



Water, Environment and Health: The impact the open dump in Brasilia-DF, Brazil

University of Brasilia– Brazil



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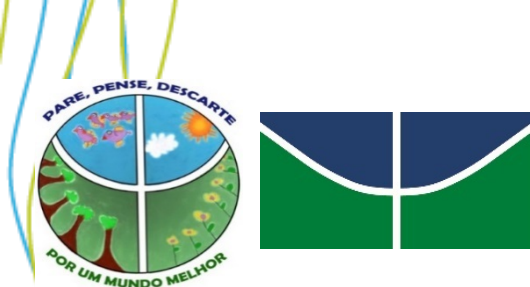
Dalla Lana School of Public Health– Division of Occupational and Environmental Health

Oct, 2018

Topics of the seminar

- 1– Contextualization of the problem;
- 2– Program “ Stop, Think and dispose”, Brasilia– Brazil
- 3– Epidemiological Survey (objectives, methods and results)
- 4– Current projects
- 5– New perspectives





Waste management– One of the bigger challenges of the Global World

In 2015, more than 190 world leaders committed to 17 Sustainable Development Goals (SDGs) to help us all end extreme poverty, fight inequality & injustice, and fix climate change.

We each have a role to play if we're going to achieve these goals of a more **prosperous, equitable, and sustainable world**.

Waste management has strong linkages to a range of other global challenges, **such** as health, water and sanitation, climate change, poverty reduction, food and resource security, decent work for all, and sustainable production and consumption.

Global Waste Management Goals: Making progress toward these would help to achieve more than half of the new United Nations Sustainable Development Goals (SDGs).

Waste Management & Research 2015, Vol. 33(12) 1049–1051

2030 UN Sustainable Development Goals



Water is central to many of the UN SDGs

2030 UN Sustainable Development Goals



Water is central to many of the UN SDGs

The WHO reports that 80% diseases are waterborne

Industrialization, **discharge of domestic waste, radioactive waste**, population growth, excessive use of pesticides, fertilizers and **leakage from water tanks** are major sources of water pollution.

These wastes have negative effects on human health.

Bacterial, viral and parasitic diseases like typhoid, cholera, encephalitis, poliomyelitis, hepatitis, skin infection and gastrointestinal are spreading through polluted water.

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Water sanitation hygiene

- Water sanitation hygiene
 - Water safety and quality
 - Sanitation and wastewater
 - Monitoring and evidence
 - ▾ Diseases and risks
 - Diseases
 - Risks
 - Burden of disease

Water-related diseases

Diarrhoea

Diarrhoea occurs world-wide and causes 4% of all deaths and 5% of health loss to disability. It is most commonly caused by gastrointestinal infections which kill around 2.2 million people globally each year, mostly children in developing countries. The use of water in hygiene is an important preventive measure but contaminated water is also an important cause of diarrhoea. Cholera and dysentery cause severe, sometimes life threatening forms of diarrhoea.

The disease and how it affects people

Diarrhoea is the passage of loose or liquid stools more frequently than is normal for the individual. It is primarily a symptom of gastrointestinal infection. Depending on the type of infection, the diarrhoea may be watery (for example in cholera) or passed with





Environmental exposure– Possible illness– Waterborne diseases



leptospirosis



Dengue, Zika Virus
Chikungunya;
Hepatitis A;
Yellow fever



The leachate (leachate) can contain dissolved or solubilized organic matter, nutrients, intermediate products of anaerobic digestion of waste as volatile organic acids, chemicals such as cadmium, zinc, mercury, organochlorines, arising from the disposal of **insecticides** and **pesticides**, and microorganisms.

**Intoxication by heavy metals,
pesticides and others**



Waste management– One of the bigger challenges in the Global World

- The disposing of waste has huge environmental impacts and can cause serious problems to public health especially for people who work with it. *Waste Management & Research 2015, Vol. 33(12) 1049-1051*
- These workers are called waste pickers or garbage collectors or solid waste segregators.



- In some developing Countries, waste pickers provide the main form of solid waste collection.
- There are more 15.000.000 of them around the world. (*Medina, 2008*)
- In Brazil, there are 390.000 workers who are responsible for segregation and the recycling of waste



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Brazil

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waste pickers

Search



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Systematic review

Waste Management 80 (2018) 26–39



Contents lists available at [ScienceDirect](#)

Waste Management

journal homepage: www.elsevier.com/locate/wasman



Ineffective waste site closures in Brazil: A systematic review on continuing health conditions and occupational hazards of waste collectors

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- 30 Studies (2009–2018);
- There were 19 (63.4%) qualitative studies, seven (23.3%) quantitative studies, and four (13.3%) studies used mixed methods approach;
- Studies occurring in the Federal District comprised the most publications (29% 20 articles);
- Open-air recyclable collectors (4 articles), and street scavengers;
- Workers in the studies appeared to be predominately female.



Risks	Types
Chemical	Drugs, Pesticides, Solvents, Heavy metals, Volatile
Physical	cold, heat, radiation, magnetic fields, pressure extremes, noise.
Ergonomic	Lifting and manual transport weight, repetitive movements, improper set up of workstation
Biological	bacteria, viruses, insects, plants, birds, animals, and humans
Psychosocial	stress, violence

Occupational exposure is rarely about a single factor; rather, it involves a combination of factors



Waste pickers in Brasilia- Brazil

- Brasilia, the capital of Brazil, generates 9.000 tonnes of solid waste every day and has more than 3000 waste pickers.
- Most of them working in bad conditions without safety.



Possible illnesses

- **Infectious Diseases**– leptospirosis, hepatitis, HIV, dengue / zica, tuberculosis, syphilis, leprosy and others;
- **Chronic diseases**– Hipertension, diabetes, respiratory diseases and others
- **Intoxication**– heavy metals, pesticides and others
- **Cancer**– oral cancer; lip cancer; skin, lung, bladder and others





Occupational Risks– Waste Pickers



Waste picker is hit by truck in the Estrutural garbage dump in Brasilia, Brazil

He went to the Base Hospital with suspected fractures in the leg and knee. Two cars and a couple of Samu biker paid help.

De G1 DF



Accidents:

- Being caught in processing equipment
- Being run over by trucks;
- Fires;
- Explosions;
- Being injured by glass, contaminated needles, medical waste;
- Death



MEDICATION DISPOSAL: A REFLECTION ABOUT POSSIBLE SANITARY AND ENVIRONMENTAL RISKS

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Results:

- Thirty percent (30% / n=118) of the 393 interviewees reported to have or to live with someone who has some type of chronic disease; hypertension 30.5% (n=36) and diabetes 16.9% (n=20) stood out among them.
- Most interviewees declared to have never received any information about proper medication disposal (80.7%).
- 73.65% discarded their medication of common residues; 8.7% stated to have disposed in the sink and 7% in the toilet.

Methods:

- 393 subjects were interviewed questions related to medication disposal in the house .
- Participants in the research were approached in public places such as malls, free fairs, squares and parks in the seven different Territorial Planning Units to hold individuals from different schooling and income levels.





Program **STOP, THINK and DISPOSE:**
a multidisciplinary approach to the dialogue between the
University, community and recyclable materials collectors
since 2007

Areas

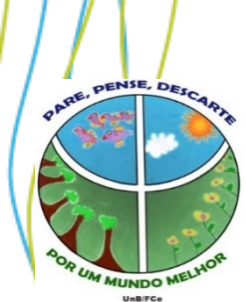
- Health Education and Environment
- Occupational Health
- Environmental monitoring and tropical diseases
- Epidemiology
- Health Law
- Economy
- Medical Waste
- Social inclusion
- Women's health
- Mental health
- Primary care
- Geriatrics
- Toxic Metal Exposure
- Water surveillance
- Waterborne diseases





Program **STOP, THINK and DISPOSE:**
a multidisciplinary approach to the dialogue between the
University, community and recyclable materials collectors
between 2007 to 2017





Program **STOP, THINK and DISPOSE:**
a multidisciplinary approach to the dialogue between the
University, community and recyclable materials collectors
between 2012 to 2017





Epidemiological Diagnosis– Occupational Health 2017

Objective– Diagnose health conditions of the garbage collectors who worked in the largest open dump in Brazil and the socio–environmental determinants and occupational risks involved in the process of illness.



VIDEO





Epidemiological Diagnosis– Occupational Health 2017

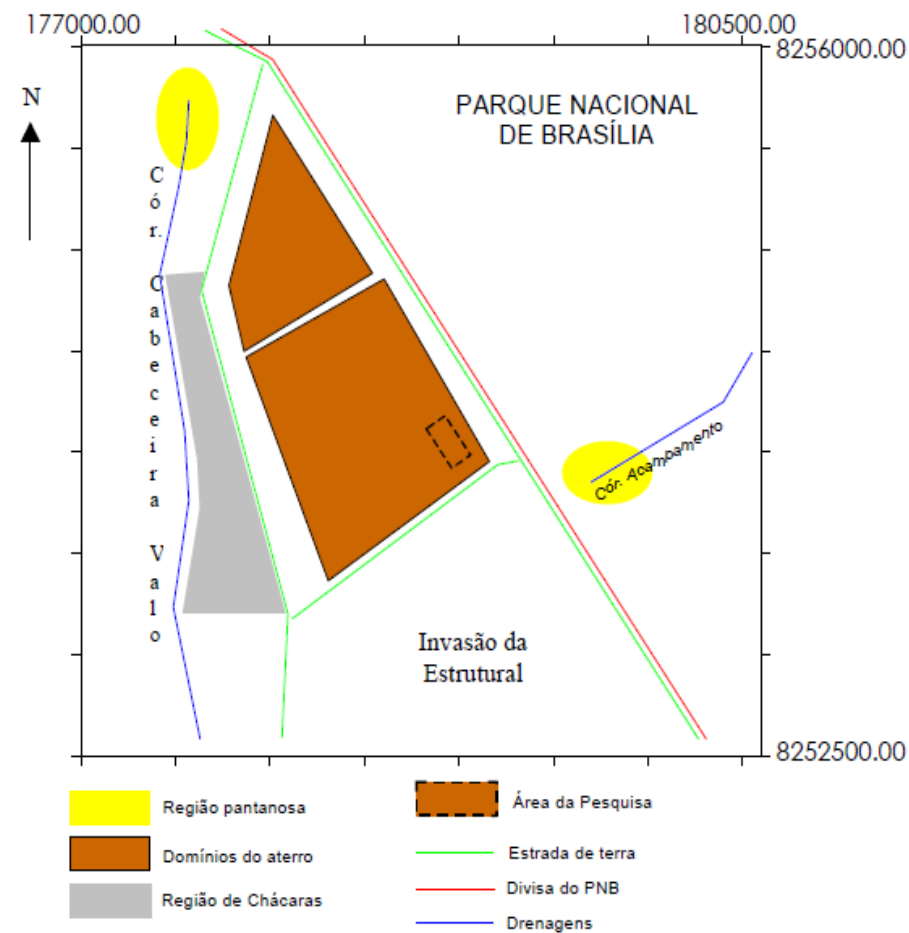
Methodology– This was a regional, cross-sectional, observational study, based on survey design.



Study locale– Around the Estrutural Garbage Dump, there is a large area of environmental degradation a center of social conflict caused by the construction there of precarious housing inhabited by the waste pickers involved in recycling materials and by people with no other residence



2017– 2030 Epidemiological Diagnosis– Occupational Health





Environmental impact of the open dump– Ground Water contamination– Estrutural City

Alcalinity (mg/L CaCO_3); Total Hardness mg/L CaCO_3 ; Conductivity ($\mu\text{S}/\text{cm}$); Turbidity(NTU); Total Iron (mg/L) pH Chlorides(mg/L) Manganese(mg/L) Barium Lead	Copper Nitrate Nitrite Aluminun Ammonia Zinc Total coliforms (MPN/100 mL) <i>Escherichia coli</i> (MPN/100 mL) Level (m)
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After monitoring the porous and fractured domain wells over four years (2013–2017), it can be concluded that there are evidences for groundwater contamination in the vicinity of Structural's dump;

The data analysis indicated parameters such as **electrical conductivity, chlorides, alkalinity, iron and lead** in high values and some of them at odds with the Brazilian legislation for drinking water and groundwater quality for human consumption;

The fact is rather worrying, because the region where the open dump is located is a watershed, where people use water from wells for drinking, a fact that can lead to several health problems.



Epidemiological Diagnosis– Occupational Health 2017

Methodology– This was a regional, cross–sectional, observational study, based on survey design. It was a multidimensional research protocol, divided in three stages:

Step 1– Identification of the subjects and scheduling for the exams;

Step 2– Interview and perform exams in the Health Unit of the Federal District;

Step 3– Return of the collectors to receive the results of the exams– Knowledge Translation and Exchange and refer them to their health care team according to their needs .

Ethics approval and consent to participate–

The project was approved by the FEPECS (Foundation for Teaching and Research in Health Sciences) Research Ethics Committee under certificate of ethical consideration N. 55754216.5.0000.5553



O mapa apresenta a seguinte distribuição de setores e quadras:

- Setor Oeste QD. 05:** ELIAS
- Setor Oeste QD. 07:** (Setor com lotes numerados)
- Setor Oeste QD. 06:** (Setor com lotes numerados)
- Setor Oeste QD. 05:** ANDERSON
- Setor Oeste QD. 05:** ROSA
- Setor Oeste QD. 05:** ELIANTO
- Setor Oeste QD. 08:** RÔMULO
- Setor Oeste QD. 02:** LEANDRO
- Setor Oeste QD. 01:** CLÁUDIA
- Setor Oeste QD. 01:** MEIRE
- Setor Norte QD. 01:** (Setor com lotes numerados)
- Setor Norte QD. 03:** (Setor com lotes numerados)
- Setor Norte QD. 04:** (Setor com lotes numerados)
- Setor Norte QD. 06:** SIRELENE
- Setor Norte QD. 07:** ROSA
- Setor Norte QD. 05:** MILENA
- Setor Norte QD. 05:** ELEUZA
- Setor Norte QD. 04:** ROSANGELA
- Setor Norte QD. 04:** PRAN
- Setor Leste QD. 03:** (Setor com lotes numerados)
- Setor Leste QD. 02:** (Setor com lotes numerados)
- Setor Leste QD. 01:** REGIA
- Setor Leste QD. 01:** JEDSON
- Setor Leste QD. 01:** OIESOM
- Setor Especial QD. 01:** (Setor com lotes numerados)
- Setor Especial QD. 02:** (Setor com lotes numerados)

Outros locais e áreas marcadas no mapa incluem: LIXÃO, Quadra 12 (Fora de Área), CENTRO OLÍMPICO, CHÁCARA SANTA LUZIA, JOSÉ LUIZ FRANCISCO FRANÇA, JEAN, SETOR DE OFICINAS, EQUIPE 01, EQUIPE 02, EQUIPE 03, EQUIPE 04, EQUIPE 05, EQUIPE 06, EQUIPE 07, EQUIPE 08, EQUIPE 09.



Family Health Strategy teams are composed of, at the minimum, one physician, one nurse, one nursing assistant and four to six full-time community health agents. Since its introduction at the national level in 1994, the FHS has expanded fairly rapidly, particularly in the 2000s, reaching 64% of the population (127 million people) in 2014.



Epidemiological Diagnosis– Occupational Health 2017

Methodology–

First Stage

Step 1– Identification of the subjects who worked in the open dump and scheduling for the exams;

Study Population:

–All the 1200 workers recorded in the non-electronic information system compiled by the Urban Cleaning Service (SLU), with more than 6 months of activity as waste pickers in the open garbage dump were invited to participate of the study;

–In order to invite the waste pickers to participate in the study, certain strategies were adopted:

(1) Individual invitation based on key informants (presidents of the cooperatives);

(2) Invitation by telephone contact and

(3) Active search during training sessions of the same to enter the materials recovery facilities and the garbage dump itself.





2017– 2030

Epidemiological Diagnosis– Occupational Health

Methodology– Step 2– (1) Interview the workers using a questionnaire and do the exams in the Health Unit of the Federal District;

- Before the questionnaire was administered, it was validated in the first week prior to the undertaking of the study in a sample less than 10%, which was later discarded.
- The instrument was used with the participants in the form of an interview and the answers were saved on tablets.
- Interviews lasted approximately 20 minutes;





2017– 2030 Epidemiological Diagnosis– Occupational Health

Topics of the Questionnaire	Variables	Number of questions	
Demographic status	age, sex, race/color, number of children	24	
Socioeconomic status	income, educational level, marital status, housing conditions	14	
Lifestyle	sexual behavior, use of illicit substances, leisure, physical activities	19	
Nutrition	type of food consumed	9	
Work conditions	Time in this job, place of the work, type of handled materials, exposure to risks, use of personal protective equipment, accidents of work	52	
Health conditions mentioned	diabetes, hypertension, cancer, kidney diseases, dermatological diseases, respiratory diseases, allergies, waterborne diseases and mental disorders	91	
Access to the health services	medications, tests, primary and secondary care	21	



Epidemiological Diagnosis– Occupational Health

Step 2– Anthropometric measures; checking cardiac frequency and blood pressure;

- After doing the interview, the waste pickers were sent for anthropometric evaluation, which consisted of measuring their weight and height to establish their body mass index (BMI);
- All the measures were done twice and if there was a difference between them, a third measure was taken to confirm the result.
- If the waste picker had blood pressure levels outside normal parameters, he or she was immediately attended by the physician or nurse from the team they were covered by.
- When this was not possible, he or she was attended by the physician and/or nurse on duty from the primary health care center and was later referred to the relevant team.





