

# Colonization and Epidemic Diseases in the Upper Rio Negro Region, Brazilian Amazon (Eighteenth-Nineteenth Centuries)<sup>1</sup>

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**Abstract.** This paper examines demographic and health impacts of the colonization of the upper Rio Negro region during the eighteenth and nineteenth centuries. Smallpox, measles, and epidemic fevers plagued native populations, contributing to the depopulation of the region and depleting the Indian workforce crucial to the economic survival of the Portuguese colony and the Brazilian empire. It examines how colonists and scientists explained the biological vulnerability to smallpox and measles, two major killers of Indians during these periods, and also discusses the nature of the diseases that plagued Indian populations.

**Key words:** History of Brazil, colonization, epidemic diseases, interethnic contact, indigenous peoples, Brazilian Amazon.

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## **Colonización y epidemias en la región del Alto Río Negro, Amazonía brasileña (siglos dieciocho-diecinueve)**

**Resumen.** Este artículo examina el impacto demográfico y sanitario de la colonización de la región del Alto Río Negro en los siglos dieciocho y diecinueve. Epidemias de viruela, sarampión y fiebres azotaron las poblaciones nativas, contribuyendo a la despoblación de la región y destruyendo la fuerza de trabajo nativa que era vital para la supervivencia económica de la colonia portuguesa y del imperio brasileño. Este examina cómo los colonizadores y los científicos han explicado la vulnerabilidad biológica de los indígenas a la viruela y al sarampión, los mayores diezmadores de la población indígena en estos períodos, y también discute la naturaleza de las enfermedades que han afectado las poblaciones nativas.

**Palabras-clave:** historia brasileña, colonización, epidemias, contacto inter-étnico, pueblos indígenas, Amazonía brasileña.

## **Colonização e epidemias na região do Alto Rio Negro, Amazônia brasileira (séculos dezoito-dezenove)**

**Resumo.** O artigo examina o impacto demográfico e sanitário da colonização do alto Rio Negro nos séculos dezoito e dezenove. Epidemias de varíola, sarampo e febres assolaram as populações nativas, contribuindo para a depopulação da região e exaurindo a força de trabalho indígena que era vital para a sobrevivência econômica da colônia portuguesa e do império brasileiro. Ele examina como colonizadores e cientistas explicaram a vulnerabilidade biológica dos Índios à varíola e ao sarampo, os maiores dizimadores da população indígena nesses períodos, e também discute da natureza das doenças que acometeram as populações nativas.

**Palavras-chave:** história do Brasil, colonização, epidemias, contato interétnico, povos indígenas, Amazônia brasileira.

## **Colonisation et épidémies dans la région d'Alto Rio Negro, Amazonie brésilienne (siècles dix-huit et dix-neuf)**

**Resumé.** L'article examine l'impact démographique et hygiénique de la colonisation d'alto Rio Negro dans les siècles dix-huit et dix-neuf. Épidémies de variole, rougeole et fièvres ravagèrent les populations natives, en contribuant au dépeuplement de la région et en épuisant la main d'œuvre indigène qui était crucial pour la survie de la colonie portugaise et l'empire brésilien. Il examine comme colonisateurs et scientifiques ont expliqué la vulnérabilité biologique à la variole et à la rougeole, les plus grands décimateurs de la population indigène dans ces périodes, et aussi il discute la nature des maladies qui ont ravagé les populations indigènes.

**Mots-clés :** histoire de Brésil, colonisation, épidémies, contact interethnique, populations indigènes, Amazonie brésilienne.

### **Introduction<sup>2</sup>**

For two centuries, forced migration and resettlement, enslavement or coerced work were the main axes of Portuguese and Brazilian policies towards upper Rio Negro

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2 A historical and bio-anthropological study on epidemic diseases affecting the Colombian Amazon was published in 2000 (see Gómez López *et al.*). My paper complements in some way this previous study of the Brazilian Amazon.

Indians during the colony and the empire.<sup>3</sup> Portuguese endeavours strongly deteriorated native way of life, disorganizing Indian societies and their environment, besides demographic and health impacts of contact. Indians were confronted to new diseases such as smallpox and measles while the deterioration of their environment fuelled the onset of more or less malign fevers. The biological vulnerability of native peoples to smallpox and measles was soon noted by Portuguese colonists, settlers, travellers, scientists, and physicians who managed to explain it. By drawing data from historical sources, this paper examines the demographic and health impacts of the colonization of the upper Rio Negro region by Portuguese and Brazilian peoples during the eighteenth and nineteenth centuries. It will show how Portuguese and foreign scientists explained the biological vulnerability of Indians to smallpox and measles, their major killers during this period. The perceptions of these affections are replaced in the context of the medical views of that time.

#### First contacts with Europeans and their diseases<sup>4</sup>

The first intermittent contacts of upper Rio Negro Indians with the Portuguese probably date back from the 1730s onwards, when the governor of the former State of Maranhão e Grão Pará sent slaving expeditions<sup>6</sup> into the region in order to replenish the population of Indian free labourers and slaves decimated by recurring epidemics of smallpox and measles, and whose work was vital for the economic survival of the colony.<sup>7</sup> Besides these expeditions, private raids in search for slaves for the

3 The independence from the Portuguese court was declared on September 7<sup>th</sup>, 1822. This was the beginning of the monarchical regime in Brazil with D. Pedro I as its first emperor. The first Brazilian constitution was imposed in 1824 and lasted until 1891.

