Porous borders, mobile migrants and malaria elimination:
Estimating population size and movements of artisanal small-scale gold mining workers in Suriname and French Guyana

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Background and introduction

Globally, porous borders and mobile migrant populations pose a substantial challenge to malaria elimination efforts [1]. Along the Guyana shield, mobile migrant populations (MMPs) active in the artisanal small-scale gold mining (ASM) sector are increasingly vulnerable to malaria [2]. Suriname has made great strides in malaria control, now aiming for elimination [3]. MMPs along its borders are key targets for malaria interventions as they account for the only imported cases [4]. Challenges in locating and reaching MMPs include remote locations, language barriers, and legal complexities [5], making the ASM population hard to measure [6], similar to other populations engaged in illegal or semi-legal activities.

Rationale

In order to adequately manage malaria testing and treatment, and to progress towards malaria elimination, the Surinamese Malaria program is in need of adequate **estimates of population size, turnover, and mobility patterns of the MMPs**. To this end, a mobile migrant study was conducted in 2020-2021.

Methodology

The study employed a triangulated methodology to capture a comprehensive picture of the ASM MMP. A **desk review** was employed to identify previously published data on MMPs. **Quantitative methods** included a survey, and network analysis through phone calls to all mining areas in Suriname. **Qualitative methods** included in-depth interviews with ASM communities and consultations with key experts in Suriname and French Guiana, aimed at contextualizing the obtained numerical data and to capture lived experiences of the population.

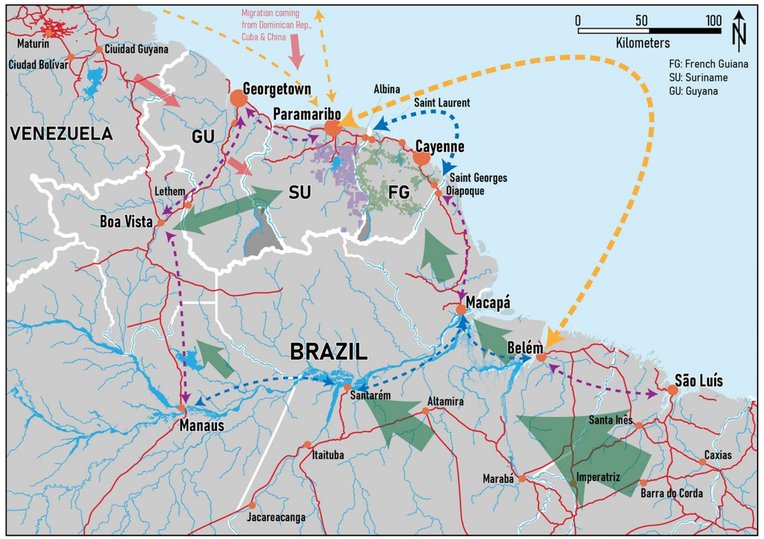

Figure 1: Mobility patterns of Artisanal Small-Scale Gold Mining Mobile Migrant Population in the Guiana Shield area

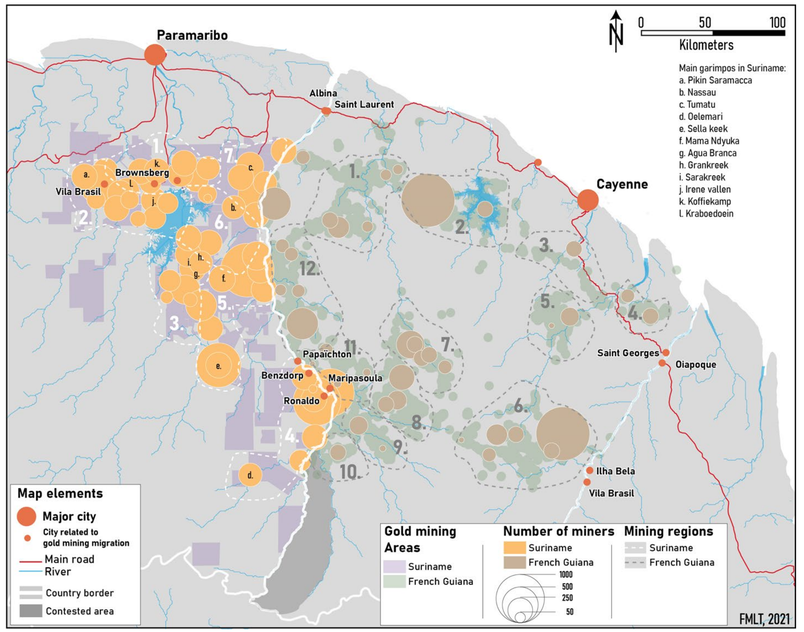

Figure 2: Location and estimated size of ASM gold mining areas in Suriname and French Guiana

Table 1: Estimates of Artisanal Small-Scale Gold Mining Mobile Migrant Population Size in Suriname and French Guiana

Population estimate (mean)	Population estimate Margin (Low-High)	Source	Method
		Suriname	
21,823	16,500 – 30,000	SHMR, Paansa, Newmont	Expert estimates
19,146	15,317 – 22,975	Quantitative survey, population headcount, phone calls	Per site estimates
17,500	14,000 – 21,000	Deforestation data (2018, SBB)	National ASM-induced deforestation / team / person
21,572	17,257 – 25,886	Gold production	Divided by area / team / person
		French Guiana	
12,300	9,840 – 14,760	Quantitative survey	Wisdom of the crowd
11,807	8,938 – 14,675	Malakit program	Expert estimates
8,978	7,182 – 10,773	Gold production data	Divided by area / team / person

Recommendations

Annual monitoring of migrant populations using the methods based on secondary data outlined here, focusing on highly mobile subgroups for disease prevention, utilizing social networks for risk communication, and expanding the Malaria Service Deliverers Network's reach for at-risk workers. Additionally, efforts should be made to build political support for malaria diagnosis and treatment in French Guiana's mining areas.

Results

In terms of population size, estimates from our study (see table 1 and figure 2) show convergence as they are strikingly similar across the different methods used. For **Suriname**, the mean figures suggest an ASM population of approximately **20,000 persons**, whereas for **French Guiana**, the ASM population estimates are around **11,000 persons**. These figures represent the population of gold miners in addition to those providing services, up to **a total of around 31,000 individuals that are currently active in the ASM sector across French Guiana and Suriname**. The data suggest population turnover of approximately 10,5% of which 95%, or some 2,000 persons annually, are newcomers to the sector in Suriname and French Guiana (data not shown).

Mobility patterns are displayed in figure 1. Populations with elevated risk of malaria transmission due to frequent cross border movement include Maroons (total estimated population 50,000-100,000), High- and lowland indigenous people (10,000), and around 1,000 Asian and Brazilian workers active in the logging industry.