



# Cost, Distance, and Complexity:

Results from a Rapid Diagnostics  
Assessment in Rural and Semi-Rural  
Communities in Madagascar

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MATAHARI

# ACKNOWLEDGMENTS

**M**atahari Global Solutions is a global health consultancy firm focusing on global health solutions with local relevance. Registered in Kuala Lumpur and with consultants based globally, our work has covered a wide range of global health issues, including [pandemic response](#) in LMICs, [transgender legal recognition](#) and impact on access to healthcare, [paediatric TB](#) and impacts of advocacy, and the evaluation of multi-country HIV projects, across Africa, Asia, Eastern Europe and Central Asia, and Latin America.

**Ankizy Gasy—Children of Madagascar** is an organisation providing Malagasy children with educational opportunities and facilitating access to healthcare services for families. Based in Ambohidratrimo, a semi-rural area 18 kms outside of Antananarivo, the organisation works in partnership with Small Steps for Africa to assist families to access healthcare services with the specific objective of enabling child development and retention in education.

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# EXECUTIVE SUMMARY

This rapid assessment found a complex diagnostics environment marked by high out of pocket spending for diagnostics relative to income, relatively long distances to get to primary healthcare centres, doctors prescribing antibiotics with incomplete diagnostics regimens or no diagnostics at all, poor clinical practices on diagnostics,<sup>1</sup> and insufficient data about stockouts. We noted that because rapid malaria tests are provided for free, doctors offer these more regularly, but upon a negative result are unable to recommend additional tests because of the cost barrier. We also found that rural communities overwhelmingly wanted more accessible and affordable testing—and perceived that people they knew were dying from ‘unknown diseases’.

We made several observations of issues that need addressing:

- Cost-prohibitiveness of diagnostics and ensuring tests are fully funded by the state.
- Accurate and respectful descriptions of diagnoses to patients.
- A lack of outreach to rural communities on available and free tests.
- More in-depth and comprehensive analysis of availability and functionality of diagnostics equipment.
- Better guidelines around abortion care, including what needs to be done if there is an incomplete abortion, and what to say to patients.

- Inappropriate use and prescription of antibiotics. Risks of antimicrobial resistance—despite viral infections, individuals are given antibiotics, as well as antivirals.
- ‘Fatigue’ as a common assumption and diagnosis, despite incomplete testing regimens.
- The lack of availability of COVID-19 rapid tests at primary healthcare level.

The following urgent reforms are needed:

- **Universal health coverage for diagnostics**  
Tests that are fully funded by the state, and made available in all public health facilities.
- **Better clinical practice around diagnostics**  
Including accurate and respectful communication of confirmed diagnoses to patients and avoiding prescription of antibiotics if diagnostics regimens are incomplete.
- **Trained & salaried community health workers bringing rapid tests to communities**  
Poor road infrastructure means that a 5.5km trek to the nearest primary healthcare centre is a deterrent for access to tests.
- **Facilities with point-of-care testing closer to rural communities**  
As aforementioned, there is poor road infrastructure and travelling to healthcare centres often takes an entire day, with many taking time off from informal jobs and losing a days’ income.

# FEHIKEVIN-PANADIHADIANA

ty tombana natao ity dia maneho fa maro sosona ary misedra olana isan-karazany ny tontolo ara-pitsaboana nodinihana. Voamarika tao anatin'izany fa mihoatra lavitra noho ny fidirambolan'ny tsirairay matetika ny vola lany amin'ny fitsaboana-tena, eo ihany koa ny halaviran-dalana manasaraka ny toeram-ponenana amin'ny tobim-pahasalamana akaiky indrindra, ny fahazaran'ny mpitsabo manome antibiotika ireo marary na dia tsy feno aza ny fizahana rehetra tokony atao mialoha izany ary ny tsy fahampian'ny fampitam-baovao matetika mikasika ny tahiry misy eo anivon'ny toeram-pitsaboana iray. Satria maimaim-poana ny fitiliana ny aretina tazomoka dia maro dia maro ireo mpitsabo manolotra izany fizahana izany ho an'ireo marary. Mampalahelo anefa fa tsy afaka manatanteraka fizahana fanampiny izy ireo raha toa ka tsy nahafa-po ny valim-pitiliana noho ny antony ara-bola. Voamarika ihany koa fa ireo mponina any ambanivohitra dia maniry mafy ny hanamorana ny fanaovana fitiliana eo amin'ny fiaraha-monina misy azy ireo ary mahatsapa fa matetika matin'ny "aretina tsy fantatra" ireo marary manodidina azy.