Epidemiological Diagnosis– Occupational Health

Step 2– Blood, hair and nail collection for more detailed analysis of overall health.

- The biochemical tests requested were:
blood glucose, blood count, urea, creatinine, uric acid, TGO, TGP, GT range and lipidogram.
- The serological screening for the infectious diseases selected were: <https://www.youtube.com/watch?v=Owmj63mVthk>
Hepatitis viral type B – HVB, HVC, HIV and T. pallidum.
- They were conducted in the Public Health Laboratory State of the Federal District, Brasília – Brazil.
- We finished this first step in November 2017.



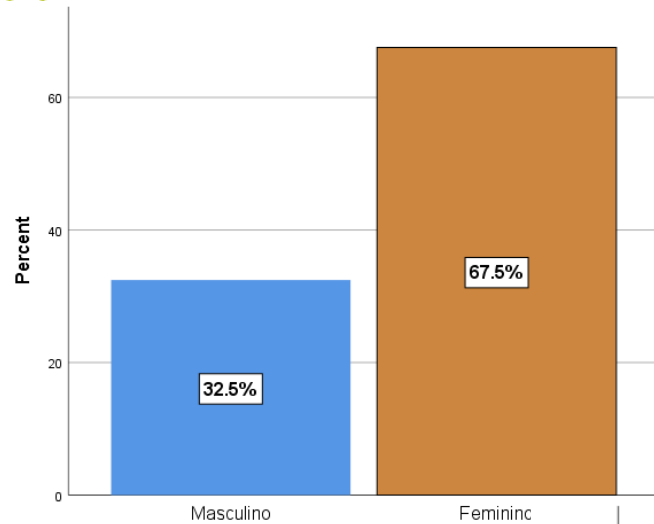
Results of the questionnaire- 2017

Socioeconomic and sociodemographic Status

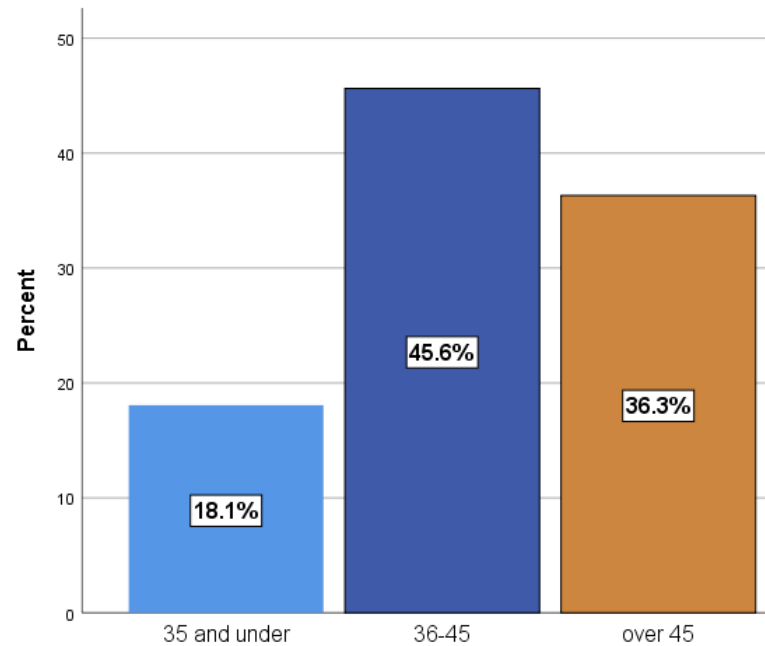
Estrutural City

- half of the population consisted of men: 50.51%;
- 34.12% are under 14 years of age;
- 63.23% are between 15 to 59 years old, who are part of the working class;
- 2.65% are 60 years or older.

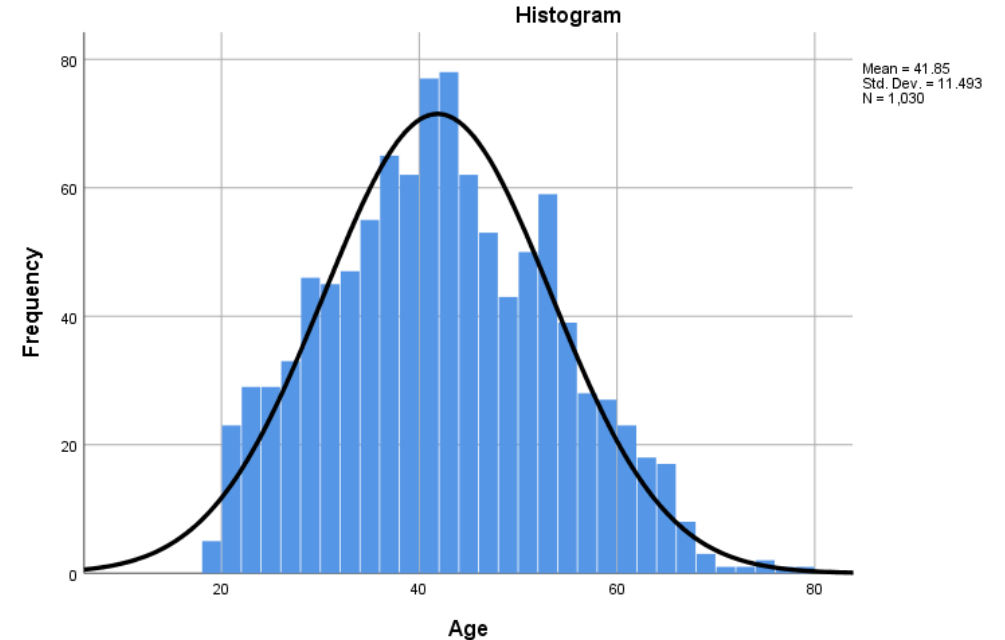
Based on the PDAD / CODEPLAN of 2013 – 2014 that had as reference the homes in regular situation, the invasions (non-regular dwellings) were not included in this study.



Gender



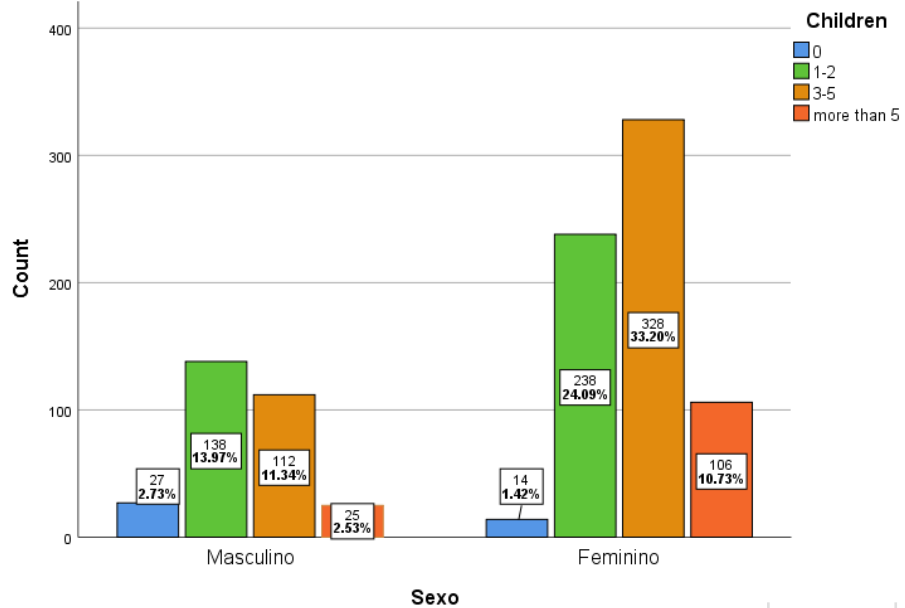
Age Range



Results of the questionnaire– 2017

Socioeconomic and sociodemographic Status

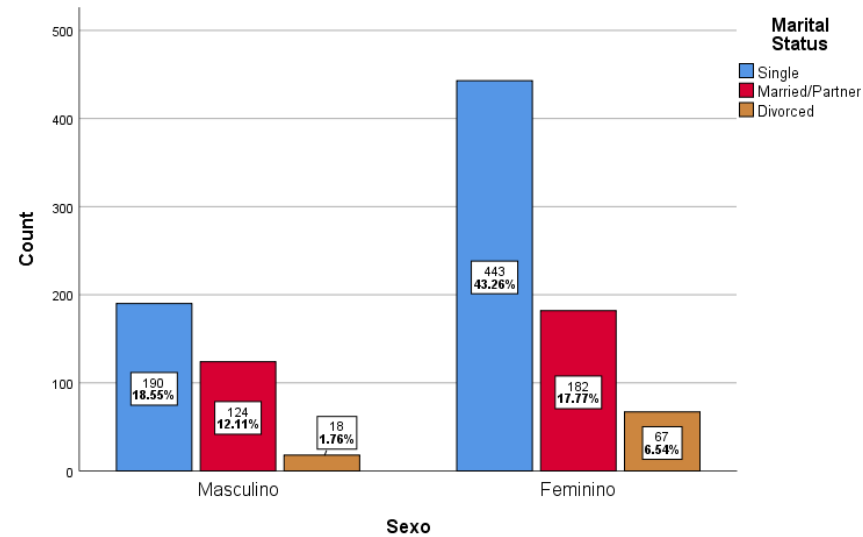
Number of children



Pearson Chi-Square $p < 0.001$

Gender	0	1-2	3-5	more than 5
Male	27	138	112	25
	8.9%	45.7%	37.1%	8.3%
Female	14	238	328	106
	2.0%	34.7%	47.8%	15.5%
Total	41	376	440	131
	4.1%	38.1%	44.5%	13.3%

Marital Status

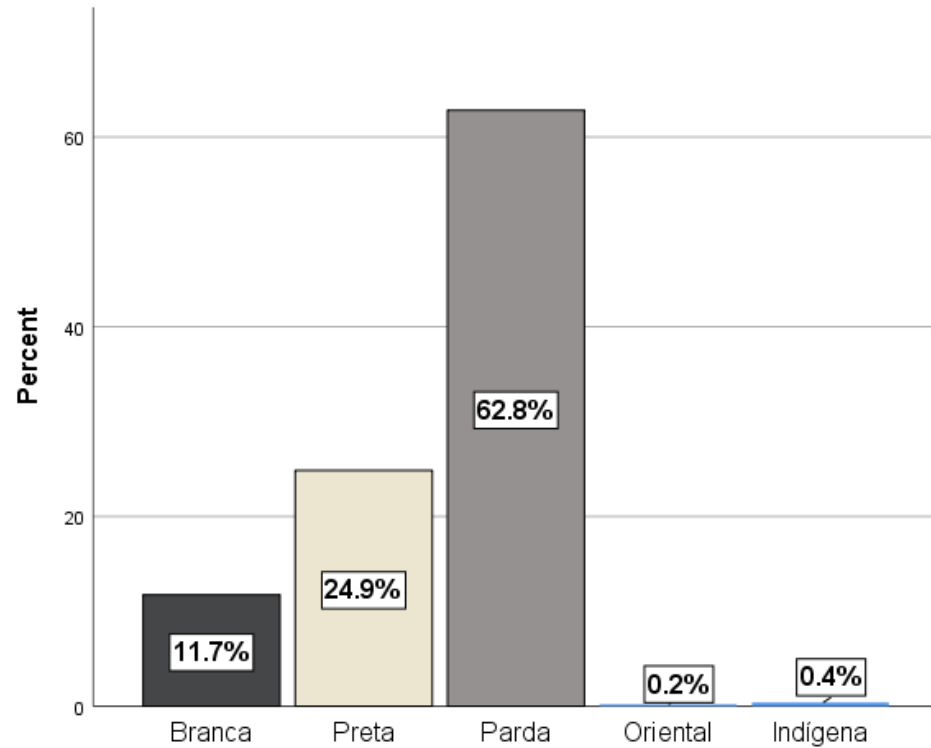


Pearson Chi-Square $p < 0.001$

Gender	Single	Married/Partner	Divorced
Male	190	124	18
	57.2%	37.3%	5.4%
Female	443	182	67
	64.0%	26.3%	9.7%
Total	633	306	85
	61.8%	29.9%	8.3%

Results of the questionnaire– 2017

Socioeconomic and sociodemographic Status



Race/Colour Category

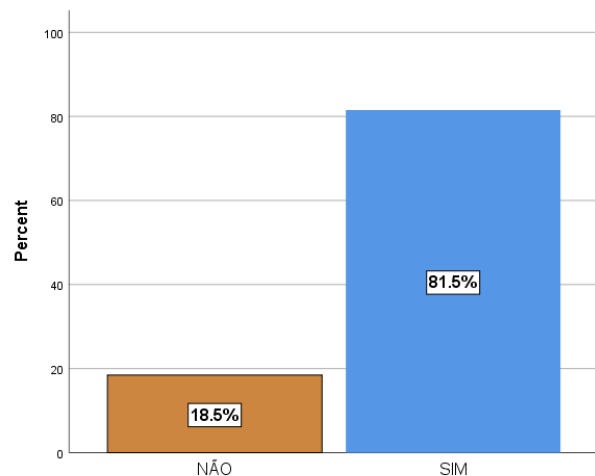
X

Race/ Colour Category	Brazil %	Brasilia %	Estrutural %
White	44.2	37	27.87
Black	8.3	6.9	18.02
Parda (brown/mix ed)	46.7	55.3	53.83
Yellow	1.09	1.62	0.28
Indigenous	0.43	0.24	0.00

According to Brazilian Institute of Geography and Statistics (IBGE), 2017

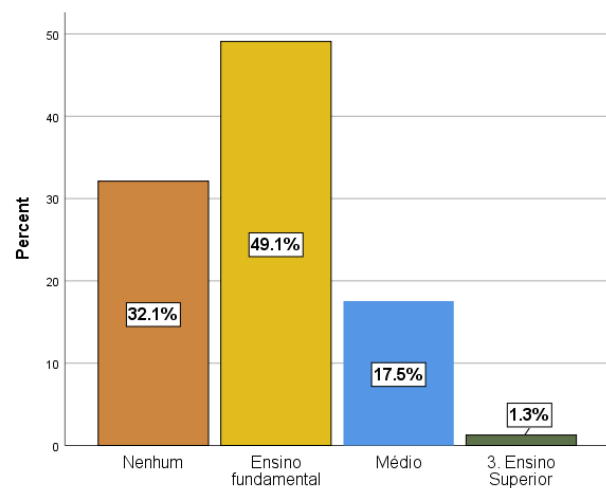
Results of the questionnaire– 2017

Socioeconomic and sociodemographic Status



Ability to read and write

Ability to read and write



Level of Education

Level of Education	Brazil %	Brasilia %	Estrutural City %
Illiterate	7.2	6.8	2.59
Elementary level	33.8	47.7	47.29
High School	26.8	24.1	12.44
University	15.7	24.5	0.51

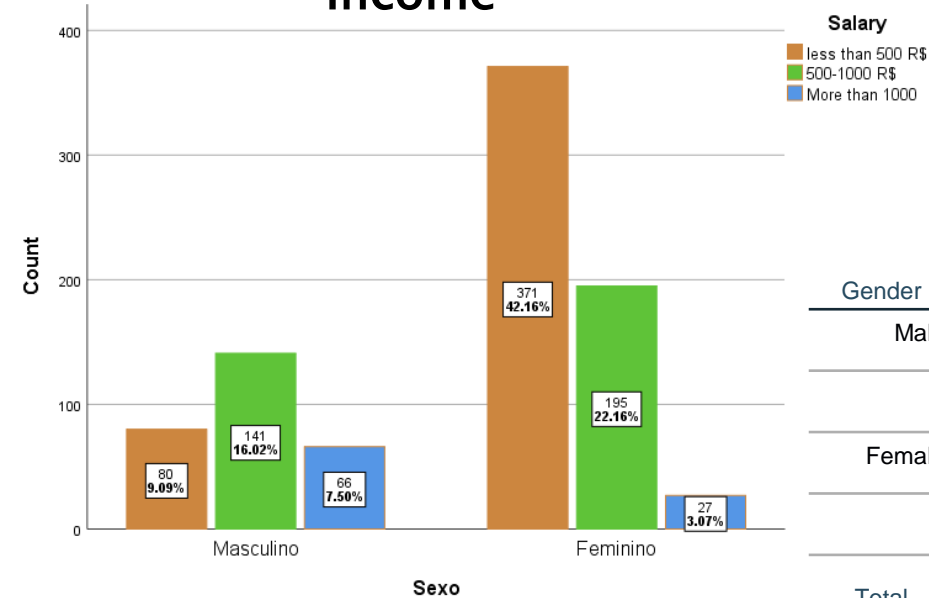
Brazilian Institute of Geography and Statistics (IBGE), 2017

According to our systematic review, the profile typically showed that recyclable collectors had an incomplete education (e.g. three years of traditional school or less) and were largely illiterate.

