



RESEARCH ARTICLE

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HEALTH CARE OF BRAZILIAN WOMEN WORKING IN CLANDESTINE MINING SITES WITHIN THE FRENCH AMAZON RAINFOREST

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ABSTRACT

Objective: This study aims to understand how health care is offered to Brazilian women working in clandestine mining sites in the French Amazon rainforest. **Methodology:** A qualitative study was carried out with 19 women working in clandestine mining sites in the French Amazon rainforest, who were predominantly aged between 30-39 years. A non-directive interview was conducted, recorded, and transcribed in its entirety. Data were analyzed through content analysis. **Results:** During analysis, three thematic categories were found: major diseases that affect women in the mining site, which were predominantly cited as malaria and cutaneous leishmaniasis; access to health care services, which are accessed predominantly in cities within French Guiana; and treatment of diseases, mainly carried out at the mining site. **Conclusion:** This study showed that the health and illness contexts of women in clandestine mining areas are critical. Access to health services is limited and health problems are mainly malaria, leishmaniasis, anemia and asthenia, which are solved in the garment environment, usually with the use of medicines from French Guiana.

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INTRODUCTION

The border between Brazil and French Guiana has a high concentration of gold ore, which leads to the creation of clandestine mining sites in the region (Douine *et al.*, 2017). The population that resides within these clandestine mining sites exerts high mobility between countries, and this population is not easily accessed owing to logistical, administrative, and security reasons (Franco *et al.*, 2019; Douine *et al.*, 2017, Neto and Neto, 2017).

Consequently, the rapid spread of diseases in this region is facilitated owing to high transboundary flow of migration, coupled with the humid tropical climate of the Amazon rainforest and the precarious living conditions in the mining sites (Douine *et al.*, 2017; Mosnier *et al.*, 2013). However, there are still gaps regarding the problems affecting the health of Brazilians in the clandestine mining sites at this border (Wilches-Gutierrez and Documet, 2018). Furthermore, the characteristics inherent to the female anatomy, combined with gender inequalities, stigma, and clandestinity associated with the geographic isolation of the region in this study, increase the health vulnerability of women who conduct illegal mining activity (Douine *et al.*, 2017). With that in mind, and based on the commitments assumed in the 2030 Agenda for

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Sustainable Development (ASD)—whose priority goals and policies are health promotion and gender inequality (Organização Mundial de Saúde, 2016)—an interest emerged as to understanding how Brazilian women working in clandestine mining sites have access to health services.

MATERIALS AND METHODS

A qualitative, exploratory-descriptive study was carried out in Ilha Bela, the resting place of the local prospectors (Neto and Neto, 2017). Recruitment was carried out using the snowball technique (Sadler et al., 2010), employed to reach groups that are difficult to access. Following were the participants' inclusion criteria: being female, Brazilian, and being experienced in the work routine at clandestine mining sites in the French Guiana. Women who were under the influence of alcohol or other drugs were not included in the study. In total, 19 women matched the selection criteria and were interviewed in this study. Regarding nationality, most women were born in the states of Amapá, Maranhão, and Pará. Black and brown women formed the majority group. Most women were never taught to read or to write nor did they finish elementary school. The predominant marital status was the common law marriage; the women declared to live with a partner.

The researcher remained in the field for 15 days. Data collection took place in April 2018, using a sociodemographic data form and conducting non-directive interviews in a separate place. The interviews were recorded in audio format, listened to by the researchers for validation, and fully transcribed, with an average duration of 45 minutes. The guiding question was: How is access to health services provided in the mining site? The procedure for analysis and organization of data was in accordance with the Content Analysis method (Bardin, 2016). A transcription was carried out; data were analyzed, interpreted, and organized; finally, the corpus was established. The analytical categories were grouped according to the identification of related characteristics among them (Bardin, 2016); three thematic categories were found: major diseases affecting women in the mining site; access to health care services; treatment of diseases in the mining site. After the categories were established, inferences were made on the material, coupled with a discussion with the relevant literature. This study respected the national and international regulatory requirements for research involving human beings, CAAE number 87073818.9.0000.0003. The Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines were also employed to comply with the methodological rigor of qualitative research. The statements were identified by a letter P (Participant), followed by the numerical order in which they were interviewed.