Noho izany dia nanao ireto fanamarihana maromaro manaraka ireto izahay momba ireo olana tokony hovahana:

- Fandrirana ny saran'ny fitiliana amin'ny alalan'ny famatsiam-bola ara-panjakana
  - Famaritana marina ary fanajana feno ireo fenitra isan-karazany mifehy ny fizahana aretina
  - Fampahafantarana ireo mponina any ambanivohitra momba ireo fitiliana izay azo atao maimaimpoana
  - Famakafakana lalina sy feno kokoa ny fisiana sy ny fomba fampiasana ireo fitaovam-pitiliana
  - Toro-làlana mazava mikasika ny fomba fikarakarana sy firesahana amin'ireo vehivavy nisedra fanalan-jaza
  - Fampiasana antibiotika mifanaraka amin'ny tokony ho izy - lasa fanome matetika ireo marary ny antibiotika na dia areti-mifindra amin'ny viriosy aza no mahazo azy ary mety hiteraka fanoherana eo amin'ny hery fiarovany vatana izany
  - Filazana fa "harerahana" no mateti-pahazo ireo marary noho ny tsy fahampian'ny fitiliana afaka atao
  - Tsy fahampian'ny fitiliana COVID-19 eny anivon'ny tobim-pahasalamana
- Ilaina manoloana izany ireto fanavaozana manaraka ireto:
- Fiantohana ara-pahasalamana ho an'ny daholo be mba ahafahan'ny rehetra misitraka fitiliana eny anivon'ny tobim-pahasalamana
  - Fanatsarana ny fomba fitsaboana marary - aretina voamarina ihany no ampitaina amin'ireo tsy salama ary fadiana ny manome antibiotika azy ireo raha sanatria tsy feno ny fizahana manamarina izany
  - Anisan'ny sakana ho an'ny fitiliana ny faharat-siana sy ny halaviran-dalana manasaraka ny toeram-ponenana sy ny tobim-pahasalamana akaiky indrindra izay mitaky fandehanana an-tongotra 5,5km matetika raha kely indrindra. Noho izany dia mila hofanina sy karamaina ny mpiasan'ny fahasalamam-bahoaka hanantona ireny olona sahirana ireny
  - Araka ny nomarihina tetsy ambony dia tsy ampy ary mandany vola sy fotoana ny fanantonana ireo foto-drafitrasa ara-pahasalamana any ambanivohitra ka mila ampitomboina ny isan'izy ireo amin'ny ho avy



*Primary School in Ambatomasina, accessible via agriculture fields.*

# INTRODUCTION

**A**ncedotal evidence indicates poor quality and access to essential diagnostics in Madagascar, including loss of samples, high cost of essential diagnostics, and long wait times for results. In general, there is a lack of publicly available data on health interventions in the country. It is also a country with multiple overlapping epidemics and neglected tropical diseases. Schistosomiasis, for example, is widespread and endemic in 74% of all administrative districts in the country.<sup>2</sup> There are also widespread nutritional deficiencies, with micronutrient-poor staples (rice, roots, tubers) comprising nearly 80% of the Malagasy diet by

weight.<sup>3</sup> A 2019 study conducted among 8050 individuals representing 1458 distinct households in Farafangana (on the southeast coast of Madagascar) found that out of those experiencing a febrile illness in the past two weeks, only 28.7% sought medical advice/care, with 74.3% reportedly receiving a malaria test.<sup>4</sup> In addition, in one study conducted among 464 children in Madagascar, 85.3% show high levels of enterobacteria in upper intestinal aspirates (105 bacteria/ml).<sup>5</sup> Combined with complexities of navigating the health system, the lack of publicly available health data is oft-cited as reasons why Madagascar is neglected by funders.



*A young farmer in Ambatomasina is asked about his experience with testing.*

## METHODS

With the support of FIND, we conducted a rapid assessment on access to diagnostics in semi-urban and rural areas within a 40 km radius of the nation's capital Antananarivo, to assess access and affordability to essential diagnostics. In discussion with Ankizy Gasy and Small Steps for Africa, a semi-structured questionnaire was developed to ensure local context relevance and cadence that could be understood by communities. The tool was translated into Malagasy and deployed in Malagasy by Ankizy Gasy, in Ambohidratrimo, Ampananina, and Ambatomasina, villages and towns located in the Analamanga region of Madagascar, which also contains the capital city Antananarivo.

