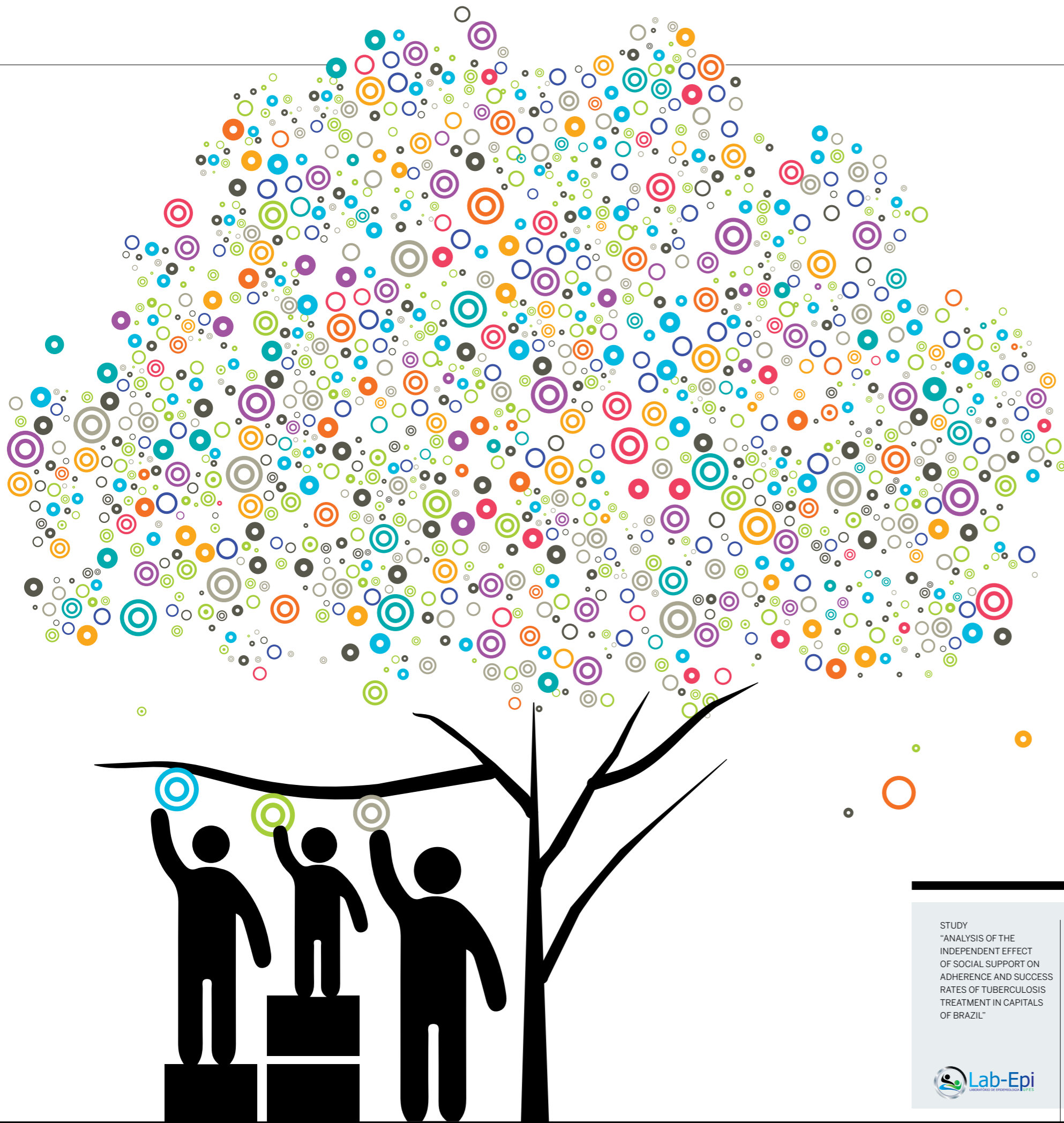




**STUDY
REPORT**

ANALYSIS
OF THE
INDEPENDENT
EFFECT OF
SOCIAL SUPPORT
ON ADHERENCE
AND SUCCESS
RATES OF
TUBERCULOSIS
TREATMENT IN
CAPITALS OF BRAZIL



Equity in health is directly connected to the concepts of equality and justice. According to this principle, one must consider people's different needs and life conditions when practicing the right to health care. Consequently, the commitment when assisting individuals is to offer more to the ones who need more. This precept guided the project "Analysis of the independent effect of social support on adherence and success rates of tuberculosis treatment in capitals of Brazil", conducted by the Laboratory of Epidemiology of Espírito Santo Federal University (Lab-Epi UFES).

One of the objectives was to analyse the relation between determinants of tuberculosis, social protection strategies and treatment outcomes in Brazil. Eight state capitals of the country took part in the study, representing its five regions.

This report will present preliminary results and stories about TB prevention and care in the studied cities' Brazilian Unified Healthcare System (SUS - Sistema Único de Saúde). They indicate that inequality reduction and distribution of equal opportunities are essential to improve the health of people with TB living within vulnerable contexts in Brazil.

STUDY
"ANALYSIS OF THE
INDEPENDENT EFFECT
OF SOCIAL SUPPORT ON
ADHERENCE AND SUCCESS
RATES OF TUBERCULOSIS
TREATMENT IN CAPITALS
OF BRAZIL"



PRINCIPAL INVESTIGATOR

Ethel Leonor Maciel

ACADEMIC COORDINATOR

Bárbara Reis-Santos

OPERATIONAL COORDINATOR

Carolina Maia Martins Sales

FUNDING

National Council for
Scientific and Technological
Development - Brazilian
Ministry of Health (CNPq -
Ministério da Saúde: MCTI/
CNPq/MS-SCTIE-Decit Nº
40/2012 - Neglected Diseases
Research)

COOPERATION

Brazilian Tuberculosis
Research Network (Rede TB)

MSC CANDIDATES

Janaína Oliosi
Rodrigo Locatelli

UFES STUDENTS

Bárbara Campos
Bruna Venturin
Geovane Fontana
Helaine Mocelim
Kerollen Cristina da Silva
Larissa Silva
Luiz Henrique Quinelato
Mariana Almeida
Mateus Nague

Nicolli Duarte

Renata Scarpatti
Tereza Cristina Silva
Walter Gomes

COLLABORATORS

Amanda Pissinati
Ana Torrens
João Paulo Cola
Lais de Almeida
Laylla Macedo
Leticia Guidoni
Leticia Negri
Mauro Sanchez
Mayara Sandri
Mayramelia Vasconcelos
Raísa Coimbra
Teresa Gomes

**"SOCIAL SUPPORT"
STUDY REPORT |
LAB-EPI UFES • 2016**

EDITOR

Débora Yuri

**GRAPHIC DESIGN
AND ART DIRECTION**

Luciana Sugino

TEXTS AND PHOTOS

Débora Yuri

EDITORIAL COORDINATION

Bárbara Reis-Santos
Ethel Leonor Maciel



LESS INEQUALITY, more health

To understand the relation between social protection and tuberculosis treatment outcomes, the researchers monitored 1,497 subjects in eight state capitals of Brazil

A study that involved 237,808 kilometers crossed travelling for field research, 12,780 hours of data collection and processing, 1,403 food vouchers distributed, 114 professionals, 91 healthcare services. Numbers compatible with the challenge's dimension that is TB control in Brazil. Even though the disease has effective treatment and drugs for seven decades, the country still registers high incidence: in 2015, the rate was 40.78 for 100 thousand inhabitants, according to the Brazilian Ministry of Health. There was 84,397 notified cases.

Continually, it is observed in the whole world that the highest TB rates are found in places that concentrate the poorest populations and large inequalities. However, the problem was only partially faced in the country. The Brazil Without

Extreme Poverty Plan (Plano Brasil Sem Miséria, launched in 2011), one of the world's largest conditional cash transfer programs with focus on productive inclusion, represents an unprecedented hope for this confrontation.

The project presented in this report had as main objective to analyse the relation between social protection programs and TB treatment outcomes. It was carried out in eight Brazilian capital cities: Manaus (Amazonas state), situated in the North Region; Fortaleza (Ceará), Recife (Pernambuco) and Salvador (Bahia), in the Northeast region; Campo Grande (Mato Grosso do Sul), Middle-West Region; Vitória (Espírito Santo) and São Paulo (São Paulo), Southeast Region; and Porto Alegre (Rio Grande do Sul), in the South Region.

