



COST & CLINICAL EFFECTIVENESS OF VARIOUS SCREENING METHODS FOR COPD AT AYUSHMAN AROGYA MANDIRS: PEAK FLOW METER (PFM) VS PFM + QUESTIONNAIRE

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Recommendations

- PFM alone achieves the greatest cost savings and the highest net monetary benefit, indicating that it provides superior value for money under all tested scenarios.
- PFM-based COPD screening in patients older than 40 years seeking care at Ayushman Arogya Mandirs is a cost-saving strategy relative to no screening.
- Any form of active COPD screening (CDQ, PFM, or CDQ+PFM) is preferable to current practice without systematic detection, reinforcing the case for introducing structured screening at the primary care level.

Key Findings

- The Incremental Cost Effectiveness Ratio (ICER) per QALY is – ₹ 409,837, – ₹ 404,569.9 for PFM and PFM + CDQ (Parallel) Screening Methods of COPD at Ayushman Arogya Mandirs. The negative values of ICER show the interventions are cost saving.
- PFM-based COPD screening for adults ≥ 40 years requires approximately ₹ 18,714 in year 1 and ₹ 45,080 over 5 years per AAM, with net savings of about ₹ 16,759 in year 1 and ₹ 36,924 over 5 years per facility.
- This would result in additional spending of 0.5% of the total health budget over three years if rolled out in a phased manner.

Background:

- The cost-effectiveness of various COPD screening strategies is unclear.
- Despite multiple initiatives to address COPD in India, there is limited evidence on the cost-effectiveness of systematic screening programs, especially those using simple, accessible tools suitable for primary healthcare settings.
- The objective of the study is to determine the cost-effectiveness of screening for COPD using a questionnaire, peak-flow meters (PFMs), and combined approach; and estimate the budget impact.
- A model-based economic evaluation was conducted using data from a systematic literature review and a targeted literature search. The model assessed the cost-effectiveness, expressed as the Incremental Cost-Effectiveness Ratio (ICER) (incremental cost per quality-adjusted life-year (QALY) gained).

PICO	Description of the components
Population	Indian adults ≥ 40 years of age attending Ayushman Arogya Mandirs.
Intervention	Screening for COPD using: • PFM alone. • Combination of PFM + CDQ.
Comparator	No formal screening/Routine care as per government guidelines.
Outcome	Diagnostic Accuracy, Costs, QALYs, ICER.



Results:

Strategy	Cost (₹)	Incr. Cost (₹)	QALYs	Incremental QALYs	ICER (₹/QALY) (lacs)	ICER-GDP Ratio
PFM	3,987.43	-1,842.15	17.66578	0.00449	-4.09	Cost-saving
CDQ+PFM (Parallel)	4,055.29	-1,774.30	17.66566	0.00438	-4.05	
CDQ+PFM (Serial)	4,778.40	-1,051.19	17.66379	0.00251	-4.19	
No Screening	5,829.59	-	17.66128	-	-	-

- PFM based screening has the lowest incremental cost and generates maximum incremental QALYs.
- All screening strategies are cost-saving relative to no-screening scenario.

Budget Impact Analysis:

- PFM-based COPD screening for adults ≥ 40 years requires approximately ₹ 18,714 in year 1 and ₹ 45,080 over 5 years per AAM, with net savings of about ₹ 16,759 in year 1 and ₹ 36,924 over 5 years per facility.
- Scaled to all AAMs in UP, this yields gross budget impacts of roughly 34.6 crores in year 1 and 83.34 crores over 5 years, with net savings of ₹ 30.98 and ₹ 68.26 crores.
- At the national level, gross impacts are about ₹ 333.10 and ₹ 802.43 crores, alongside net savings of ₹ 298.31 and ₹ 657.24 crores over 1-year and 5-year horizons.
- The budget could be distributed over 3 years as proportion of annual budget, first year 0.33%, second year 0.47% and third year 0.42% for its introduction from medical colleges to primary health care each year respectively.

Conclusion:

- PFM-based COPD screening emerges as the most cost-effective option for primary-care case detection, offering the lowest total cost and the highest health gains among all evaluated strategies. It is alone the least costly strategy and yields the highest QALY relative to no screening.
- CDQ alone is slightly more costly than PFM with nearly identical effectiveness.
- When compared to no screening, all four screening strategies (PFM, CDQ, CDQ+PFM Parallel, and CDQ+PFM Serial) remain cost saving and more effective, providing higher net monetary benefits.

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