RESULTS

Main diseases affecting women in mining sites: The collaborators cited Malaria, American cutaneous leishmaniasis, anemia, asthenia, diarrhea, low back pain, stings by venomous animals, and pruritus as the most recurring diseases. Here are some descriptions of these diseases mentioned by the interviewees in the non-directive interviews: *"I think that we see leish [leishmaniasis] and malaria more often in the mining sites.*

*However, we also feel a lot of weakness, diarrhea."*P1 *"There is a lot of fleas in here, the kids get all itchy. We also feel a lot of back pain, although the most frequent diseases are malaria and leish."*P3 *"Once a snake stung my husband up there in the Sikini [a local mining site], a monster snake, a 'jararaca,' then he killed it and put it in a 5l bottle [5l is a cachaça brand]. He got well. I still prefer to get stung by a snake than to get this bad malaria disease."*P5

Access to health careservices: Among the main programmatic health issues related to the health services available to these women, the following aspects were highlighted by the interviewees:

*"In Oiapoque, there is nowhere to stay. The time we spend there is a waste of our money. I was tired to see so many women coming down the river in the rain, in the hot sun, with their children just to get a vaccine because not even the campaigns arrived here. Then we go to Camopi"*P14.

*"You have the problem of childbirth, when the child is born there [Camopi] or Cayena, because the birth certificate takes too long to come out, and you cannot register here. Then the children have no right to anything, no help. They will not receive a family stipend or get a vaccine at the health care clinic, which is not the same as the ones there, right [The vaccines]?"*P8.

*"We were taken care of over there [Camopi]. Last time I went there, they said I had a uterine myoma and a polycystic ovary. I went to Saint George, and then to Cayenna. But there [in Camopi], sometimes they put up a sign saying that they will not serve Brazilians."*P9.

Treatment of diseases at mining sites: Furthermore, the use of medication from other countries at clandestine mining sites was referenced by the interviewees, especially medications to treat malaria and leishmaniasis, as shown in the following statements:

*"Artecom was the medication I took from the other side [French Guiana]. However, I think Brazil's medication is better, because it really kills, you know?"*P4.

*"I have already taken all kinds of medications from this place. Artecom is weak. It will not kill malaria; it becomes incubated. Once I took the two [diseases] at once, they were incubated for a long time, so I had to go to Pará."*P17. *"I took Pentacarinat because of a leish [Leishmaniasis] I got on my leg, you know?"*P14

DISCUSSION

Regarding their demographic profile, data analysis showed that the interviewees were mostly young women, aged between 30 and 39 years, who belonged to the northern region of the country, were either black or brown, and had low levels of education. They define their marital relationships as "common law marriages." It was also found that, to access health care services, the interviewees predominantly looked for cities of French Guiana, namely Camopi, Saint George, and Cayenna. Further, the interviewees reported that they are well received in French Guiana's territory when trying to access health care services within that country. However, such services are not continuous, and there are periods when they do not provide

such services to Brazilians. It was also noted that the interviewees referenced malaria and leishmaniasis as recurring diseases in the clandestine mining site, and this finding corroborates with previous studies that mention malaria as a disease strongly associated with the Brazilian northern arc border (Franco *et al.*, 2019). Additionally, all subregions of this border have poor living conditions, scarce human resources, and precarious health care infrastructure (Peiter *et al.*, 2013). According to the Health Surveillance Coordination of the state of Amapá, leishmaniasis is considered a highly transmissible disease in the municipality of Oiapoque (G1 News, Brasil, 2016). Thus, in view of the favorable environment for the proliferation of the *Lutzomyia longipalpis* mosquito species in the reservoirs around Ilha Bela, and taking into account that containing reservoirs within a rainforest environment is a difficult task to be properly executed, strategic actions to prevent mosquito bites must be taken in the area to prevent the dissemination of the leishmaniasis disease (Brazilian Ministry of Health, 2018).