There were three different steps. In the first, a linkage of tuberculosis cases reported to the Brazilian Notifiable Diseases System (SINAN - Sistema de Informação de Agravos de Notificação) and the register of social programs (CadÚnico) was performed. In 2010, 71,660 new TB cases were identified and the linkage showed that 76% had no cover by social programs. Thus, the research studied 7,152 individuals that were beneficiaries of the cash transfer program Bolsa Família during TB treatment and 1,863 (21%) that received this benefit after the treatment.

The results pointed out that being a Bolsa Família Program (BFP) beneficiary elevates in 7% the odds of cure for TB treatment and that these odds, with the mentioned social support, reach 11% among individuals who are not under directly observed therapy (DOT).

THREE YEARS OF RESEARCH In the second step, a cohort of 1,497 ≥ 18 years old individuals with TB was performed. They were monitored in 78 healthcare services distributed in the eight mentioned capitals. This phase lasted from 2014 to 2016.

Three evaluation questionnaires were applied - in the beginning, second month and sixth month of treatment -, with data being collected by healthcare workers. Subjects who were BFP beneficiaries represented 22% of the total and had a median of income of USD\$ 65. Among the 78% out of the BFP, the median of income was USD\$ 129.

Regarding the treatment outcomes, the dropout proportion among the beneficiaries of the BFP was 6% and among non-beneficiaries, 6%. As for the cure, the proportion was 78% and 79% among beneficiaries and non-beneficiaries, respectively.

Simultaneously to the cohort study, the third phase took place, an intervention study. In the capitals where supplemental food packages were not a governmental incentive for TB treatment, 13 healthcare services were randomly selected. The individuals attended in these units who accepted to be included in the project received food vouchers to purchase specified products during the whole treatment.

The intervention step had 222 people with TB attending. The proportion of treatment dropout among them was 9% and of cure, 85%. Among individuals who didn't get the food vouchers as a social assistance, the proportions of dropout and cure were, respectively, 12% and 76%.



DATA TO IMPROVE PEOPLE'S LIVES

Created in 2009, the Laboratory of Epidemiology of Espírito Santo Federal University (Lab-Epi UFES) operates in the Health Sciences Center campus, in Vitória, and has 25 researchers. The team started to develop the "Social support" project in 2013, when the grant was conceded.

Questionnaires with data about the subjects monitored in the eight capitals went through codification, extraction to the main database and then revision, audit and informatization of pending issues. Part of the group worked constructing the database that will allow to investigate this population.

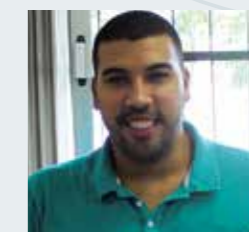
"It's hard to find a study with so much information about people with TB in Brazil", says Carolina Maia Martins Sales, the project's operational coordinator. Head of the financial sector, she planned and distributed the research funds.

Monthly visits to the studied cities happened in the course of three years, in order to check the data collection and to solve pendencies. MSc candidates Rodrigo Locatelli e Janaína Olios were in charge of updated reports about every healthcare service and scheduling all the field trips. Academic coordinator Bárbara Reis-Santos led the out-of-the-lab activities and travelled with the lab's students. "They need to know the TB control programs around Brazil and need to understand how different the country is. Also, it's important that they have contact with this so-talked vulnerability."

The young crew celebrates the experience. "It was a huge impact to undergo Brazilian Unified Healthcare System (SUS), especially in the outskirts", says Bruna Venturin. "I was charmed by the research field. No one changes a city in one day, but without data it's not even possible to start thinking about solutions", points out Renata Scarpatti.

The inspiration came from a conference with British researcher Sir Michael Marmot about social determinants of health, Lab-Epi's coordinator and Principal Investigator of the study Ethel Leonor Maciel explains. "He stated that taking action to fight poverty would enable to end several diseases. By the same time, Barack Obama announced a billionaire bank rescue plan. It's not a matter of lack of resources. It's a matter of lack of priorities."

In TB history, no chapter caused such an effect as England's Industrial Revolution, when poverty was fought, complements Ms. Maciel. She's being studying the disease for 22 years. "Brazil is very large, unequal, complex. We don't want to perform researches only for the researches. We want to use our data to contribute to public health, improving people's lives."



ETHEL LEONOR MACIEL (LEFT), BÁRBARA REIS-SANTOS, CAROLINA MAIA MARTINS SALES, RODRIGO LOCATELLI E JANAÍNA OLIOSI



Photos: Débora Yuri



Multi-skilled TEAM

The fight against TB in Brazilian state with the higher risk of the disease

In the capital with the highest incidence of TB cases in the country, a primary healthcare service in the outskirts registers a high cure rate. This makes nurse Graziela da Silva Moura proud. "We have transfers of treatment center for drug-resistance and moving to other cities, but our dropout rate is low."

She works from 6am to 6pm at Dr. José Avelino Pereira, in Jorge Teixeira neighborhood, east side of the city - an area of invasions, deficiency in sanitation, lack of schools

and childcare. She's always overwhelmed, because TB is not her single responsibility: there's also vaccination, inhalation, bandage, conversation sessions, DOT, coordinating the active search for TB.

The service was selected to receive the project's social intervention, food vouchers for every subject with TB who agreed to be included in the study. "For me, this support is essential", Ms. Moura says. "We assist people who are totally dependent of the supplemental food; 90% of the population we have here live in vulnerable conditions. For the others, the benefit is a plus, a motivation to keep going under treatment."

Reference in the state of Amazonas (AM), the largest one in the North Region and Brazil in territorial extension, Cardoso Fontes Polyclinic is located downtown, within walking distance from tourist attractions like the Amazonas Theatre and the Provincial Palace. Opened in 1944, it was projected specially for TB control - its structure, for example, allows appropriate circulation of air.

The most complex cases are treated in the service: extrapulmonary forms and drug-resistant. The struggle, according to the board of directors and nurse technician Dulcilene

Maria Couto, is to get specialist physicians willing to work in the region.

Other challenges are adherence to the treatment process and contact tracing, to identify possible latent infections, says Dinah Carvalho Cordeiro, chief of tuberculosis control at the Municipal Department of Health (SMS). "Hospitality, service organization, handling follow-ups, opportune search of the absent, personalized DOT and social support are major points to improve indicators."

For ten years in TB field, she was responsible for Dr. Antônio Comte Telles' Ambulatory of Pneumology, in the east zone. It assists one the most populous regions of the capital, where around 500,000 people live. The service was also included in the project and received food vouchers.

Besides providing exchange with the researchers, the study reinforced the bond between patients and Brazilian Unified Healthcare System (SUS) professionals, Ms. Cordeiro evaluates. "We spent more time with them, learned their life stories better. And the food voucher supply was a meaningful support for everyone."

CLOCKWISE FROM LEFT: JORGE TEIXEIRA NEIGHBORHOOD AND AN AREA'S PRIMARY SERVICE; DULCILENE COUTO; GRAZIELA MOURA AND GISA SERRÃO AT AVELINO PEREIRA HEALTHCARE SERVICE; AND DETAIL OF CARDOSO FONTES BUILDING'S ROOF

RESULTS

CHARACTERISTICS OF INDIVIDUALS STUDIED IN MANAUS

Sociodemographic features

273 INDIVIDUALS 3 HEALTHCARE SERVICES

39 YEARS (± 16 YEARS) - MEAN AGE 53% MEN 58% BROWNS

Table 1 • Distribution of Manaus' study sample, according to individual and contextual characteristics.

CHARACTERISTICS	N	%
Schooling (272)		
Illiterate	10	4
Primary school	112	41
High school	107	39
College/University	43	16
Occupational status (255)		
Student	21	8
Unemployed	74	29
Employed	137	54
Employed and student	3	1
Retired	20	8
Housing status (272)		
Own	194	71
Ceded	26	10
Other	52	19
Waste collection (271)		
No	19	7
Yes	252	93
Sanitation (269)		
Sewage system	181	67
Septic tank	77	29
Open sewage	11	4
Water supply (270)		
No	29	11
Yes	241	89
Public lighting (270)		
No	1	0.5
Yes	269	99.5

Clinical features

8% PREVIOUS TB

67% DIAGNOSED WITH PULMONARY TB

12% UNDER DOT AT THE BEGINNING OF TREATMENT

Median of income during the treatment

USD\$ 129 BEGINNING USD\$ 124 SECOND MONTH USD\$ 147 SIXTH MONTH

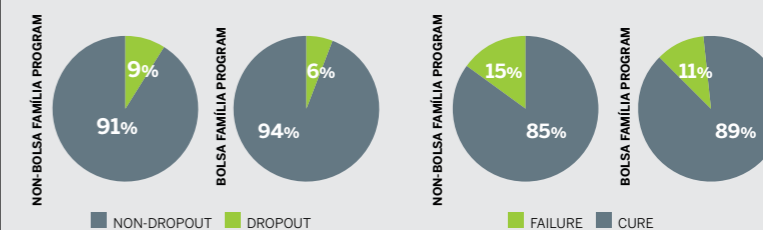


Figure 1 • Distribution of beneficiaries and non-beneficiaries of Bolsa Família Program in Manaus, according to tuberculosis treatment outcomes.

