

## ***Integrated multiplex serosurveillance for neglected parasitic and co-endemic infections in the Philippines: population-level evidence from the Philippines***

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### **Abstract**

Routine surveillance in the Philippines relies mainly on health facility reporting and incompletely captures neglected parasitic infections. Helminth and protozoan transmission is usually assessed using stool diagnostics, which are logistically challenging and insensitive in low-intensity settings. Serological markers offer an alternative to measure cumulative and recent exposure. We evaluated multiplex serology for integrated parasitological surveillance in Rizal, Palawan, including co-endemic infections.

Dried blood spots were obtained from archived health facility surveys (2017–2018; n=1,958) and a community survey (2021–2022; n=1,125). Samples were analysed using magnetic bead-based multiplex assays on Luminex platforms. Parasitic markers included antigens from *Giardia lamblia*, *Strongyloides stercoralis*, and *Taenia solium*. Additional markers included dengue (four serotypes), chikungunya, bacterial infections causing trachoma (*Chlamydia trachomatis*) and yaws (*Treponema pallidum subsp. pertenue*), and tetanus toxoid as a vaccine coverage indicator. Seropositivity thresholds were defined. Age-specific seroprevalence and catalytic models estimated transmission intensity.

Helminth and protozoan markers showed moderate seropositivity with age-related acquisition consistent with cumulative exposure. Dengue seropositivity was high and increased with age. Bacterial markers showed lower to moderate exposure. Age-seroprevalence patterns were similar in health facility and community samples. Household mapping demonstrated spatial clustering of parasitic and multi-pathogen exposure.

Multiplex serology provides age-structured and spatial measures of exposure while enabling integrated assessment of co-endemic infections. This approach complements conventional diagnostics and supports transmission monitoring and programme evaluation in endemic settings.