# Effectiveness of Typhoid Conjugate Vaccine (TCV): A systematic review


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Introduction

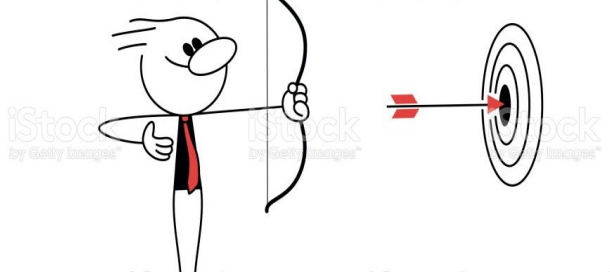
World Health Organization

Organisation mondiale de la Santé

**Typhoid vaccines: WHO position paper – March 2018**

Typhoid Conjugate Vaccine (TCV) was recommended by WHO in 2018 to be used in endemic countries for children 6 months of age and older.

WHO also recommended vaccination in response to confirmed typhoid outbreaks. However, data on the use and effectiveness of typhoid vaccines for outbreak control were very limited.



## Aim of the work

To assess the effectiveness of the TCV from campaign settings conducted in line with WHO recommendations.

Introduction

# Vaccine efficacy vs effectiveness

A **vaccine's efficacy** is measured in a controlled clinical trial under ideal and controlled circumstances – comparing a vaccinated group with a placebo group.

**Vaccine Effectiveness** is measured by observing how well the vaccines work to protect communities as a whole a more variable population .

Effectiveness in the real world can differ from the efficacy measured in a trial.

# Methodology

## Search strategy

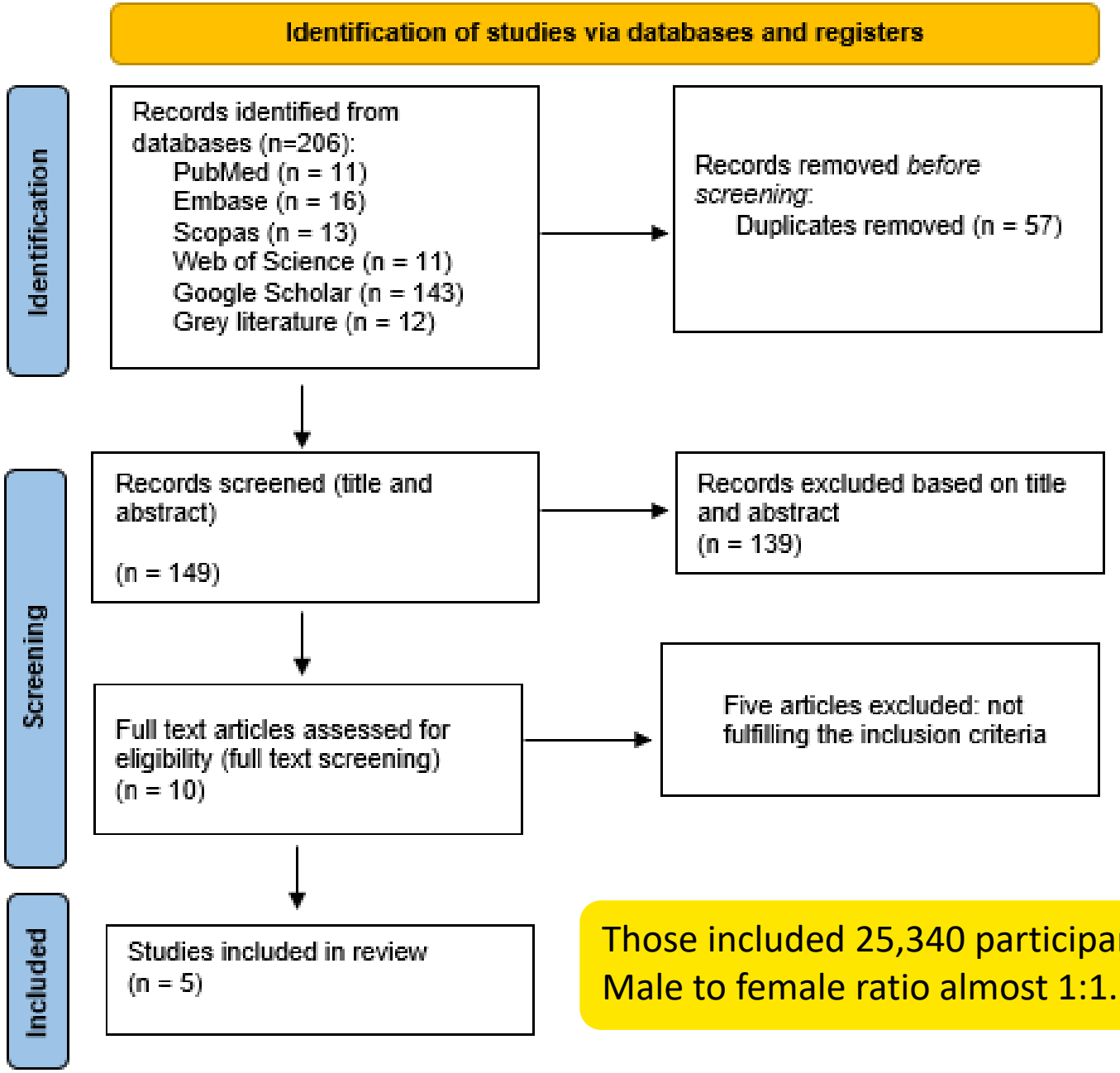
We conducted an electronic search in the relevant databases (PubMed, Embase, Scopus, Web of Science, and google scholar) in addition to gray literature search and manual search by citation chaining.