WHATSAPP IS AN ALLY IN ISOLATED AREAS

Amazonas state has particularities defined by its geography, explains infectologist Irineide Assumpção Antunes, the Cardoso Fontes director. "We are very different and need to adjust the protocol to our reality." In order to decentralize the control actions, the disease's local committee organizes itinerant meetings around the territory, with 62 municipalities. Technology became a powerful ally in Brazilian state number 1 in TB incidence. Irineide is part of the group of specialist doctors who use WhatsApp to discuss cases diagnosed within indigenous populations, in areas with poor accessibility and communities based along the Amazonas River. "With our mobile phones, we share images and opinions. This way, we can solve people's health issues through life's countryside."





Photos: Débora Yuri

Invisible DISEASE

To face it, public system believes in social protection and commitment

She never really cared for April 1, adopted as “the Fools’ Day” in several Western countries. This year’s one, however, won’t be forgotten.

That date, 24-year-old Talita Silva de Andrade received the TB diagnosis. She had spent months with headaches and fever, running around Fortaleza’s public healthcare system. When cough with bloody sputum started, the clinical staff decided to test her for tuberculosis.

It wasn’t a joke. Her treatment was per-

formed at Fernando Façanha Primary Attention Healthcare Service (UAPS). Talita used to select chestnuts in a food factory, but had to temporarily stay away from the job. “Drugs made me feel nauseous, vomiting, with stomach ache. I had to use a mask to work and people were scared and prejudiced.”

With her mother and closest friends support, she finished her treatment in October and once again was making plans, like studying Law, an old dream. Included in the project, the young woman received food vouchers for six months. That was another important encouragement, she says. “I used to pick up a voucher here at the service and went to the supermarket to collect the supplies. It helped me a lot, I could spend money only with rent, water and power bills and some light snacks.”

“We need to eat well under TB treatment”, states 61-year-old Antônia da Silva Bento, who was assisted at Rigoberto Romero UAPS. The disease was found out at Praia do Futuro Beach Emergency Assistance Unit (UPA), forcing Ms. Bento to take a break from cleaning apartments in upscale neighborhoods by the sea. “The food voucher is a blessing. Now I eat well, I’m strong, with no fever. Soon I’ll be back to work.”

Second most populous city in the Northeast Region, the capital of Ceará state has 2.6 million inhabitants and an average of 1,500 TB cases per year.

Nurse José Adalberto Jataí, who works at George Benevides UAPS, usually cheers when is able to get the response of a defaulting subject. “I know all of them by the name, I call them, I reinforce the importance of DOT with the community healthcare agents.”

Supplemental foods are not a regular protection in Fortaleza, and many workers who collaborated with the study hoped for the intervention to be held in their services. They wanted to see improvements in cure and dropout rates, and believed these results would be easier to achieve with the support. “I could never evaluate the influence of this benefit”, mourned in September Raiane Martins Ximenes, technical advisor at the Municipal Tuberculosis Control Program.

“Everything stops for dengue, zika, and TB doesn’t have this visibility. But when you see the indicators, you realize it kills more and debilitates more”, she compares. “We have the expected number of cases, exams, drugs, electronic records, few patients for many healthcare workers. What is lacking? Commitment by some health teams and priority of the administration.”

RIGOBERTO ROMERO FRONT (LEFT); RAIANE XIMENES, FROM SMS; TALITA DE ANDRADE AT FERNANDO FAÇANHA SERVICE; AND ANTÔNIA BENTO WITH HER 29-YEAR-OLD DAUGHTER ANA CAROLINE DA SILVA



RESULTS

CHARACTERISTICS OF INDIVIDUALS STUDIED IN FORTALEZA

Sociodemographic features

95 INDIVIDUALS **10** HEALTHCARE SERVICES
37 YEARS (± 15 YEARS) - MEAN AGE **67%** MEN **75%** BROWNS

Table 2 • Distribution of Fortaleza’s study sample, according to individual and contextual characteristics.

CHARACTERISTICS	N	%
Schooling (92)		
Illiterate	12	13
Primary school	47	51
High school	31	34
College/University	2	2
Occupational status (91)		
Student	3	3
Unemployed	40	44
Employed	29	32
Employed and student	4	4
Retired	15	17
Housing status (92)		
Own	62	67
Ceded	8	9
Other	22	24
Waste collection (92)		
No	1	1
Yes	91	99
Sanitation (92)		
Sewage system	68	74
Septic tank	18	20
Open sewage	6	6
Water supply (90)		
No	2	2
Yes	88	98
Public lighting (92)		
No	2	2
Yes	90	98

Clinical features

13% PREVIOUS TB
87% DIAGNOSED WITH PULMONARY TB
53% UNDER DOT AT THE BEGINNING OF TREATMENT

Median of income during the treatment

USD\$ 75 BEGINNING **USD\$ 75** SECOND MONTH **USD\$ 75** SIXTH MONTH

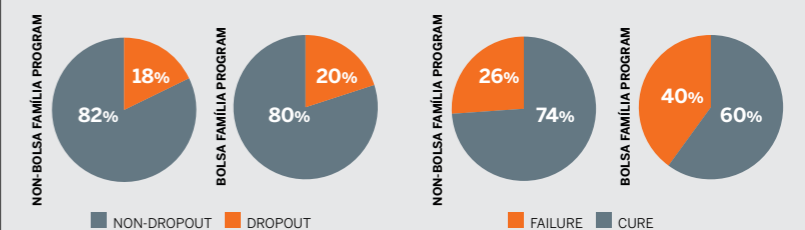


Figure 2 • Distribution of beneficiaries and non-beneficiaries of Bolsa Família Program in Fortaleza, according to tuberculosis treatment outcomes.

THE LOGISTICS CHAMPION DUO

Workers at the Municipal Department of Health (SMS) of Fortaleza, Francisco Hodairton Assunção and Raiane Martins Ximenes were decisive for the research’s development in the city. She programmed and guided all the team’s field visits, collected questionnaires, relocated food supplies if that was necessary, sent cars to pick up and deliver study materials.

In the chronic diseases department for six years, the driver also backed the logistics. “I used to take the project crew to the healthcare centers, supermarkets, to have lunch, picked them up at the hotel, left them at the airport. I really enjoyed this work, it was something new for me.”





Photos: Débora Yuri



A DAY IN THE life

The city challenges hunger, prejudice and unequal realities

It's a Thursday afternoon in Afogados neighborhood, west zone of the capital of Pernambuco, and Agamenon Magalhães Polyclinic is busy. Maria Lacerda de Sá runs from one place to another: between an evaluation and a chat with friends from the healthcare service, she gets the ride that will take her food supply home. "Can you help me to carry it?" is her request to a young man. "Their car is already parked outside!"

COURSE CONNECTED ACADEMY AND SERVICE

In Recife, TB incidence is three times higher than the national average rate. After a request by the Municipal Department of Health (SMS), the project's team developed a course for its workers to attend - doctors, nurses, pharmacists, administrators. Classes were held during six months, conducted by researcher Bárbara Reis-Santos. The objective was to bring academy and service closer, she explains. "We presented successful experiences and the latest topics being discussed about the disease around the world. And we showed that we can have a circle, not a dichotomy, because most of the knowledge we debate is also produced by them."

The 49-year-old woman had a cancer detected in 2013 and extracted one breast. Three years later, during control exams, she went through the tomography that revealed TB. She says her husband and the two teenage daughters provide support and the basket of staples is "a hell of a help" - he's the only one in the family who's in the formal labour market. "I used to cook and sell work lunchboxes, now I produce baby party favors. We stop buying some food items and are able to buy some others." With tuberculosis, she remembers, it's important to eat fruits and vegetables "every day".

