Stories from the past and everyday experiences of malaria: Portugal, 1930-1960*

Histórias do passado e experiências quotidianas da malária: Portugal 1930-1960*

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Resumo

Este artigo é uma breve história sobre a malária em Portugal entre 1930 e 1960. Centra-se nas memórias e narrativas das experiências individuais de "ter malária", de antigos trabalhadores rurais. Pretende tomar estas memórias como o ponto de partida metodológico, que revela a malária como uma doença complexa, de amplas conexões sociais, ecológicas, económicas e políticas, que alberga diversos significados e definições. Neste artigo procura-se também recuperar a dimensão física da doença, conforme rememorada pelos antigos trabalhadores rurais; propõe, assim, uma abordagem histórica e antropológica à malária, que procura dar conta da sua complexidade.

Palavras Chave:
Malária, memória, história, antropologia, Portugal.

Abstract

This article is a brief history of malaria in Portugal, from 1930 up to 1960. It centres on the memories and discourses of former rural workers about their personal experiences of "having malaria". It takes these memories as the methodological standpoint to analyse the complexity of malaria, a disease with broad social, ecological, economic and political dimensions. The article also highlights the multiplicity of meanings and definitions it comprises and retrieves the physical dimension of the disease, as remembered by former rural workers. It thus proposes an historical and anthropological approach to malaria that endeavours to grasp its complexity.

Key Words:
Malaria, memory, history, anthropology, Portugal.

* This paper is a shorter version of some parts of the book *A Malária em Portugal: Histórias e Memórias* (Lisbon: Imprensa de Ciências Sociais, 2014). Parts of this paper have also been published in the article "Malária, mosquitos e ruralidade no Portugal do século XX", *Etnográfica*, 2013, 17, 1: 51-76 (DOI: 10.4000/etnografica.2545).

This is a short story about malaria in Portugal; the story of a time when malaria was not just a disease of the tropics but also a domestic ailment that hassled rural populations at intervals. I intend to consider malaria as perceived and defined by former rural workers as a methodological standpoint that reveals this disease as a broad social, ecological, economic and political event with multiple definitions (Saavedra 2014). This is where a biosocial and syndemic perspective (Hanna and Kleinman 2013; Singer 2009), as proposed by medical anthropology, proves appropriate. Although each of these approaches has its specificities, both consider disease causation as the result of the interaction between political, social, biological and environmental factors and their historical framework. Moreover, both take the impact of these interactions on people's lives as the centre of their action-oriented analysis.

Documents in archives and libraries in Lisbon mention rural workers, especially migrant groups, mainly as subjects of medical research and action (Cambournac 1938, Hill 1938, Landeiro and Cambournac n.d.). Social factors as disease causation were discussed among Portuguese doctors as fundamental parts of preventive medicine and of the State's social and medical services (Faria 1934). But such factors were not considered in their deepest structural causes. A few doctors did write accounts of malaria describing the living conditions of a great portion of the rural population, drawing attention to their poverty and how all these compromised any attempt at eliminating the disease (Ramos 1944). However, in a country where censorship controlled every printed text, not much could be said lest too much was said.

By recovering personal memories of people who had malaria, I intend to retrieve the physical dimension of the disease, the local appropriation of medical models and resources, and the coexistence of different ways of perceiving the disease (Saavedra 2014). Narratives about experiencing malaria reveal its broader ecology, combining natural environment, personal, social, cultural, political, economic and historic factors. Thus, malaria memories add to the medical narratives about this disease, meeting contemporary approaches to health issues in the fields of history of medicine, medical anthropology and in critical epidemiology (Singer 2009, Breilh 2008, Rosenberg 1992) that emphasise the multiple dimensions of disease. On the other hand, personal narratives about 'having malaria' may also inspire a reflection about the estrangement between the 21st century's scientific agendas for malaria research, control and prevention and the compound everyday experience of living with and managing this disease. Thus, history meets the present and calls attention to sometimes overlooked perspectives on health and illness.

Taking personal memories of malaria experiences as a source among others for writing one of the many possible histories of malaria in Portugal also means going beyond concerns about objectivity and truth. Certainly I mean to be as accurate as an anthropologist/historian should be in my account and analysis of the sources that I have deliberately chosen, actually accessed or accidentally found. But through the research process I relished the contradictions, misunderstandings and intersecting meanings, taking this as fundamental to a broader understanding of malaria's complexities patent in the distance between scientific knowledge, sanitary regulation, institutional norms and the everyday practice of malaria control and treatment on the ground.

