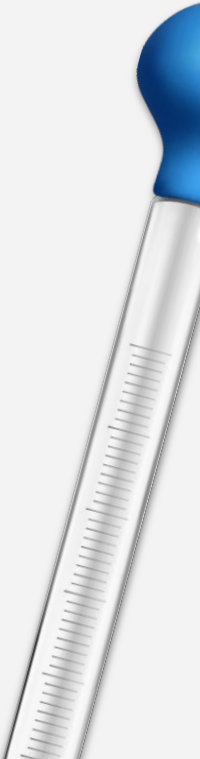
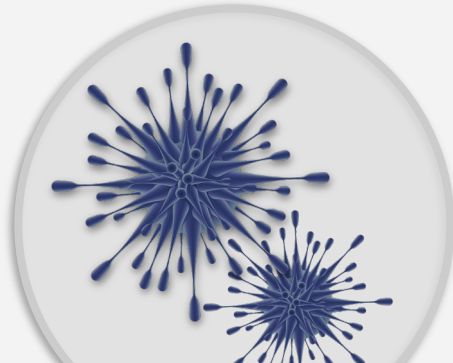
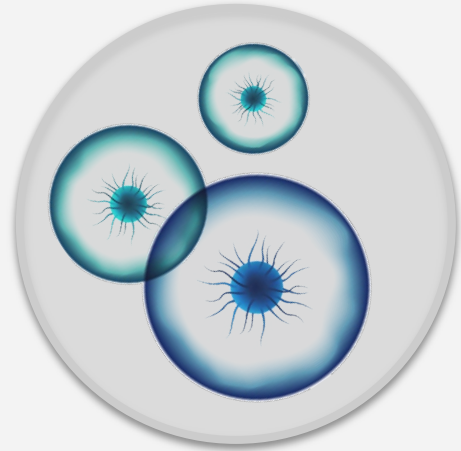
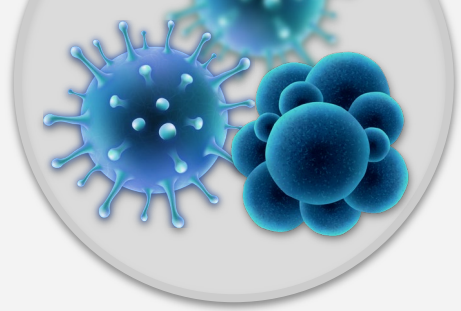


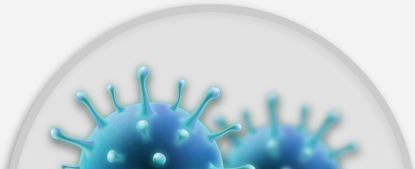
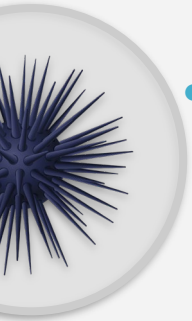
OPTIMIZING ROTAVIRUS VACCINE EFFICACY THROUGH ADVANCED COLD CHAIN SYSTEMS IN RURAL UGANDA

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BACKGROUND OF STUDY

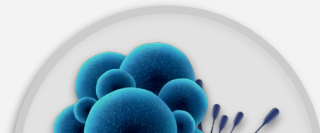
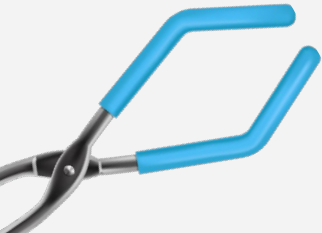
- Rotavirus → leading cause of severe diarrhea in children <5 in Uganda
- Vaccine works but is temperature sensitive(2-8 degree celsius)
- Rural districts face power outages, long transport, poor roads → risk of reduced vaccine potency
- Cold chain → “life support” for vaccines



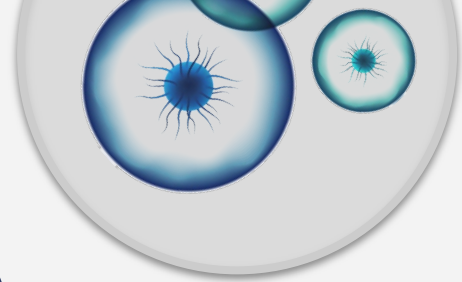
OBJECTIVES

To evaluate the impact of portable solar powered cold chain units on;

- Vaccine temperature stability.
- Vaccination coverage
- Seroconversion(immune response)
- Diarrhea incidence and mortality in rural Uganda



METHODS OVERVIEW

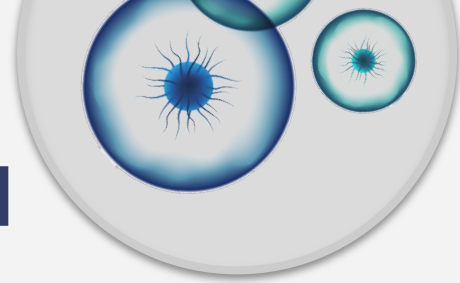


- Design; mixed - methods trial(2023 -2025)
- Population; 23,000 children under 5 across 3 districts
- Intervention; rugged portable solar cold chain units for transport and storage
- Quantitative; DHIS -2 data for coverage and diarrhea incidence; lab tests for seroconversion.
- Qualitative; 40 focus groups (care givers and health workers)
- Analysis; logistic regression and Kaplan -Meier ($p < 0.05$)