"The population we assist is vulnerable. When they have income, it's one minimum wage for four, five people. If subjects don't have what to eat, the treatment is even more painful because the drugs normalize the appetite", says Girlene Alves, a nurse at the TB reference service for 21 years.

Hours before, Ver. Romildo Gomes Healthcare Center, in Imbiribeira, south zone, was also packed. The neighborhood is close to Pina and Boa Viagem, districts with famous beaches, fancy buildings and trendy restaurants. Local reality, however, is the opposite. "There are lots of slums in the area and residents suffer with floodings: when it rains, this street becomes a river", nurse Paula Bissoli described, pointing through the window. "Our job is beautiful for the social component. Sometimes I come here on a day off to talk to anguished patients. Just providing the drugs is not enough."

The afternoon goes easier at Gouveia de Barros Polyclinic, in Boa Vista. Coordinator of Mu-

nicipal TB Control Program Silvana Cornélio Lira explains that the biggest challenge is the adherence of primary attention workers. "There's a strong stigma also among them and our job is to fight this prejudice. We have 255 Family Health Program teams in the city and all of them must be capable of treating the disease."

We are downtown, where healthcare services assist a floating population - workers who live far away and homeless people. Ms. Lira reinforces the need to associate TB treatment and nutritional protection. "In practice, it's already known that this relation exists. But to include tuberculosis as priority within the Social Assistance Department and establish a program, we need scientific evidence."

Thursday late afternoon in Recife, back to Afogados. Maria de Sá grabs her phone to check if the food supply got home. And tells the cancer is back: she's once more under chemotherapy.

- Is it worse than the treatment we do here?, a friend from Agamenon asks.

- It's the worst of all. But I want my health, she answers.

- I think Maria is very strong, another woman in the group comments.

Who would disagree?

CLOCKWISE FROM LEFT: SILVANA LIRA, FROM SMS; MARIA DE SÁ AND HER FOOD SUPPLY, WITH GIRLENE ALVES; FABIOLA CARNEIRO DOS SANTOS, NURSE AT ALBERT SABIN POLYCLINIC; AND PAULA BISSOLI AT ROMILDO GOMES HEALTHCARE CENTER

RESULTS

CHARACTERISTICS OF INDIVIDUALS STUDIED IN RECIFE

Sociodemographic features

110 INDIVIDUALS **7** HEALTHCARE SERVICES

44 YEARS (± 15 YEARS) - MEAN AGE **68%** MEN **57%** BROWNS

Table 3 • Distribution of Recife's study sample, according to individual and contextual characteristics.

CHARACTERISTICS	N	%
Schooling (109)		
Illiterate	9	8
Primary school	48	44
High school	26	24
College/University	26	24
Occupational status (101)		
Student	5	5
Unemployed	36	36
Employed	43	42
Employed and student	3	3
Retired	14	14
Housing status (109)		
Own	71	65
Ceded	8	7
Other	30	28
Waste collection (108)		
No	5	5
Yes	103	95
Sanitation (108)		
Sewage system	71	66
Septic tank	26	24
Open sewage	11	10
Water supply (106)		
No	4	4
Yes	102	96
Public lighting (108)		
No	2	2
Yes	106	98

Clinical features

17% PREVIOUS TB

81% DIAGNOSED WITH PULMONARY TB

31% UNDER DOT AT THE BEGINNING OF TREATMENT

Median of income during the treatment

USD\$ 127 BEGINNING **USD\$ 128** SECOND MONTH **USD\$128** SIXTH MONTH

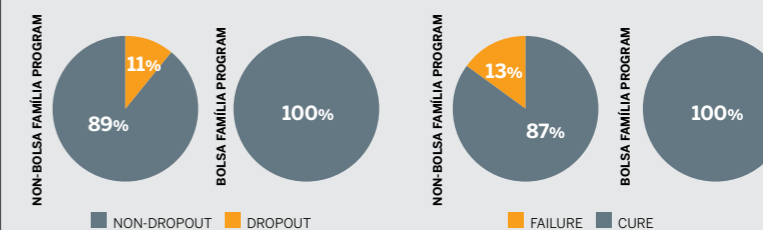


Figure 3 • Distribution of beneficiaries and non-beneficiaries of Bolsa Família Program in Recife, according to tuberculosis treatment outcomes.



Photos: Débora Yuri

BEYOND THE rhythm

Workers' creativity becomes a strategy in the capital of Bahia

“I walked around the community with a polystyrene box, asking who was coughing and calling out to perform sputum smear test. Lots of people were ashamed to spit out right there, but looked for me in the healthcare center after a couple of days.”

The story told by Rosemeyre de Oliveira Borges, “nurse Rose” from Dra. Cecy Andrade Primary Healthcare Service (UBS), summarizes the TB approaching model she believes in. Working for ten years controlling the dis-

ease in Salvador, she states that TB demands priority. “Subjects with tuberculosis may transmit the bacillus. It’s necessary to educate healthcare workers: whoever sees someone coughing should refer the person to the responsible one.”

All the services in the capital have a reference-nurse to TB. “It’s not a complete structure but it’s a start”, Ms. Borges evaluates. She organizes meetings with the community, talks about what they have to eat, explains “the scientific part in the popular language” and would like to have a team to perform household visits at least once a week. “Our DOT is ineffective. We need aunt, mother to do the monitoring, wife who puts the drugs inside the husband’s mouth.”

Northeast Region’s largest city in terms of population and fourth in the country, after São Paulo, Rio de Janeiro and Brasília, Salvador has 12 Health Districts, each one with its reference service for the disease. “We handle the districts as municipalities, because the realities are very different”, explains Sandra Conceição Pereira, responsible for the Municipal Tuberculosis Control Program.

There’s from Cabula/Beiru, in the outskirts,

which hosts the seven main penitentiaries of Bahia, to the Historic Center, with a homeless population, and Barra/Rio Vermelho, an upper-middle class area where subjects only use the Brazilian Unified Healthcare System (SUS) to get the medicines. Among the reference services, the capital has historic TB control institutions like Octavio Mangabeira Specialized Hospital and Ramiro de Azevedo UBS, opened 97 years ago.

Professionals from the local health system report lack of community healthcare agents and resistance within the teams to perform DOT, due to the violence spread in certain locations. Many of them refer critical cases to Octavio Mangabeira, managed by the state government. The routine is messy. “Sometimes we spend two weeks going after a laboratory, when we should get the results of exams within three days”, says Luciene Siqueira de Oliveira, a nurse at Prof. Mário Andréa UBS.

To collect data in Salvador, Lab-Epi UFES received the collaboration of researchers from Bahia Federal University (UFBA), coordinated by Professor Susan Pereira. The food supplies intervention didn’t happen - social benefits used to be given to subjects with TB in the municipality, but were suspended in the course of the study.

CLOCKWISE FROM LEFT: ROSEMEYRE BORGES; MÁRIO ANDRÉA HEALTHCARE SERVICE; VIEW FROM ALFREDO BUREAU UBS; RAMIRO DE AZEVEDO MAIN BUILDING; AND PÉRICLES LARANJEIRAS TB ROOM



RESULTS

CHARACTERISTICS OF INDIVIDUALS STUDIED IN SALVADOR

Sociodemographic features

600 INDIVIDUALS **50** HEALTHCARE SERVICES
40 YEARS (± 16 YEARS) - MEAN AGE **63%** MEN **58%** BROWNS

Table 4 • Distribution of Salvador’s study sample, according to individual and contextual characteristics.

CHARACTERISTICS	N	%
Schooling (600)		
Illiterate	24	4
Primary school	282	47
High school	240	40
College/University	54	9
Occupational status (600)		
Student	48	8
Unemployed	204	34
Employed	270	45
Employed and student	12	2
Retired	66	11
Housing status (600)		
Own	456	76
Ceded	30	5
Other	114	19
Waste collection (600)		
No	18	3
Yes	582	97
Sanitation (600)		
Sewage system	576	96
Septic tank	18	3
Open sewage	6	1
Water supply (600)		
No	6	1
Yes	594	99
Public lighting (600)		
No	3	0.5
Yes	597	99.5

Clinical features

12% PREVIOUS TB
89% DIAGNOSED WITH PULMONARY TB
3% UNDER DOT AT THE BEGINNING OF TREATMENT

Median of income during the treatment

USD\$ 110 BEGINNING **USD\$ 121** SECOND MONTH **USD\$ 129** SIXTH MONTH

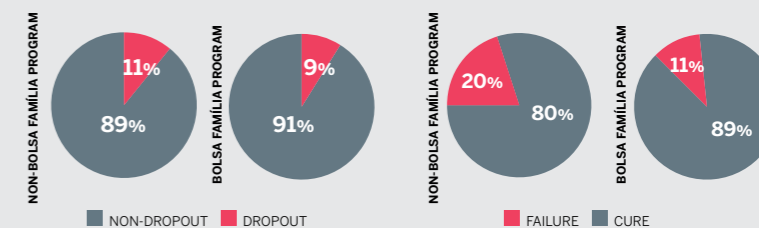


Figure 4 • Distribution of beneficiaries and non-beneficiaries of Bolsa Família Program in Salvador, according to tuberculosis treatment outcomes.