Malaria memories and rice fields

By privileging former rural workers' memories I followed medical accounts of malaria as a rural disease. I interviewed fifty men and women from 65 to 90 years old, almost all of them former rural workers. Also according to the medical and official sources, I looked for malaria memories in Alcácer do Sal, Águas de Moura, Azambuja and Benavente. These villages and small towns, as well as the surrounding areas, had been medically classified as malarious; specially following a 1933 survey carried out by two Portuguese doctors (Fausto Landeiro and Francisco Cambournac), under the sponsorship and supervision of the International Health Division of the Rockefeller Foundation (Landeiro and Cambournac n.d.). This brings us to a medical geography of malaria in Portugal evincing its ecological aspects.

"Intermittent fevers" in Portugal, as in the rest of the world where European science gained ground, had long been medically described and popularly perceived as the result of bad airs emanating from swampy lands and putrefactive vegetable matter. Thus, since the increase of rice cultivation in flooded fields during the 18th century, rice fields became connected to malaria:

> *We have widely made known the effects of the stagnant waters and floods, but those that remain on the fields after rice cultivation are the most pernicious. It is known that, to fructify, that plant needs to be covered in water and have the fields where the seeds lay flooded. And if landowners do not drain these waters as soon as sowing is over through channels, drawbridges and dykes then those waters remain exposed to summer heat during the months of August and September; the air becomes infected and people pay the price with every sort of fevers that finish by death or illness that lasts a life long* (Sanches 1757, 84, 85).

Swampy lands and decaying vegetable matter, high tem-

peratures and soil emanations were widely perceived by Western medicine as sources of "intermittent fevers", as well in the "Tropics" as in Europe. The change from a malaria causation model based on "miasmatic" or "telluric" elements to a parasitological model based on a specific cause – a parasite transmitted to man through the bite of an *Anopheles* mosquito – did not acquit flooded or swampy lands; consequently it did not acquit rice fields. As mosquitoes' breeding sites, these lands kept their insalubrious reputation. Until its disappearance from Portugal, around 1960, malaria had always been related to rice cultivation with rare exceptions. From the 1930s, and particularly after the 1933 survey, rice fields became the scientifically legitimized axis of malaria research and control actions in Portugal in an effort undertaken by some doctors to follow international health trends, and strategies professed by the League of Nations Health Organisation and its Malaria Commission (League of Nations - Health Organisation 1927), as well as by the International Health Division of the Rockefeller Foundation.

It should be noticed that rice fields were not unavoidably malaria sites. In Spain, although these lands were under the close scrutiny of sanitary authorities, they did not represent the core of malaria's ecological conditions; irrigation development and land structure were regarded as major environmental factors influencing malaria distribution (see Perdiguero-Gil 2005). Randal Packard (2007) also states that rice fields' influence in malaria numbers is closely related to agricultural techniques (namely mechanisation and irrigation methods), land exploitation models, living conditions, etc. The less people needed to work on rice fields, the better housing and living conditions they had, the less rice fields weighed on malaria numbers. But in Portugal, although machinery was used in agriculture, rice cultivation required large number of seasonal workers, until the late 1950s. Some of them came from far away regions in the north of the country, where work was harder to find but where climatic and geographical conditions did not favour malaria. These migrant workers were particularly vulnerable to malaria when they arrived in the southern rice fields. They had no resistance resulting from previous infections and, especially until the late 1930s, they slept in very rudimentary shelters, vulnerable to mosquitoes' bites. Even when their shelters improved, under legal regulation, they never offered complete protection or sanitary conditions (Ministério do Interior – Direcção Geral de Saúde 1944).

Despite this complex set of ecological circumstances embedded in political, economical and social factors, malaria was not one of the major health problems in Portugal during the first half of the 20th century. Malaria has always affected mostly children, everywhere in the world; it is still among them that it causes the greater number of deaths. Until the 1970s Portugal had high infant mortality rates (77,5 per thousand in 1960, 55,5 per thousand in 1970),[1] which were seen by Portuguese doctors as a disgrace to the national reputation and a pressing sign of much needed improvement in health policies. But malaria was not one of the main causes of children's deaths.