Results of the questionnaire- 2017

Socioeconomic and sociodemographic Status

Income

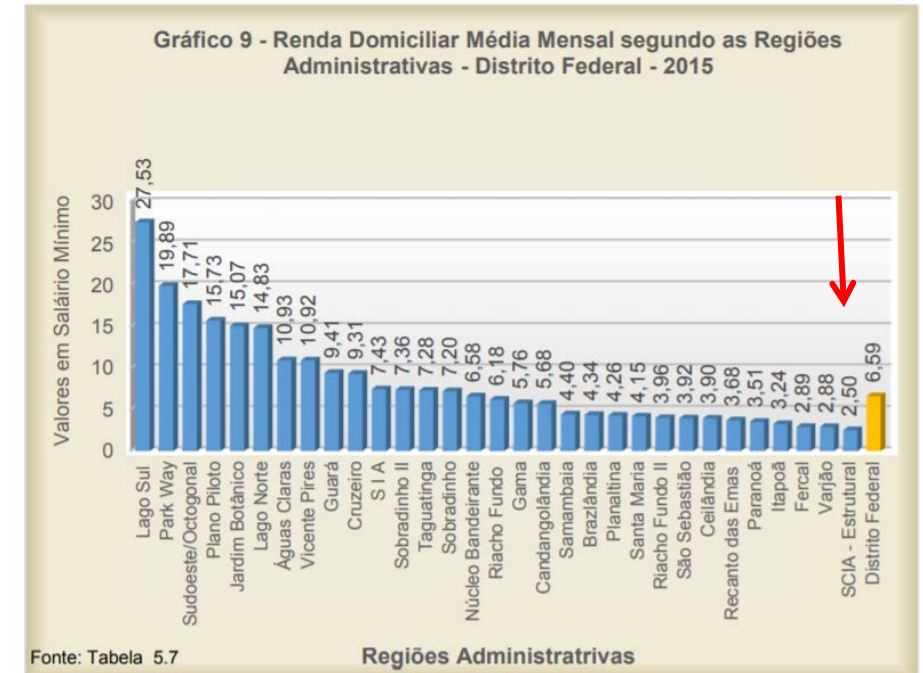


Pearson Chi-Square $p < 0.001$

Gender	less than 500 R\$	500-1000 R\$	More than 1000
Male	80	141	66
	27.9%	49.1%	23.0%
Female	371	195	27
	62.6%	32.9%	4.6%
Total	451	336	93
	51.2%	38.2%	10.6%

According to our systematic review, socioeconomic status of the participants was reviewed in most studies. The indicated income of the workers appeared **to be below or up to minimum wage** in studies

Zolnikov TR, da Silva RC, Tuesta AA, Marques CP, Cruvinel VRN. Waste Manag. 2018 Oct;80:26–39.



Fonte: Tabela 5.7

Regiões Administrativas

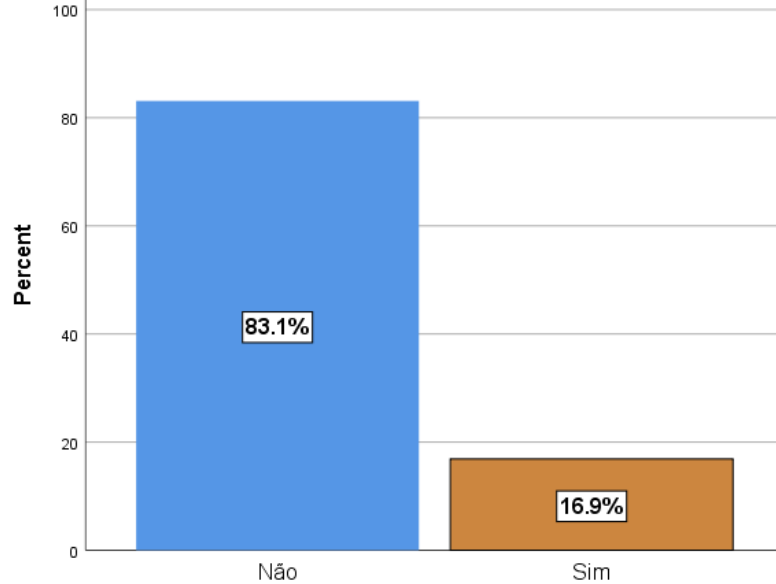
Data: CODEPLAN, 2015

Brazil income: 949.99 reais
Distrito Federal: 2097.83 reais

Data: IBGE – Demographic Census, 2010

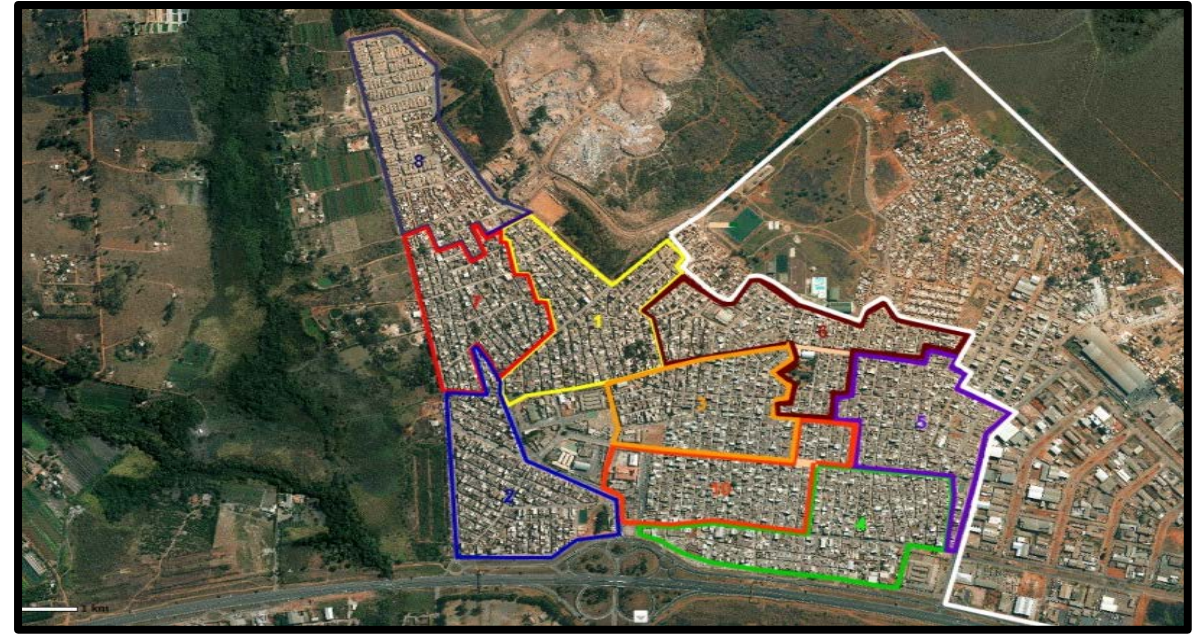
Results of the questionnaire– 2017

Socioeconomic and sociodemographic Status



Living in Santa Luzia

Home Location



Systematic review

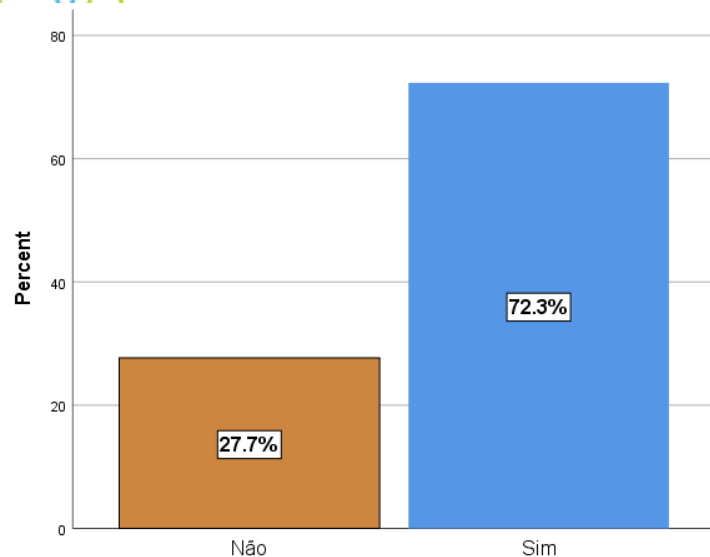
- There were some recyclable collectors that lived in their own residences, but these were often provided by the city administration and social programs.
- Most workers lived in rental houses, while others resided in non-permanent housing or communities that lacked basic infrastructure and quality sanitation.
- Some workers had admitted to living on the streets or on the waste collection sites where they worked, near the open dumps; lived illegally or squatted.

Zolnikov TR, da Silva RC, Tuesta AA, Marques CP, Cruvinel VRN. [Waste Manag.](#) 2018 Oct;80:26–39.

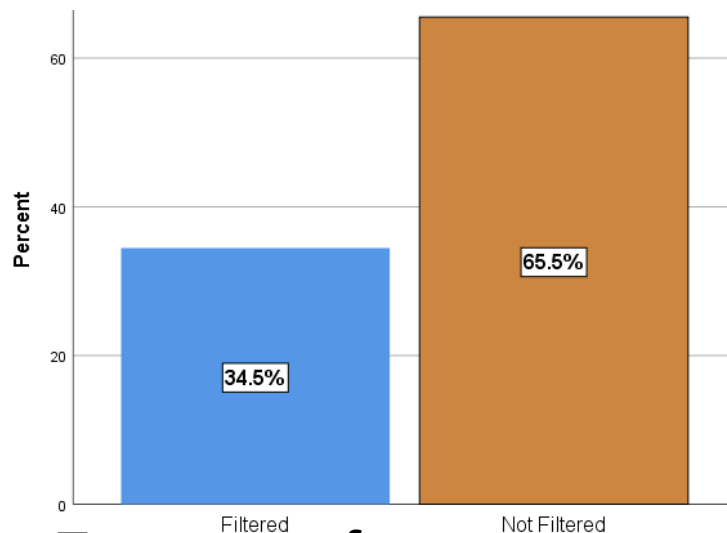
Results of the questionnaire– 2017

Socioeconomic and sociodemographic Status

Estrutural City



Sewer system



Treatment of water

- Water supply through the general network covers 90.89% and 9.11% use other forms of supply;
- Regarding drinking water consumption, it was observed that in 32.67% of the households in the Administrative Region of the SCIA–Estrutural, no filter was used;
- 41.11% consume filtered water in a clay filter.

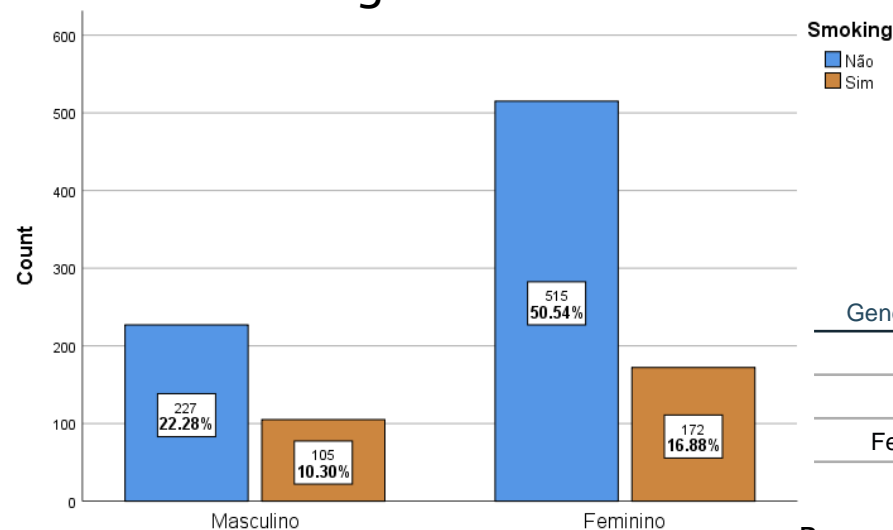
Brazilian Institute of Geography and Statistics (IBGE), 2016



Results of the questionnaire– 2017

Life habits

Smoking

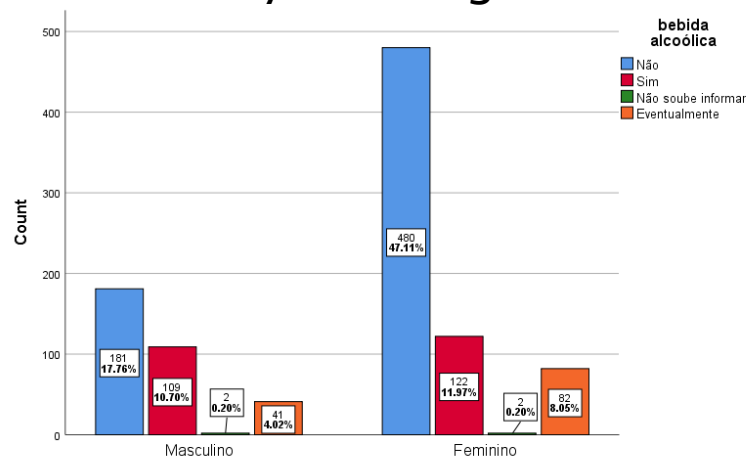


Pearson Chi-Square $p = 0.017$

Smokers in the population above 18 years of age in Brazil from 1989– 2017

Search	Year	Total	Men	Women
National Survey of health and Nutrition	1989	34.8%	43.3%	27.0%
World survey of health	2003	22.4%	27.1%	18.4%
Special Survey of smoking	2008	18.5%	22.9%	13.9%
National Survey of Health	2013	14.7%	18.9%	11.0%
VIGITEL	2017	10.1%	13.2%	7.5%

Heavy drinking



Pearson Chi-Square $p 0,001$

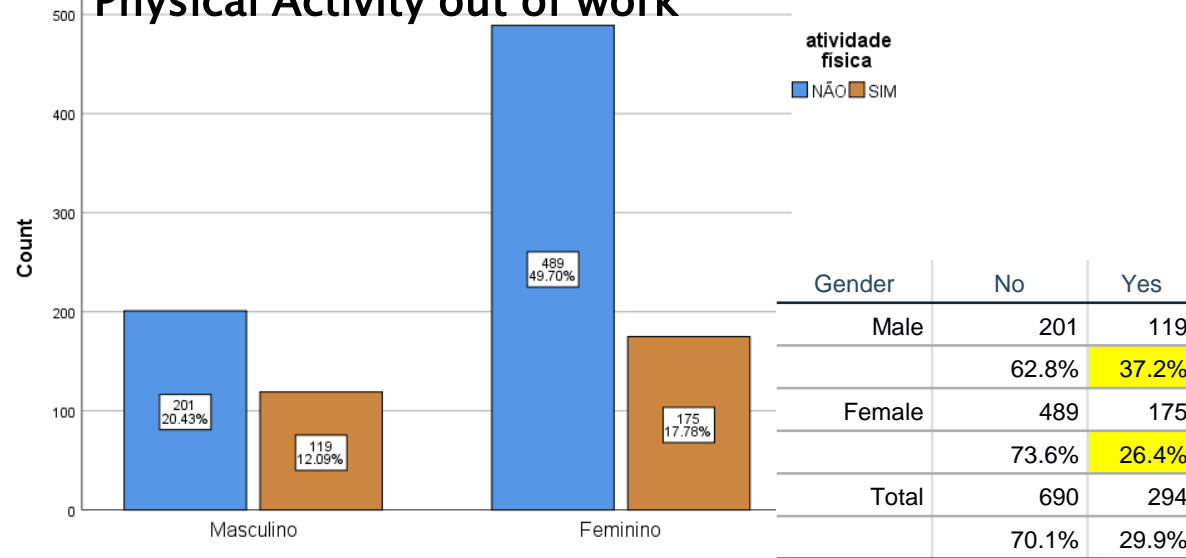
Heavy Drinking in the population above 18 years of age in Brazil from 1989– 2017

Search	Year	Total	Men	Women
Brazil National Health Survey	2013	13.7%	21.6%	6.6%
VIGITEL	2017	19.1%	27.1%	12.2%