We interviewed 43 individuals from the community with both quantitative and qualitative surveys covering several themes, including on whether they'd ever seen a doctor when they

were ill, whether they were referred for a test, whether the diagnosis was confirmed and communicated to them, and what improvements they would like to see. These were triangulated and contextualised with survey responses from four healthcare workers (two doctors, one midwife, and one nurse), with three of these working in primary health settings and one working in an NGO setting. The second survey was conducted among health workers and was predominantly focused on essential tests offered at their facilities and whether those tests were affordable/available. For the purposes of this exercise, ten essential diagnostics for primary care settings (as defined in The Lancet)<sup>6</sup> were used as a reference, i.e., HIV, malaria, urine glucose and protein, urine pregnancy, syphilis, microscopy, haemoglobin, and glucose by glucometer, ultrasound, and additionally, tuberculosis.

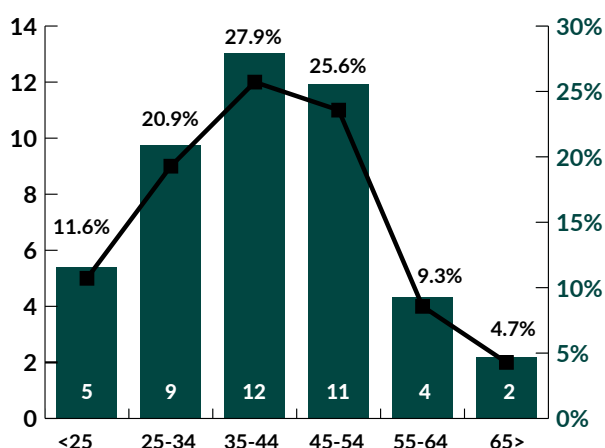


*A social worker from Ankizy Gasy makes her way to Ambatomasina on foot, to conduct interviews for this report.*