4 On the history of the colonization of the upper Rio Negro region, see especially Sweet (1974), Wright (1981), Hugh-Jones (1981), and Buchillet (1983).

5 Created in 1621, the State of Maranhão e Grão Pará had a distinct administration from the rest of the Portuguese America and direct relationships with Lisbon. It became the State of Grão Pará e Maranhão in 1751 and encompassed the northwest region of present-day Brazil.

6 Official slaving activities had two forms: *tropas de guerra* (war troops) and *tropas de resgate* (ransom troops). The first were “sent to ‘punish’ Indian tribes which had attacked Europeans without provocation, [and] charged with capturing and enslaving as many members of the ‘guilty’ tribes as possible.” The second were “sent to barter trade goods for slaves with friendly Indian chiefs, who normally also raided villages to capture people as well.” According to the law, Indians found “tied up” and “in danger of being eaten” by their enemies could be ransomed. Both intertribal wars and practice of cannibalism were considered to be *causas justas* (just causes), allowing official troops to take captives in friendly villages or make war against the aggressors. The legal base for enslavement was examined by missionaries (Sweet, 1974: 819 and chapter 11; Wright, 1981: 122-123).

7 From seventeenth until the beginning of nineteenth century, countless epidemics of smallpox and measles swept the state (especially in 1621, 1644, 1662, 1690, 1724, 1740, 1749, 1750-1758,

gathering of forest products and the attempts of missionaries to relocate Indians in mission settlements operated somewhat concurrently for the control of the Indian labour force (Sweet, 1974: 689). It is nevertheless possible that upper Rio Negro Indians had been influenced before by Western goods and diseases either through trade exchanges with other indigenous groups already in contact with the Portuguese and other European peoples, or through the slaving raids undertaken by the Manao from the middle Rio Negro valley who were trading Indians from other groups as slaves for material goods with the Dutch and the Portuguese. From the 1690's to the 1720's, the Manao virtually controlled slave trade on the river, going as far as the upper reaches of the Negro and Orinoco Rivers to make captives. The Portuguese conducted various punitive expeditions against them, resulting in their death, enslavement or flight during the years 1723-1730. The upper Rio Negro was consequently opened to official slaving troops (Sweet, 1974: 557; Wright, 1981: 124-125).

Using as slaving base the fortress of São José da Barra do Rio Negro,<sup>8</sup> various official slaving expeditions were organized between 1730 and 1750, taking a great number of Indians as captives. Various fortified villages (notably São Gabriel da Cachoeira, São José de Marabitanas, and São Felipe) were built along the upper course of the Rio Negro in order to delimit Portuguese possessions, prevent foreign powers from taking over the area, and resettle Indians from the headwaters and small streams (*Igarapés*) where they were forced to work in agriculture and gathering forest products (the *drogas do sertão* such as dyes, medicinal, stimulant and odorous plants, condiments, oleaginous seeds, Brazil nuts, fibres, vines, etc.). From then on, slaving expeditions began to operate on the Vaupés and Içana Rivers, two tributaries of the upper course of the Rio Negro.

Reliable demographic data do not exist for this period. It is nevertheless evident that Indians suffered a lot from official and private slaving raids and missionary-sponsored relocations. It is estimated for instance that about 20.000 Indians have been enslaved only during the 1740-1750 period (Wright and Hill, 1986: 39). Besides enslavement and compulsory work, Indians had to face up the epidemiologic and health impacts of contact with the Portuguese. In 1740, for instance, an epidemic of *bexigas* (variola major) swept the upper course of the Rio Negro. It probably killed a great number of Indians, since the introduction of smallpox in a

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1762, 1763-1772, 1776, 1790, 1819, etc.), causing a great number of deaths. See Chermont (1885), Vianna ([1908] 1975), Sweet (1974), Alden and Miller (1987), and Chambouleyron *et al.* (2011) on the havoc brought by these epidemics in the state. Smallpox and measles were differentiated as soon as 1685 through the work of Thomas Sydenham but it is possible that, in some instances, European observers confused both diseases in their reports and memoirs. Their viral origin (respectively, viruses from the Poxviridae and Paramyxoviridae families) was only established by the late nineteenth century.

8 Installed in 1669 "two leagues up the mouth of the Rio Negro," this fortress will become later Manaus, capital city of the Amazonas State.

previously unexposed population typically results in a large-scale epidemic affecting all age groups and with death rates ranging from 30 to 40 percent.<sup>9</sup> Mortality rates of 100 percent have even been recorded among Native Americans (Duffy, 1951). The disease may have also reached remote parts of the region deprived of any direct contact with the Portuguese and their African slaves, either through infected Indians running away from their community or through cotton clothes, blankets and fabrics contaminated with pus or scabs.<sup>10</sup> In December 1743, the French geographer Charles-Marie de La Condamine—who was blocked at Belém of Pará due to the lack of canoe-men product of the smallpox epidemic that was raging there—attributed the great mortality among Indians recently arrived to the state to some physical and lifestyle characteristics:

[...] like amphibian animals, [they] live in water as much as on earth, [and] strengthened since their infancy by air injuries, their skin is perhaps thicker than that of other people and this may turn difficult the onset of the eruption. Their habit to paint the body with achiote and genipap<sup>11</sup> and various other greasy and thick oils which in the long run may obdurate skin pores may also contribute to the difficult [onset of the] eruption. This assumption is confirmed by another fact. Black slaves, transported from Africa, and who do not have the same customs, better resist to the disease than the natives of the country. In any case,