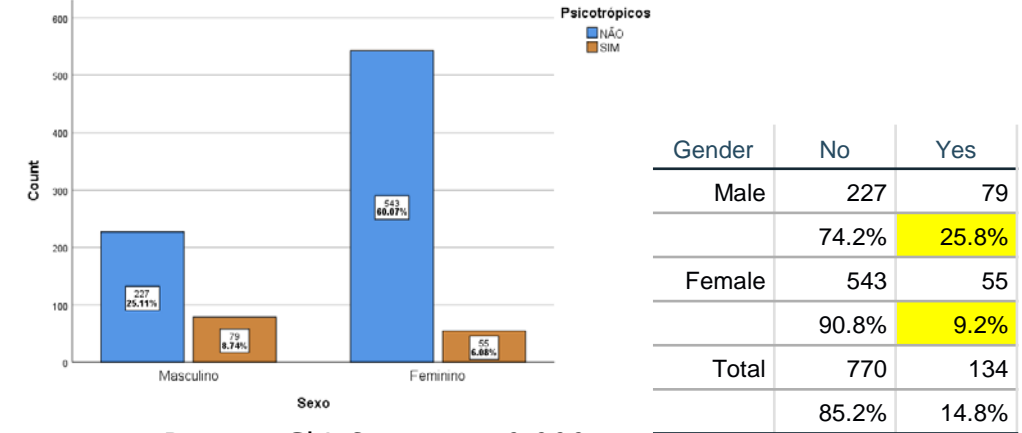
Results of the questionnaire– 2017

Lifestyle habits

Physical Activity out of work



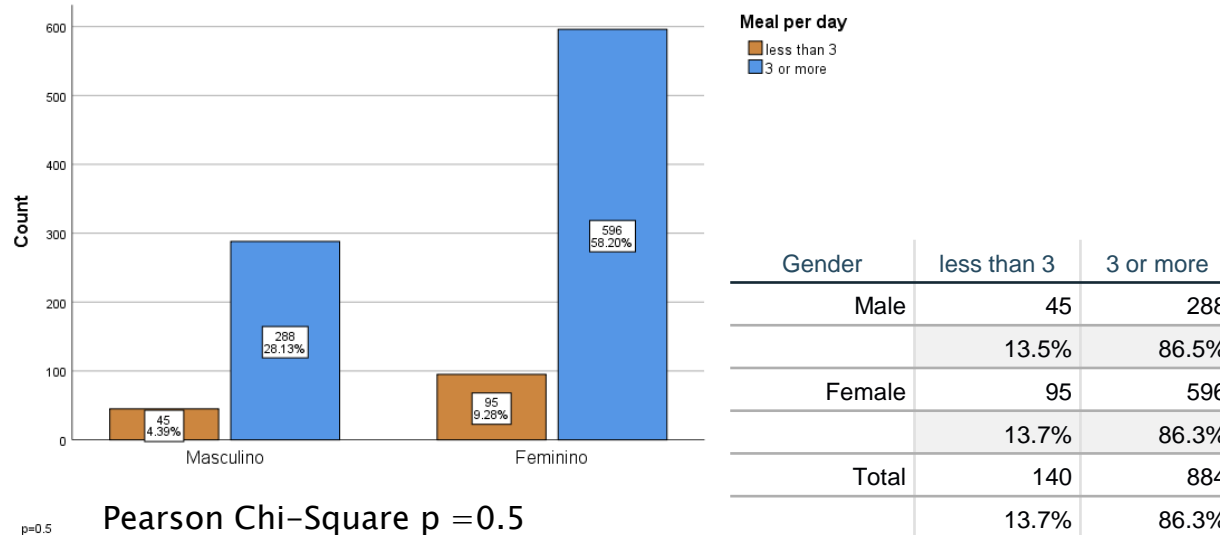
Psychotropics



Pearson Chi-Square $p=0.000$

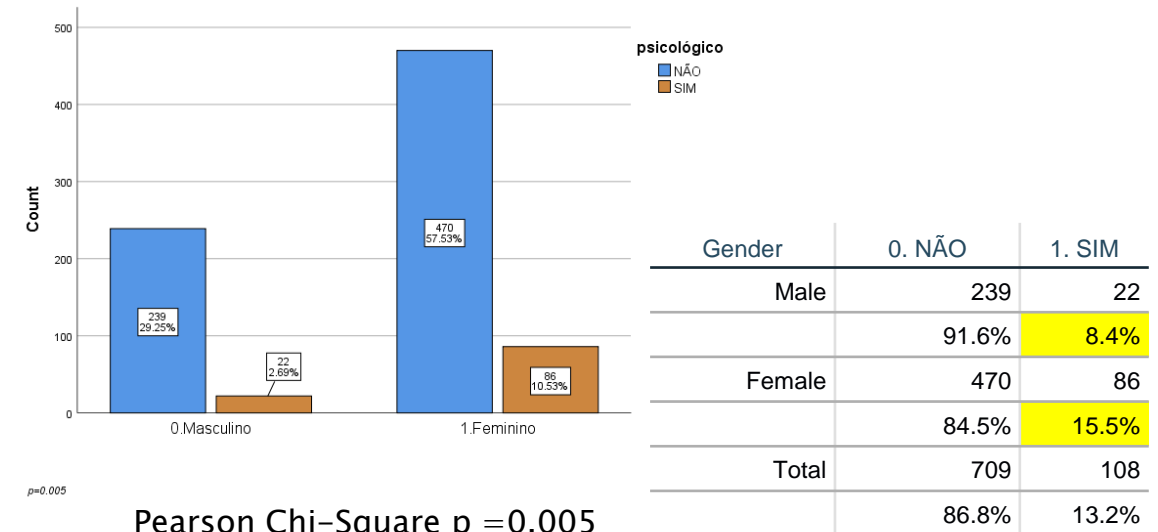
Pearson Chi-Square $p=0.001$

Meals per day



Pearson Chi-Square $p=0.5$

History of psychological or psychiatric treatment.

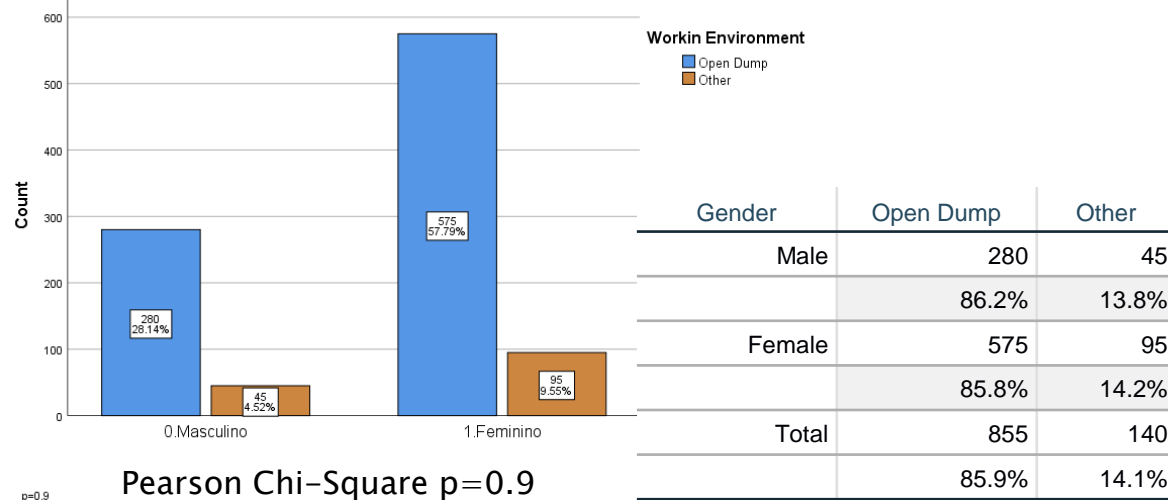


Pearson Chi-Square $p=0.005$

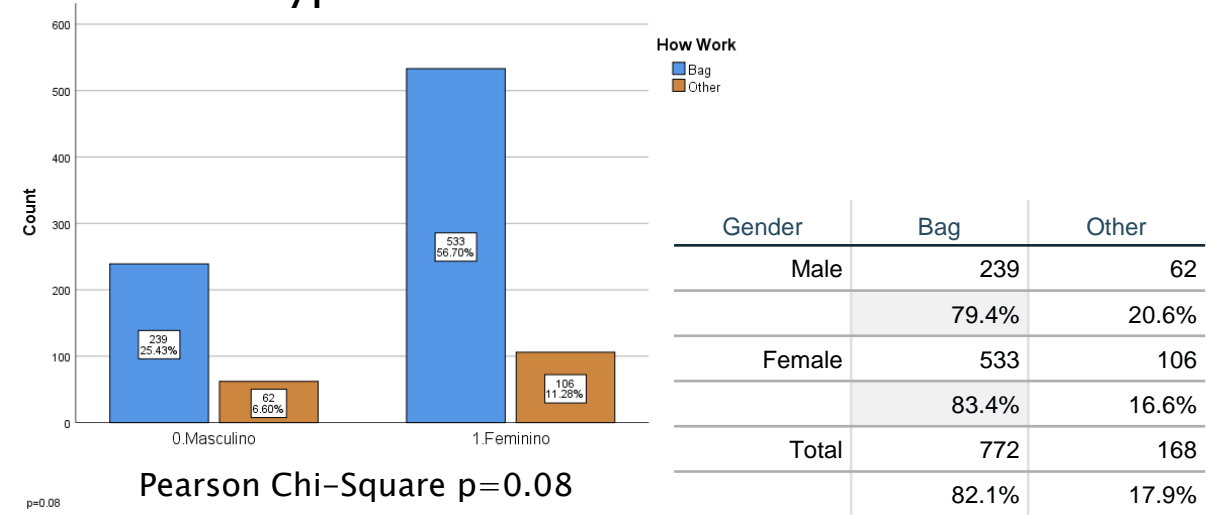
Results of the questionnaire– 2017

Work conditions

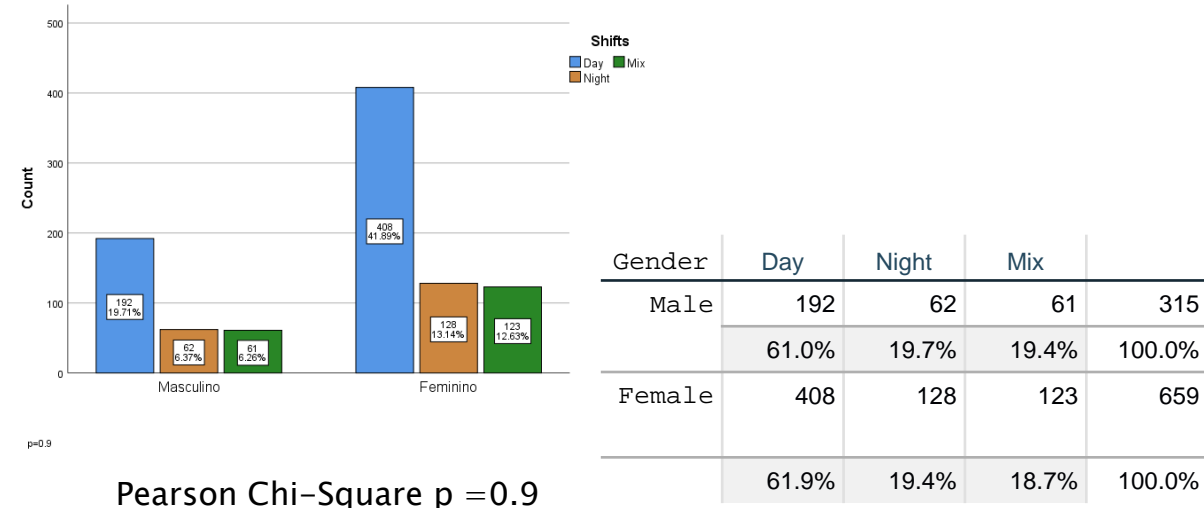
Working place



Type of work



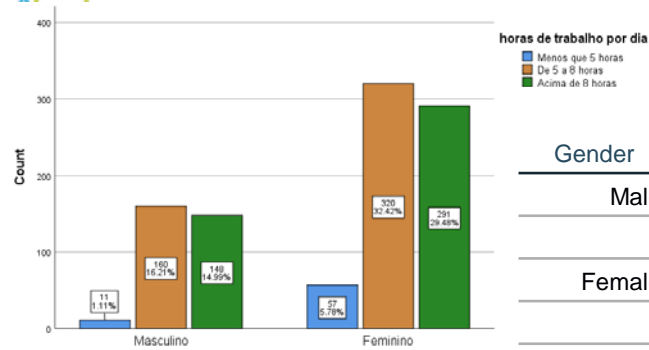
Shift work



Results of the questionnaire– 2017

Work conditions

Hours per day



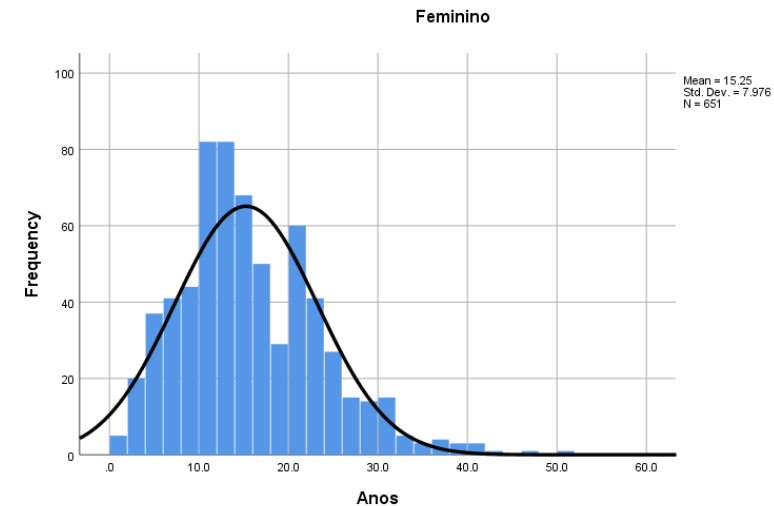
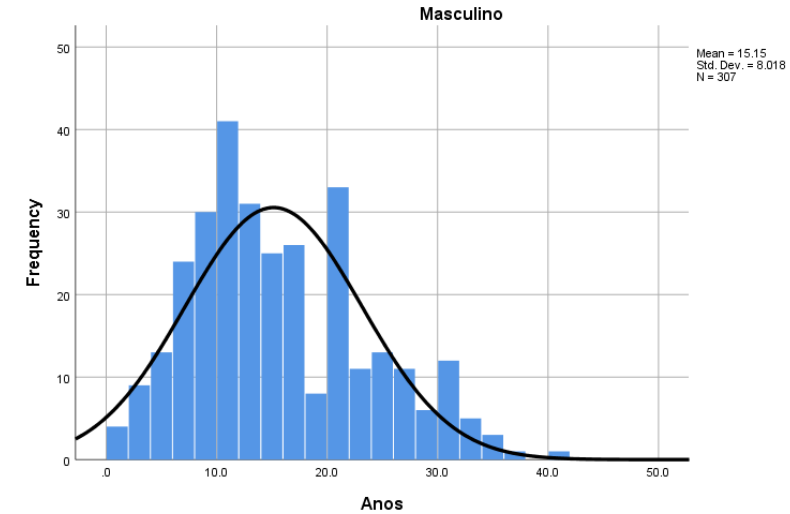
Gender	Under 5 hours	5-8 hours	More than 8 hours
Male	11 3.4%	160 50.2%	148 46.4%
Female	57 8.5%	320 47.9%	291 43.6%
Total	68 6.9%	480 48.6%	439 44.5%

$p=0.003$ Pearson Chi-Square $p=0.008$

- According to our systematic review, many of these people have been working as recyclable collectors most of their life.
- This amount of time suggests chronic exposure levels from possible contaminants and hazards.

Zolnikov TR, da Silva RC, Tuesta AA, Marques CP, Cruvinel VRN. Waste Manag. 2018 Oct;80:26–39.