# FINDINGS

## Demographics

Distribution of respondents by Age Groups

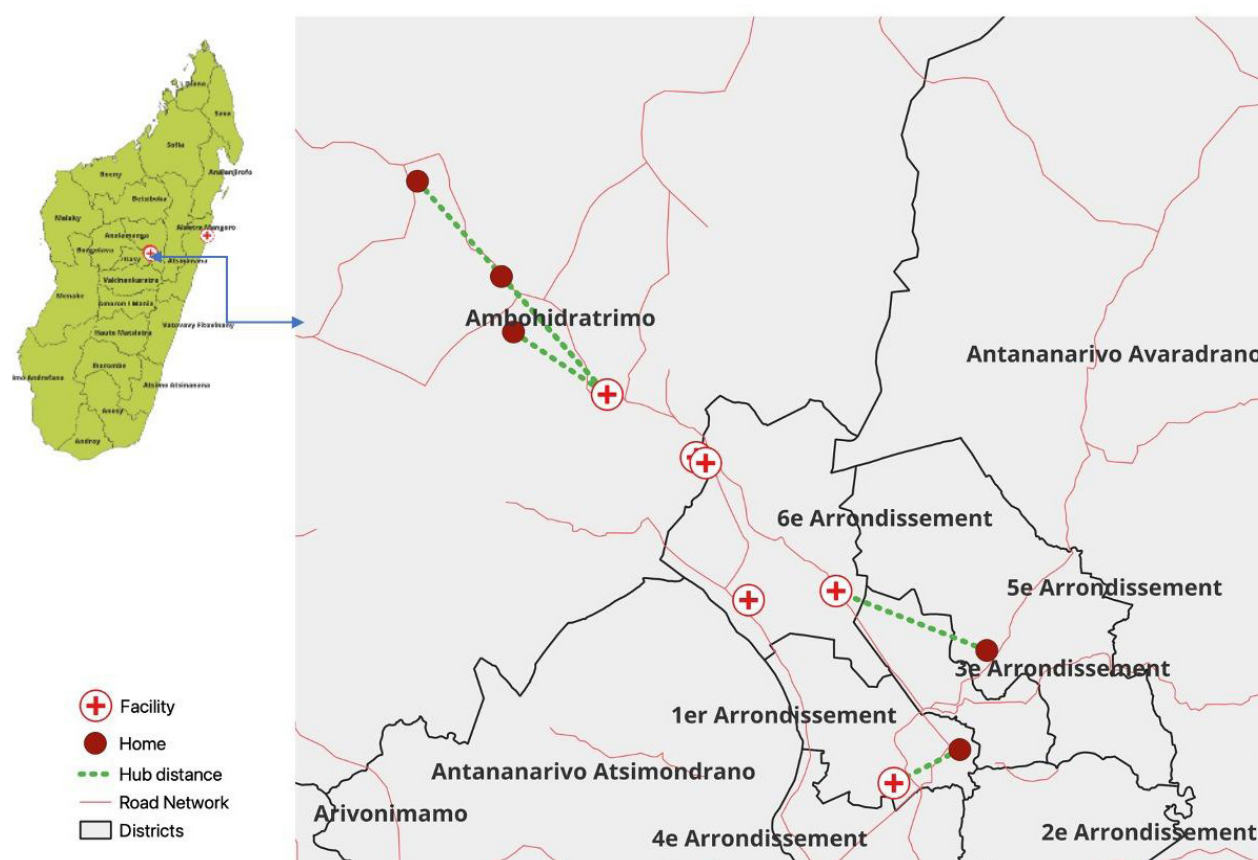


The majority of community interviewees were female (N=36, 84%) with the remaining seven males. Median age of community interviewees was 39 years old. Most (77%) were in low-income or informal employment, with 11 individuals (31%) working as subsistence farmers/agricultural labourers,<sup>7</sup> three earning money through washing clothes, one selling charcoal, and three operating food hawker stalls. Only three were unemployed or were homemakers, aged 40, 62, and 65, with the latter two supported financially by their children. Of those in formal employment (N=10, 23%), three were teachers, two were social workers, and two worked at the textile factory. While we did not ask about monthly income, one of the individuals who worked at the textile factory stated that her income was between 150,000 and 250,000 Madagascan Ariary per month (approximately US\$34-57 per month).

## Proximity of Primary Health Care Services

An accurate geospatial analysis was difficult as many homes in Madagascar do not have addresses. Based on geocoded data where both home and health facility data were available, participants travelled an average of 5.51km from their homes to the health facilities. Based on geospatial analysis conducted on these five individuals' addresses, three did not go to facilities that were closest to them. For example, one individual who worked as a plumber (self-employed/informal) had to travel almost 5 km from home to the Lutheran Hospital in Ambohibao for a diabetes diagnosis when there was an AMIT (*Association Medicale Inter-Entreprises de Tananarive*) clinic in Talatamaty 2.4 km away. Given that AMIT facilities are occupational health facilities and only provide healthcare for registered workers, this individual was not eligible to receive healthcare there and had to travel further.

With additional estimates by Ankizy Gasy on distances between homes with no addresses and health facilities, this average may be slightly higher at 6.69km, although given the lack of discoverability on online mapping software this is difficult to verify. According to these estimates, two individuals travelled 15 and 20 kilometres respectively to get to the closest health facility. Given poor road infrastructure, distances of 5.51km - which would take relatively short amounts of time to get to in the Global North - are challenging and time-consuming for individuals living in the areas we examined.



Eight individuals stated that they had taken a bus to the health facility, three stated that they had walked, two were brought to the facility in their employers' cars, and one had attempted to make the journey walking, but had fainted and was taken to the hospital on a passer-by's motorcycle. Of the five that provided cost data for bus transportation, individuals paid an average of 3,900 Madagascan Ariary (US\$0.90) to be transported to the health facility. Given that 80% of Madagascans live below an international poverty line of US\$2.15 per day,<sup>8</sup> this means that a bus ride constitutes 42% of an individual's daily income.

Transportation costs and poor road infrastructure meant that diagnostics are often out of reach. One 24-year-old subsistence farmer/agricultural labourer illustrated:

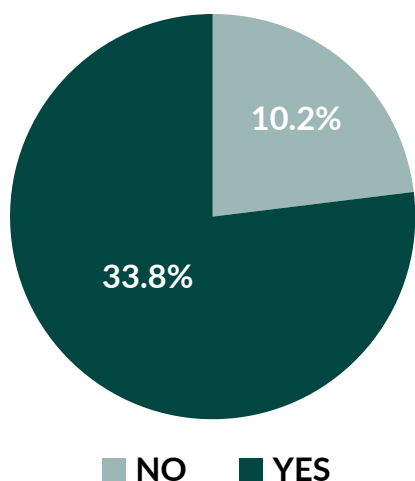
***"It would be perfect if a test facility could be built in our rural area because our village is based in a remote area. We live here in Ankadinakoho and it is only in Anosiala commune that we can do this test. It is approximately 7km from here. We really need a test facility if it is possible."***

