

## Key traveller groups of relevance to spatial malaria transmission

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As people become increasingly mobile, their movement is becoming increasingly relevant to disease transmission. The importance of this to malaria transmission is highlighted by the failure of the Global Malaria Eradication Program during the 1960s that, among other factors, was attributed to the movement of people re-introducing malaria parasites in elimination settings and spreading drug-resistant parasites. Despite its importance, critical knowledge gaps exist regarding human movement in sub-Saharan Africa, where over 90% of the global malaria burden is concentrated.

To address this, we conducted surveys of travellers and their movement patterns in Mali, Burkina Faso, Zambia and Tanzania. Our surveys included questions about demography, recent travel, malaria risk, bed net ownership and children accompanying family members. We also asked questions about cell phone usage, to enable anonymous cell phone signal data to be better-correlated with movement patterns.

We found that women travelling with children are a remarkably consistent traveller group of relevance to malaria transmission. While they are more likely than other travellers to own a bed net in some countries (Burkina Faso OR = 1.77, 95 % CI = 1.25–2.53 and Zambia OR = 1.74, 95 % CI = 1.34 – 2.27), they are more likely to travel to areas of high malaria prevalence in all countries surveyed with odds ratios of 4.46 (95 % CI = 3.42–5.83) in

Mali, 1.58 (95 % CI = 1.23–1.58) in Burkina Faso, 1.50 (95 % CI = 1.20–1.89) in Zambia and (OR 2.28 in Tanzania (95 % CI = 1.71–3.05). The children that accompany them are particularly susceptible to malaria infection and have less developed immune systems, enabling them to contribute greatly to parasite dispersal. Our study also highlighted youth workers as a key traveller group of relevance to parasite dispersal in Mali: they were more likely to travel to areas of relatively high malaria prevalence (OR = 23, 95 % CI = 17–31) and for longer durations (mean of 70 days versus 21 days,  $p < 0.001$ ) compared to other travellers. This is largely due to their agricultural labour trips coinciding with the rainy season, when malaria risk is highest.

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### Reference:

1. Marshall JM, Touré M, Ouédraogo AL, et al. Key traveller groups of relevance to spatial malaria transmission: a survey of movement patterns in four sub-Saharan African countries. *Malaria Journal*. 2016;15:200.