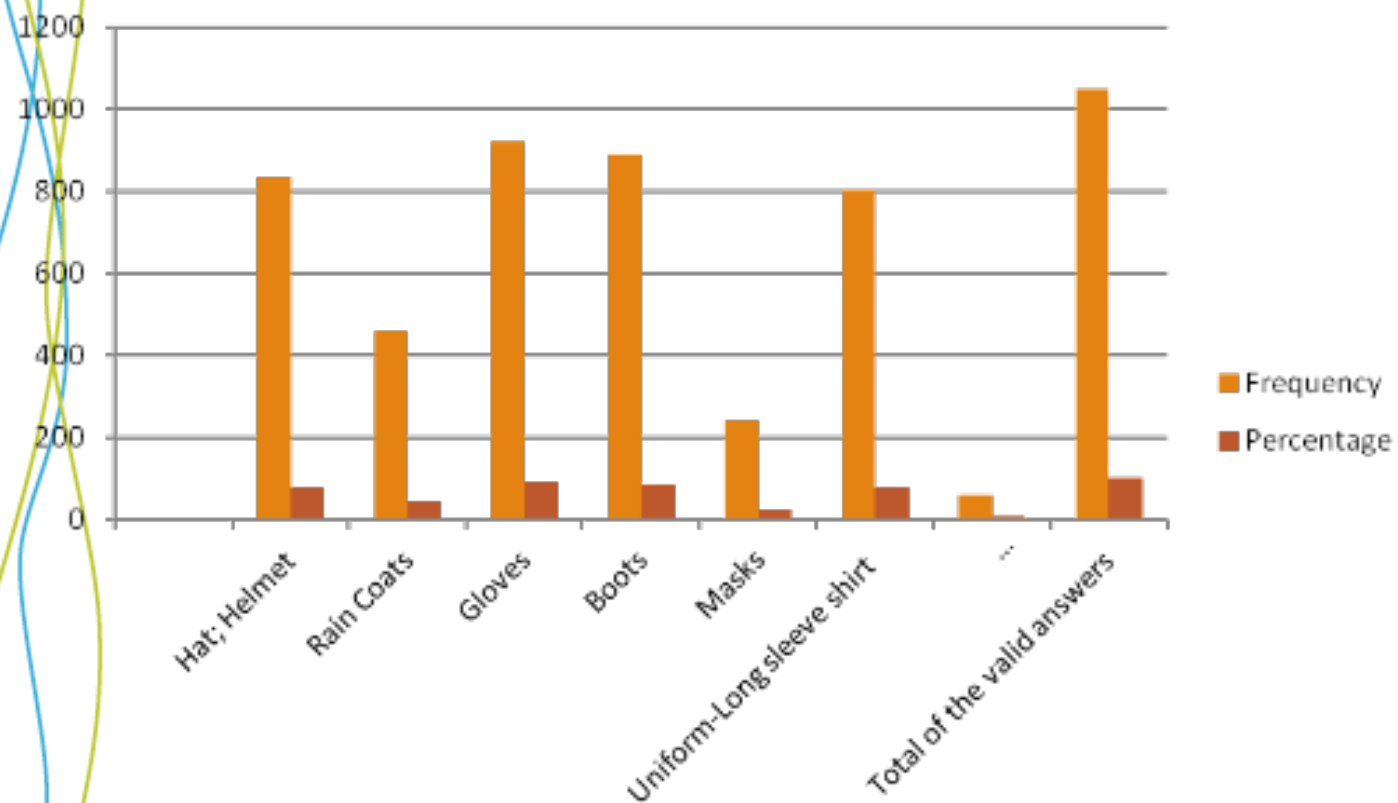
Years worked as Garbage Collector





Preliminary Results of the questionnaire– 2017 Work conditions

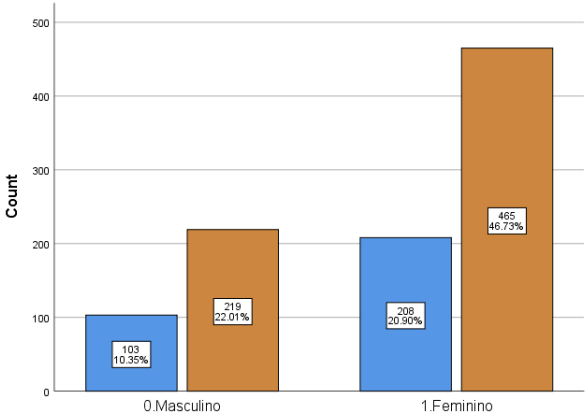
Use of personal Equipment of protection



Results of the questionnaire- 2017

Work conditions

Accident at work



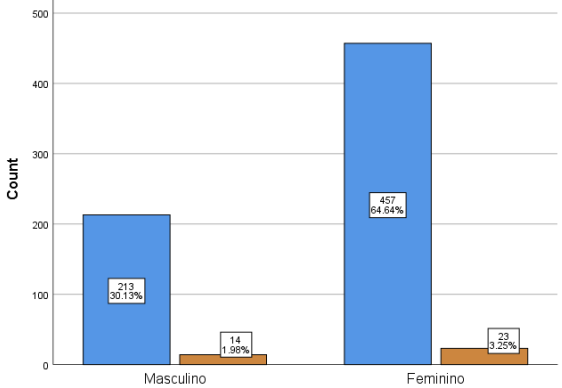
Gender	No	Yes
Male	103	219
	32.0%	68.0%
Female	208	465
	30.9%	69.1%
Total	311	684
	31.3%	68.7%

Pearson Chi-Square p =0.39



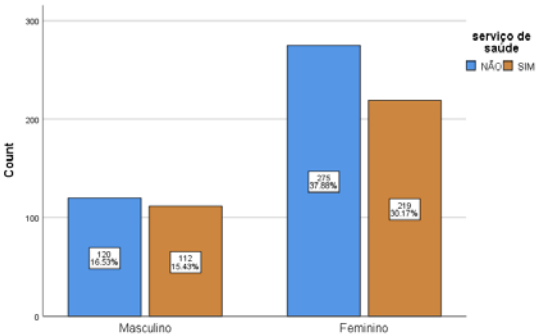
Seeking medical attention

Support from Co-op



Gender	0. NÃO	1. SIM
Male	213	14
	93.8%	6.2%
Female	457	23
	95.2%	4.8%
Total	670	37
	94.8%	5.2%

Pearson Chi-Square p =0.27



Gender	No	Yes
Male	120	112
	51.7%	48.3%
Female	275	219
	55.7%	44.3%
Total	395	331
	54.4%	45.6%

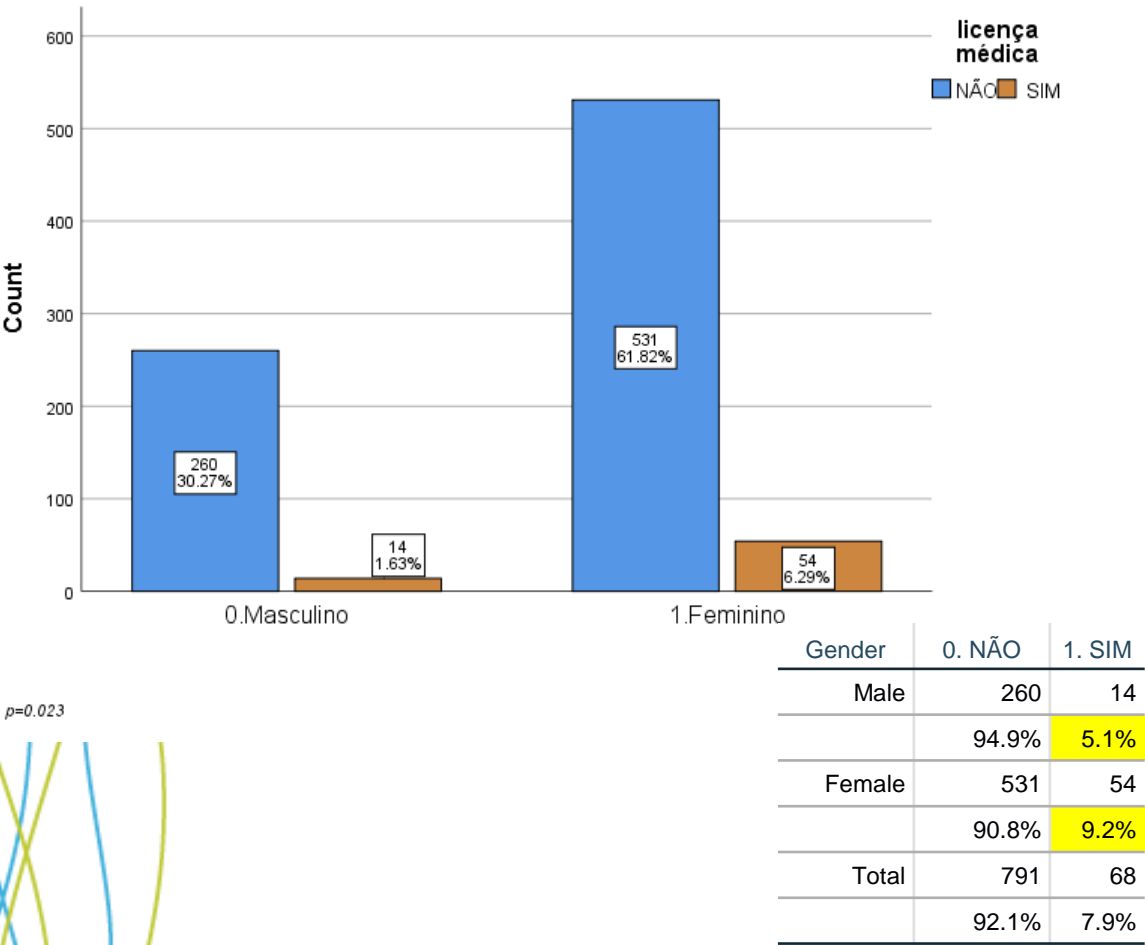
Pearson Chi-Square p =0.18

92.48% did not open the work accident notice
89.69% of the accidents were related to cut with sharp objects including glass and needles.

Results of the questionnaire– 2017

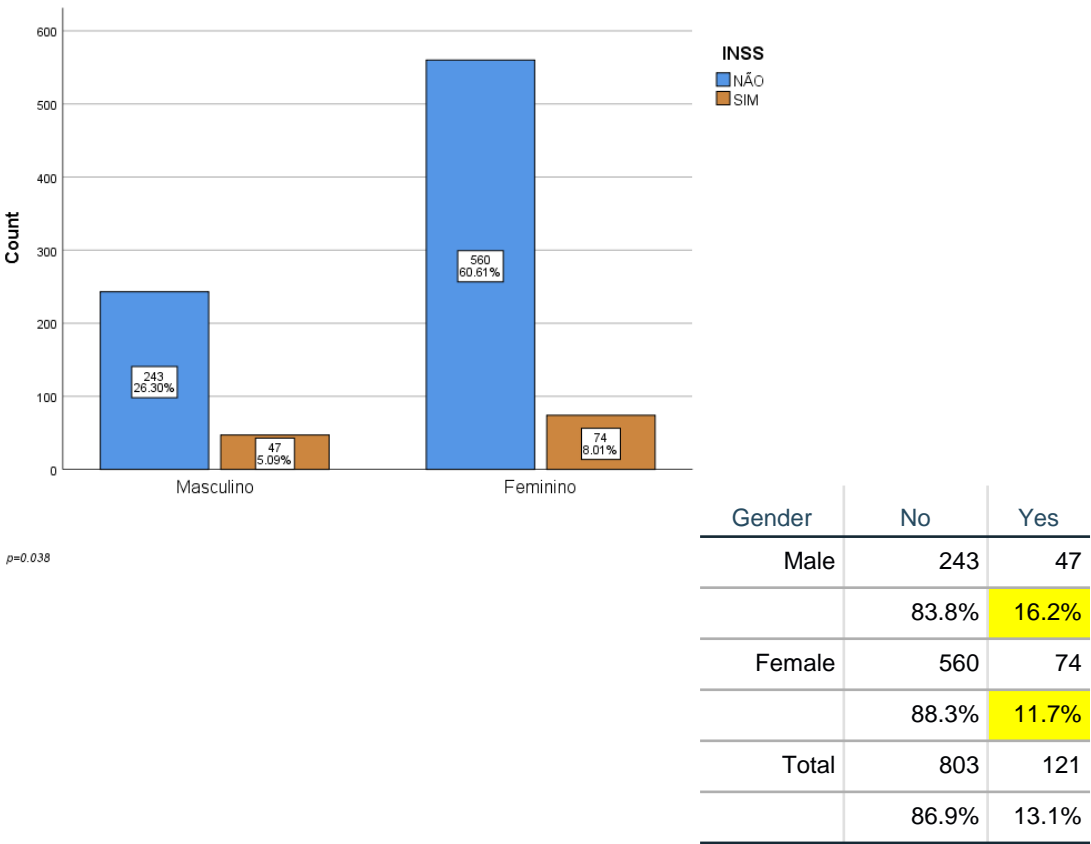
Work conditions

Medical leave



Pearson Chi-Square $p = 0.023$

Contribution to employment insurance



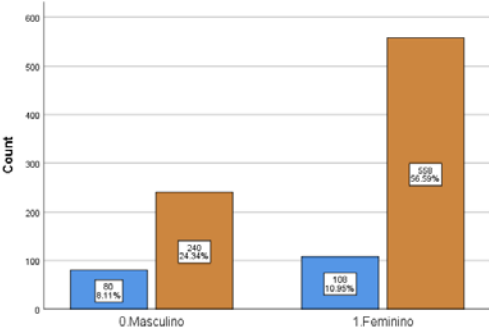
Pearson Chi-Square $p = 0.038$

Results of the questionnaire– 2017

Work conditions

Batteries, E-waste

Contact with decomposing garbage



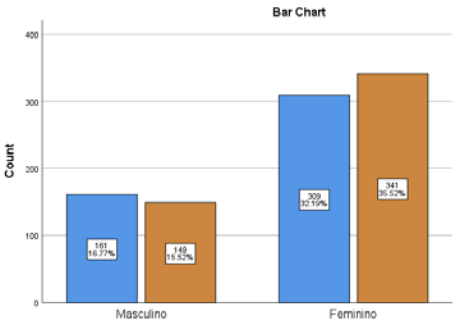
Gender	0. NÃO	1. SIM
Male	80	240
	25.0%	75.0%
Female	108	558
	16.2%	83.8%
Total	188	798
	19.1%	80.9%

Pearson Chi-Square $p = 0.038$

Animal carcass



Chemical products



Gender	0. NÃO	1. SIM
Male	161	149
	51.9%	48.1%
Female	309	341
	47.5%	52.5%
Total	470	490
	49.0%	51.0%

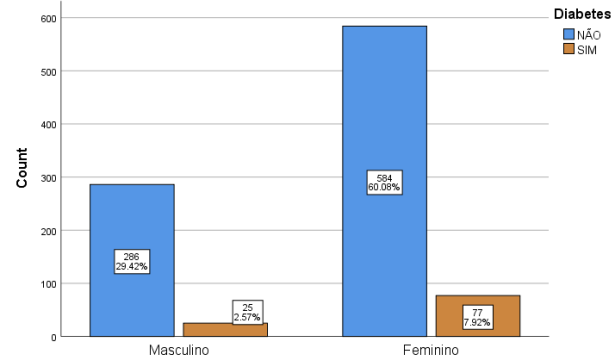
Pearson Chi-Square $p = 0.11$

Drugs, Pesticides, Solvents, Heavy metals

Results of the survey- 2017

Health conditions- Risk factors and Chronic Diseases

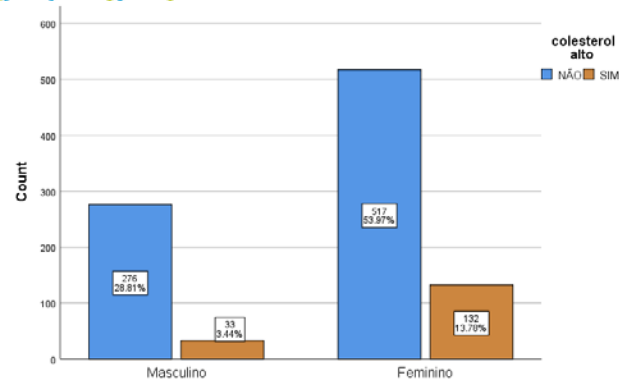
Diabetes



Gender	No	Yes	
Male	286	25	311
	92.0%	8.0%	100.0 %
Female	584	77	661
	88.4%	11.6%	100.0 %
Total	870	102	972
	89.5%	10.5%	100.0 %

Pearson Chi-Square $p = 0.005$

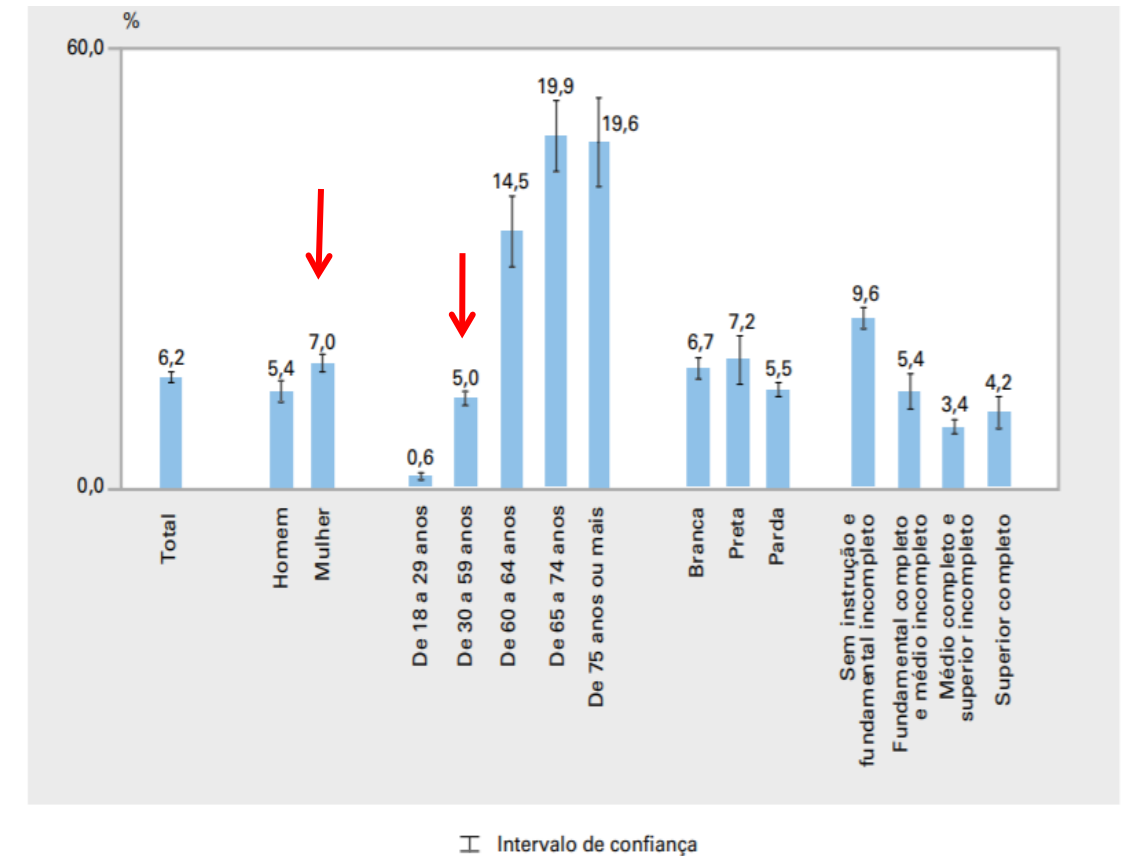
High Cholesterol



Gender	No	Yes	
Male	276	33	309
	89.3%	10.7%	100.0 %
Female	517	132	649
	79.7%	20.3%	100.0 %
Total	793	165	958
	82.8%	17.2%	100.0 %

Pearson Chi-Square $p > 0.001$

Proportion of people over 18 years old with medical diagnosis of diabetes, according to sex, age groups, color or race and level of education, Brazil 2013



Fonte: IBGE, Diretoria de Pesquisas, Coordenação de Trabalho e Rendimento, Pesquisa Nacional de Saúde 2013.