Participants also said that results of blood tests often took time to be returned as they need to be collected in person, and the facilities are often too far away from their homes. The need to return to facilities and collect tests in person is a key barrier—with many patients not collecting test results owing to long distances, the cost of transport, and the cost of missing work to attend health facilities. In the words of a 64-year-old florist/street vendor:

*I really hope there should be a change in the way blood tests are being dealt with here in Madagascar. Many people live so far away from the test facilities and since they don't have money to pay for that, people just end up dying because hospitals are far away. I want it to be improved and to have better test facilities.*

## Experiences in Accessing Testing and Routine Care

Percentage of Individuals Who Reported Seeking Health Care the Last Time They Felt Sick



22 individuals (51%) of individuals reported seeing a doctor in the past year, with four occurring in the past month. Two individuals stated that the appointment was for their child and one stated that the appointment was both for them and their child. Of these 22 individuals, 12 reported receiving a confirmed diagnosis. Of all individuals surveyed, 14/43 (33%) tried to treat their illness themselves, with seven then going on to see a doctor after self-treatment did not work.

### Non-Completion of Referred Tests

Of those who saw a doctor, 14 (64%) were referred to a test. Not all went through with the

recommended test. In the case of one 66-year-old male subsistence farmer from Ampananina suffering from symptoms of acid reflux, he was prescribed omeprazole for gastroesophageal reflux disease, and was referred to further tests. When he arrived at the hospital for these tests, the relevant doctor was not available, and he returned home. He did not return for the tests as the public hospital is 10 kilometres from his home, incurring travel costs and time away from work.

A 36-year-old female subsistence farmer from Ambatomasina reported suffering from abdominal pain and bleeding and presented to a doctor who informed her that her 'womb was too cold to keep a baby'. She was prescribed antibiotics and referred to additional tests but did not go through with the referral as she did not have money to pay for the tests. It should be noted that routine antibiotic prophylaxis for complete abortions is not recommended due to the low quality of available evidence, and due to concerns around antimicrobial resistance.<sup>9</sup>

Anecdotes indicate that there are many stock-outs of reagents and tests are not always available. We interviewed two doctors, one midwife, and one nurse about availability of 10 essential diagnostics (HIV, malaria, urine glucose and protein, urine pregnancy, syphilis, microscopy, haemoglobin, and glucose by glucometer, ultrasound, and additionally, tuberculosis) at facilities where they worked. With the exception of the midwife who said that TB microscopy was not available/was non-functional at the INGO-operated health facility she worked at, the other health workers (working at government primary health care facilities) said all tests were available and functional and that diligent inventory management was conducted, so stockouts do not occur. While this seems at face value to be positive, NGO experts interviewed for this report stated there may be fear

of reprisals from government and employers should they report imperfect diagnostics conditions. This suggests that an assessment in collaboration with authorities/international actors such as WHO/UNICEF needs to be conducted to ensure a more objective assessment.

These testimonials present several key issues that need addressing:

- Accurate and respectful descriptions of diagnoses to patients.
- More in-depth and comprehensive analysis of availability and functionality of diagnostics equipment.
- The lack of prescription of mifepristone or misoprostol to complete the miscarriage indicates a complete abortion, however this is unclear from the testimony.
- The potentially unnecessary prescription of antibiotics.
- Cost-prohibitiveness of additional abortion care.

### **Fatigue': Incomplete Diagnostics Regimens**

Several individuals reported being diagnosed with 'fatigue', albeit being subject to incomplete testing regimens, including the lack of provision of COVID-19 rapid testing. One 45-year-old reported undergoing a week-long illness with symptoms of weakness, fatigue, and being unable to get out of bed. She presented with low blood pressure, however, was not given any other tests and diagnosed with fatigue. It was unclear whether the facility she presented at had COVID-19 rapid tests available.

One 25-year-old male presenting at the Centre Santé de Base II (CSB II - Basic Health Centre Category II)<sup>10</sup> Ambavarano Ambohidratrimo presented with a headache, tiredness, and poor appetite. The doctor suggested that it might be COVID, however proceeded with a rapid malaria test. Following a negative rapid malaria test, the patient was diagnosed with fatigue.

