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Reaching semi-nomads for NTD programmes in Cameroon

Research summary

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Introduction

Onchocerciasis is a parasitic disease caused by a nematode worm, *Onchocerca volvulus*, that is transmitted to humans through the bites of infected blackflies of the genus *Simulium*, which breed in fast-flowing rivers and streams. The infection can cause skin lesions, severe itching and ocular disorders including visual impairment which can lead to irreversible blindness. In 2019, the World Health Organization (WHO) estimated that 217.5 million people are at risk of infection. Currently, the main strategy for the elimination of onchocerciasis is annual mass treatment using ivermectin. In some specific areas and contexts, alternative treatment strategies are currently being considered.

Semi-nomads are traditional groups of hunter-gatherers and pastoralists who do not have a fixed habitation and regularly move about. Sometimes, they have a temporal base which they return to seasonally. They often face inequity in health interventions including MDA for neglected tropical diseases (NTDs).

In the Massangam Health District of Cameroon's West Region, semi-nomadic minority people are being missed for treatment during ivermectin mass drug administration (ivm MDA). This study designed and trialled strategies to reach this group of people with ivm MDA and an alternative treatment strategy (ATS) – test and treat with doxycycline against onchocerciasis. We then evaluated the strategies for participation, impact and cost. In doing so, we also explored the semi-nomadic population and determined the onchocerciasis rate (prevalence) among them.

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The alternative strategy, test and treat with doxycycline (TTd), involved collecting skin samples (snips) from participants, examining them under the microscope and providing a 35 day daily doxycycline 100mg treatment to those found with an infection. After collecting samples, ivermectin treatment was offered to all, including those not participating or eligible for TTd.

Why is this issue important?

As well as the implicit equity concerns with the exclusion of this semi-nomadic group in the treatment of NTDs and other health interventions, there is a risk that they could now, or in the future, constitute a roaming reservoir of transmission and will impede onchocerciasis elimination efforts. This study provides valuable findings which directly inform Sightsavers' own NTD programmes on why and how to reach and include nomadic, semi-nomadic, remote or mobile populations for treatment.

What do the research findings tell us?

Key messages

- The semi-nomadic population are at risk of becoming a reservoir for ongoing transmission and specific programming is needed for them. The semi-nomadic population is very young (median age 15 years, mean age 19.5 years) and dynamic with a turnover rate of 47% (364 immigrant and emigrants) over one year. They have a high prevalence of onchocerciasis (17.2%) and low MDA participation (38% in previous ivm MDAs). As a result, specific programming is required to reach them.
- Mobile outreach to semi-nomadic groups was successful. A strategy that reaches semi-nomads at their camps through nomad-specific engagement and sensitisation increased participation compared to previous programmes. Improving engagement with this population is critical in MDA as well as in other interventions. Programmes that reach everyone in the risk zone are necessary. This includes adapting the programme sensitisation materials, integrating leaders in planning processes and extending it to them.
- Test and treat with doxycycline was impactful and may be a good strategy for this and similar contexts. In one year, the strategy reduced the prevalence and intensity of infection significantly. Combining ivm MDA with test and treat was acceptable and boosted MDA coverage. The cost of a single round of test and treat was 76 USD per person tested and 307 USD per positive individual fully treated with doxycycline. In situations with high turnover and hard-to-reach populations, long term ivm MDA may not be the most feasible or effective option, and a test and treat or combined strategy delivered one or two times may be preferable and efficient.
- Combining community knowledge and GIS tools to identify hard-to-reach populations is important. This can be done once at the beginning of intervention or at any point during implementation when detailed and accurate coverage information is required. It is a good way to discover unoccupied camps (that could be occupied in the future), detect unknown places by the community and increase the ceiling of where settled communities can top out.
- GIS tools developed in this research could be re-purposed for other contexts and programmatic needs. Satellite imagery allowed for community knowledge to be verified. Furthermore, using GIS tools, some semi-nomads were found outside community boundaries but within the risk area. This knowledge boosts coverage of the hardest-to-reach communities and ensures that MDA coverage estimates are accurate. The tools can be repurposed for precision during breeding mapping and surveys. These are needed, more than ever, at this time of elimination when the challenge of reaching mobile and/or remote places/sub-groups such as the Maasai people in Tanzania and Kenya, Fulani in Nigeria and Cameroon or Karamojong in Uganda requires an urgent