# Methodology

## Selection Criteria

| PICOTS | Inclusion criteria | Exclusion criteria |
|---|---|---|
| Target Population | Children | |
| Intervention | TCV (Typbar TCV) vaccination campaigns | Vaccination by any other vaccine type |
| Outcome | Culture confirmed typhoid cases | suspected or probable cases |
| Comparison | Non vaccinated | |
| Time | From 2018-2023 | |
| Study design | Observational studies (cross sectional- case control- cohort) | • Non-human/ in vitro studies<br>• Randomized controlled trials (RCTs)<br>• Conference papers, reviews, systematic review, modeling study, author response, editorials or letter to the editor, books. |
| Language | English | |

# Results

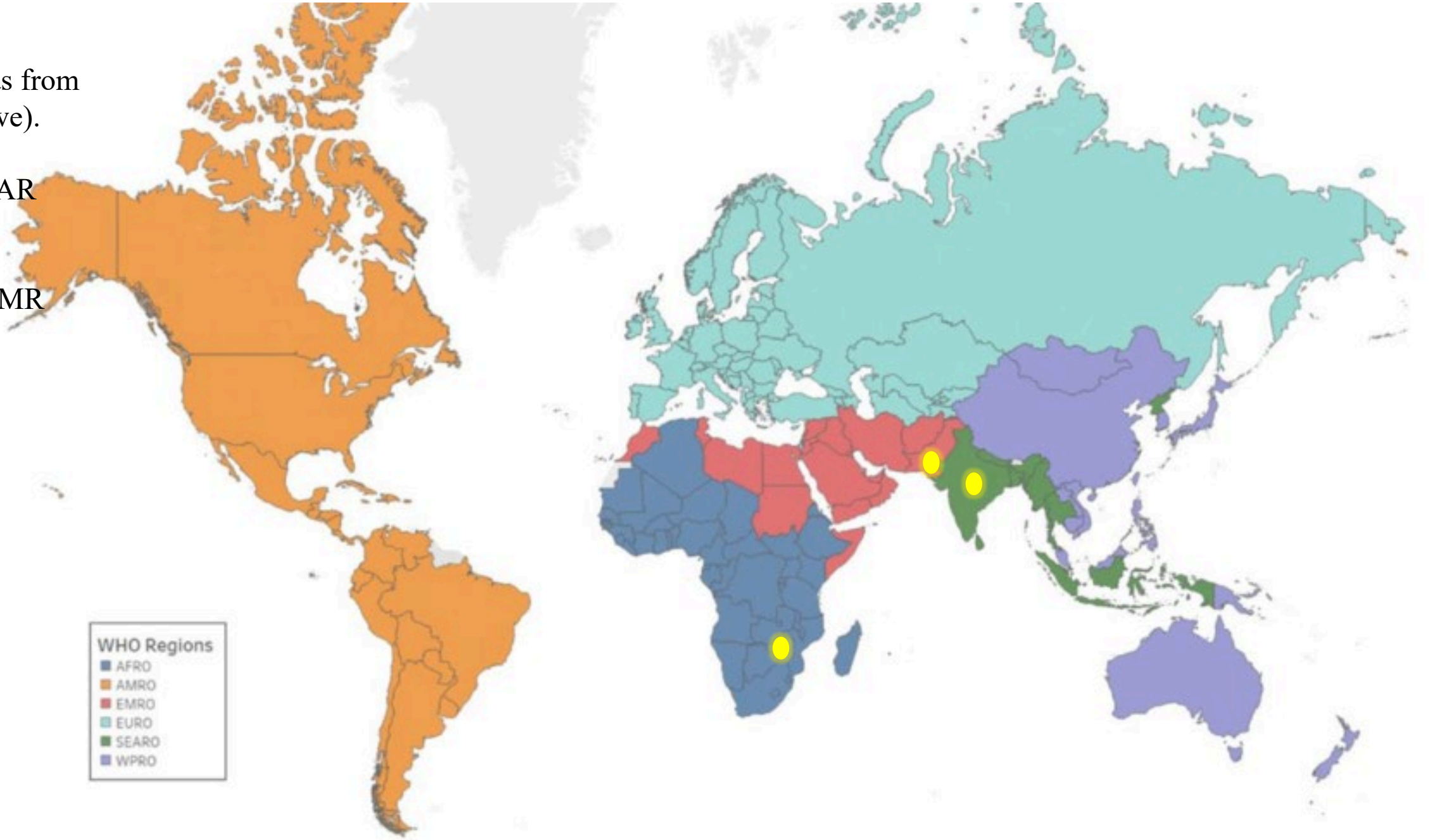



Those included 25,340 participants (aged from 6 months to 15 years).
Male to female ratio almost 1:1.

