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Effectiveness of Participatory Strategies for Prevention of Dengue and Leptospirosis: A Two-Year Controlled Community Trial in Santa Fe, Argentina

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INTRODUCTION & AIM

The city of Santa Fe (Argentina) is highly exposed to environmental conditions that favor outbreaks of dengue and leptospirosis. Official public health campaigns often rely on top-down compliance-based approaches, underestimating the potential of community participation. This study aimed to quantify the effectiveness of participatory strategies compared to conventional methods through controlled community trials in four riverside neighborhoods with similar socio-environmental conditions.

METHOD

Study Design: Longitudinal pre-post design (2024/2025) across 4 sites (n = 80 households each).
Intervention: Health promoter training based on Popular Education and Participatory Action Research (PAR) (collective mapping, community dialogue)(Figure 1).
Control: Traditional, top-down public health campaigns.
Analysis: Evaluated via Generalized Linear Mixed Models (GLMM) tracking KAPP indicators, Aedes aegypti (larvae/adults), and rodent activity (hair traps).

Figure 1: Community health promoters conducting collective territorial mapping during the PAR cycles.

RESULTS & DISCUSSION

Significant interaction effects were found across all biological indicators ($p < 0.05$)

Biological Risk Indicator	Observed Reduction (%)	Odds Ratio (OR)*	p-value
Potential larval breeding sites	39%	0.61	< 0.05
Active larval breeding sites	41%	0.59	< 0.05
Adult Aedes aegypti abundance	31%	0.69	< 0.05
Rodent activity (hair traps)	44%	0.56	< 0.05

** OR < 1 indicates lower probability of occurrence in the participatory group compared to control. Analysis conducted via Generalized Linear Mixed Models (GLMM) evaluating the treatment × time interaction effect.*

Community participation also triggered a significant increase in KAPP scores, shifting community risk perception and knowledge.

CONCLUSION

Participatory methods demonstrate greater efficacy than traditional approaches in reducing biological risk indicators. Community empowerment acts as a cost-effective strategy by fostering social sustainability, reducing dependence on recurring chemical interventions, and mitigating the risk of zoonotic disease transmission in vulnerable settings

FUTURE WORK

Institutional scaling: Integrate the Participatory Action Research (PAR) framework into municipal public health policies for broader urban replication.
Economic evaluation: Conduct a cost-effectiveness analy comparing long-term community-led strategies against recurring vertical chemical interventions.
Climate resilience tracking: Model the intervention's efficacy against extreme climate events (e.g., severe flooding in Santa Fe riverside areas).