Separately, a 52-year-old female presented to an OSTIE (*Organisation Sanitaire Tananarivienne Inter Enterprises*) health facility (a health facility for individuals who are formally employed) in Andranomena with pain in her extremities. Upon first contact with the doctor, she was told that it was most likely fatigue, but was referred to a blood test for Antistreptolysin O (ASLO) (used to confirm diagnoses of streptococcal infection, kidney disorders, and rheumatic fevers). The tests came back negative, and she underwent an additional two tests and was finally confirmed to have gout.

A 53-year-old female street vendor who sold cakes for a living presented to a CSB II with flu-like symptoms and was given a COVID rapid test, indicating availability of COVID-19 rapid tests in some public health facilities. Upon a negative test, she was diagnosed with influenza, and given 'flu medicines', antibiotics, and an injection, although she professed not knowing what the injection was called or what it was for.

These testimonials indicate the following:

- 'Fatigue' as a common assumption and diagnosis despite incomplete testing regimens.
- Despite symptomology being consistent with COVID-19, patients were not offered COVID-19 rapid tests. It is unclear whether this was because of the lack of availability of COVID-19 rapid tests in facilities or due to poor clinical practice.

- Rapid malaria tests are free in Madagascar<sup>11</sup> and may be offered more regularly because of this fact.
- Risks of antimicrobial resistance—despite viral infections, individuals are given antibiotics as well as antivirals.

### Inappropriate Use of Antibiotics

Available evidence suggests a strong link between a lack of access to diagnostic tests or diagnostics uncertainty<sup>12</sup> and the inappropriate prescription of antibiotics. In our interviews, we found that despite long duration or severity of symptoms, individuals were prescribed antibiotics without adequate diagnostics.

In total, six individuals were prescribed antibiotics by a doctor while two reported self-treating with antibiotics. Of the six who were prescribed antibiotics as a treatment, only two were appropriate uses of antibiotics (i.e., in combination with an antimalarial and as a treatment for typhoid fever). Hence in this small sample, antibiotics were inappropriately prescribed in 67% of cases. In the four cases where antibiotics were inappropriately prescribed (influenza, stomach pain, miscarriage, fatigue), only one individual (with influenza symptoms) was given any diagnostic test (a COVID-19 rapid test).

One 24-year-old male from Ankadinakoho, a rural area approximately 27 km from the capital Antananarivo, reported symptoms of fatigue, drowsiness, and being in a state of delirium. He sought medical help and was told that his illness was due to fatigue as he worked as a night security guard and during the day he worked as domestic helper/agricultural labourer and that this was most likely due to the lack of sleep. He was sent home without any further tests and a supply of amoxicillin, vitamin C, and multivitamin tablets. He remained ill for approximately one month.

Two individuals (one with toothache and another eventually diagnosed with diabetes) said that they had self-treated with amoxicillin, with the former stating that he was advised to see a dentist, but as this was not affordable, he self-treated with amoxicillin. The latter patient, a 40-year-old female, self-medicated with amoxicillin prior to her deciding to see a doctor for her symptoms.

A 2020 article in the *African Journal of Clinical and Experimental Microbiology* stated that in Madagascar, it is difficult to make an accurate diagnosis because 'diagnostic tools for bacterial infections are limited and only present in major cities', and doctors often 'immediately establish antibiotic therapy even if they are aware of the viral origin of infection. Moreover, in rural localities, patients often travel more than 10 miles to reach a healthcare facility suggesting that a patient who has received medication from the doctor will no longer return for follow up checks as far as his condition does not really get worse. Aware of these different parameters and constraints, physicians generally opt for empirical antibiotic coverage'.<sup>13</sup>

While the government has developed a national action plan on AMR, they have not supported nationwide AMR awareness campaigns and have not formalised a multisector coordination mechanism on AMR.<sup>14</sup>

### Out-of-Pocket Costs for Diagnostics

Cost of diagnostics was considered the main barrier for access to tests by both members of the community and all healthcare workers interviewed. Surveyed participants paid an average of 117,300 Madagascan Ariary (US\$26.63) for diagnostics. Given that 80% of the population live below the international poverty line of US\$2.15 and assuming 28 days of work a month (US\$60.20 earnings per month), this average cost for diagnostics is beyond the reach of ordinary people.

Three individuals reported other parties paying for their diagnostic tests as they were unable to afford the quoted price. This included one individual who required comprehensive hepatitis B testing (blood test and liver ultrasound) and was quoted 400,000 Madagascan Ariary (US\$90), which was paid jointly by an osteopath providing free care at Ankizy Gasy and her daughter's employer. Another individual who washed clothes for a living was quoted 60,000 Ar (US\$14) for an electrocardiogram and chest x-ray for her 15-year-old daughter—a steep sum for those earning below the poverty line.