THE ‘BAHIA WAY’ TO EMBRACE THE CAUSE

Beaches, moqueca, acarajé, Carnival, religious syncretism, party people: Bahia has a room in collective imaginary and a particular way to fight the disease. Salvador United Against Tuberculosis Project brought together relevant celebrities and trendsetters in the capital, like Olodum musicians, Bahia and Vitória football players, different religions leaders and Negra Jhô, Pelourinho’s entrepreneur who became a reference for afro hair.

“People think TB no longer exists, so it’s important to engage famous partners”, says Sandra Conceição Pereira, from the Municipal Department of Health (SMS). Conversation sessions among healthcare workers are held every Thursday in the districts.

Reproduction





Photos: Débora Yuri

THAT THING CALLED geography

How the population density may affect TB incidence

Large rural properties and large empty spaces: these are strong characteristics of Mato Grosso do Sul, located in the Central-West Region of Brazil. Low occupancy is also seen in the state capital: Campo Grande has 107 inhabitants/km², according to Brazilian Institute of Geography and Statistics (IBGE). That's the lowest population density among the eight municipalities included in the project. Fortaleza occupies the rank-

ing's opposite spot, with 8,297 inhabitants/km², followed by São Paulo (7,914) and Recife (7,446).

Campo Grande also registers the lowest TB incidence among the studied capitals. As it is known, the context is a determinant of tuberculosis: living in urban areas, overcrowded housing and informal settlements increase the risks of transmission, once neighbors are also contacts.

But not everything runs smooth in the city. Sandra Leone, a nurse at Prof. Esterina Corsini Daycare Center, service connected to Mato Grosso do Sul Federal University (UFMS), says primary attention workers face lots of doubts about how to treat TB. "The program here is decentralized, the disease is their responsibility. And they see very few TB cases. How this is going to work? The chance of losing patients along the way is huge."

Another problem is the long wait one can face when assisted by the municipality's services. "We are an University Hospital, processes here are faster", compares Ms. Leone, who's been working for 15 years at the service, a reference in the state for infectious and parasitic diseases.

She usually organizes actions that support TB control. "We created a guidebook for patients and health teams with orientations about the treatment, and we provide certificates to the ones who finish it."

Social vulnerability is also present. Some outskirts areas are precarious, inhabited by a population who lives in ceded houses. "It's common to see three or four people sharing the same room", says nurse Everton Ferreira Lemos.

Working with TB in the public health system for 32 years, nurse Rosângela Rodrigues Dobbro remembers the disease "is a social and health problem". "Social support is not paternalism, it's strategic to achieve the regularity of a hard treatment. Today it's easier to treat HIV: the subject takes one drug. For TB, there are four of them. If the person is not eating properly, he interrupts it."

Ms. Dobbro has 22 years of service at Cedip Nova Bahia, a health center specialized in infectious and parasitic diseases located in the outskirts of the city. She points out the struggle to get results for exams. "This way, it's hard to get diagnosis and provide sequence for treatments. To act against TB, we have to take into consideration the reality of Brazilian Unified Healthcare System [SUS] and the population's financial condition."

CLOCKWISE FROM BOTTOM LEFT: EVERTON LEMOS; CEDIP HEALTHCARE SERVICE, IN NOVA BAHIA NEIGHBORHOOD; PROF. ESTERINA CORSINI DAYCARE CENTER; AND NURSE SANDRA LEONE

RESULTS

CHARACTERISTICS OF INDIVIDUALS STUDIED IN CAMPO GRANDE

Sociodemographic features

18 INDIVIDUALS 2 HEALTHCARE SERVICES
39 YEARS (± 16 YEARS) - MEAN AGE 64% MEN 73% WHITES

Table 5 • Distribution of Campo Grande's study sample, according to individual and contextual characteristics.

CHARACTERISTICS	N	%
Schooling (18)		
Illiterate	0	0
Primary school	13	73
High school	3	18
College/University	2	9
Occupational status (18)		
Student	3	18
Unemployed	6	36
Employed	7	37
Employed and student	0	0
Retired	2	9
Housing status (18)		
Own	6	36
Ceded	2	9
Other	10	55
Waste collection (18)		
No	2	9
Yes	16	91
Sanitation (18)		
Sewage system	12	64
Septic tank	6	36
Open sewage	0	0
Water supply (18)		
No	0	0
Yes	18	100
Public lighting (18)		
No	2	9
Yes	16	91

Clinical features

36% PREVIOUS TB
91% DIAGNOSED WITH PULMONARY TB
36% UNDER DOT AT THE BEGINNING OF TREATMENT

Median of income during the treatment

USD\$ 92 BEGINNING USD\$ 79 SECOND MONTH USD\$ 88 SIXTH MONTH

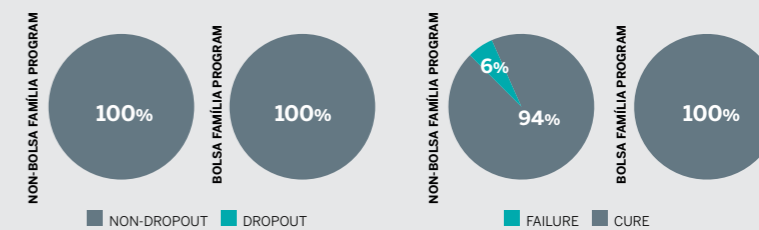


Figure 5 • Distribution of beneficiaries and non-beneficiaries of Bolsa Família Program in Campo Grande, according to tuberculosis treatment outcomes.

A PARTNER IN THE CITY'S 'MERCADÃO'

In Campo Grande, one of the city's top tourist attractions was the place where food supplies provided by the project were taken. The supplier was Box do Gordinho, which operates in Antônio Valente Municipal Market ("Mercadão"), a spot also visited by residents and located downtown. The box is traditional and sells basic-needs grocery packages for over 20 years. Researchers didn't want that subjects received their baskets in the health services; they wanted them to go to a market, an action that reaffirms the social inclusion. In Recife and Fortaleza, however, the team couldn't find partners willing to collaborate for some services.





Photos: Débora Yuri



CLOCKWISE FROM
BOTTOM LEFT:
ALEXANDRINA
MONTEIRO; SHIRLEY
PEGORETTI; WAITING
ROOM IN MARUÍPE
FAMILY HEALTHCARE
CENTER; LAB-EPI UFES
STUDENTS; AND DETAIL
OF THE LABORATORY'S
BOARDS

TOGETHER FOR THE CURE

Complementary actions by the TB Program, Epidemiological Surveillance and Social Assistance benefits the disease control

FOOD SUPPLIES RESPECTED REGIONAL DIFFERENCES

"Moqueca is capixaba, the rest is peixada." Repeated all over Espírito Santo, the popular saying mentions this famous Brazilian dish's distinct preparations. In the state, it's made without dendê oil or coconut milk, unlike what happens in Bahia.

To select the items that would be part of the food supplies distributed, the study's group respected differences in Brazilian regional cuisine. Some products were fixed, but the complete basket of staples provided in every capital was examined. This way, subjects from each of the eight cities included in the research received "personalized" ingredients like the flour more used in the area.

Many people who visit the capital of Espírito Santo describe it affectionately as "mini Rio", maybe because there's somehow a geographic resemblance between Vitória and the country's second largest city. Smaller in population and territory, it is also the Brazilian municipality included in the study with the second lowest TB incidence - Campo Grande hits number 1.

The treatment is centralized, with healthcare services taking over the disease's supervision. Plus, there is shared monitoring. "Throughout the capital, we organize workshops for DOT implementation and search for respiratory symptomatic subjects. We need to show the importance of the Epidemiological Surveillance, the Social Assistance and the Municipal TB Control Program (MTCP) to work together", says Shirley Pegoretti, a nurse at Maruípe Family Healthcare Center.