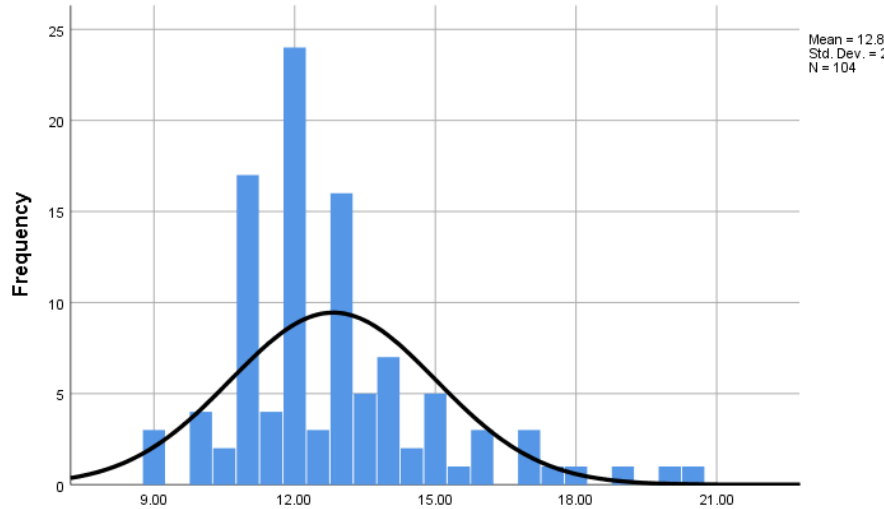
In Brazil, women presented a higher proportion of high cholesterol (15.1%) than men (9.7%).

Results of the survey- 2017

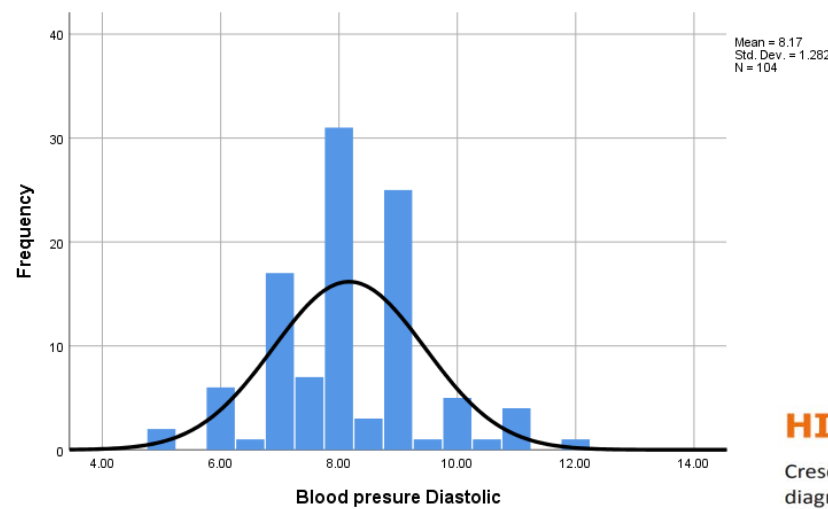
Health conditions- Risk factors and Chronic Diseases

Blood Presure Systolic

10.Sexo:: 0.Masculino

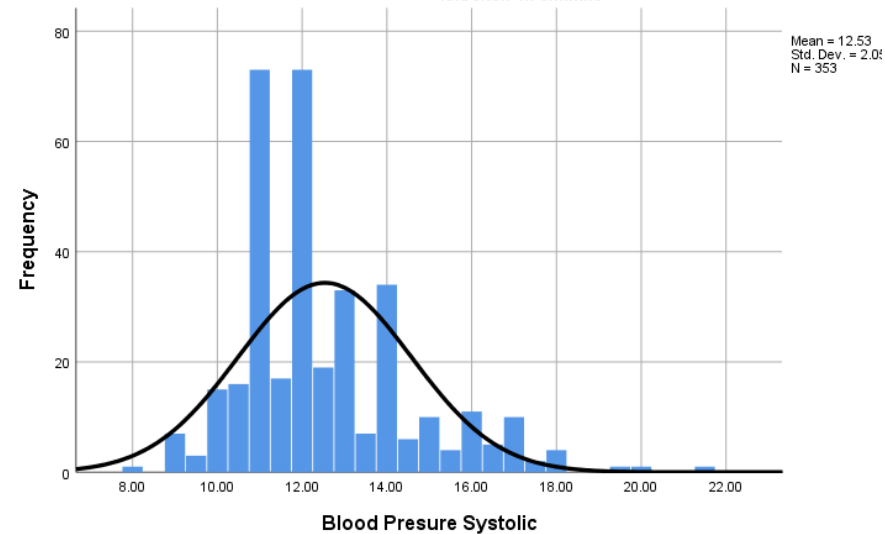


Blood presure Diastolic (Masculino)

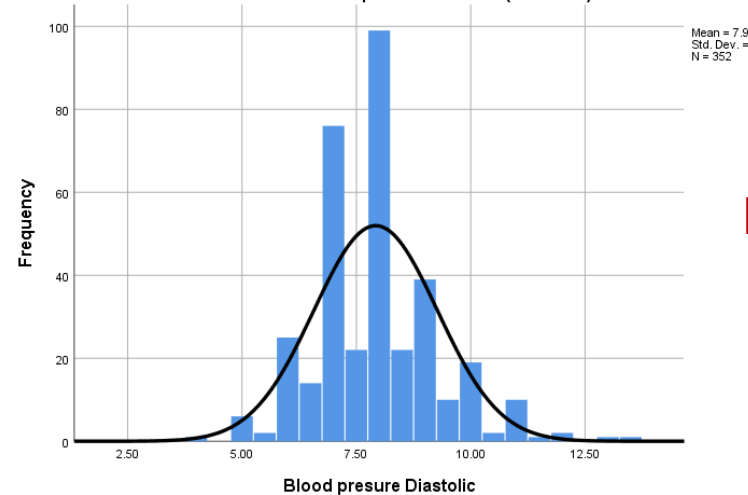


Blood Presure Systolic

10.Sexo:: 1.Feminino



Blod presure Diastolic (Feminino)

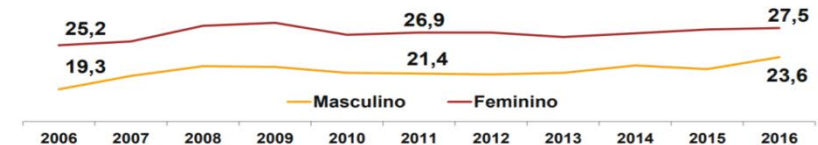


HIPERTENSÃO ARTERIAL

Cresceu **14,2%** o número de pessoas que foram diagnosticadas por hipertensão
Passou de **22,5%** em 2006 para **25,7%** em 2016



Mulheres têm mais diagnóstico de hipertensão

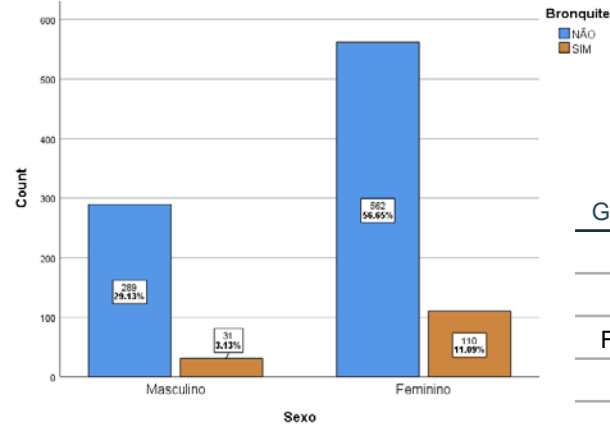


<http://portalarquivos.saude.gov.br>

Results of the survey– 2017

Health conditions– Risk factors and Respiratory Diseases

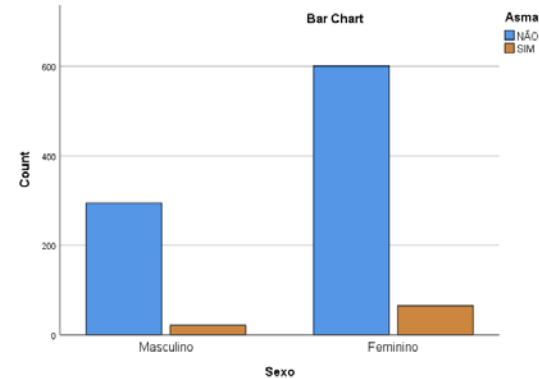
Bronchitis



Gender	Yes	No
Male	289 90.3%	31 9.7%
Female	562 83.6%	110 16.4%
Total	851 85.8%	141 14.2%

Pearson Chi-Square $p = 0.003$

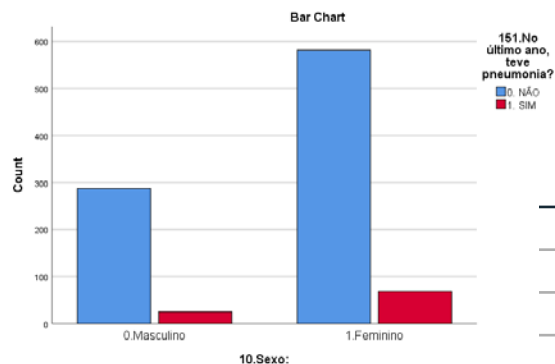
Asthma



Gender	No	Yes
Male	295 93.4%	21 6.6%
Female	601 90.2%	65 9.8%
Total	896 91.2%	86 8.8%

Pearson Chi-Square $p = 0.066$

Pneumonia



Gender	No	Yes
Male	287 92.0%	25 8.0%
Female	582 89.4%	69 10.6%
Total	869 90.2%	94 9.8%

Pearson Chi-Square $p = 0.124$

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Chronic obstructive pulmonary disease	21.4	21.7	22.3	20.4	20.6	20.0	19.1	18.8	19.2	19.8	18.5
Tuberculosis	3.2	3.0	2.9	2.7	2.7	2.6	2.6	2.5	2.4	2.3	2.1
Lung cancer	10.3	10.5	10.8	10.9	10.9	11.2	11.2	11.1	11.1	11.1	11.2
Influenza	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9	0.1	0.1	0.2
Pneumonia	20.6	21.2	22.6	21.1	24.2	24.7	24.6	27.2	28.1	29.5	29.4
Bronchitis, emphysema, and asthma	22.9	23.3	23.9	22.0	22.5	21.7	20.6	20.2	20.6	21.0	19.7

Data are deaths per 100 000 people. Source: Ministry of Health (Brazil).

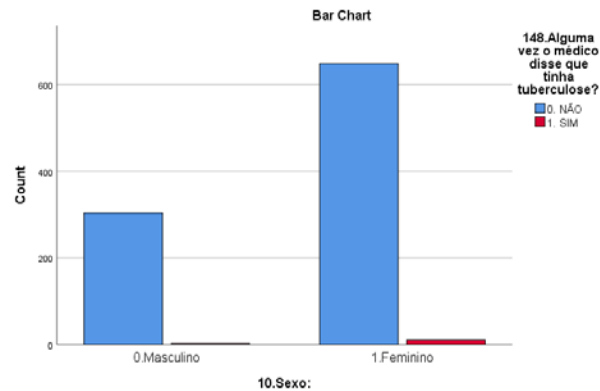
Table: Deaths from respiratory diseases in Brazil, 2002–12

www.thelancet.com/respiratory Vol 3 May 2015

Results of the survey– 2017

Health conditions– Risk factors and Respiratory Diseases

Tuberculoses



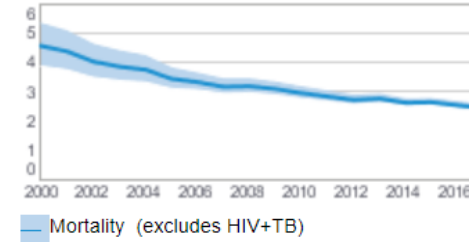
Pearson Chi-Square $p = 0.166$

Gender	No	Yes
Male	304	2
	99.3%	0.7%
Female	649	11
	98.3%	1.7%
Total	953	13
	98.7%	1.3%

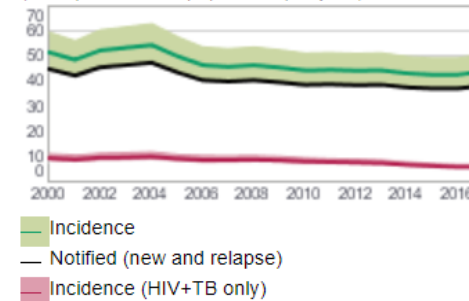
Tuberculosis profile

BRAZIL

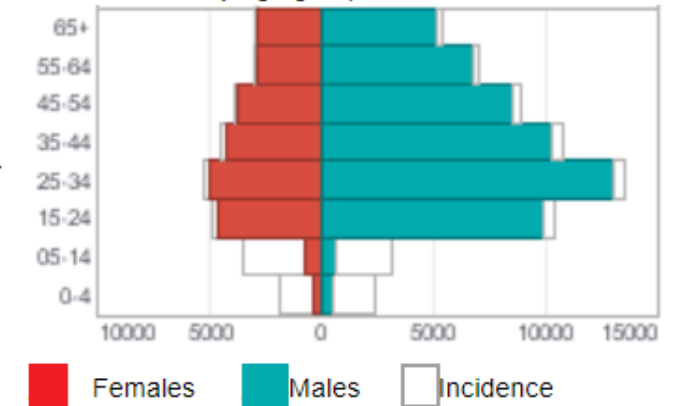
(Rate per 100 000 population per year)



(Rate per 100 000 population per year)



Notified cases by age group and sex, 2017

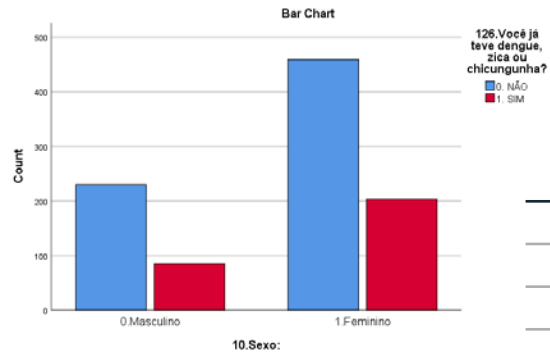


- About 75,000 new and recurrent cases of tuberculosis were registered in Brazil in 2016 equivalent to 200 cases per day.
- Worldwide, about 10.4 million people were infected with tuberculosis in 2016, and 10% of the victims have HIV.
- Brazil accounts for one-third (33%) of the entire burden of tuberculosis in the Americas, and is one of a group of countries accounting for almost 40% of all tuberculosis cases in the world and about 34% of cases of HIV coinfection.