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- 9 At least under its major form, Smallpox has two main clinical forms distinguished by their severity degree and mortality rate: *variola major* (*bexiga(s)* or *variola* in Brazil), the more severe form; and *variola minor* (*alastrim* or *varicela* in Brazil), much milder. *Variola major* was introduced into colonial Brazil through the slave trade from Africa (Alden and Miller, 1987: 195). It dominated the world until the late nineteenth century. *Alastrim* was first noted in Brazil in 1909 (Peixoto, 1938: 201-202), being only identified as a mild form of smallpox in the mid-1950s (Fenner *et al.*, 1988: 3). The last case of smallpox in Brazil was reported on April 19th, 1971. In May 1980, the World Health Organization declared the world as free of smallpox.
- 10 The first symptoms appear twelve to fourteen days after the exposure to the virus and include high fever, malaise, vomiting, and head, muscle and body aches. Two days later, a diffuse rash appears. First on the face and hands, it spreads to the trunk and then to the arms and legs within twenty-four hours. At the same time, lesions in the pharynx, membranes of the mouth and tongue begin to ulcerate, and the virus is excreted in saliva and pharyngeal secretions. The rash progresses through various stages: papules evolve into vesicles with a head, and then into pustules. On the 8<sup>th</sup> or 9<sup>th</sup> day of the rash, pustules begin to dry and scab. The patient is infectious from the onset of the rash until all scabs have fallen off (i.e. about four weeks) because scabs contain a large amount of live viruses. Secretions of the oropharynx are the main source of infection, but the virus can also be transmitted through clothing, bedding or blankets contaminated with pus or scabs (Fenner *et al.*, 1988: 5-29). The capacity of the smallpox virus to survive in scabs (about two weeks) and in cotton clothing, bedding or blankets (up to eighteen months) according to the temperature and the humidity (Upham, 1986: 119), allowing it to travel over great distances and to affect distant communities, may explain why this disease was so lethal for natives, comparatively to other infectious diseases (measles and influenza, for instance).
- 11 Respectively, *Bixa orellana* and *Genipa americana*.

a savage Indian recently arrived from the woods and attacked by this disease is usually a dead person.<sup>12</sup> (La Condamine, 1745: 183-184)

From 1749 to 1763, severe epidemics of smallpox and measles swept again the region. The 1749 measles epidemic made countless ravages among the population of the state with great social, political, and economic consequences, and was known as “the great measles” (*o sarampo grande*).<sup>13</sup> According to the lieutenant-colonel Theodozio Constantino de Chermont in his memoir on the ravages caused by smallpox and measles from 1720 onwards, it was not so much deadly by itself. It was lethal by the associated diarrhoea from which no one escaped and also by the lack of remedy (Chermont, 1885: 29). Initiated during the visit of the fortresses of the Rio Negro by the Captain-Major Joseph Miguel Pires and the relocation on the river of Indians from the Branco River (a tributary of the upper Rio Negro), it swept the entire state. More than two thousand Indians from the mission settlements of Rio Negro and the Solimões<sup>14</sup> died from the disease (Alden, 1985: 437, in Gomes, 2011: 8). Evidently, these recurring epidemics greatly contributed to lowering the resistance of natives against Portuguese invaders. As Chermont (1885: 29) put it: “those who escaped from the disease didn’t escape from slavery.”<sup>15</sup>

### **Health impacts of “descent” (*descimentos*) policy**

In 1754, during a reconnaissance expedition of the upper Rio Negro region, Xavier de Mendonça Furtado, then governor of the State of Grão Pará e Maranhão, in want of canoe-men, found many Indian villages deserted at his approach, a fact that he credited to the egoism of the missionaries who wanted to keep the Indians for their proper use. In fact, these villages had been deserted due to a recent smallpox epidemic. On returning to Lisbon, he referred the fact to his step-brother, Sebastião José Carvalho e Melo, better known as Marquis of Pombal, then prime minister of Portugal, who put an end to Indian slavery (law of June 6, 1755), withdrew the “worldly power” from missionaries (edict of June 7th, 1755), and gave the administration and governance of colonial villages to magistrates and city councillors. Missionaries could however pursue their evangelical work in the villages and were also requested to convince Indians from the backlands to resettle along the Rio Negro but their influence was

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12 Translation made by the author.

13 A measles epidemic in a previously unexposed population kills 20 to 30 percent of the affected people (Ball, 1977: 243-245). However, death rate may increase as a consequence of secondary infections (diarrhoea and bronchopneumonia, for instance).

14 Name of the upper stretches of the Amazon River from its confluence with the Rio Negro upstream to the frontier border with Peru.

15 Author’s translation.

greatly reduced. The most prosperous villages took the status of villages or towns and received a Portuguese name, usually that of a Christian saint.

Unfortunately, the “law of liberty” was difficult to apply because of the importance of the Indian workforce for the economic survival of the colony. As the desertion of Indians from colonial villages after their freeing from slavery was greatly feared, and because of “their supposed great penchant for laziness and an inactive life,”<sup>16</sup> the colonial government decided that Indians should work for their ancient masters for six years with a salary. A transitory period of some years between slavery and absolute freedom was seen as necessary (Farage and Carneiro da Cunha, 1987: 106-107). New villages were established along the Rio Negro in locations usually chosen for the quality of the soil or for offering military advantages to the Portuguese, strongly concerned with security along the frontier borders of their territory with Venezuela.<sup>17</sup> Attempts were made to convince Indians from the backlands and small streams to resettle permanently in these villages and to accept Portuguese governance (Wright, 1981: 140). This was the system of *descimentos* (“descents”) that Francisco Xavier Ribeiro de Sampaio, then general inspector of the recently created Captaincy of São José do Rio Negro,<sup>18</sup> defined under the following terms: “the term *descimento* was adapted to mean the transmigration of Indians from the forest to our villages”<sup>19</sup> (Sampaio, 1856: 94, footnote b).