Attending takes place in the reference centers, but drugs distribution and DOT are held in the service closest to where the subject lives. In Vitória, people with TB receive food supplies and Social Pass - free bus tickets - as protection for the treatment months.

"I know the city's reality is not the same from other municipalities in the country", compares Alexandrina Monteiro, a nurse technician who works in the TB Program since 2008. The food is an essential support for an appropriate nutrition during six months, she evaluates. Free access to the

public transport also plays an important role. "Lots of subjects are unemployed and many others go through that delicate time: they're self-employed individuals and the income drops while their health is not recovered."

Ms. Monteiro was one of the workers who collected data for the study and says she faced no obstacles. "We have a computer-based system. When some personal information was missing, I talked to the patients." The project's purpose is relevant, in her opinion, once there are several social vulnerabilities connected to TB. "But they're not taken seriously. The epidemic is only seen as a disease."

The health service is just 700 meters away from Lab-Epi UFES, so researchers could monitor the study's progression almost in real-time. This way, pendencies with subjects' data could be solved faster. It also made the exchange between students, Brazilian Unified Healthcare System (SUS) workers and the population it assists easier.

Curiously, UFES Health Sciences Center expanded around the University Hospital, where Getúlio Vargas Sanatorium operated in the last century. Home for the state's people with TB back then, the place was opened in 1942, on the top of a breezy hill in Maruípe region, today Santos Dumont neighborhood.

RESULTS

CHARACTERISTICS OF INDIVIDUALS STUDIED IN VITÓRIA

Sociodemographic features

43 INDIVIDUALS 1 HEALTHCARE SERVICE

37 YEARS (± 14 YEARS) – MEAN AGE 64% MEN 57% BROWNS

Table 6 • Distribution of Vitória's study sample, according to individual and contextual characteristics.

CHARACTERISTICS	N	%
Schooling (43)		
Illiterate	1	2
Primary school	14	32
High school	19	45
College/University	9	21
Occupational status (43)		
Student	2	5
Unemployed	13	30
Employed	19	43
Employed and student	3	7
Retired	6	15
Housing status (43)		
Own	37	87
Ceded	5	11
Other	1	2
Waste collection (43)		
No	0	0
Yes	43	100
Sanitation (43)		
Sewage system	43	100
Septic tank	0	0
Open sewage	0	0
Water supply (43)		
No	0	0
Yes	43	100
Public lighting (43)		
No	0	0
Yes	43	100

Clinical features

11% PREVIOUS TB

84% DIAGNOSED WITH PULMONARY TB

12% UNDER DOT AT THE BEGINNING OF TREATMENT

Median of income during the treatment

USD\$ 147 BEGINNING USD\$ 118 SECOND MONTH USD\$ 126 SIXTH MONTH

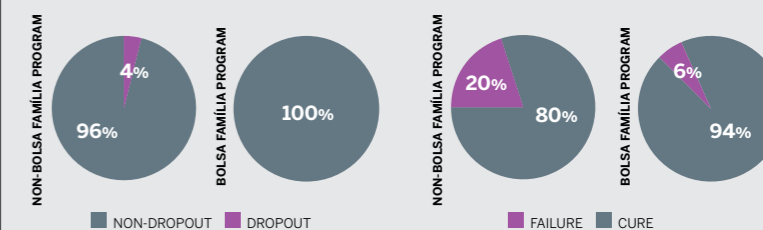


Figure 6 • Distribution of beneficiaries and non-beneficiaries of Bolsa Família Program in Vitória, according to tuberculosis treatment outcomes.





Reproduction



Photos: Débora Yuri

FIGHT IN THE Babel's Tower

Challenges include homeless population, HIV-positive people and the new immigration wave

“Forest of concrete and steel”, “land of skyscrapers”, Babel’s Tower where “the drizzle rips the flesh”: with 12 million inhabitants, the largest city in South America has been sung in almost every possible way. From the start, the capital’s size presents challenges to the epidemiologic control. And São Paulo

is home to multiple vulnerable groups: immigrants, homeless, slums residents, prison population, indigenous, HIV-positives.

“The combination of diversity with dimension produces a huge complexity. Only in the central region, we have all of these people and 50% of the total homeless population. A positive element is that the TB Program is decentralized”, says public health physician Naomi Kawaoka Komatsu, the Municipal TB Control Program (MTCP) coordinator for 15 years. “Each team knows their public and must adapt in order to achieve the expected outcomes.”

Among the most vulnerable groups, the focus at the moment is on HIV-positives, homeless and immigrants - after an South-American wave, São Paulo now receives many Haitians, Congolese, Nigerians, Chinese and Syrians. With them, however, the language is a more complicated obstacle. To assist Bolivians and Paraguayans, the crew organized awareness campaigns in Spanish - or “Portunhol”, the popular mix of informal Portuguese and Spanish - about SUS, “a health system that welcomes everyone that looks for it, do not arrest and do not extradite”. Other strategies adopted were partnerships

with consulates and educational brochures production.

The municipality offers social benefits to subjects with TB who agree to be under supervised treatment: food supplies and free pass to the metropolitan public transport.

“When the patient doesn’t take the drugs, his pulmonary deterioration progresses and he may keep the transmission”, Ms. Komatsu notes. She also remembers TB many times is associated with another issue - unemployment, family breakdown, homeless condition, HIV, diabetes. “To want to be assisted, the subject needs to see a light at the end of the tunnel. You won’t end poverty with a food supply. But treating the disease, the person may get a job, for example.”

Katia Fernandes Fonseca, a social assistant at Nossa Senhora do Ó Reference Service for HIV, located in Freguesia do Ó, north zone, mentions problems the city faces: few healthcare workers and employee turnover. Besides that, services in the outskirts struggle to attract physicians.

Researches in healthcare services are relevant to figure out certain challenges, like the high relapse rates, she states. “Dropout rates are also alarming. There’s a lack of understanding about the treatment’s value? Of social support? We need to uncover this phenomenon.”

COMIC BOOK PRODUCED BY THE MUNICIPAL DEPARTMENT OF HEALTH (LEFT); NAOMI KOMATSU, FROM THE CITY’S TB CONTROL PROGRAM; AND KATIA FONSECA AT NOSSA SENHORA DO Ó REFERENCE SERVICE FOR HIV

RESULTS

CHARACTERISTICS OF INDIVIDUALS STUDIED IN SÃO PAULO

Sociodemographic features

60 INDIVIDUALS 13 HEALTHCARE SERVICES
36 YEARS (±13YEARS) – MEAN AGE 65% MEN 67% BROWNS

Table 7 • Distribution of São Paulo’s study sample, according to individual and contextual characteristics.

CHARACTERISTICS	N	%
Schooling (60)		
Illiterate	1	2
Primary school	33	55
High school	20	33
College/University	6	10
Occupational status (60)		
Student	4	6
Unemployed	21	35
Employed	32	53
Employed and student	1	2
Retired	2	4
Housing status (60)		
Own	23	38
Ceded	7	12
Other	30	50
Waste collection (60)		
No	2	4
Yes	58	96
Sanitation (60)		
Sewage system	55	91
Septic tank	4	7
Open sewage	1	2
Water supply (60)		
No	1	2
Yes	59	98
Public lighting (60)		
No	1	2
Yes	59	98

Clinical features

24% PREVIOUS TB
84% DIAGNOSED WITH PULMONARY TB
76% UNDER DOT AT THE BEGINNING OF TREATMENT

Median of income during the treatment

USD\$ 118 BEGINNING USD\$ 137 SECOND MONTH USD\$ 118 SIXTH MONTH

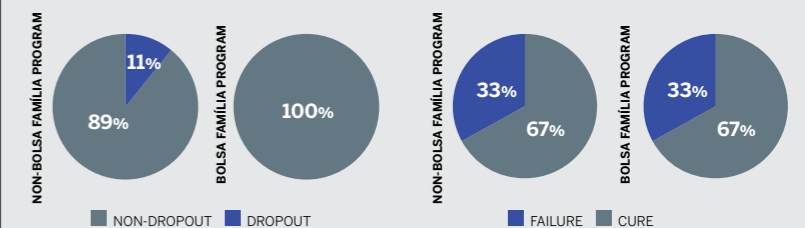


Figure 7 • Distribution of beneficiaries and non-beneficiaries of Bolsa Família Program in São Paulo, according to tuberculosis treatment outcomes.