COLD CHAIN INTERVENTION

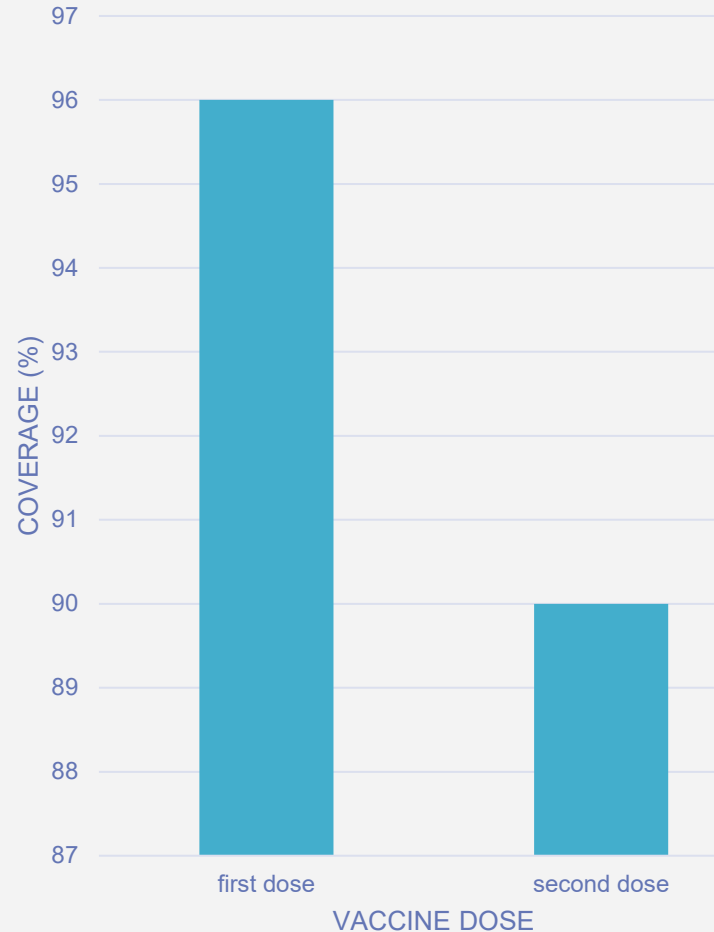
- Portable solar powered
- Rugged for rural transport
- Continuous temperature monitoring
- Performance; 98% stability in 2 -8°C range



COVERAGE RESULTS

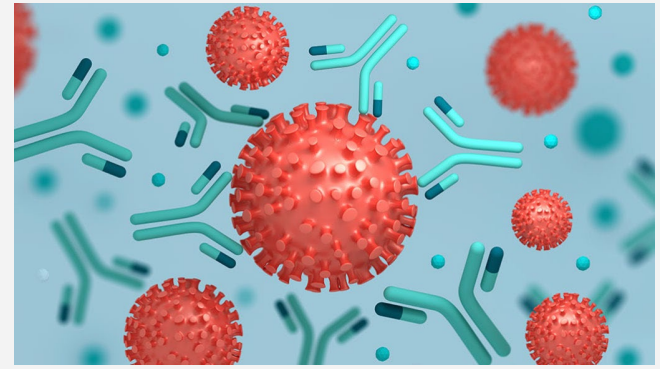
- First dose; 96%
- Second dose; 90%
- Small drop - off between doses(likely due to access and follow -up challenges)
- Higher coverage sustained even in remote communities

BAR GRAPH SHOWING DOSE 1 VS. DOSE 2 COVERAGE



SEROCONVERSION

- Measured anti - rotavirus IgA via ELISA
- Blood before dose 1 and 4 weeks after dose 2
- 94% seroconversion - strong immune response comparable to or better than controlled trial results in similar settings

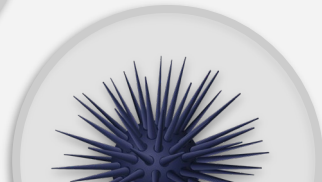
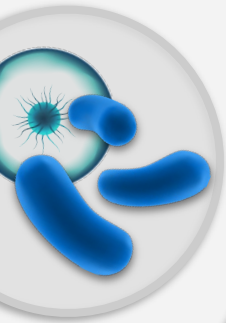


HEALTH IMPACT

For every 1% increase in coverage → 2.5% drop in diarrhea incidence($p < 0.001$)

Estimated 2700 deaths averted annually(modelled)

Greatest impact in most remote areas



COMMUNITY FEEDBACK

85% of care givers confident in vaccine quality($p < 0.01$)

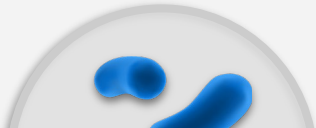
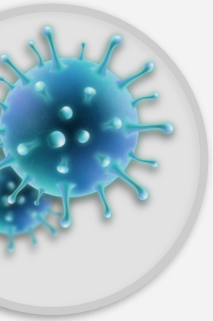
Health workers reported improved reliability and reduced wastage

High acceptability for continued use



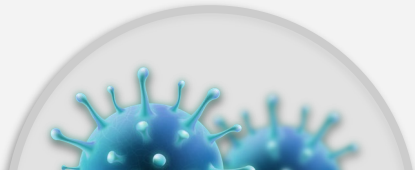
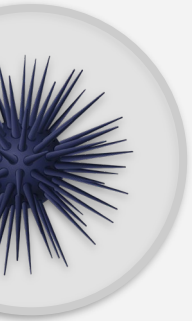
LIMITATIONS

Other factors like nutrition, sanitation may contribute to diarrhea trends cost effectiveness analysis still needed for scale-up planning



CONCLUSIONS

- Portable solar cold chain units improved vaccine storage, coverage and immune response
- Reduced diarrhea incidence and potential deaths
- Scalable model for sub-Saharan Africa
- Should be prioritized in remote area immunization programs



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THANK YOU FOR LISTENING

DO YOU ANY QUESTIONS