Further, regarding the mentions of anemia and asthenia by the interviewees, it is possible to infer that these diseases may be related to the repeated episodes of *Plasmodium* infections and the low nutrient variability of this specific population diet. Moreover, these diseases may also be linked to parasitic infections, since the drinking water consumed by this population mostly comes from the river, and it is usually consumed raw (Mosnier *et al.*, 2015). Based on these assumptions, we believe that further investigations must be carried out to more clearly denote the main factors that may be facilitating the dissemination of these two diseases. We also noted that the interviewees—and the population related to the clandestine mining practices—live in a forest environment, in houses built by the riverside and made with either plastic or stilt ones, and that they work in these same rivers; for this reason, previous studies have shown that people working in mining sites are subject to accidents with wild animals (G1 News, 2016). In that regard, corroborating data was found confirming that it is common to encounter prospectors stung by snakes in the State Hospital of Oiapoque (HEO). Further, encounters involving other wild animals, such as jaguars and alligators, are also likely to happen in this type of practice (G1 News, 2016).

The interviewees also brought two other important topics to our attention regarding access to health services: there is a lack of support houses and policies focusing on assistance to the riverside population living in the outskirts of the urban area; and there are difficulties in the exchange of information with neighboring countries as well as hinderances in the continuity of treatment in these same countries. Further, asymmetries were found between Brazil and French Guiana related to the behavior of the health service users on the border, which leads to an increase in diseases between the borders as well as an increase in patient flow in the health care centers located in these areas. Previous studies have found that, when prospectors are in international territory in clandestine circumstances, the diagnosis and treatment of diseases—especially malaria and leishmaniasis—are predominantly performed by prospectors themselves, still in the forest environment (Franco *et al.*, 2019). In this study, the use of medications such as Artesunate and Pentacarinat for malaria and leishmaniasis treatments, respectively, were referenced. Regarding the choice of drugs, it was found that the treatment of these diseases differs between Brazil and French Guiana. In

French Guiana, the single dose of primaquine to eliminate *Plasmodium falciparum* gametocytes is not officially authorized by the European Union (Musset *et al.*, 2014). In Brazil, the administration of the single dose of Primaquine is restricted only to pregnant women owing to the high risk of hemolysis (Brazilian Ministry of Health, 2010); furthermore, the first-choice treatment in Brazil for tegumentary leishmaniasis is the administration of N-methylglucamine antimoniate (Sb+5), with a dose calculated in mg Sb+5/kg/day (Brazilian Ministry of Health, 2010). The results show that health promotion strategies used in clandestine mining sites and the Amazon border region must take into account the complexity of the specificities of these women's routine and congregate the environmental, social, and cultural contexts of these areas and populations; furthermore, although these women engage in pendular migration, passing through several mining sites, resting places such as Ilha Bela are, potentially, strategic health care sites. Thus, improving knowledge on the health of women located in remote, high-flow population areas was proven to be paramount information for public policy managers to succeed in improving quality of life and health for Brazilian women prospectors in clandestine mining sites.

Limitation: As a limitation of this study, it should be noted that sampling was not probabilistic; therefore, the results must not be generalized to the entire population of women working in clandestine mining sites in this border area. Despite this limitation, this study is the first to address the health situations of Brazilian women working in clandestine mining sites located in the French Amazon rainforest. The data collection was performed in a single scenario of rest of the activities of the mining. In this way, one should consider, in relation to the number of data in the region, the data can not be generalized.

Conclusion

This study showed that the health and illness contexts of women in clandestine mining areas are critical. Access to health services is limited, and the main health problems are malaria, leishmaniasis, anemia, and asthenia; these are usually solved in the garment environment with the use of medicines from French Guiana. Further, due to the lack of governmental programmatic actions, and the absence of effective planning and maintenance of public services—which should be organized based on the geopolitical concept of frontier—the situation is favorable for the circulation of diseases in these areas. Unfavorable economic conditions, coupled with geographical limitations, constitute important barriers to access to health services and to the improvement of the living conditions of these women. Isolation and migration flows challenge traditional health systems in these areas, and there is thus a need for innovative interventions regarding health promotion. Despite the pendular migration, resting places can be strategic to health care. It is hoped that these results may contribute to the development of future research on the health of Brazilian women working in the French Amazon forest, regarding malaria, leishmaniasis, asthenia and anemia, and to identify aspects that allow the articulation of public policies to these peoples.

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