In 1758, the administration of colonial villages and towns was allocated to white military officers or to civilians (*moradores*) who received the title of “Director of Indians.” In these villages, Indians were compelled to work building community houses and homes for directors, in collective gardens of cotton, coffee, indigo etc., and gathering forest products. This new system of labour exploitation strongly deteriorated their way of life, favoured community leaders co-optation who became functionaries of the Portuguese work system while making Indians dependent on Western trade goods (Wright, 1981: 140).

Throughout this period, Indians had to live with military presence, Directors of Indians and missionaries. They also had to cope with demographic and health impacts of their continuous presence and of the descent and relocation policies. Numerous native communities from the backlands had been depopulated due to the transfer of their inhabitants to new villages on the Rio Negro, to Manaus or to their desertion by Indians wanting to escape from the resettlement or from epidemic diseases. Epidemic outbreaks of smallpox, measles, flu, and “intermittent”

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16 Author’s translation.

17 On Spanish attempts to colonize the upper reaches of the Rio Negro, see Wright (1981: 141-145).

18 It was created on March 3rd, 1755, at Barcelos (former village of Manao Indians under the name of Mariuá), on the lower course of the Rio Negro.

19 Authors’ translation.

(*intermittentes*) or “tertian” (*terçã*) fevers periodically swept native communities, colonial villages and mission settlements during this period. In 1774-1775, during a reconnaissance expedition on the Rio Negro, Sampaio found a great number of villages ravaged by smallpox. Like La Condamine, he considered the disease as a “mortal evil” (*mal mortal*) among the natives:

[...] smallpox is a mortal evil among Indians, of which very few escape. This may be due to the difficult onset of the eruption because their cutis is less porous [than in White peoples]; as they live entirely nude, outdoor, and almost always in the water, they are quite amphibious animals, and necessarily their skin pores need to be more closed.<sup>20</sup> (Sampaio, 1825: 24)

In 1785-1786, during his journey to the Captaincy of São José do Rio Negro in order to assess the state of the commerce and economy, the Brazilian naturalist Alexandre Rodrigues Ferreira collected valuable information about economic and natural resources, hygienic conditions of settlements, and diseases plaguing native populations. He mentioned, for example, the epidemic outbreaks of smallpox and measles that attacked Indians of the middle Rio Negro during the years 1763-1776 and also cited the devastating effects of the reconnaissance expedition of the upper Rio Negro region led by Colonel Lobo de Almada in 1784-1785 which gave rise to several epidemics of smallpox, measles, and fevers. He also reported the great contribution of fevers of various kinds (i.e. “intermittent,” “quotidian,” “tertian,” and “quartan”)<sup>21</sup> which could be “benign” or “pernicious,” in Indian morbidity, mortality and depopulation of the region, and mentioned the great fear that natives had of them. Some places were especially feared for this reason. Actually, Indians had an “indivisible horror” (*indivível horror*) of the cataracts and their diseases (i.e. fevers)<sup>22</sup> (Ferreira, [1885-1888] 1983: 212). Unlike smallpox and measles, these fevers were said to attack indifferently Indians and non-Indians. According to An-

20 Author’s translation.

21 Based only on somewhat obscure descriptions, it is impossible to affirm with any degree of certainty that these variously labelled fevers point unequivocally to malaria. For instance, “intermittent” fever (fever present only for some hours during the day) may appear in malaria, tuberculosis, pyogenic infections or schistosomiasis etc. It seems nonetheless conceivable that malaria is a possible aetiology for the intermittent fevers registered during the colonization of the upper Rio Negro region. It is now known that “quotidian” malaria (periodicity of 24h) is caused by *Plasmodium falciparum*, “tertian” malaria (periodicity of 48h) by *P. vivax* and *ovale*, “quartan” malaria (periodicity of 72h) by *P. malariae*, and “malignant” tertian malaria also by *P. falciparum* (Bruce-Chwatt, 1980: 11; Ogoina, 2011: 114). Moreover, the prevalence of malaria in the Rio Negro region was confirmed at the beginning of the twentieth century by the Brazilian physician Oswaldo Cruz (1913). It is still an important health problem in the region.

22 According to Desana Indians whom I worked with, small depressions in the rocks of rapids enclose pots containing the malarial poison. Furthermore, some places in the upper Rio Negro region



tônio Joseph de Araujo Braga,<sup>23</sup> credential barber-surgeon attached to the Fourth Departure of Investigation of the Demarcation of Limits who had been living in Barcelos for eight years, and to whom Ferreira sought advice on the diseases affecting the region, “quartan” (*quartan*), “tertian” (*terçã*), or “pernicious” (*perniciosas*) fevers usually appeared at the start of the river overflow, varying in severity according to the degree of heat and moistness. Besides epidemic fevers, there were also frequent “catarrhs with or without cough” (*defluxões com ou sem tosse*) that usually occurred during the river flood and the ebb tide, i.e. respectively in February and July in the region. When associated with a convulsive cough, they were particularly deadly for children, as it happened in 1786 in Barcelos where about 25 children died in a few days (in Ferreira, [1885-1888] 1983:750-751).