Results of the survey- 2017

Health conditions- Risk factors and Arboviral Diseases

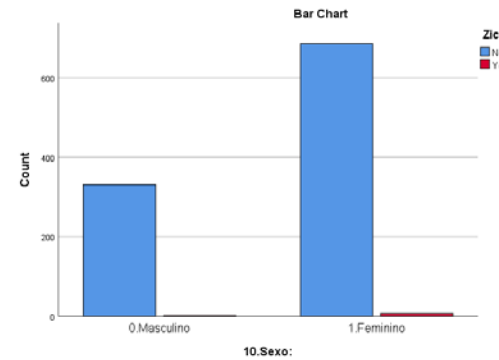
Dengue fever, Zika virus, Chikungunha



Gender	No	Yes
Male	230	85
	73.0%	27.0%
Female	459	203
	69.3%	30.7%
Total	689	288
	70.5%	29.5%

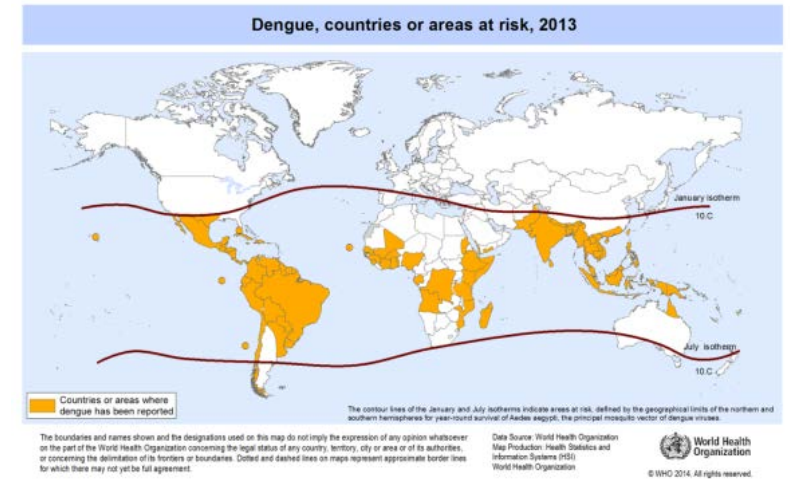
Pearson Chi-Square $p = 0.135$

Zika virus

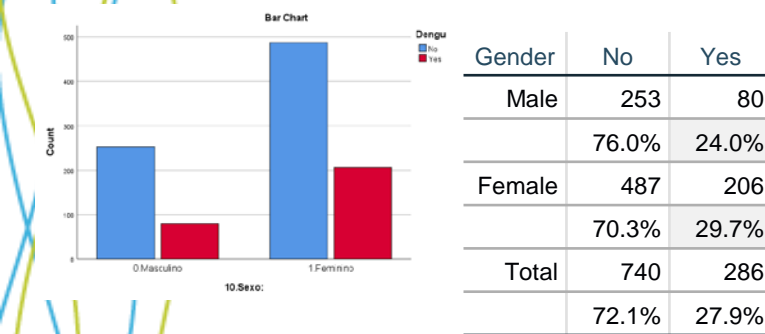


Gender	No	Yes
Male	331	2
	99.4%	0.6%
Female	686	7
	99.0%	1.0%
Total	1017	9
	99.1%	0.9%

Pearson Chi-Square $p = 0.135$



Dengue fever



Gender	No	Yes
Male	253	80
	76.0%	24.0%
Female	487	206
	70.3%	29.7%
Total	740	286
	72.1%	27.9%

Pearson Chi-Square $p = 0.033$

Dengue

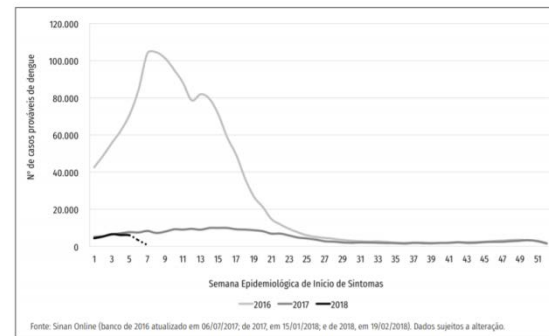


FIGURA 1 Casos prováveis de dengue, por semana epidemiológica de início de sintomas, Brasil, 2016, 2017 e 2018

Chikungunha

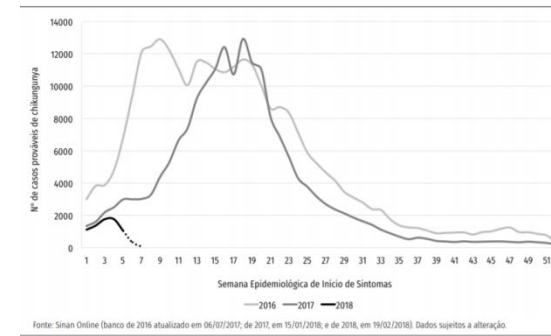


FIGURA 2 Casos prováveis de febre de chikungunha, por semana epidemiológica de início de sintomas, Brasil, 2016, 2017 e 2018

Zika

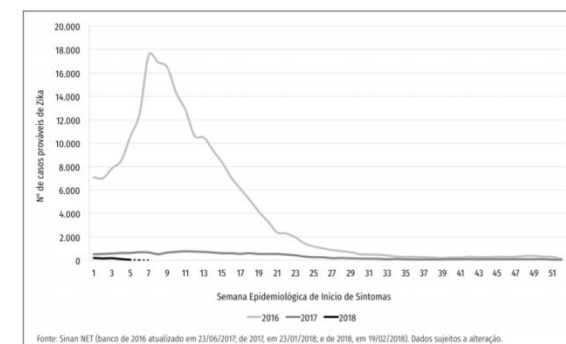


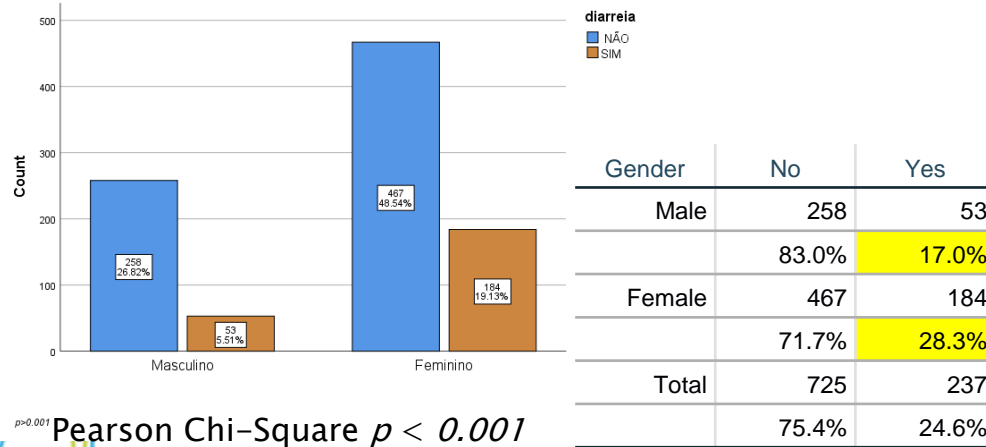
FIGURA 3 Casos prováveis de febre pelo vírus Zika, por semana epidemiológica de início de sintomas, Brasil, 2016, 2017 e 2018

Weekly report by the Ministry of Health Brazil, (2016-2018), Mar 2018

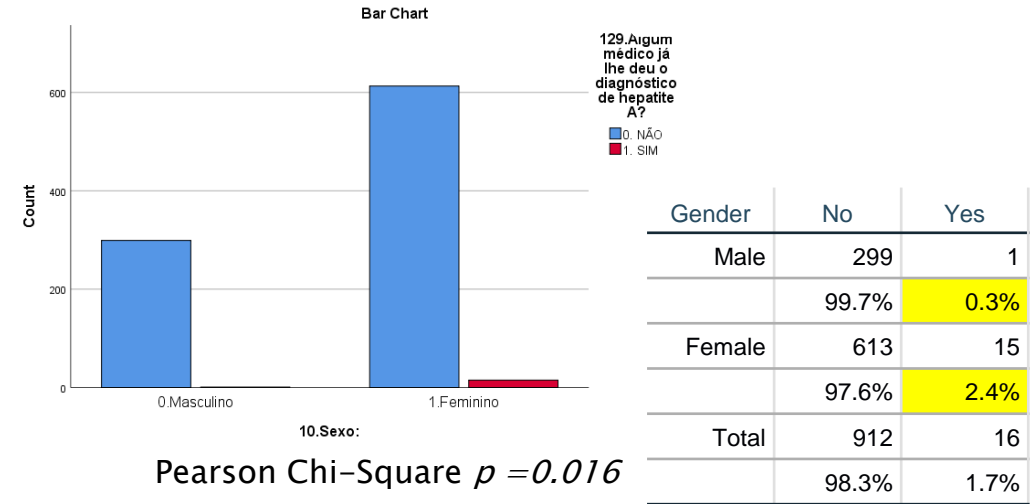
Results of the survey– 2017

Health conditions– Risk factors and Waterborne Diseases

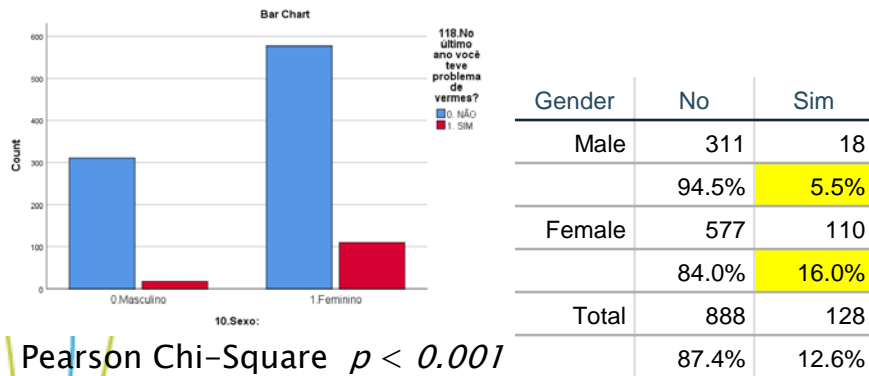
Diarrhea (last month)



Hepatitis A



Worms (last year)



Leptospirosis



Gender	No	Yes
Male	311	3
	99.0%	1.0%
Female	655	4
	99.4%	0.6%
Total	966	7
	99.3%	0.7%

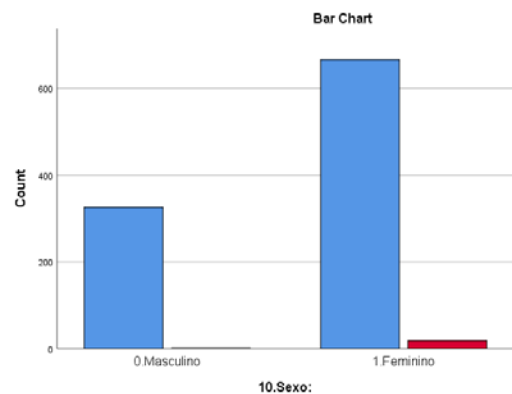
Pearson Chi-Square $p = 0.405$

Women had almost 3 times more chance to have worms in relation to men;
Who didn't filter the water had 1.8 more chance to have worms in relation who did it.

Results of the survey- 2017

Health conditions- Risk factors and Chronic diseases

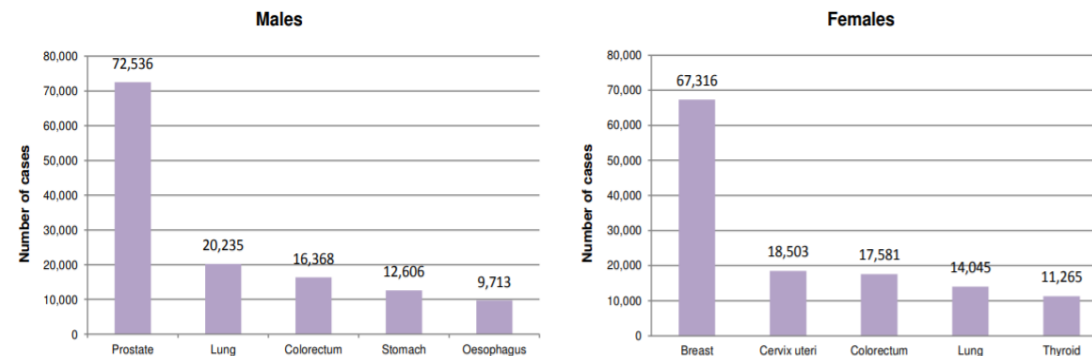
Cancer



Gender	No	Yes
Male	325	1
	99.7%	0.3%
Female	666	18
	97.4%	2.6%
Total	991	19
	98.1%	1.9%

Pearson Chi-Square $p = 0,008$

Cancer Incidence



Adult Risk Factors

	Males	Females	Total
Current tobacco smoking (2011)	21.6%	13%	17.3%
Total alcohol per capita consumption, in litres of pure alcohol (2010)	13.6	4.2	8.7
Physical inactivity (2010)	24.9%	29.4%	27.2%
Obesity (2014)	17.2%	22.9%	20.1%
Household solid fuel use (2012)	-	-	6.0%

World Health Organization - Cancer Country Profiles, 2014.

The World Health Organization (WHO) recognizes that most new cases of cancer occur in developing countries.

In the workplace carcinogens can be found and can be increased in combination with other risk factors, such as **environmental pollution**, **diet rich in trans fats**, **excessive consumption of alcohol**, biological agents and **smoking**.

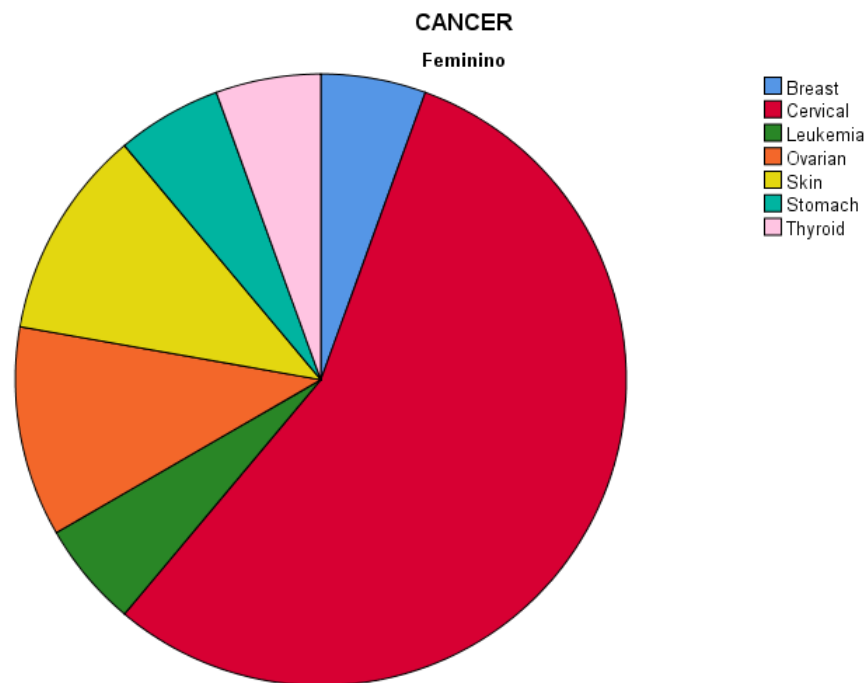
The most frequent types of work-related cancers are lung cancer, mesotheliomas, skin cancer, bladder cancer and leukemias.

National Institute of Cancer (INCA), Brazil 2010

Results of the survey- 2017

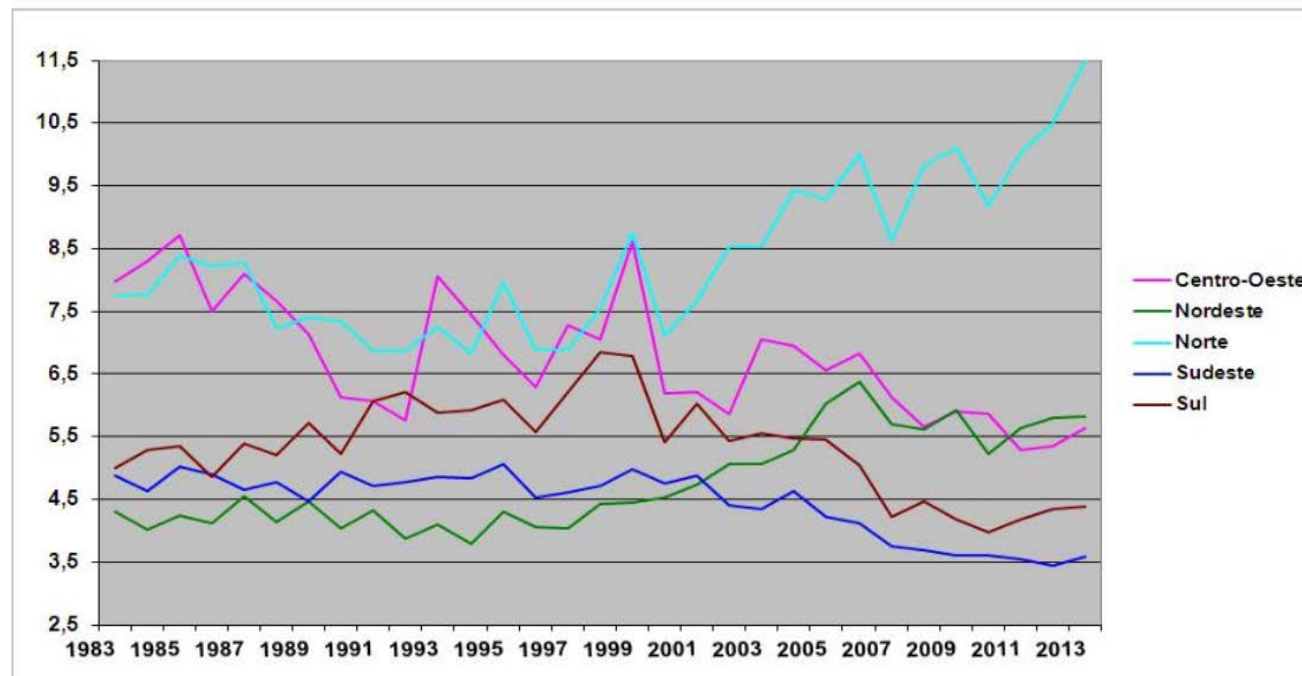
Health conditions- Risk factors and Chronic diseases

Type of Cancer



Pearson Chi-Square $p = 0.008$

Mortality rate adjusted * by the world population for cervical cancer. Regions. Brazil, 1983 to 2013



*Taxa por 100 mil mulheres

About cervical cancer

- In Brazil, in 2018, 16,370 new cases are expected, with an estimated risk of 17.11 cases per 100,000 women.
- It is the third primary location of cancer incidence and mortality in women in the country, excluding non-melanoma skin.
- In the Federal District, it occupies the second position, with rates of 20.72 / 100 thousand women.

