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An information system for interventional research in isolated tropical settings: the Malakit study

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Context: In French Guiana, the population working on gold-mining sites is the most affected by malaria. Their high mobility on the Guyana plateau and their frequent use of inappropriate self-medication have led to fears of the emergence and regional spread of resistant parasites. Designed as a response to a lack of access to healthcare in an isolated situation, Malakit is an innovative intervention based on the diagnosis and treatment of malaria by the gold miners themselves using a kit and initial training provided by mediators.

Methods: The Malakit intervention was evaluated between April 2018 and March 2020 and implemented in five sites located on Guyana's borders with Brazil and Suriname, imposing strong constraints on the study's information system: isolation in the Amazon rainforest, tropical climate, lack of reliable power supply and internet connection, multilingualism and multiculturalism. The Malakit information system was developed as a patchwork of existing open source software, commercial services and in-house developed tools. The collection of participant data by the mediators was based on the ODK Collect application via Android tablets. An R package and dashboard were developed to download, decipher, aggregate, track and clean the data based on feedback from mediators and field supervision.

Results: Between April 2018 and March 2020, nine mediators entered a total of 4,863 forms, an average of 202 records per month. The mediators' free feedback and comments were essential to adapt and improve the collection and monitoring of mobile data. Few technical problems were reported. Electronic data entry by a mediator took a median of five minutes, saving the participants' time to train them to use the kit. Data quality was satisfactory with only 3% of records requiring correction.

Conclusions: The development of the Malakit project's information system was a source of innovation, as was the intervention itself. This experience confirms that it is possible to produce quality data and evaluate a public health intervention by adapting the tools to the constraints of the field and the experience of the mediators.