Summary

What we did:

Based on the challenges faced in reaching the semi-nomadic groups identified in previous work, we adapted strategies to better reach semi-nomads which included nomad-specific mobilisation, sensitisation and engagement, satellite-based identification of camps, mobile outreach to camps, updated timing and adapted treatment monitoring. These adaptations were then rolled out in the field. All eligible individuals within semi-nomadic communities were targeted for TTD and ivm treatment with the testing undertaken at roll-out constituting the baseline. The impact was measured through an exhaustive sampling endline survey. With the result of the roll-out showing an unsatisfactory reach of satellite-identified camps, an interim verification of semi-nomadic camps was undertaken alongside the endline survey. Activity costs were tracked and categorised into specific project activities and the cost per person tested and per person treated was determined.

Results:

The test and treat intervention: participation

47% of the eligible nomad population participated in the testing process (skin snip biopsy). This is an improvement on another study in the area which had no specific interventions to target nomadic groups. In this study, only 30% of semi-nomadic population were tested. However, close to 54% of the individuals tested came from the settled community.

All 20 people with the infection successfully completed a 35 day course of daily 100mg doxycycline treatment without any noted inferences to their normal routine. 59% of semi-nomads, up from 39%, previously took part in ivm MDA.

The test and treat intervention: impact

The strategy was successfully implemented and it created more engagement and participation from the semi-nomads. In one year, the strategy reduced the prevalence and intensity of infection significantly. Out of the 10 people treated and retested, all were negative by microscopy and only one was positive by PCR. As expected, this shows that treatment with doxycycline clear macrofilaria measured through mf (proxy of macrofilariae) in almost all those treated in a one-year timeframe, from a place with a high infection rate and after more than 20 years of annual ivm treatment, would have still need multiple years of rounds of MDA to clear macrofilaria.

Onchocerciasis prevalence in the nomadic population

An infection rate (prevalence) as high as 17.2% was found, this is the best estimate from the baseline and endline surveys from the semi-nomads. Being a young population, the profile of infection is different from the usual and as the population grows older, the infection rate may increase as the exposure to onchocerciasis infection grows.

Semi-nomadic population dynamics in this area

The total number of occupied camps was 62. At the time of the baseline survey, 748 people were living in the camps, but this number fell to 624 at the endline. This gives an average of 686 and a cumulative population of 862. At the endline, the population had reduced by 17% (124) as 238 (32%) individuals emigrated and 114 (15%) joined the communities. This gives a population turnover rate of 47% (364) from the baseline. The mean age of the semi-nomadic population is 19.5 years, and the median is 15 years. 48% of the population are females and 52% are males. People aged 25 years and below constituted 72% of the semi-nomadic population.

Success of community identification with satellite imagery

94% of all occupied camps were identified by the community. 49% of camps identified by satellite imagery and visited using GIS tools turned out not to be camps. Meanwhile, 14% turned out to be unoccupied. Community sensitivity is high (85%) compared to satellite (65%). Similarly, community specificity is higher than satellite (100% vs 32%). Combining both methods produces a sensitivity of 100% and a specificity of 58%. However, it is important to state that the satellite imagery was used for the first time and its role was to verify uncertain feedback.

Limitations and suggestions for future research

This research focused on a small area. Further research on nomadic or remote populations in other epidemiological contexts will be beneficial to understand how these hard-to-reach populations can impact elimination and lead to tailored programming. It will also be useful in setting up and/or improving a post-elimination surveillance strategy.

Learn more about

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- **Read the full report here**
- Learn more about field implementation here:
 - <https://www.sightsavers.org/from-the-field/2020/11/research-finding-nomadic-communities/>
 - <https://storymaps.arcgis.com/stories/ce5e07ab62ab4f3fa920e46f27567a82>
 - <https://www.youtube.com/watch?v=vKjq9VGkkFc>
 - <https://www.ntdsupport.org/cor-ntd/blog/finding-nomadic-communities-sightsavers-research-action>
 - <https://www.globalcitizen.org/en/content/the-last-milers-Kareen-Atekem/>
 - <https://www.sightsavers.org/blogs/2020/07/nomadic-communities-covid-19/>
- A paper based on this research is being written for publication in: **PLOS Neglected Tropical Diseases**
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