A 30-year-old teacher in a rural area told us:

***“In my opinion the cost of tests should be reduced. (In addition), there needs to be outreach to the***

***rural people because they are afraid of having tests (due to price). The health workers who administer testing should be connected to the rural people so that there will be no fear of having tests.”***

A doctor working in a primary health centre raised costs as well, with an appeal to the Ministry of Public Health:

***“In order for everyone to benefit from tests, the Ministry of Public Health should cover all related costs (for diagnostics) in Madagascar. In my opinion, this is the only way for Malagasy people to benefit from the tests as they will be free of charge and will not affect any of their earning capacity.”***

## CONCLUSION & COMMUNITY RECOMMENDATIONS

Madagascar's diagnostics landscape is complex and there is poor accessibility. Cost of tests was cited as the main barrier, but there are also additional problems. Community testimony highlights the critical urgency of these reforms for diagnostics access:

***My workplace pays for my healthcare, and it is easier for me (because of this). But for people who can't afford seeing the doctor, they end up in death because the symptoms of their diseases are unknown. It would be helpful if tests are free or at the very least reduced.***

—52-year-old social worker

***My suggestion is that it would be good if there is a testing facility because nowadays there are many unknown diseases, many sick people who should be tested but they can't afford it, and they are also scared of finding out what disease they have. It would be helpful if a test facility especially for the poor people could be built as they should know what kind of diseases they have. There are many people who are sick, but they just stay at home, they fear being operated on after being tested, and they also don't have money to pay for (treatment and surgeries) so their health just deteriorates slowly."***

—37-year-old agricultural labourer

Health care workers corroborated these testimonies, with one nurse stating that diagnostics access should be expanded at the local level rather than predominantly at teaching hospitals (Centre Hospitalier Universitaire—CHU) and District Hospitals (Centre Hospitalier de Référence de District—CHRD):

***"The best thing to do is to increase the number of testing sites in Madagascar so that it is not restricted to CHU or CHRD but is available at a local level so that people in rural areas can hear about it and access it more easily. We also need to reduce the cost because the Malagasy people have many financial difficulties."***

—Nurse, primary health facility

***"There are many barriers, especially in the public sector, that prevent the general public from getting tested. The main reason is affordability. It is not so much a question of willingness, because people who come for treatment are ready to be treated, but it is the financial ability that is lacking. The government is already making efforts as only its efforts can improve services for all. The tests should be made available to the hospital and should be free of charge which will allow for progress."***

—Doctor 2, primary health facility

Overall, there need to be urgent reforms on:

### **Universal health coverage for diagnostics**

Tests that are fully funded by the state, and made available in all public health facilities.

### **Better clinical practice around diagnostics**

Including accurate and respectful communication of confirmed diagnoses to patients and avoiding prescription of antibiotics if diagnostics regimens are incomplete.

### **Trained & salaried community health workers bringing rapid tests to communities**

Poor road infrastructure means that a 5.5km trek to the nearest primary healthcare centre is a deterrent for access to tests.

### **Facilities with point-of-care testing closer to rural communities**

As aforementioned, there is poor road infrastructure and travelling to healthcare centres often takes an entire day, with many taking time off from informal jobs and losing a days' income.