For Braga, Indian and black peoples were especially vulnerable to the contagion of smallpox and measles (in Ferreira, [1885-1888] 1983: 748). As a matter of fact, the native susceptibility to these diseases had been observed since the beginning of the colony. In 1616, for instance, in the “Second Dialogue” dedicated to diseases and remedies of the *Diálogos das grandezas do Brasil* [Dialogues on the greatness of Brazil] first published during the years 1883-1887, Ambrósio Fernandes Brandão explicitly stated that smallpox (*bexigas*) was foreign to the country, that it was introduced to Brazil through the slave trade from Africa and affected

natives only, those arriving from the African coast [African slaves], the descendants of whites and Indians, that we name *mamalucos*, and also those born in the country from white fathers and mothers. It has never been transmitted to people arriving from Portugal where they have been raised, be they of Portuguese or of any other European origin, although I may have seen two or three people dying from it.<sup>24</sup> (Brandão, [1883-1887] 1997: 73)

The observation of Brandão of a pathological selectivity of smallpox is especially accurate considering the fact that when the Portuguese arrived in the Terra de Santa Cruz (former name of Brazil) in the sixteenth century, smallpox had become endemic in many parts of Europe, being mainly reported as a childhood disease. This means that they had already been in contact with the disease and were thus immunized. That was not the case of Indians and mestizos who were living in colonial villages and towns and/or arriving there from their communities.

For Braga, the great susceptibility of Indian and black peoples to smallpox was due to factors of different orders: characteristics of their skin (abundance of

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are known as malaria endemic areas for mythological reasons (see Buchillet, 1995: 196-197 and Buchillet, 2013: 461-465).

23 Medical observations made by Braga have been published without any title in Ferreira ([1885-1888] 1983: 743-775).

24 Author’s translation.

oil in the adipose membrane “that serves to alter the acrimony of liquids in hot countries”<sup>25</sup> and consequent difficulty for “evil matters” to cross the barrier of the skin); poor living conditions (*má vida*) of the Indians resulting from the violent works which they were submitted to and which served “to dissipate the spirited portion of their blood,”<sup>26</sup> consumption of corrupted fish or game during travels; heavy exposition to the air because they were living nude, being thus more subject to the effects of the sun, rain, heat, and humidity; and finally, the use of liqueurs and spirituous beverages that debilitated them (i.e. their immune system), making them prey to diseases proceeding from this cause (in Ferreira, [1885-1888] 1983: 748-749).

Ferreira also considered that the poor living conditions of Indians working for the colony made them highly vulnerable to disease. In his “Second Contribution” (*Segunda Participação*) on the upper Rio Negro dated from January 30th, 1786, he resumed their situation very accurately: overwork, too little food and no one taking care of them in case of disease:

[...] those [Indians not employed as canoe-men] staying in the villages, if they are able to work, work more than they eat because they usually fast with bread and water, and their bread is not our bread made of wheat; it is made of manioc flour mixed with water that they call here *ticoara* or *beijú* and on the Rio Negro *caribé*. They don’t die suddenly; [heavy] work and daily fast lead them little by little to disease and death; when disease comes [...], the Directors of Indians don’t take care of them, as missionaries did, because there is no pharmacy in the village [...]. As I always said, Indians after their emancipation are in worse conditions than when they were enslaved. The master was administering his money in [taking care of] the life of his slave; the Director [of Indians] has no [personal] interest in this or that life.<sup>27</sup> (Ferreira, [1885-1888] 1983: 76)

In 1791, the capital of the captaincy of São José do Rio Negro was transferred to Manaus. Under its administration by Colonel Lobo de Almada, Manaus became an important industrial and agricultural centre (producing fabrics, indigo, ropes, cotton, cocoa, coffee, and dry fish etc.) based again on the Indian workforce (Hugh-Jones, 1981: 31-32). In 1798, the Directorship system implemented by Pombal was abolished due to the numerous abuses committed by Directors towards Indians. In order to remedy the problem of workforce, the Queen of Portugal created two units in which Indians should enrol themselves: a militia unit (*corpo da milícia*) and a workforce unit (*corpo dos trabalhadores*). Also, missionaries were again responsible for the administration of the villages. However, their activities were insignificant as there is no mention of them until 1832 (Buchillet, 1983: 40-41).

25 Author’s translation.

26 Author’s translation.

27 Author’s translation.

## Merchants, extractivism, public service labour, and Indian morbidity and mortality

During the nineteenth century, epidemic diseases continued to sweep wide parts of the region. The German naturalist Carl Friedrich Philipp von Martius who travelled from 1817 to 1820 throughout Brazil in the company of the zoologist Johann Baptist von Spix, collecting data on botany, anthropology, diseases, family remedies, language, folklore, and music, noted —like precedent observers— the great susceptibility of native peoples to smallpox, the “long” and difficult process of emergence of the exanthematous eruption among them and also their drastic method of looking for relief from the internal heat by taking bath in the cold water of rivers and streams. For him, smallpox had the same disastrous effects among natives than the bubonic plague had among Europeans in the past: it caused terror, desolation, social disruption, abandonment of ill people and flight from the infected community. He also remarked that the disease was spreading more intensively among settled than among free, isolated or scattered Indians. This observation is especially accurate because, as it was discovered later, smallpox cannot sustain in an endemic form in small and dispersed communities due to certain epidemiological characteristics such as, for instance, the lack of a natural reservoir; the long incubation period (twelve to fourteen days) but short period of infectiousness; the inability of the variola virus to remain in a latent form within the organism; the absence of virus excretion after the patient recovered from the acute infection; and, finally, the life-long immunity after recovery (Fenner, 1993: 400-401). These epidemiological characteristics mean that, in small and isolated communities, smallpox epidemics appear periodically, in waves, depending on the reintroduction of the virus by infected people or objects and the number of susceptible (not immunized) people. Last but not least, Martius ([1844] 1979: 75-77) reported the difficulty to meet Indians with smallpox scar marks because the great majority of those attacked by the disease had died. Finally, he cited the great contribution of intermittent fevers to Indian morbidity and mortality and the depopulation of the Rio Negro region. Those affecting the lower course of the river were so virulent that they were killed in the space of three or four days (Spix and Martius, [1831] 1981: 262).

