IMPACT AND COST-EFFECTIVENESS OF COVID-19 RAPID SELF-TESTING STRATEGIES IN SCHOOLS

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BACKGROUND

- SARS-CoV-2 antigen rapid diagnostic tests (Ag-RDTs) can be used to scale up and meet testing capacity in LMICs, creating a more equitable pandemic response landscape.
- Strategic deployment of SARS-CoV-2 Ag-RDTs to the sectors of society with increased transmission potential, such as K-12 schools, can reduce the overall burden of COVID-19 within communities.

We modelled the health and economic impact of school-based SARS-CoV-2 rapid diagnostic self-testing strategies across three country contexts to determine which testing strategies may be the most cost-effective

METHODS

- We analyzed 11 different self-testing strategies within the school-going population at three testing frequencies under 24 different epidemic conditions (**Table 1**) comprising a total of 696 scenarios for three country archetypes (***Brazil, Georgia, Zambia***).
- Strategies included **symptomatic testing**, and in addition to symptomatic testing, **asymptomatic testing at 5, 20, 40 or 100% of schools**, or **asymptomatic contact testing,** targeted to either only teachers or teachers and students. The cost to offer a COVID-19 self-test in schools was assumed to be USD 2.50.

Table 1. Epidemic model parameters.

Parameter	Values
Effective reproductive number (*Rt*)	0.9, 1.2, 1.5, 2.0
Vaccination coverage	10%, 50%, 80%
Vaccination effectiveness	30/70% protective against infection/severe disease 70/90% protective against infection/severe disease

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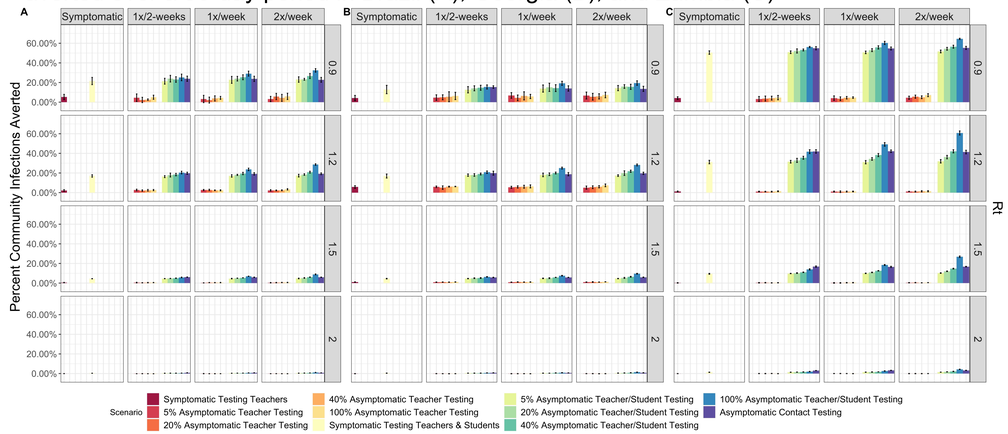
When financial resources are limited, symptomatic COVID-19 Ag-RDT self-testing of teachers and students is the most ***cost-effective*** strategy to reduce SARS-CoV-2 infections in schools

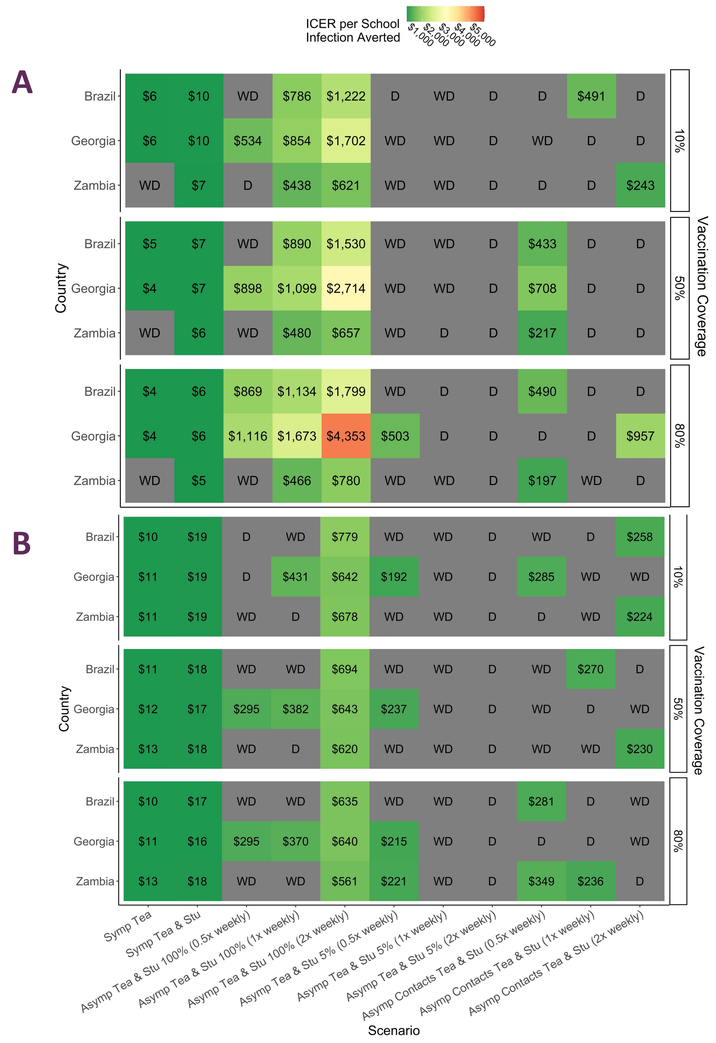
Figure 1. Impact of different school testing strategies on community-level infections averted over a 90-day period in Brazil (A), Georgia (B), and Zambia (C)



RESULTS

- Symptomatic testing of all teachers and students can prevent up to 22%, 17%, 51% of community infections in Brazil, Georgia and Zambia respectively over a 90-day epidemic wave (**Figure 1**)
- Symptomatic testing of teachers and students, as well as asymptomatic testing twice weekly of teachers and students at 100% of schools, were on the cost-effectiveness frontier for every country and epidemic context (**Figure 2**)
- Symptomatic testing of both teachers and students can prevent 30.9–69.3%, 33.7–64.5%, 22.8–75.5% of school infections in Brazil, Georgia, and Zambia, across all epidemic scenarios, while asymptomatic testing at 100% of schools for teachers and students can prevent 40.5–90.7%, 47.8–91.2%, 31.2–92.5% of school infections, respectively.

Figure 2. Incremental cost-effectiveness ratios of COVID-19 self-testing strategies in schools by country at Rt 1.2 (**A**) and 2.0 (**B**). Weakly dominated (WD) and Dominated (D) are scenarios that were not on the cost-effectiveness frontier.



CONCLUSIONS

Routine asymptomatic testing of teachers and students at 100% of schools reduced the greatest number of infections across contexts, but at the greatest cost

With respect to the reduction in infections and total cost, symptomatic testing of all teachers and students is the most efficient strategy