

Note: This is an earlier-stage internal document that we are publishing for the sake of transparency about an important part of our research process. Some of the links below may go to internal GiveWell documents.

See [EIR evidence review](#) for study descriptions and effect sizes.

Overview

I conducted an evidence review on (i) effect of electronic immunization registries, (ii) SMS, and (iii) decision support for vaccinators. I did not look into other kinds of support ZM provides, including training vaccinators (I thought there might be too much variation in quality/nature of training for evidence base to be that useful), GSM tracking, and predictive analytics.

Strength of evidence

Overall, I believe the evidence on electronic immunization registries (EIRs) is weak but plausible, consisting of two pre/post studies and one differences-in-differences (based on a pre/post with matched controls). The EIRs in all these studies included SMS reminders.

I believe the evidence on SMS reminders alone is moderately strong, based on a meta-analysis of 18 studies (13 RCTs, 5 non-RCTs; N=32,712). There is high heterogeneity in the effect sizes found by these studies ($I^2=90.36\%$), but the reported effects are consistently positive. The meta-analysis finds a pooled effect size of $RR=1.16$ on full immunization rates.

I did not find relevant studies on decision support systems.

See more on potential biases / limitations of each study here in the [EIR evidence review spreadsheet](#).

Main findings

All the EIRs studied also included SMS reminders, so I think the results of those studies give us our best estimate for the effect of the ZM platform (which includes the digital registry + SMS reminders).

Although the studies differ a fair amount in the percentage point effect sizes on the coverage of each individual vaccine (likely in part due to differences in baseline coverage between study contexts), the studies' reported effects on full immunization rates were fairly consistent.

I average together the effect sizes reported in all the studies of EIR + SMS reminders [in this tab of the spreadsheet](#). See the highlighted row for my best guess of effect size on vaccine take-up throughout the sequence.

Weighting:

- I put the most weight on [Nguyen et al. 2017](#) because of its large sample size, but I also weigh [Uddin et al. 2015](#) heavily because of its context being more similar to ZM's (in Bangladesh) and

its differences-in-differences with matched controls design, which may have lower bias than the pre/post design of the other studies.

- Although [Chandir et al. 2018](#) is based on the ZM platform and thus most similar to the program we're assessing, I believe it has a higher risk of bias than the other studies due to its study design. See more on the characteristics and biases/limitations of these studies [here](#).

Key mediators of effect

I didn't identify enough studies on EIRs to say much about key mediators of the intervention's effect.

For SMS reminders, the meta-analysis ([Eze et al. 2021](#)) performed several subgroup analyses. The main substantial subgroup differences were by country's income status: the effect on full coverage rates was $RR=1.39$, 1.19 , and 1.01 for low-income, lower middle-income, and upper middle-income countries, respectively ($p<0.001$).

My process

EIRs

For electronic immunization registries, I searched Google Scholar for each combination of:

- Electronic immunization registry, digital immunization registry, electronic health records, mHealth, eHealth
- AND Impact/Evidence/Evaluation
- AND Vaccination/Immunization
- AND Coverage/Takeup/Uptake

I also searched up and down the citation trails for the studies I identified (Nguyen et al. 2017, Uddin et al. 2015, and Chandir et al. 2018). I also searched the Cochrane Library for reviews on: Electronic immunization registry, digital immunization registry, electronic health records, mHealth, eHealth.

SMS reminders

I searched Google Scholar for "SMS reminders" AND immunization OR vaccination. I found two recent meta-analyses ([Eze et al. 2021](#), [Yunusa et al. 2020](#)) and one RCT published after Eze et al. 2021. All other studies I found were included in Eze et al. Yunusa et al. was not as comprehensive as Eze et al., so I went with Eze et al.

Decision support systems

I searched Google Scholar for:

- impact decision support immunization systematic review
- decision support system AND "immunization" OR "vaccination" AND "coverage" OR "takeup"
- decision support immunization coverage; decision support immunization impact

I also searched on Cochrane Library and didn't find relevant systematic reviews. I did not think about other terms this could fall under, and it's possible there are similar programs called different things that I missed.