From the 1830s onwards, Brazilian itinerant merchants (*regatões*) —white men or mestizos of Indians with whites— began to travel up the upper Rio Negro with the intent to trade with Indians on a permanent basis, acting as intermediaries between Indian villages and exporting firms in Manaus and Pará. Through threats, manipulation of local leaders and distribution of trade goods and *cachaça* (distilled spirit made from sugar cane) etc., and with the complacency of the military from São Gabriel da Cachoeira and São José de Marabitanas to whom they were useful allies, they maintained Indians into an oppressive system of labour exploitation, forcing them to work in the extraction of cacao, sarsaparilla, piassava, balata, Bra-

zil nuts, etc. (Wright, 1981: 210). The British explorer and naturalist Alfred Russell Wallace who travelled in the region in 1850-1852 wrote the following about the methods used by merchants to recruit Indians:

Many of the worst characters in the Rio Negro come to trade in this river, force Indians, by threats of shooting them, into their canoes, and sometimes even do not scruple to carry their threats into execution, they being here quite out of reach of even that minute portion of the law which still struggles for existence in the Rio Negro. (Wallace, [1853] 1889: 192)

On September 5th, 1850, the Captaincy of São José do Rio Negro was separated from the State of Grão Pará and became Province of the Amazonas. João Baptista Figueiredo de Tenreiro Aranha, his first president, sought to develop the economic resources of the new Province and reverse the problem of desolation found everywhere. Through a program of “public service labour,” Indians of both sexes would be sent regularly to Barra (actual Manaus), capital city of the new Province, to work in the construction or reconstruction of buildings. When Aranha took on the presidency of the new Province, there were emigration movements of upper Rio Negro Indians to Venezuela, a fact that he ascribed to the lack of missionaries in the region and to the recurring epidemic outbreaks of measles and intermittent fevers.

Considering that the permanent presence of a missionary on the Vaupés and Içana Rivers together with a full-time Director of Indians<sup>28</sup> could control the problem of emigration and contribute to the advance of civilisation in this distant region, he gave the charge of “catechising” and “civilising” Indians to the Capuchin Frei Gregorio José Maria de Bene who was also required to keep watch on the borderline villages with Venezuela in order to prevent Indians to migrate. He also appointed Jesuino Cordeiro, then lieutenant of the Police Guard at São Gabriel, “Director of the *Aldeias* of the Vaupés and Içana Rivers”. One of his tasks was to send Indian village leaders to Manaus to receive letters-of-patent and presents. In return, the latter should send people from their communities to work in the reconstruction of the capital. He should also entice Indians to leave their traditional longhouses located deep in the forest to resettle in villages and towns located along the middle and lower course of the Rio Negro for building, agriculture, and forest products collection.

A few Indians began to resist and launched vindictive expeditions against white peoples. In retaliation, Cordeiro conducted punitive expeditions with soldiers or with Indians from other ethnic groups. In fact, retaliation or punitive raids were sometimes driven on other purposes: for instance, refusal by a community leader

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28 The post of General Director of Indians was revived in 1845. His task was to appoint local supervisors (usually chosen among the military) who should look after the Indian populations of the province (Wright, 1981: 228-229).

to send his people to Manaus, or as a way to kidnap children who were then sold to the military or given as presents at Manaus. The government of Manaus even asked merchants to procure children of both sexes to sell them as servants, encouraging Indians in this way to make war upon one another (Wallace, [1853] 1889: 206-207). This period also saw the emergence of messianic movements led by Arawak and Eastern-Tukanoan shaman-prophets who prophesied the end of this world and preached liberty from the political and economic oppression from white peoples.<sup>29</sup> All were suppressed with violence by the military.

In his first report on the situation of the Province of Amazonas (1852),<sup>30</sup> Aranha emphasized the great contribution of intermittent fevers in the annual morbidity and mortality in the region, considering them responsible for the great state of desolation and decadence of villages located along the middle and lower course of the Rio Negro. In their yearly reports to the President of the Province, some observers directly related the decadence of the Rio Negro region, the decrease of the native population, and the onset of malignant intermittent fevers to the economic and political endeavours of the new Province towards Indians. For instance, Marius Porte, professor of homeopathy, wrote the following:

When the capital of the Captaincy was located at Barcelos, the Rio Negro banks were inhabited by white peoples and a lot of Indians and there were some cattle; the river banks were then healthy. After the transference of the capital to Barra [Manaus], the government wanted to make it flourishing. For an ephemeral prosperity of a place to the great detriment of another, numerous Indians were brought in and many *moradores* followed them along with their slaves and Indians [workers]. Then, the Rio Negro began to be depopulated and intermittent fevers raging along its tributaries started to appear with a benign character in towns and parishes located along its banks. These fevers killed some Indians while leading others to run away. The so-called descents were carried on and while the [Indian] population was diminishing, fevers acquired a more malign character. Today, pernicious intermittent fevers and dysentery do exist in various places of the Rio Negro, acquiring an epidemic character during the river flood and ebb tide.<sup>31</sup> (Porte, 1854: S1-v-ix)

29 On messianic movements in the Rio Negro region, see Schaden (1983-1984), Wright (1981), Wright and Hill (1986), Hill and Wright (1988), and Hugh-Jones (1994). See also the genealogy of Indian messiahs of the Rio Negro region in Galvão and Galvão (2004: 657-675).