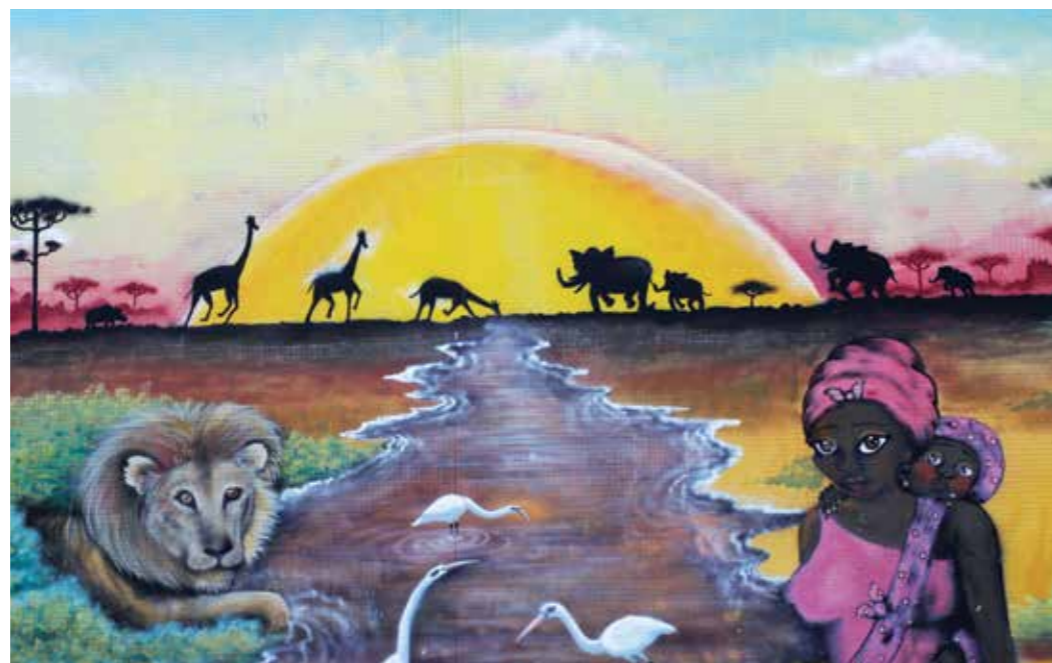
THEY OCCUPIED THE STREETS

In 2015, MTCP developed the PACTU for the Cure Project, with daily DOT and cross-sector activities as the main strategies. The objectives were to increase the cure rate and foster civic integration among downtown homeless people. For 12 months, the subjects attended cultural workshops, conversation sessions and got to eat at partner-restaurants, suffering no discrimination. From the group assisted, 89.1% was cured, 52.2% applied for social assistance programs and 21.7% rebuilt broken family bonds. In October, during the XIII Tuberculosis Meeting of the city, the Municipal Department of Health rewarded three street healthcare teams for their fight against the disease.





Bárbara Reis-Santos



Photos: Débora Yuri

PART OF THE history

In the past and in the present, search for the cure is active throughout the city

Popularly called Vila Cruzeiro “postão” - local slang for a crowded public health service -, Cruzeiro do Sul Emergency Service has been stage to shootings and killings in the last couple of years. At the same address, operates Glória/Cruzeiro/Cristal TB Reference Center, one of those that treat the disease in Rio Grande do Sul’s capital. The state has a

higher TB incidence than the national average. Nurse Denise Gomes, the center’s coordinator, describes the assisted population: vulnerable, unemployed and low-income families. Her expectation regarding the project’s intervention study is that it validates “what we already think”. “The food supply would be something else to keep people under treatment. It would collaborate with the cure and dropout rates.”

TB assistance in the city is centralized; free transport pass and a snack are offered to subjects under DOT. At Bom Jesus TB Reference Center, which was selected to receive the vouchers, routine showed the support’s effectiveness, states nurse Eula Wollmann Cardoso. “Among our patients, 42 were included in the research and only two dropped out. It’s a positive outcome, almost all got treated.”

Most of them have no income and the ones who are informal workers - bricklayers, cleaning people, street vendors - endure the disease’s impact on the money earned per month. They live in “vilas” (villages), which means “slums” in the capital’s dialect, and used to get their food supplies in supermarkets close to

the health services. “Everyone likes the experience”, Ms. Cardoso says. “They call us, ask if they can come and get the voucher, praise the ‘heavy’ basket, tell they thought it would only come with some few items. The benefit helps their families.”

Dropouts are higher among the most vulnerable groups, with no social protection, former inmates and drug addicts, observes Ana da Silva Trindade, a nurse technician at Partenon Sanatorium Hospital. She assists people with TB for 15 years and points out the study allowed workers to access a more complete profile of each subject.

Reference for multi-resistance, TB-HIV co-infection and special drugs schemes, Partenon was opened in 1951 in a city’s rural and remote area. It had 400 beds and was part of São José Hospital, built 40 years earlier by the state government and used as a confinement complex for people taken away from social interaction. Besides TB, it hosted subjects with diphtheria, bubonic plague, smallpox, typhoid and leprosy.

Currently, the ambulatory treats complex TB cases from the whole state and exhibits a functional structure for the service. “Adaptations were made in an old sanatorium corridor. There was a time we used to work with no windows”, nurse Daniela Wilhelm remembers.

PARTENON SANATORIUM HOSPITAL FRONT (LEFT); STREET ART AT GLÓRIA/CRUZEIRO/CRISTAL TB REFERENCE SERVICE, IN VILA CRUZEIRO NEIGHBORHOOD; AND NURSE EULA CARDOSO

RESULTS

CHARACTERISTICS OF INDIVIDUALS STUDIED IN PORTO ALEGRE

Sociodemographic features

303 INDIVIDUALS **5** HEALTHCARE SERVICES
41 YEARS (± 15 YEARS) – MEAN AGE **61%** MEN **54%** WHITES

Table 8 • Distribution of Porto Alegre’s study sample, according to individual and contextual characteristics.

CHARACTERISTICS	N	%
Schooling (303)		
Illiterate	14	5
Primary school	183	60
High school	72	24
College/University	34	11
Occupational status (299)		
Student	8	3
Unemployed	110	37
Employed	147	49
Employed and student	3	1
Retired	31	10
Housing status (300)		
Own	189	63
Ceded	27	9
Other	84	28
Waste collection (296)		
No	10	3
Yes	286	97
Sanitation (295)		
Sewage system	258	88
Septic tank	18	6
Open sewage	19	6
Water supply (294)		
No	2	1
Yes	292	99
Public lighting (296)		
No	1	0,5
Yes	295	99,5

Clinical features

30% PREVIOUS TB
79% DIAGNOSED WITH PULMONARY TB
15% UNDER DOT AT THE BEGINNING OF TREATMENT

Median of income during the treatment

USD\$ 126 BEGINNING **USD\$ 124** SECOND MONTH **USD\$ 118** SIXTH MONTH

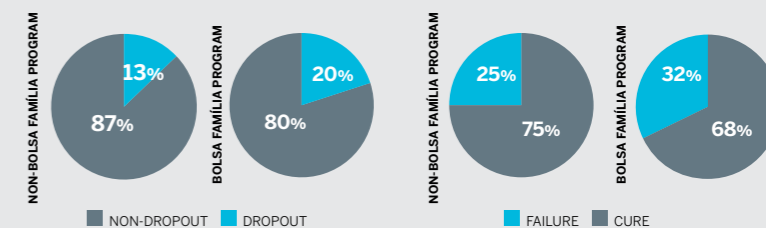


Figure 8 • Distribution of beneficiaries and non-beneficiaries of Bolsa Família Program in Porto Alegre, according to tuberculosis treatment outcomes.

SERVICE HOSTS A TB MEMORIAL

“All of this was a field when subjects with the disease were forced to live here”, says Tania Regina Cappra, the person in charge of memory and documentation at Partenon Sanatorium Hospital. The service created a TB Memorial, open to the public, with machines and tools used in the confinement period, documents and historical photos.

Records show a vibrant social life that was established in the sanatorium - in the early 50’s, residents organized balls and parties, created a radio and also a small cooperative of agricultural products. Many of them fell in love and got married. “Our idea is to present the life that happened and still happens here”, Ms. Cappra explains.



SOWING THE equity

ETHEL LEONOR MACIEL

We started this study with an idea: if we could understand the barriers that people with tuberculosis face to access social protection programs, it would allow us to improve the adherence and the outcomes of TB treatment. Knowing the various regions of Brazil, a country with such diversity, it would be possible to develop a better proposal to approach this population.