However, sources suggest that some Portuguese doctors may have seen this disease as a gateway into the enhancement of state supported health services, by applying for international technical and financial aid (Saavedra 2014). The Malaria Committee of the League of Nations Health Organisation had drawn up a set of recommendations regarding malaria control, in the late 1920s. These comprehended research, prevention and treatment (League of Nations - Health Organisation 1927). Also, in 1931 the Health Organisation promoted a conference about rural health making it one of its priority subjects (Société des Nations - Organisation d'Hygiène 1931). The Rockefeller Foundation's International Health Division was also very active in Europe promoting public health, rural health, etc. and also had malaria as one of its main foci (Farley 2004). Therefore, malaria was a promising field for securing financial or technical support to compensate poor national investment in health services and to encourage it.

Portuguese doctors may also have perceived a focus on rural health as a way of attuning to the dictatorial regime's ideology, thus making their own cause more appealing. The New State regime adopted the rural world, its population and alleged "traditions" as core symbols of its rhetoric about the "Portuguese national identity" (Leal 2000; Melo 2001; Rosas 2001). In fact, the Portuguese historian Fernando Rosas states that one of the ideological myths of the regime "was the myth of rurality". According to it "Portugal was an essentially and inevitably rural country, a traditional rurality taken as a specific characteristic and virtue from which the true qualities of the race sprang and in which the national being was seasoned. […] Thence, land as the first and the principal source of possible wealth, the path to order and social harmony, the cradle of national virtues (Rosas 2001, 1035).

Yet, the New State's 1933 constitution established Portugal as a corporatist republic (Lucena 1976; Rosas e Brito 1996; Ferreira 2008), privileging private initiative under state guidance; and the state's controlling and dirigiste bent favoured the economy (Ferreira 2008), bypassing social and health issues. Investing on

1 - https://www.pordata.pt/Portugal/Taxa+bruta+de+mortalidade+e+taxa+de+mortalidade+infantil-528-2950

efficient and comprehensive healthcare, guided by the inspiring models of social and preventive medicine of the time, was not a priority.

However, the regime did not object to international support for developing rural health in Portugal, as long as it did not interfere with landowners' interests. Thus, in 1934, a station for the study of malaria financed and directed by the International Health Division of the Rockefeller Foundation was created in Águas de Moura, a very small village surrounded by great extents of rice fields, 65 kilometres south of Lisbon. It was renamed Institute of Malariology in 1939 (Saavedra 2014; Câmara Municipal de Palmela 2001). This institute was mainly a research centre although a dispensary had eventually been provided to help the many people who went there looking for assistance. The institute's purpose was to develop epidemiological research and experiment with larvae and mosquitoes' control techniques, as well as with malaria treatment. Before that, in 1931, the Portuguese government and other institutional donors had created a malaria station in Benavente, a small village also surrounded by rice fields about 60 kilometres north-east of Lisbon. During the 1930s and 1940s other malaria stations, posts and dispensaries were installed in rural areas to treat the population and develop sanitary interventions to control malaria infections.

The most striking feature of former rural workers' speech about malaria was their deprecation of the disease in face of the retrospectively perceived everyday deprivation, hard work and hunger threat. Therefore, without directly blaming malaria on their everyday life circumstances these people's memories show that it must be considered as the result of a compound causation model; as part of a complex set of local conditions and personal experiences that dictated the order of priorities in the face of multiple vulnerabilities that affected them.[2] Although it has a specific agent (*Plasmodium* parasites), malaria is deeply inscribed in ecological, historical, political and social circumstances that dictate its distribution, determine who is more vulnerable and why, and how it is handled.

Most of the memories collected refer to the period between 1940 and 1970 marked by dictatorship, its resistance to changes and its repression of any form of dissent and opposition. Until the 1960s the economy was dominated by agriculture. On the valleys of the rivers Tagus and Sado, where wide expanses of rice fields were located, the differentiation of social groups and social interactions were strongly marked by people's relation to the land. The two extreme groups in a gradient of modes of access to land were "landowners" and "day-labourers". The agricultural landscape was dominated by large properties (in some districts they could be over 250 acres) and social relations were highly hierarchical and unequal. Life could be hard for day-labourers, subject to uncertain work and meagre wages, sometimes having to move from place to place in search of work:

Here, the rice thing was over and there was no more work; and so what did I do? My wife stayed at home with my two grown up daughters, and I did not know what to do with my life. In those days we had poultry; my wife fried a couple of eggs with a little shredded cod and a little bred, put everything inside a basket and I went down there to catch a train, there at Vale de Guizo station [...] I went to Algeruz to ask for work at the vineyards. (Antonio, 2006)[3]

Therefore, in their narratives about "having malaria", former rural workers would always downplay the disease while giving emphatic, detailed and emotional descriptions of their labour; of its harshness; of their destitution or scantiness of comfort; of the hunger threat. Malaria came as one among the many struggles of everyday life being not much thought of except when it prevented them from working, compromising their day wage, or caused them extreme physical discomfort. The interviewees' discourse was often punctuated with the expression "we suffered a lot". Suffering, recognised from the standpoint of the present and perceived as persistent and inescapable, was a prevailing notion throughout their narratives as was the sense of sharing such suffering with their fellow rural workers. Suffering was perceived as inherent to their class and inescapable. It was only while recollecting their past experiences in light of the presently dominant values; labour laws; the current historical discourse about the dictatorial regime and its oppressive mechanisms; the democratization of health services – as well as in light of their own socio-economic changes – that the interviewees recognised suffering as a socially produced condition, as defined by medical anthropology:

> *Social suffering [...] brings into a single space an assemblage of human problems that have their origins and consequences in the devastating injuries that social force inflicts on human experience. Social suffering results from what political, economic, and institutional power does to people, and, reciprocally, from how these forms of power themselves influence responses to social problems* (Kleinman, Das and Lock 1996, xi).

Suffering is a social condition as well as a category that

2 - On the connections between "vulnerability, malaria and health-seeking processes" see Ribera ans Hausmann-Muela (2011, 104).

3 - The interviewees' names have been changed to protect their anonymity.

helped them think, define and make sense of their past experiences. On the other hand, discourses about suffering harboured an ambivalent feeling. Such emotional encounters between past and present produced narratives that entwined praise, sorrowfulness and fatalism; a critical and sometimes irate reflection about the inequalities, deprivations and repression; a nostalgia for their young and active body; considerations about the superiority of past values related to work; the nostalgia for a more supportive and righteous community life; and the notion of an unavoidable "social destiny".

What is malaria?

Malaria made sense only as a transient bitter part of the rural workers' trying life. Therefore, its causes, modes of transmission and cure were pragmatically perceived, considered and explained according to the way the disease interfered with the workers' performance of their daily tasks; or the transitory discomfort that it caused. Malaria was identified, described and dramatized according to its physical symptoms. Calling malaria *sezões* (shakes) was (is) not just a reminiscent of a past designation common to medical literature and lay people; it also illustrates the importance given to its impressive physical traits, as well as the centrality of the body as an instrument of work in the interviewees' memories of the disease:

D – That fever, that fever that we had, the all body shook!
M – We wanted to stop shaking but we couldn't; our teeth clattered!
(Domingos and Marcolina, 2006).

We went to work […] after an hour or so we started – in midsummer! – we started shaking all over with an unbearable cold and throwing up. We felt weak and had to go home.
(Dâmaso, 2006).

Malaria was also characterized by the different regularities of fever bouts. Thus, after the first recognisable symptoms, work could be carried out within the regular intervals of the predictable recurrences of the fever:

In those days, there were the seizures; people called it the seizures. And it was every other day: we worked today and tomorrow we rested. But we rested suffering; it would not let us work [laughter]
(José, 2006).

I went [to work] with my mother and she was ill, poor thing, with those seizures fevers. But because she had so many children she wanted to do the most [work] she could. She would lie down here and there.
(Elvira, 2006).

As for malaria causation, parasites and mosquitoes were not the only recognised sources of the "shakes" although the interviewees' speeches evinced the influence of the medical version. Other causes were admitted that brought together contemporary and ancient medical models. Poisons transmitted by the mosquitoes or venoms stemming from stagnant waters and putrefying matter could also cause the "shakes":

The mosquito hassled us during the rice weeding because we slept on the fields. We were in the water all day long weeding rice and when night came, when sunset came we went to where the camping place was – 30 to 100 people. Each of us took a handful of ferns and made a little bed. We put a blanket underneath and another over us and slept there all night. The other day early in the morning back to rice again. And so, mosquitoes would bite us a lot. In those days mosquitoes were poisoned and many people had the seizures. […] mosquitoes have something poisonous that is on the fields.
(José, 2006).