30 On the epidemic and prevalent diseases affecting the Province of Amazonas from 1851-1852 to 1899, see the chapters dedicated to “public health” (*saúde pública*) or “public hygiene” (*higiene pública*) and the annexed reports by physicians in the yearly *Reports of the presidents of the Province of Amazonas*. Each year, references were made to smallpox, measles, flu, fevers of different kinds, beriberi, dysentery and other diseases affecting a part or another of the Province. It is especially clear that there was rarely a year when the region of the Rio Negro escaped from the devastating impacts of some epidemic disease.

31 Author’s translation.

A few years later, in his report about the situation of Indian communities dated December 31st, 1861, the engineer Joaquim Leovigildo de Souza Coelho synthesised the reasons of the decadence of the Rio Negro region in the following way:

From 1833 until the present [1861] the Rio Negro has been decaying; a great number of villages have disappeared and those still existing are almost abandoned [...]. Usually, Indians ran away from their villages, going deep within the forest and installing their thatched huts along the margins of the vast *igarapés* and lakes existing in the Province. This is due in part to the commerce to which Indians indulge themselves, to their fear of recruitment and also, if not in great part, to the arbitrariness committed by sub-delegates and inspectors of villages. In some places, intermittent fevers led Indians to desert their villages, to live in other communities or to go deep within the forest. Some villages have disappeared for this reason. Between the city of Barra and Santa Isabel [lower course of the Rio Negro], the river is a bit unhealthy. Its endemic evils are the intermittent fevers that local people call *sezões*; on the Rio Negro, they always go along with vomiting. From Santa Isabel up the Rio Negro they are somewhat rare, except near Cucui [border frontier with Venezuela] which is also subject to this evil. Smallpox epidemics are raging near São Gabriel in the surroundings of the Camanaus rapid [...].<sup>32</sup> (Coelho, 1862: 21-22)

In accordance with medical beliefs and representations of the time, intermittent fevers were explained by varying causes acting as predisposing or as secondary agents and stemming from the regional physical and social environment. The President of the Province of Amazonas summarised well the beliefs about fevers in his Report for the year 1868:

Waters stagnate [and] there is a decomposition of plants and other bodies which begin to rot, producing pernicious and deleterious effluvium [...]. There is also the rise and dropping of the water level, alluvium, and dead fish through the backwards system of fish poison (*timbó*) and finally the action of terrible heat to which these miserable peoples are submitted. Bad food combined to atmospheric influences are one of the predisposing causes of these morbid affections.<sup>33</sup> (Rego, 1868: 486-487)<sup>34</sup>

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32 Author's translation.

33 Author's translation.

34 The classification of fevers by the British William Cullen (1710-1790) was followed by physicians of the late eighteenth and beginning of the nineteenth centuries in Brazil (Santos Filho, 1991: 166). Cullen differentiated those originating from marsh miasma (such as, for instance, malarial fevers which were further distinguished according to the presentation, symptomatology and evolution into "intermittent", "quotidian", "tertian" etc.) from those originating from human effluvia and which he labelled as "continued fevers" (Cullen, 1800). The aetiology of malaria was discovered by the late nineteenth century: role of a parasite suspected in 1846 by the Italian physician Giovanni Rasori; discovered in 1880 by the French army surgeon Charles Louis Alphonse Laveran of parasites in the red blood cells of a feverish soldier in Algeria; vector role of the anopheles mosquito first described by Sir Ronald Ross in 1897 in India etc. Three

By the 1870s and until the 1910s, the rubber boom reached the upper course of the Rio Negro, setting up another cycle in the labour exploitation and mistreatment of Indians engaged in the extraction of rubber and other wild products. Historical records leave no doubt as to the extreme cruelties committed by rubber patrons and traders (very often with the absence of reaction from regional civil and military authorities), the terror that traders induced among Indians and the impact of wild rubber extraction on demographic, health and socio-economic conditions of native populations: forced enrolment and work in extraction sites; maintenance of Indian workers into a vicious credit system (debt-bondage relationship) turning them into near slaves; threats and physical violence; abandonment of houses and communities; the population having been carried off to work for a rubber merchant or having fled deep within the forest in order to escape from the forced enrolment; kidnapping and rape of women and young girls; enforced cohabitation of women; deserted rivers and streams etc.<sup>35</sup> The Brazilian physician Oswaldo Gonçalves Cruz who assessed the medical-sanitary conditions of Indians in 1913 described well their situation:

Almost all workers in this extraction site are Indians from different tribes. They are in a very precarious physical and moral condition, being men of small stature, little robust constitution, and with a little friendly general aspect. Women are extremely ugly [*sic*], prematurely aged or, better, bringing since youth stigmas of old age. Extreme indolence predominates in both sexes. They work only because they are forced to by the patron and without any ambition of fortune, being only driven by their proper care and contented by small gifts of clothing, alcohol etc. [...] they are much exploited by white peoples and, in the Rio Negro region, more than in other regions, we get an impression of near slavery.<sup>36</sup> (Cruz, 1913: 106)

Malarial fevers were a dominant cause of morbidity and mortality in rubber and piassava extraction sites. Although they also affected white peoples, Indians seemed to suffer the most from them. As noted by Agassiz and Agassiz: “It is a curious thing that the natives seem more liable to the maladies of the country than strangers. They are very subject to intermittent fevers, and one often sees Indians reduced to mere skin and bone by this terrible scourge” (1868: 226).