*School in remote area in Ambatomasina*

# ENDNOTES

- 1 Such as not accurately naming conditions or the confirmed diagnoses, defaulting to a diagnosis of 'fatigue' without thorough diagnostics regimens, and using non-clinical terminology such as 'your womb is too cold'.
- 2 Deka, Mark A. 2022. "Predictive Risk Mapping of Schistosomiasis in Madagascar Using Ecological Niche Modeling and Precision Mapping" *Tropical Medicine and Infectious Disease* 7, no. 2: 15. <https://doi.org/10.3390/tropicalmed7020015>
- 3 Christopher D Golden and others, 'Seasonal trends of nutrient intake in rainforest communities of north-eastern Madagascar' *Public Health Nutrition*, 22(12), 2200-2209. doi:10.1017/S1368980019001083
- 4 Dean Sayre and others, 'Baseline malaria prevalence and care-seeking behaviours in rural Madagascar prior to a trial to expand malaria community case management to all ages' (2021) 20 *Malar J* 422 <https://doi.org/10.1186/s12936-021-03956-z>
- 5 Jean-Marc Collard and others, 'High prevalence of small intestine bacteria overgrowth and asymptomatic carriage of enteric pathogens in stunted children in Antananarivo, Madagascar' (2022) *PLoS Negl Trop Dis* 16(5): e0009849. <https://doi.org/10.1371/journal.pntd.0009849>
- 6 Harika Yadav and others, 'Availability of essential diagnostics in ten low-income and middle-income countries: results from national health facility surveys' (2021) *The Lancet Global Health* VOLUME 9, ISSUE 11, E1553-E1560
- 7 Defined in the Oxfam Inclusive Language Guide as 'someone who works in agriculture and has a low income'. Oxfam, 'Inclusive Language Guide' (March 2023) <<https://oxfamlibrary.openrepository.com/bitstream/handle/10546/621487/gd-inclusive-language-guide-130323-en.pdf;jsessionid=7DC296DA5B18B7E-A20D5D7D7257AF650?sequence=4>> p. 84
- 8 World Bank, 'Poverty & Equity Brief: Madagascar' (April 2023) <[https://databankfiles.worldbank.org/public/ddpext\\_download/poverty/987B9C90-CB9F-4D93-AE8C-750588BF00QA/current/Global\\_POVEQ\\_MDG.pdf](https://databankfiles.worldbank.org/public/ddpext_download/poverty/987B9C90-CB9F-4D93-AE8C-750588BF00QA/current/Global_POVEQ_MDG.pdf)> accessed 30 May 2023
- 9 National Institute for Health and Care Excellence, 'Abortion care: Antibiotic prophylaxis for medical and surgical abortion' (September 2019) p. 12 < <https://www.nice.org.uk/guidance/ng140/evidence/d-antibiotic-prophylaxis-for-medical-and-surgical-abortion-pdf-6905052976>> accessed 26 May 2023
- 10 CSB II facilities are usually located in bigger villages or regional centers and staffed by a medical doctor and have beds and rooms for patients. CSB I's are staffed by trained paramedics or nurses. <[https://zahana.org/Site\\_With\\_Pix/CARMMA-or-CSB-in\\_Madagascar.html#gsc.tab=0](https://zahana.org/Site_With_Pix/CARMMA-or-CSB-in_Madagascar.html#gsc.tab=0)> accessed 26 May 2023
- 11 However, scholars have noted that while diagnostics and treatment is free, 'costs of additional treatment and indirect costs of travel and patient accompaniment can result in a disincentive to attend health care facilities.' Severe Malaria Observatory <<https://www.severemalaria.org/countries/madagascar-0#:~:text=All%20malaria%20diagnosis%20and%20treatment%20in%20public%20facilities%20is%20free.&text=For%20case%20management%2C%20the%20main,care%20facilities%20and%20referral%20hospitals>> accessed 13 June 2023; The malaria budget, including tests, is largely financed by donors, including the President's Malaria Initiative, the Global Fund to Fight AIDS, Tuberculosis, and Malaria, WHO, and UNICEF. U.S. President's Malaria Initiative, 'Madagascar Malaria Profile' (5 May 2022) <<https://d1u4sg1s9ptc4z.cloudfront.net/uploads/2023/01/Madagascar-Malaria-Profile-1.pdf>> accessed 13 June 2023
- 12 Diagnostics uncertainty is defined as 'difficult(y) for clinicians to identify a satisfactory explanation of the patient's presenting problem', whether due to poor accessibility of diagnostics, variability of symptoms, among other factors. Bhise V, Rajan SS, Sittig DF, Morgan RO, Chaudhary P, Singh H. Defining and Measuring Diagnostic Uncertainty in Medicine: A Systematic Review. *J Gen Intern Med*. 2018 Jan;33(1):103-115. doi: 10.1007/s11606-017-4164-1. Epub 2017 Sep 21. PMID: 28936618; PMCID: PMC5756158.; Wang D, Liu C, Zhang X, Liu C. Does diagnostic uncertainty increase antibiotic prescribing in primary care? *NPJ Prim Care Respir Med*. 2021 Mar 25;31(1):17. doi: 10.1038/s41533-021-00229-9. PMID: 33767206; PMCID: PMC7994848.
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***“We would like to have a test facility in our village because the test facility is far away. Most people catch unknown diseases so they need tests but they can’t afford it. But we need to check our health. My suggestion is for a test facility to be set up in our village, with affordable prices.”***

— 36 year old female in Antohibe,  
a village northwest of Antananarivo



**MATAHARI**