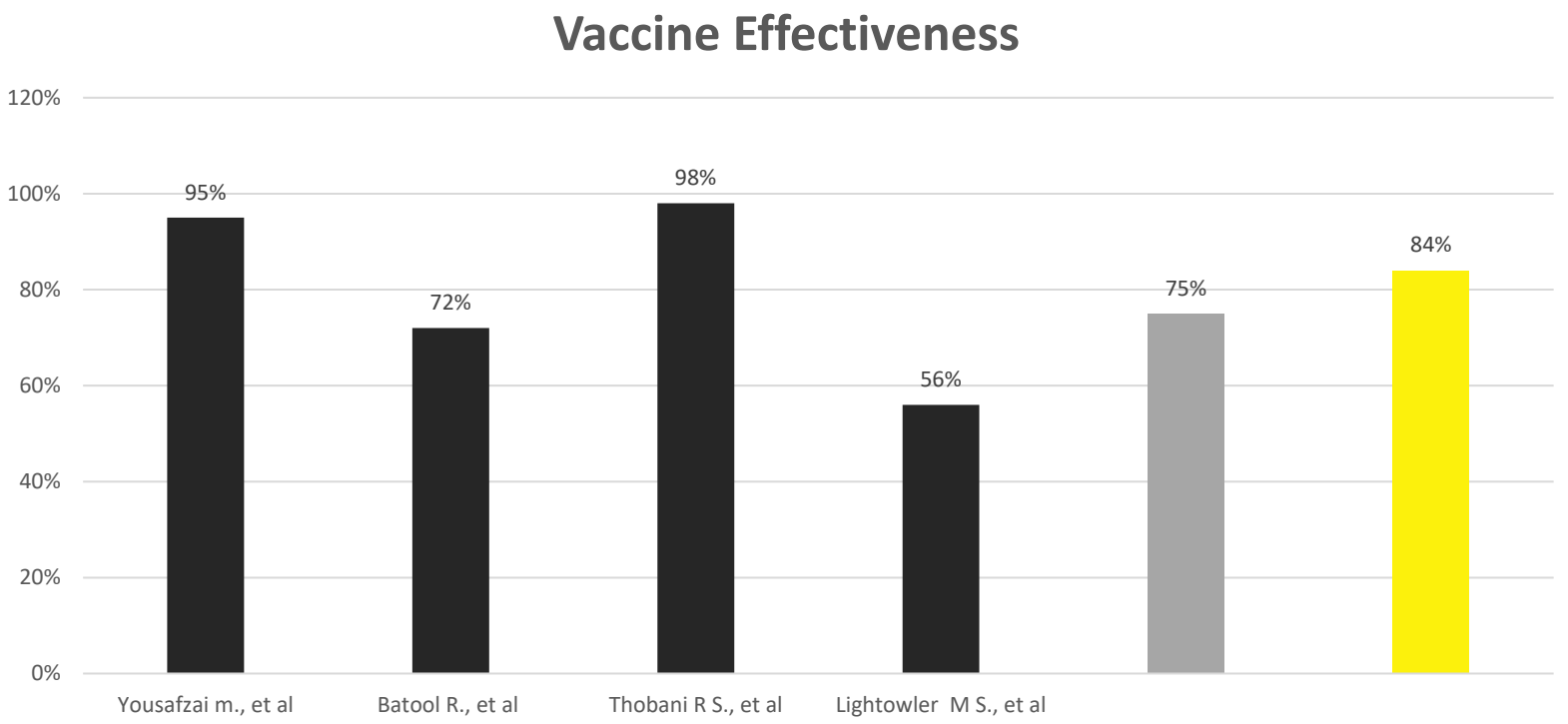
- One study was from AFR (Zimbabwe).

- One from SEAR (India).

- Three from EMR (Pakistan).



# "Vaccine effectiveness against culture confirmed typhoid"




The vaccine effectiveness (VE) against culture confirmed typhoid infection ranged from 56% to 98%

The difference in VE was probably attributed to the different context, study design, sample size, sampling strategy, criteria of selection, and the time period between the campaign and the study.

# "other outcomes"

## XDR

Extensively drug resistant typhoid (XDR) was addressed in one study in which 85% of the culture confirmed cases had antimicrobial resistance and the vaccine showed 96·7 effectiveness against XDR.

## Time

One study addressed the change in VE by time in which programmatic VE was higher during the 1st year compared to the 2nd -3rd year after the campaign.

## Risk factors

Typhoid risk factors were addressed in one study in which Eating food prepared outside the home more than once per month significantly increased the risk for contracting typhoid.

# Conclusion & Recommendation

# Conclusion and Recommendation

- A single dose of typhoid conjugate vaccine administered in campaign settings showed effectiveness in prevention of culture confirmed typhoid infection among children.

TCV is a valuable tool in typhoid protection. However, it is not likely to interrupt all transmission or eliminate the disease because:

- Although highly effective, typhoid vaccines are not 100% effective.
- Vaccine campaigns are difficult to fully reach all the targeted population groups.
- The effect on TCV on S. Typhi chronic carriers is still a question.

Thus, stakeholders and public health planners should invest more in long-term sustainable interventions such as clean drinking water, environmental hygiene, and sanitation alongside with the vaccination.

# Conclusion and Recommendation

It is important to follow and compare changes in paratyphoid trends, especially in areas with high prevalence. As TCV is a monovalent vaccine and provides protection against S. Typhi only.

# Conclusion and Recommendation

Further studies are needed to evaluate:

- The indirect protection of the vaccine “herd immunity”.More evidence is needed regarding the combined direct and indirect effects of the TCV on AMR.
- The effect of TCV on long term S. Typhi carriers.
- The field effectiveness against the antimicrobial resistant typhoid as well as the duration of its protection.


thank you