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of the parasites of malaria (i.e. *Plasmodium vivax*, *P. falciparum* and *P. malariae*) are found in the Brazilian Amazon with the *Anopheles darlingi* mosquito as their main vector. It breeds in a variety of habitats (excavations, canals, ground depressions, etc.) and in the vegetation of river banks.

35 See, for example, the travel notes of Wallace ([1853] 1889), Coudreau (1886-1887), Koch-Grünberg ([1909] 1995) and Nimuendaju (1950).

36 Author's translation.

At the beginning of the twentieth century, Cruz also observed the great lethality of the disease in rubber plantations and in riverine communities, pointing out the difficulty to meet an Indian without any sign of a chronic malarial infection. In his opinion, malaria, along with hookworm disease, was responsible for the indolence and “great state of organic decadence” (*aspecto de profunda decadência orgânica*) of the majority of the population of the Rio Negro (Cruz, 1913: 114-116).

## Conclusion

In this paper, I have examined the demographic and health consequences of the policies conducted by Portuguese and Brazilian peoples towards upper Rio Negro Indians in the Northwest of Amazonia in Brazil. The European colonization and its expansion have created the conditions for the eruption of devastating epidemics. Co-occurring or subsequent epidemics of smallpox and measles, preceding or following epidemic “fevers” plagued native populations during the eighteenth and nineteenth centuries, and undermined their resistance to the colonization process of the region. Highly destructive for the natives, they had a severe impact on the economic survival of the Portuguese colony and the Brazilian empire.

At the time of the colonization, the true nature of the diseases affecting Indians, their causes and/or patterns of transmission and spread were not fully comprehended. All along the eighteenth and nineteenth centuries, more or less three ancient theories were competing to explain the origin, development, and spread of epidemic diseases: the “miasmatic theory” (epidemics were attributed to “changes in the atmosphere” caused by miasma effluvia); the “contagionism” (epidemics were caused by specific or unspecific contagious agents<sup>37</sup> transmitted from person to person by direct contact, fomites or through the air); and the “limited or contingent contagionism” (contagious agents acted in conjunction with other elements such as the state of the atmosphere, conditions of the soil or social factors) (Rosen, [1958] 1994: 211-212; Hopkins, 1983: 10-11). The perceptions of the factors contributing to the emergence of epidemic diseases reviewed in this paper clearly show a mixture of the miasmatic and limited contagionist theories.

My analysis in this paper allows drawing several important conclusions. First, the devastating impacts of epidemic diseases are strongly tied to the Portuguese and Brazilian policies towards natives during the colonization process. Second, Portuguese and foreign observers, scientists and non-scientists, made significant observations on diseases that proved true centuries later, especially: the link between importation of African slaves and introduction of variola major to Brazil; the fact that smallpox was spreading more intensively among settled than among scattered

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37 For instance, the *seminaria* of Girolamo Fracastoro (1546) in the case of smallpox and measles.



Indians; and, third, the greater vulnerability of Indians to smallpox and measles and also to the “maladies of the country” (Agassiz and Agassiz, 1868) comparatively with white peoples.

Ignoring the causes of such biological vulnerability, they resorted over the time to explanations of varying orders: physical (i.e. skin characteristics) and/or extrinsic factors (i.e. climate, quality of the air, way of life, preventive and therapeutic behaviour, improper diet etc.). Some observers stated with acute perceptiveness that it was the by-product of sociocultural and economic disruption produced by Portuguese policies towards Indians. As seen above, Ferreira ([1885-1888] 1983: 76) blamed them for the poor life and nutrition conditions of the natives and Porte (in Penna, 1854: S1-V-IX) directly linked the pernicious character of intermittent fevers to Portuguese endeavours.

More recently, Indian susceptibility to smallpox and measles was attributed in part to their genetic homogeneity which eases the adaptation of the disease to new hosts because of their similar immune system (Black, 1992, 1994). It seems evident however that, besides the psycho-social trauma engendered by the contact with the colonists, European colonization and expansion in the upper Rio Negro have inaugurated a series of transformations into the physical and social environments of natives that increased the devastating impact of epidemic diseases: for instance, socio-cultural disorganization, life, nutrition and environmental conditions deterioration, etc. The co-occurrence of epidemic outbreaks and the complications of diseases (diarrhoea, for instance, is a frequent complication of measles as it was observed by Chermont, see above) also concurred to strengthen their effects.<sup>38</sup> In any case, this paper clearly shows that medical and non-medical observers of eighteenth and nineteenth centuries have registered some of these factors, demonstrating a precocious and acute perceptiveness of the diversity and complexity of factors involved in the health and disease process.

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38 On the discussion about the factors that may have contributed to the Indian depopulation consecutive to epidemics, see Crosby (1976), Black (1992, 1994), Jones (2003), and Buchillet (2003, 2016).

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