The origin of the seizures were stagnant waters […], swamps, rice. [To his colleagues] I don't know if you remember well but in those days we were weeding the rice, we made [holes] and buried [the weeds] in the water. They rotted and that's what caused water's putrefaction. That was it and nothing else! I was there [in the rice fields] three years; those were the worst years of my life. I barely survived!
(Manuel, 2005).

Although mosquitoes were often mentioned as a nuisance, the DDT (Dichlorodiphenyltrichloroethane) sprayings that took place once or twice a year in the malaria areas since the 1950s were not perceived as a means of eliminating them. As a former DDT spraying operator stated, "people thought that it was to kill the houseflies. Nobody thought of mosquitoes. They let us in because of the houseflies" (Oliveira, Benavente, 2007). The "letting them in" part means that the sprayings would not have been so promptly accepted if they had not been perceived as a useful thing. Sprayings required moving or covering furniture and any foodstuffs. It involved extra work for householders and would not have been welcomed unless it was for a good cause. Some of the interviewees knew the DDT spraying men by name, as they were neighbours from town. Isilda, one of the interviewees, stated that "when there were

many, many fleas in the house it was Mário Jorge and another man called José that came with a disinfecting device; it was a disinfection with DDT"; and her friend added that "DDT was for fleas and bedbugs" (Isilda and Matilde 2006).
The sometimes embarrassed reference of the interviewees to fleas and bedbugs, as well as to mosquitoes and the radical measures to eliminate them had nothing to do with malaria; they were a means to reinforce rural workers' former appalling living conditions, when considered from the standpoint of what is presently thought of as hygienic and proper. In their speech, their houses made of pug and cane, covered with straw and windowless were not *Anopheles*' harbouring sites, threatening them with malaria, as described in medical literature; they were a material proof of their dignified poverty. Mosquitoes were much less thought of as malaria transmitters than as an annoying presence disturbing or preventing the labourers rest:

These houses around here would thrive with mosquitoes. Do you know what we used for the mosquitoes? It was a stove like that one over there filled with bits of sticks and straw and such smoke that it felt as if we were inside an oven, hot as hell! I don't know how we didn't suffocate. And our houses didn't have these windows; they had these slits for airing, almost nothing. (Antonio, 2006)

We lived in shacks but it was all… outside canes and inside they were lined with [rice] bags; we seamed the bags together and then lined the walls and everything was whitewashed. It was all very white inside.
(Dionisia, 2006)

Do you know where we slept to have some rest? On top of the trees, like birds. We put some sticks tied with wire or rope and then a cork board and ferns and that was it… that's how we slept because of the mosquitoes that would not let us rest, in those days.
(José, 2006)

Treating malaria

Such varying accounts of malaria causation did not prevent infected people from looking for medical assistance at the malaria stations and posts. People used these places according to their perceived needs, work hours and the distance to be travelled; in some places malaria stations and posts became very popular as places where people went looking for relief for their various ailments and not only malaria. As one of the interviewees, put it "the shakes post was the poor people's relief; whether we had the shakes or not, we always went there. Otherwise we would have to pay to see a doctor" (Isilda 2006).
Nevertheless, when it came to malaria people did not depend on the post for a diagnosis; although many interviewees mentioned the ear pricking and spleen palpation done there, they did not rely on these technical procedures to know what was making them ill. While to doctors and visiting nurses malaria diagnosis should be confirmed through such procedures, people who went to the post had already decided what their trouble was by experiencing the well-known symptoms. Therefore, they submitted to the "medical ritual" just to get free medicines; quinine and atebrin (a synthetic malaria drug) were the two mostly mentioned and were given at the post under strict dosage and treatment length instructions, which were often ignored. Peoples' use of these drugs followed a practical sense based on visible symptoms instead of microscopic parasites, as well as by a pressing need to end physical suffering and return to work. Therefore, the drugs treatment might be interrupted as soon as symptoms disappeared.
On the other hand, medicines given at the malaria post were not the only therapeutic resource that people could get. Quinine and other peculiar drugs had been advertised in newspapers for many decades. For those who could afford it these were alternative choices. But the most mentioned complementary therapeutics were home made remedies and mixtures that could be used along with the ones given at the malaria post. Home remedies were often recommended by neighbours or relatives and prepared mostly by women, the ones who had the caring role. These remedies were property of the community, immediately available to everyone regardless of medical diagnosis and easy to take. If the malaria post was far or malaria had not been diagnosed by medical procedures, leading to drugs not being given to the ailing, home remedies did the job. Furthermore, the ingredients used to prepare those mixtures were easily found at the neighbouring fields and woods or were part of the common diet (Saavedra 2014).
A very bitter beverage consisting of water used to soak a wild plant called "marcela" was one of the most popular remedies. Other herbs and grains were also used to make similar beverages, such as lupine beans and *erva férrea* (Prunella vulgaris). Their bitterness, comparable to quinine's, was perceived as a distinctive sign of their efficiency to cure malaria (Landeiro 1943). On the other hand, the fact that these mixtures were the result of vegetable maceration and that some of them should be left outdoors overnight to catch night dew brings to mind the miasmata that were identified as the cause of malaria until the 19th century:
For the shakes it was *marcela* water that tasted like poi-

