

Mapping the existing body of knowledge on new and repurposed TB vaccine implementation: A scoping review

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Background

- Safe and effective tuberculosis (TB) vaccines for adults and adolescents are urgently needed.
- Despite advances in research, significant gaps remain in understanding factors influencing implementation of such a vaccine.
- We conducted a scoping review, synthesizing evidence from published works on adult/adolescent TB vaccine preparedness.

Methods

This review explores four key dimensions:

- ♥ (1) epidemiological impact
- ⚖️ (2) costing, cost-effectiveness, and/or economic impact
- ✓ (3) acceptability
- 🛣️ (4) feasibility of implementation

Search engines: PubMed, Medrxiv, and PLOS journals. Articles published between 2013- May 2023.

Results – Study characteristics

A total of 23 articles were included for the analysis.

	LMICs/high burden countries	China	India	South Africa	Cambodia	Indonesia
Nr. studies	7	6	9	7	1	1
Vaccine readiness focus						
Epidemiological impact	4	4	6	4	1	1
Costing, cost-effectiveness, economic impact	4	2	5	3	-	1
Acceptability	-	1	1	1	-	-
Implementation feasibility	-	1	2	4	-	-
Vaccine candidate or profile						
Hypothetical	6	3	4	2	1	-
M72/AS01e	1	3	6	4	-	1
BCG revaccination	-	2	3	4	-	-
Endpoint hypothetical vaccines						
PoD1	6	2	3	2	1	-
Pol2	-	2	3	1	1	-
PoR3	-	-	-	-	-	-

Table 1. Studies per thematic area across countries. 1 PoD= prevention of disease, 2 Pol=prevention of infection, 3 PoR= prevention of recurrence.

♥ Epidemiological impact (1)

Aspect	Key point
Potential health impact	65.5 million TB cases and 7.9 million TB deaths could be prevented between 2028-2050.
Coverage	PoD vaccine (VE: 60%) could help achieve END TB targets with - Minimum of 72% coverage South Asia, CAR, EU - Minimum of 40% coverage in Sub-Saharan Africa
Context	Health impact depends on vaccine characteristics, target population, implementation strategy, TB burden, coverage rates, and timing.

⚖️ Costing, cost-effectiveness, economic impact (2)

Aspect	Key point
Cost-effectiveness	Adult/adolescent TB vaccine cost-effective in 73/105 LMICs Cost-saving in 58/105 LMICs
Economic impact	40% reduction in catastrophic costs
Context	Impact dependent on vaccine characteristics, TB burden, country-specific context and thresholds for cost-effectiveness, coverage, and timing of a program

✓ Acceptability (3)

Barriers -	Facilitators +
TB-related stigma	Low price
High cost	High public awareness
Low vaccine efficacy	High community engagement
Vaccine hesitancy	Routine vaccination
Negative publicity of side effects	Familiarity with the vaccine
The need for a second dose	Political commitment



*Acceptability depends on country context, vaccination strategies, and target group.

🛣️ Implementation feasibility (4)

Aspect	Key point
Recommended target populations	Adolescents, adults, elderly, socially vulnerable groups, PLHIV, biological high-risk groups, mining populations, high risk contacts, occupational groups, and healthcare workers
Recommended implementation strategies	routine program, mass campaign, targeted vaccination program, vaccination campaign integrated into existing healthcare system



Discussion/Conclusion

- Vaccine candidates modelled included hypothetical vaccines, M72/AS01E, and BCG revaccination-like candidates. Most studies focused on PoD; recommended target population were mainly adults and adolescents.
- Models show that an adult/adolescent TB vaccine could save millions of lives and be cost-effective in LMICs.
- There is limited research on TB vaccine preparedness, especially acceptability and implementation feasibility in LMICs.
- **There is a need for future research to include broader geographic- and target populations to ensure optimal and equitable vaccine implementation strategies.**

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