The task proved to be extremely challenging. It's not easy to translate their realities, most of the times accompanied by an accumulation of vulnerabilities and the social background. They already deal with daily struggles and, when TB happens, it is just another burden.

This way, the role of the State is crucial to stop the chain of TB transmission from being perpetuated, because social programs play a key part in the fight against the pain inflicted by the disease. Even though our preliminary results don't indicate that programs sensitive to tuberculosis, like Bolsa Família, improve the treatment outcomes, a specific initiative like the food vouchers supply was important to reduce the dropout and increase the cure rates, providing relief during the segment months.

Our research's role is to bring to light thousands of voices of Brazilians who went through this journey and, for being supported by the State, could complete the crossing in a positive

way. In the end, there are several lessons to keep, from very committed healthcare workers from the North to the South of the country, who dedicate themselves to making the best for the communities they assist - sometimes, with serious restrictions. Our acknowledgements to everyone who took part in this study, individuals with tuberculosis, healthcare workers, administrators.

In conclusion, despite not affecting exclusively populations in poverty or extreme poverty conditions, the disease's disproportionate incidence in this group is unquestionable. Thus, the State's support to these people becomes imperative. We hope our results can promote the creation of cash transfer programs to individuals with tuberculosis in Brazil.

ETHEL LEONOR MACIEL Professor at Espírito Santo Federal University, Epidemiology Coordinator of Brazilian Tuberculosis Research Network (Rede TB) and Principal Investigator of the study "Analysis of the independent effect of social support on adherence and success rates of tuberculosis treatment in capitals of Brazil".

ACKNOWLEDGEMENTS

National Tuberculosis Control Program (PNCT)
Brazilian Tuberculosis Research Network (Rede TB)

CAMPO GRANDE

Campo Grande Department of Health
Everton Lemos
Rosângela Dobbro
Sandra Leone

FORTALEZA

Fortaleza Department of Health
Aline Almeida
Ana Érika Pinto
Ana Paula da Frota
Camila Rodrigues
Danielle Feitosa
Eldenisa Maria dos Santos
Fernanda Kucharski
Francisco Hodairton Assunção
Iniswane da Silva
Iracema Almeida
Ismaelle Vasconcelos
Jacqueline Alcântara
Jeanne de Souza
José Alberto Jataí
Juliana de Moura
Juliana Gaspar
Kátia Batalha
Lidiane Terto
Maria Elisabete Santiago
Maria Valdirene Coelho
Natália Régia da Silva
Raiane Martins Ximenes
Renata Tavares
Renata de Santana
Sarah Lucena
Savana Ferreira
Sílvia Helena da Frota
Viviane Parente
Wanderlene Maria dos Santos

MANAUS

Manaus Department of Health
Alfredo da Silva
Dinah Carvalho Cordeiro
Dulcilene Maria Couto
Graziela da Silva Moura
Jair Pinheiro
Paulo Saraiva

PORTO ALEGRE

Porto Alegre Department of Health
Ana Elise Trindade

Cátia Stein
Daniela Wilhelm
Denise Gomes
Eula Cardoso
Mara Essini
Rita Marizete Weller
Taimara Amorim

RECIFE

Recife Department of Health
Arene do Monte
Ariane Bezerra
Cristiane de Albuquerque
Fabríola dos Santos
Girleine Falcão
Girlene Alves
José de Alexandre Ferreira
Paula Bissoli
Maíra Georgiana Ferreira
Maria de Lourdes Prazeres
Maria do Carmo de Araújo
Silvana Lira

SALVADOR

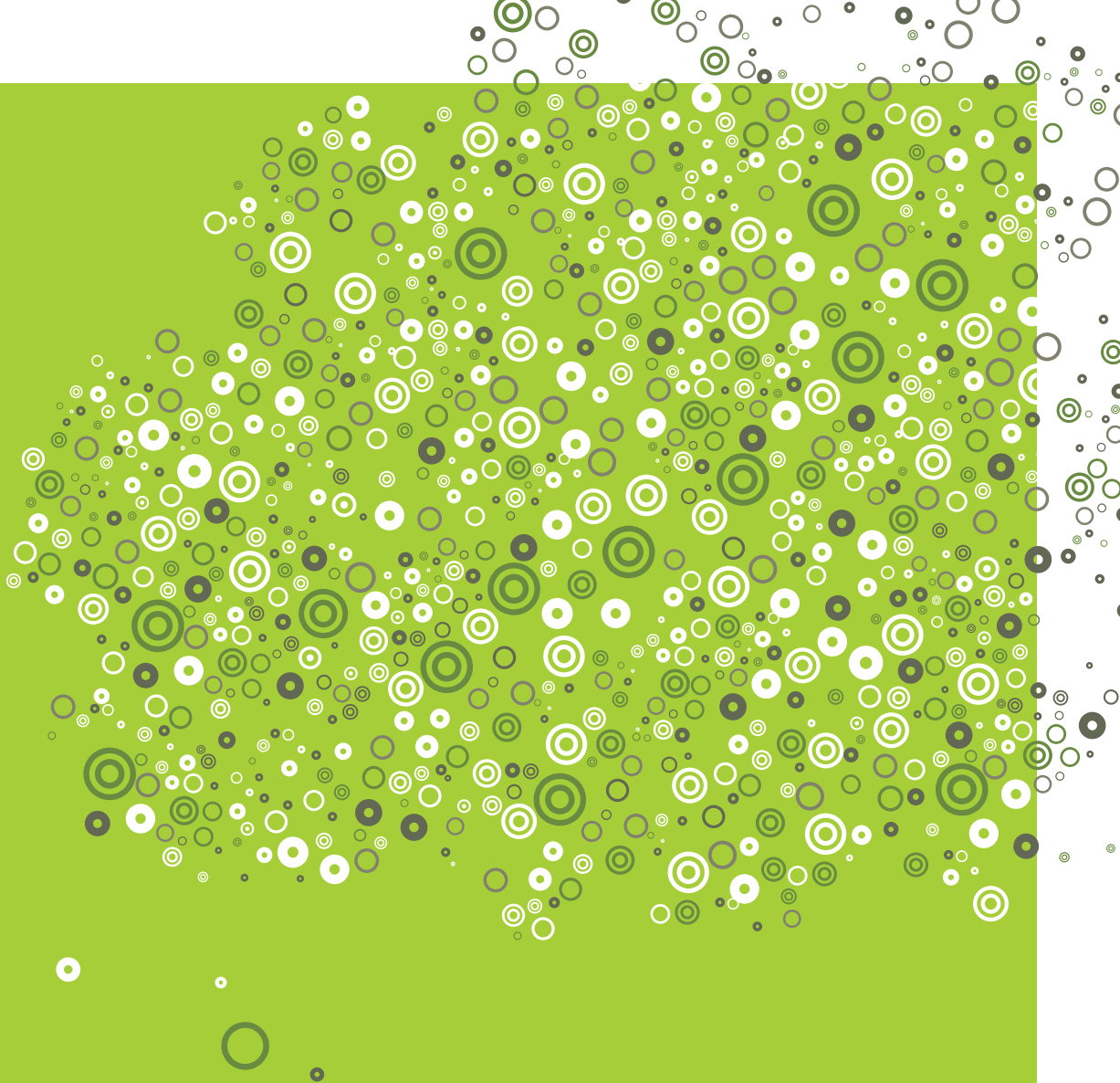
Salvador Department of Health
Carla Lima
Goya Pitágoras
Joilda Nery
Kaio Andrade
Sandra Pereira
Susan Pereira

SÃO PAULO

São Paulo Department of Health
Anne Magda Leno
Cibele Aparecida Marchezin
Enven Santos
Heloisa de Freitas
Jessica Mestre
Karen Eloiza Mascarenhas
Marcela Paixão
Marlene Aparecida Barbosa
Naomi Komatsu
Katia Fonseca
Rafaela Parra
Regiane Carneiro
Sonia Regina Silva
Tatiane Souza
Vera Lúcia de Siqueira

VITÓRIA

Vitória Department of Health
Alexandrina Monteiro
Shirley Pegoretti



Lab-Epi UFES

Laboratory of Epidemiology

Espírito Santo Federal University - Health Sciences Center
Av. Marechal Campos, 1468, Vitória, Brazil, CEP 29043-900

Phone/fax: + 55 11 3335-7287

E-mail: coordenacaolabepi@gmail.com