son!… Oh I could never drink that. It was for fever; but oh it was so, so bitter! But it had to be bitter things to combat (sic.) the seizures. And lupine beans soaked; and then we drank that water that was also very bitter. You name it…
(Maria, 2006).

Here we made a tea of *marcela* and *erva-férrea*. Our mothers made it and then they put it outside in a bowl on top of a pot to catch the night dew. And then they would seep it and in the morning we would drink it, that *marcela* water, before eating. It was very, very bitter!
(Bárbara, 2006).

Other mixtures that stimulated perspiration were also prepared using garlic, spirit, sugar, vinegar and even gunpowder. But, according to some interviewees' childhood and youth memories, definite cures of malaria sometimes followed the simple satisfaction of unusual appetites. Many of them reported such uncommon cravings for food as a malaria effect. They did not crave for "exotic" foods but for those that they could not have as often as they would like or that they would only have in very small portions. Thus, appetites meant feeling like eating a whole box of sardines; grilled or fried cod instead of bread soup; oranges; bread with sausage; or drinking wine directly from the cask. As if these longings were a pretext to dodge food scarcity and monotonous diets perceived as markers of their destitute condition; the only transgression that would not incur in violent repression.
Hence curing malaria meant resorting to a variety of therapeutic means deeply embedded in local social structures and habits. This pluralism matched immediate practical needs and did not stem from rejection of or suspicion towards medical therapeutics, which were rather one among the many choices presented to the rural workers.

Final remarks

Looking at malaria history in Portugal from the standpoint of former rural workers' memories evinces how local ecological, political and social factors influence the disease's epidemiological trajectory and dictate gradients of its social relevance, as well as the range of responses that it triggers.
Malaria's medical recognition as a health issue needing attention changed over time and was not the same for every doctor. All in all, and despite not very trustworthy statistics, malaria was not a life threatening disease though it did cause some deaths. Although malaria could reach significant numbers in its worst years (as was the case during the Second World War due to shortages of medication, of labour and food) it did not weigh on national morbidity numbers as much as other diseases, especially children's diseases; moreover malaria was confined to well defined regions of the country. It could result in loss of hours of work, but so could other diseases prevalent all year round, while malaria was seasonal. So was it really a national issue, a public health problem?
At least for some Portuguese doctors it was; maybe due to its cyclical upsurges that brought it to their attention, maybe due to these doctors humanistic principles and everyday experience on the ground in particularly afflicted regions. For others, malaria was a means of stimulating governmental investment in health, following the social medicine model that had been adopted for sexually transmitted diseases and tuberculosis. It was also a means of attaining international support for their attempt at enhancing and reframing state health services especially in rural areas. Yet for other doctors, like the Portuguese malariologist Francisco Cambournac, it was also a means of developing skills, building professional networks and promoting their careers – Cambournac became the director of the World Health Organisation Regional Office for Africa in 1954.
But, for Portuguese rural workers malaria was one among a collection of predicaments, losing impact due to its transitory passage in their lives and the persistence of other daily troubles. Thus, malaria came up in their recollections of the past as part of personal and communitarian histories – tinted by the present – of hard working conditions and unequal relations, poor housing, exploitation and hunger. Doctors wrote about the need to install windows and doors screens and to use bed nets to prevent malaria; former rural workers described their shacks and how they slept in the fields, disturbed by mosquitoes and scorpions, as symbols of their deprivation. Doctors counted mosquitoes larvae at rice fields, destroyed them with chemicals and experimented with irrigation techniques to reduce mosquitoes breeding. Rural workers described rice fields as sites of hard work under extreme climatic conditions, tormented by many sorts of aquatic creatures; but also as a fundamental means of making a living and of joyful comradeship.
Such different perspectives and various ways of dealing with malaria never clashed, unlike in Mexico, during the last years of the malaria eradication programme (Cueto 2007); in Portugal they coexisted peacefully, overlapping, ignoring one another or creatively combining. In the end all went well and malaria was conquered (around 1960) just like in Italy, Greece or Spain, although quietly, with much less national or international stir. It would take over 10 years before the WHO

