Measles seroprevalence after repeated epidemics and reactive vaccination campaigns in Magaria and Mirriah, Niger in 2023

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Background

- Magaria and Mirriah Districts have had multiple measles epidemics since 2018
- Reactive vaccination campaigns were conducted in 2018, 2019 and 2022
- Studies in similar contexts in DRC have shown lower than expected measles seroprevalence after vaccination campaigns.
- Discrepancies between expected and observed seroprevalence could be due to host factors, vaccines, the tests used to measure seroprevalence, or laboratory techniques.

Conclusions

Measles seroprevalence in this study was lower than expected based on reported vaccination coverage, mirroring similar studies in other settings

Further investigations of laboratory techniques and methods are ongoing, and could provide insight into this apparent discrepancy

Photo credit: Céline Langendorf

Reported two-dose vaccine coverage was high, but few children had written proof of measles vaccination, either in EPI settings or in reactive vaccination campaigns.

Findings

- 936 children were enrolled
  - 50.2% female, median age 5 years (IQR 3-9)
- Recent (within 2 years) history of measles infection:
- Magaria: 2.1%, [1.1-4.1], deff 1.2
  - Mirriah: 4.9%, [3.1-7.8], deff 1.3

There were no differences in seroprevalence by age, sex, recent history of measles infection, nor by total number of doses of measles vaccine received.

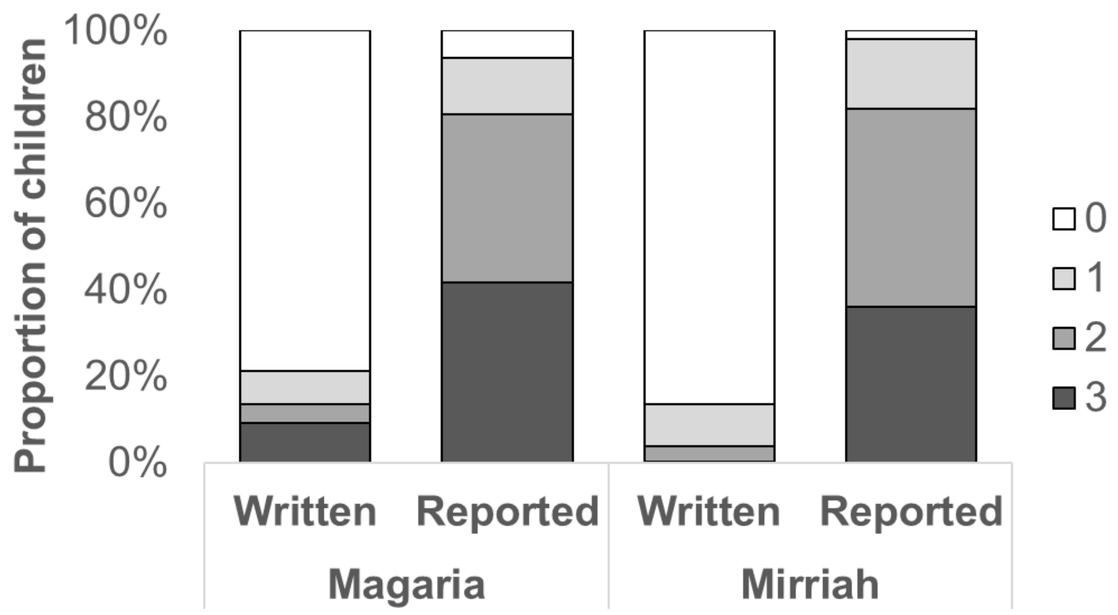

Figure: Number of doses of measles vaccine received, in campaigns and routine settings, with written proof, and when reported vaccination is also considered, by district.

Primary results: seroprevalence by district

Magaria: 59.8%, [54.1-65.3], deff 1.5

Mirriah: 68.8%, [63.9-73.3], deff 1.2

Discrepancies between expected and observed seroprevalence could be due to host factors, vaccines, the tests used to measure seroprevalence, or laboratory techniques.

Methods

- A cross-sectional survey using two-stage spatial cluster sampling was performed in September-October 2023.
- 78 clusters of 6 households with ≥1 child aged 1-14 years were selected randomly in each district.
  - First stage: probability proportional to size sampling
  - Second stage: random selection of roofs using satellite imagery
- Sample size provides 80% power to demonstrate a seroprevalence of 60% with 5% precision, assuming a design effect of 1.2.
- One child selected per household
  - Questionnaire on medical and vaccination history
  - Capillary blood collected directly onto filter paper
- In one participant per cluster, additional capillary and venous blood samples were collected to explore seroprevalence when using different specimen types (results not shown).
- ELISA (Anti-measles Virus ELISA IgG, EuroImmun) was performed and interpreted according to manufacturer's instructions.

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