Código	Exam Group Description	Reference value	Values within the reference limits		Values outside the reference limits		Total
			n	%	n	%	
B015	Uric acid	3,5 - 7,2	586	76,10	184	23,89	770
B025	Creatinine	0,80 - 1,40	356	45,93	419	54,06	775
B035	GT Range	10,0 - 49,0	634	83,75	123	16,24	757
B046	TGO (Oxalacetic Glutamic Transaminase)	0 - 38	733	94,70	41	5,29	774
B047	TGP (Transaminase Glutamic Pyruvate)	0 - 41	701	90,56	73	9,43	774
B053	Glucose	70 - 99	499	64,47	275	35,52	774
B113	Creatinophosphokinase (CPK)	N/a	null	null	null	null	null
U002	Clearence of Creatinine	N/a	null	null	null	null	null
I005	VDRL (Inclusive Quantitative)	Non reactive	654	95,89	28	4,1	682
I017	Antic. Anti-hiv1 + Hiv2 (elisa)	Non reactive	764	99,22	6	0,77	770
I135	HIV1 / 2 Rapid Immunoblot	Non reactive	4	57,14	3	0,42	7



2017– 2030

Epidemiological Diagnosis– Occupational Health

Stage 3—The return of the waste pickers to receive the results of the tests and report occupational accidents (Knowledge Translation and Exchange- KTE)

In this stage, the waste pickers who underwent the tests **were called in by their respective family health teams** to receive the results, and, according to their needs, are being treated in primary care. If necessary, they were referred to a more complex level of care.

Also in this stage, if the waste picker **has suffered a serious work-related accident or has been exposed to biological waste, more detailed information was collected about the accident so that it may be recorded on the Occupational Accidents Surveillance System of the National Information System of Notifiable Diseases and Injuries (SINAN– *Acidentes de trabalho*)**, Ministry of Health.

Some tests not covered in the initial stages for the waste pickers can be requested by the family health care team in specific situations when there are symptoms, a clinical history or a positive or strong epidemiological factor, as long as the tests are available, and can be undertaken by the Federal District's Health Laboratory Network.

Limitations of the Study

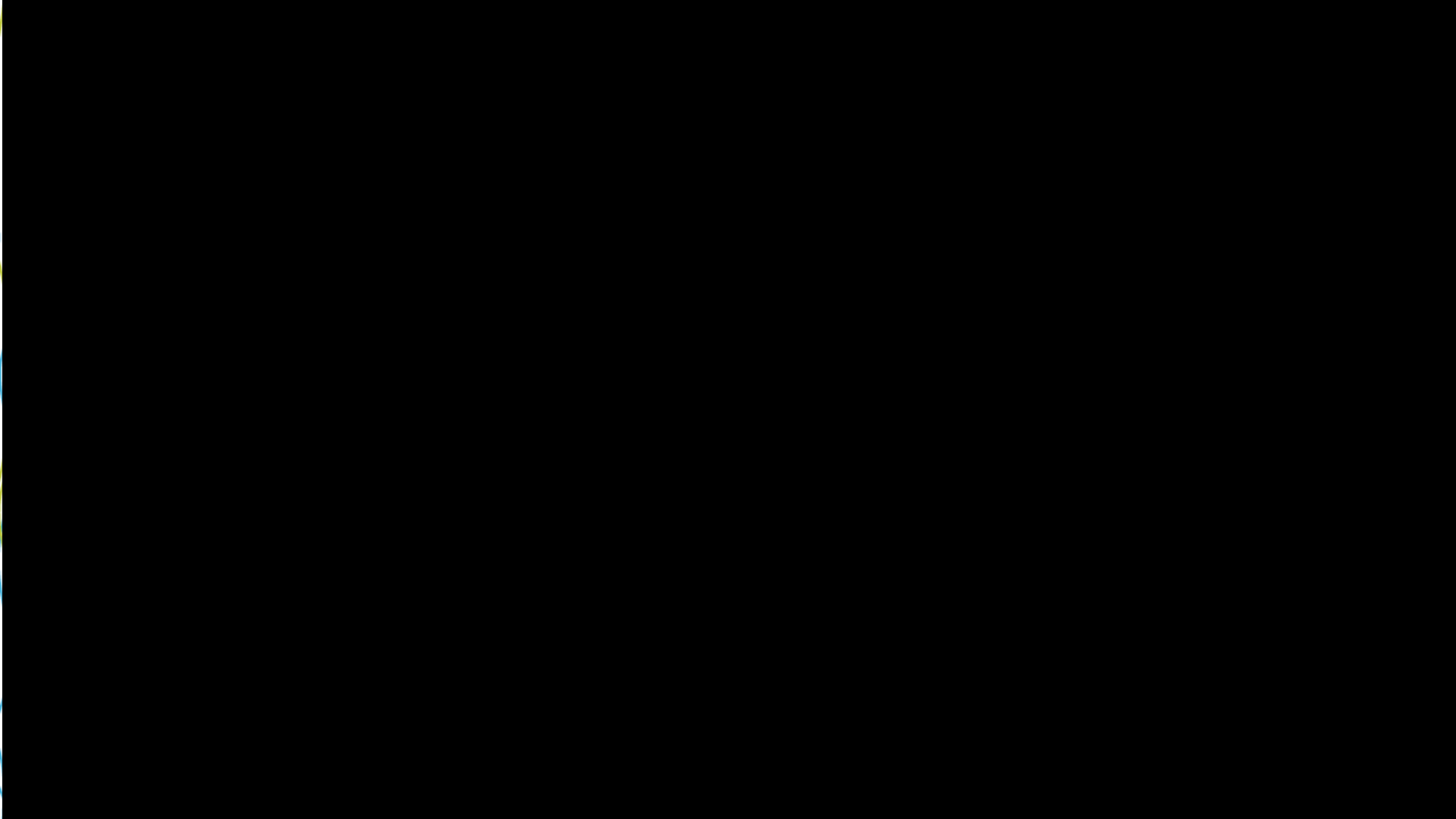
Underestimation of the diseases, especially for men group.

It is not possible to define causal links between the health conditions observed and the waste pickers' living and work conditions.

These limitations could be minimized only by studies of the cohort or case-control type.

Conclusions

- Women and men had the same work, demographic and sanitary conditions;
- Men smoked more, drank more and used more psychotropics;
- Otherwise, women were more vulnerable : had more children, were more single or divorced, had lower income, did more psychological treatment and medical leave, less contribution to employment ensurance.
- Women had worse health conditions in relation to respiratory diseases (bronchitis); waterborne Diseases like diarrhea, worms and Hepatitis A and a higher prevalence of cancer.





Current projects: Prevention of oral cancer



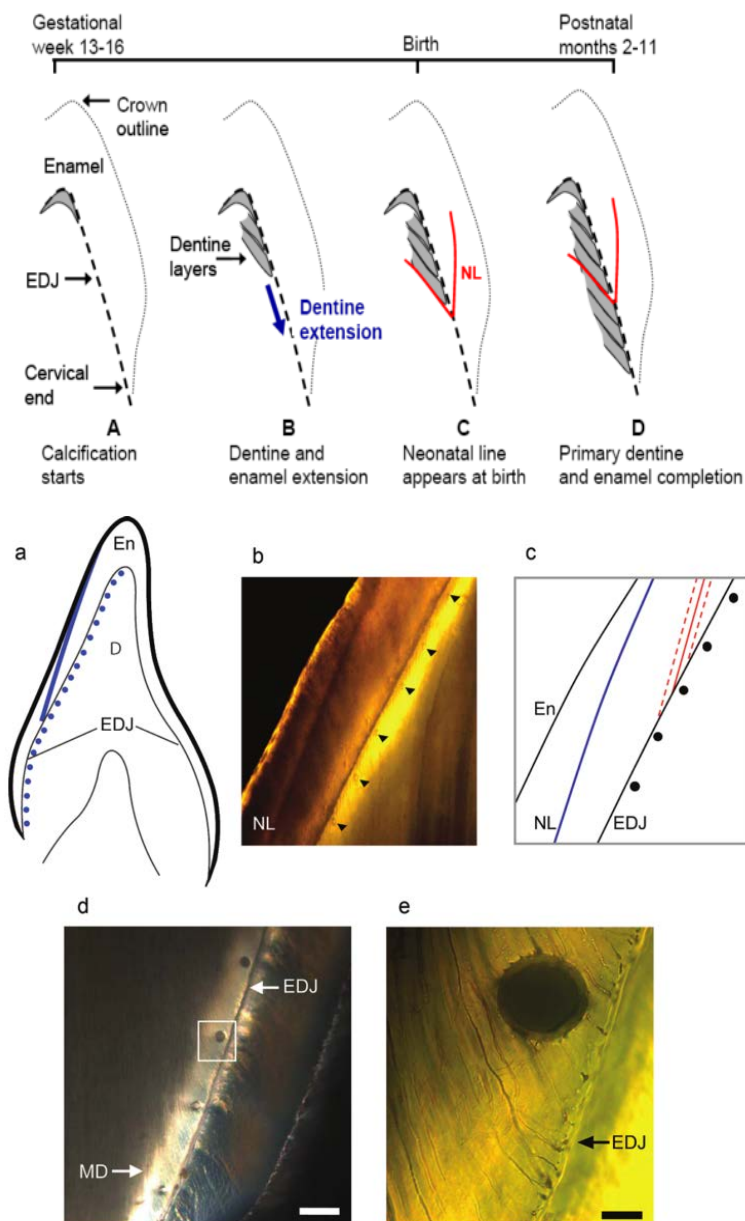
–11 000 cases of
Oral cavity cancer
in Brazil in 2016;
–5th position of
incidence
in men
www.inca.com.br





Current projects:

Detection of lead in saliva and baby teeth of children of waste pickers, to correlate with their health conditions





Current projects: Survey on entomofauna of sanitary importance in Territory adjacent to the Open Dump – Distrito Federal, Brazil



Territories with environmental degradation, which is typical of places with the presence of areas with inadequate disposal of solid waste or even preserved areas present in their fauna diverse species of vectors of diseases.

To describe and analyze the composition of the entomofauna of importance in health of the area near the National Park, rural area of Cabeceira do Valo and Setor Santa Luzia, bordering the landfill of Cidade Estrutural, in Distrito Federal.





Next Steps

Publish the protocol of the epidemiological survey



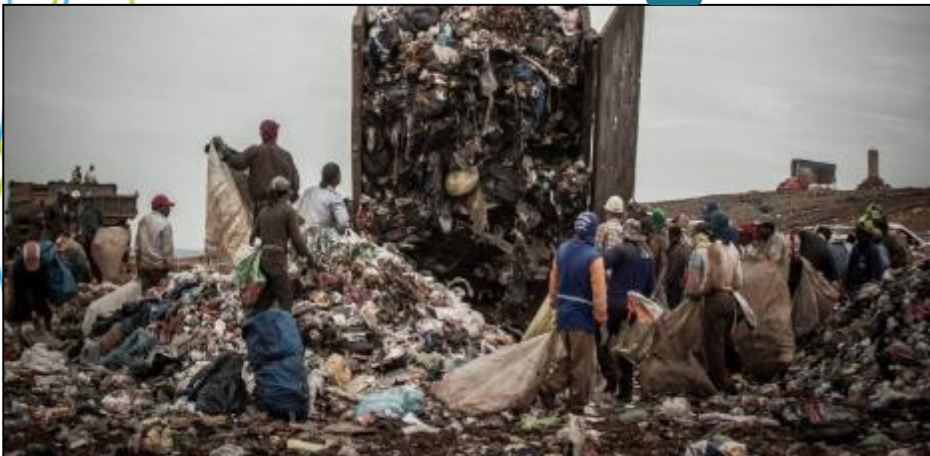
STEP 4– Follow-up with the collectors and their families and do other complementary tests: Including the metal analysis



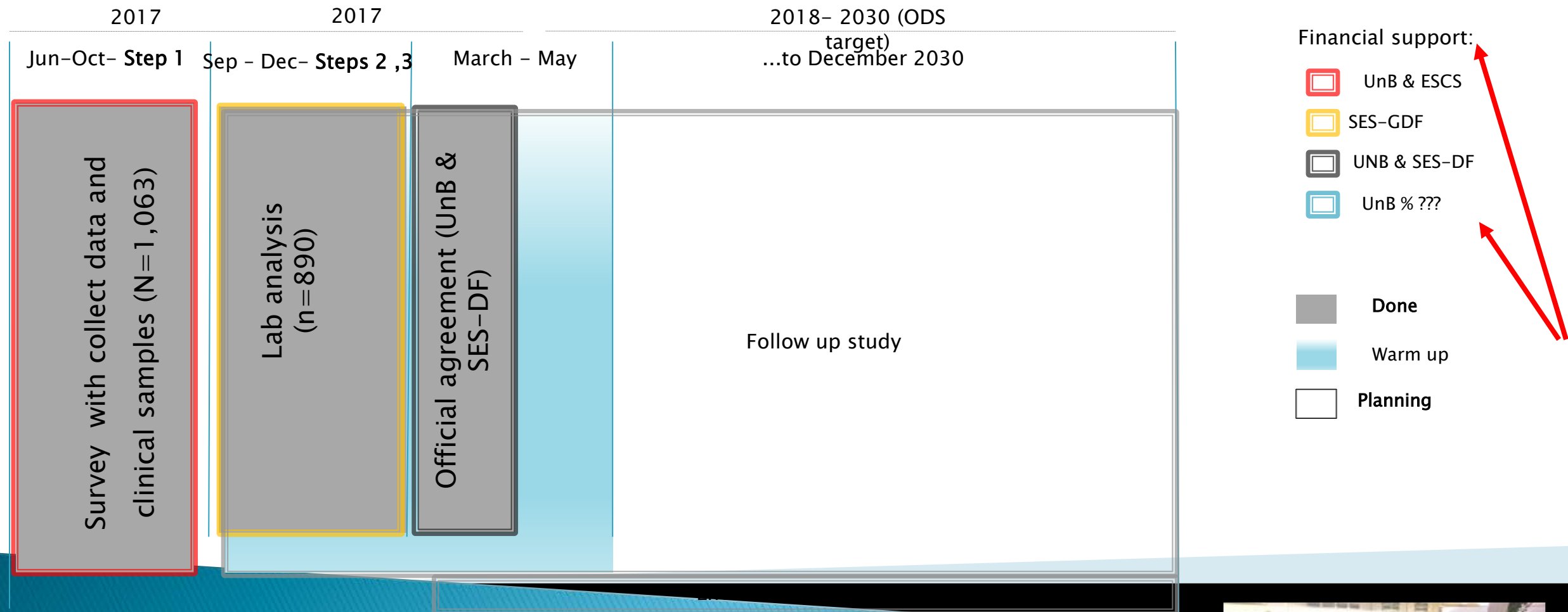
STEP 5– Environmental assessment and monitoring with emphasis on water quality



STEP 6– Correlation the water quality with the waterborne diseases and intoxication by heavy metals.



Timeline of the project about monitoring a open dumping in a slum urban area with poor people living in the Federal District, Brazil, 2017 to 2030



New perspectives



To investigate both lung and skin problems with the view to training and prevention

To measure Air Exposure of the indoor transitory facilities.



New perspectives



Workplace Health Without Borders

Imagine a world where workers do not get sick because of their work


<https://www.whwb.org/>




Waste Workers Health International Committee

Not secure | www.whwb.org/current-projects/waste-workers-occupational-safety-health/

trada (20) - vaness (2) WhatsApp SEI - Controle de Pi Plataforma Brasil http://www.unb.br/ Acesso à Plataforma Inicial


 **Workplace Health Without Borders**

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