officially recognised malaria eradication in Portugal, in 1973. There were the Portuguese colonies in Africa – the continent that was left out of WHO's malaria eradication programme – and there was the colonial war; people coming and going between Portugal, Angola, Cape Verde, Guinea-Bissau and Mozambique; soldiers leaving and returning from and to the rice fields regions. All these circumstances made things harder, politically and epidemiologically speaking.

A history of malaria elimination in Portugal is yet to be written. Maybe it will clarify the multiple elements that combined to make it possible, besides malaria seasonality, limited distribution, mosquitoes feeding habits and DDT use. Was it a blend of ecological, social and technical circumstances? Was it a confirmation that disease can be conquered regardless of social conditions? Anyway, it was an accomplishment for medicine recognised and respected by the interviewees; except for the fact that, as one of them put it "the shakes were gone but not poverty".

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WORKSHOP
Malaria transmission: current challenges and new tools in the elimination context

30 - 31 October 2017

Instituto de Higiene e Medicina Tropical | Sala Fraga de Azevedo

PROGRAM
30 October

8h30	Reception
9h15	Official opening
9h30	**Geospatial modelling of changes to vector populations following insecticide-based malaria control** *moderator:* João Pinto | IHMT, UNL Catherine Moyes | Malaria Atlas Project, Big Data Institute, University of Oxford, UK
10h20	Coffee-break | Posters
10h50	**Current approaches and new tools to measure malaria transmission** *moderator:* Carina Silva | CEAUL Escola Superior de Tecnologia da Saúde de Lisboa, IPL Nuno Sepúlveda | CEAUL; LSHTM, UK
11h40	Oral Communications *moderators:* Catherine Moyes | University of Oxford, UK; Nuno Sepúlveda | CEAUL; LSHTM, UK **Local epidemiology and spatial analysis of malaria transmission in the Brazilian Amazon** | Tiago Ferreira **Malaria determining risk factors at the household level in two rural villages of mainland Equatorial Guinea** | Mónica Guerra **Leveraging artificial intelligence to improve malaria epidemics' response** | Mélanie Maia
12h30	Lunch (Cambournac room)
14h00	**The economic challenges and benefits of eliminating malaria** *moderator:* Jorge Varanda | CRIA, Universidade de Coimbra, Portugal Elisa Sicuri | ISGlobal, Barcelona, Spain
14h50	Oral Communications *moderators:* Elisa Sicuri | ISGlobal, Barcelona, Spain; Jorge Varanda | CRIA, Universidade de Coimbra, Portugal **Stories from the past and everyday experiences of malaria: Portugal, 1930-1960** | Mónica Saavedra **Effectiveness of private sector malaria control: the case of sugarcane workers in southern Mozambique** | Joe Brew
15h30	Coffee-break | Posters
16h00	**Impact of genetic and bioecological heterogeneities of mosquito vectors on Malaria transmission and control in Africa: future perspectives in context of elimination and growing urbanization"** *moderator:* Paulo Almeida | IHMT, UNL Alessandra dela Torre | Università de Roma, Roma
16h50	Oral Communications *moderators:* Alessandra dela Torre | Università de Roma; Paulo Almeida | IHMT, UNL **Evaluation of the ownership and use of long-lasting insecticidal nets in rural Mozambique: a cross-sectional household survey six months after the pilot of a new delivery campaign model** | Jorge Arroz **Human antibody responses to the Anopheles salivary gsg6-p1 peptide: a novel immuno-epidemiological biomarker tool for evaluating the efficacy of malaria vector control methods** | Filomeno Fortes

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