, particularly in resource-limited settings. It also allows for early intervention, potentially reducing the incidence of active TB and associated treatment costs. Scaling such interventions requires careful consideration of implementation challenges, including workforce training, resource allocation, and sustained funding.

Study design and key findings

The pragmatic cluster-randomized trial assessed the cost-effectiveness of home-based preventive TB treatment compared to standard facility-based care. The trial involved multiple clusters, each representing a community or geographical area, with random allocation to either the intervention or control group. The intervention group received preventive treatment delivered at home by trained health workers, while the control group adhered to the standard facility-based approach. The cost analysis adopted a societal perspective, considering both direct and indirect costs incurred by healthcare providers and households. Data were collected on resource utilization, such as medication, personnel time, transportation, and administrative costs, alongside household expenses like lost income due to illness or care provision. The study found that home-based treatment reduced direct costs for households by eliminating travel expenses and reducing time lost for clinic visits. For the healthcare system, the intervention required upfront investment in training and logistics but demonstrated cost savings in reduced facility overheads and improved resource allocation. Indirect costs borne by households were significantly lower in the intervention group. Participants in the home-based arm reported fewer days of lost work and reduced caregiving burdens, translating to economic relief for families. The Incremental Cost-Effectiveness Ratio (ICER) highlighted that home-based treatment was cost-effective compared to the facility-based approach, particularly in settings with high TB incidence and limited healthcare infrastructure. This finding underscores the potential for home-based strategies to be scaled up sustainably. Beyond cost savings, the intervention group demonstrated improved adherence to preventive treatment regimens. Enhanced adherence rates were attributed to the convenience and personalized support of home-based care, leading to better clinical outcomes and long-term cost savings by averting active TB cases.

Implications for practice

The results of this cost analysis provide robust evidence for the economic feasibility of home-based preventive treatment for TB. Policymakers in resource-limited settings can leverage these insights to prioritize interventions that reduce the economic burden on households while optimizing healthcare system resources. Scaling up home-based treatment could also align with broader global health goals, such as universal health coverage and sustainable development. Moreover, integrating such interventions with community health worker programs and leveraging digital tools for monitoring and reporting could enhance efficiency and impact. Tailored strategies addressing local contexts and barriers will be essential to maximize benefits. Additionally, fostering partnerships with non-governmental organizations and international donors could provide essential support for implementation and sustainability. Clear guidelines and training for community health workers can ensure consistency and quality in service delivery. Emphasizing equity in

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access to these interventions will be essential to address disparities in healthcare. Continuous monitoring and evaluation should be integral to the program to assess outcomes and adapt strategies over time. Ultimately, such approaches can strengthen health systems, improve patient outcomes, and contribute to the global fight against TB.

CONCLUSION

The cost analysis of this pragmatic cluster-randomized trial reveals that home-based preventive treatment for TB offers a cost-effective and equitable alternative to traditional facility-based care. By reducing both direct and indirect costs while improving adherence and outcomes, this approach holds potential for transforming TB prevention efforts in high-burden regions. Future research should explore long-term cost savings and scalability to inform comprehensive TB control strategies globally.