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Final Report

Estimation of the direct and indirect costs attributable to alcohol consumption in Brazil

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Summary

Alcohol consumption is one of the main risk factors for non-communicable diseases, which contribute to direct and indirect economic costs for countries and their populations, considering healthcare expenses and productivity losses to the economy. In Brazil, we are now seeing increasing rates of both regular alcohol use and binge drinking, particularly among women, as well as the introduction of alcohol consumption during adolescence.

This study was conducted based on a comparative risk analysis methodology to estimate the direct and indirect costs of alcohol consumption in Brazil using data from publicly available sources and from scientific literature, considering direct and indirect estimates of alcohol consumption in the country, with 2019 as its year of reference.

Based on this methodology, it was estimated that, in Brazil in the year of reference, between 47,900 and 104,800 deaths were attributable to alcohol consumption, and that the total costs attributable to the same cause ranged from R\$10.1 billion to R\$18.8 billion. Breaking down these results, between R\$9.7 and R\$17.7 billion represent indirect costs (productivity losses due to absenteeism, premature deaths, and social security expenses) and between R\$483 million and R\$1.1 billion are direct costs (hospitalizations and outpatient procedures).

These results indicate the need to strengthen and expand policies, such as the proposal to increase taxation of alcoholic beverages through the present Tax Reform, in order to address this public health issue.

1. Introduction

Alcohol consumption is a predominant aspect of social culture worldwide, which significantly contributes to direct and indirect economic costs of illness. Direct costs of illness include healthcare expenses, such as those of health systems and families, while indirect costs involve the broader social impacts of alcohol consumption, including reduced productivity, crime, and premature mortality (Pan American Health Organization (PAHO) 2021).

According to the World Health Organization (WHO), the global average per capita alcohol consumption was 5.5 liters in 2019, with the highest levels of consumption in the WHO European Region (9.2 liters) and in the Americas Region (7.5 liters). Despite 56% of the global population aged 15 and older not drinking alcohol—a figure that has remained relatively stable over time—the per capita alcohol consumption among drinkers averages 27 grams of pure alcohol per day, which is associated with significantly increased risks of various health conditions, as well as related mortality and disabilities. It is particularly concerning that the prevalence of alcohol consumption among young people aged 15 to 19 is very high worldwide (22%), with little difference between genders (World Health Organization (WHO) 2024a).

Over time, binge drinking by Brazilian adults has gradually increased, reaching 20.8% in 2023. It is also troubling that alcohol consumption has risen more significantly among women (Ministry of Health 2023) and that more than 60% of students aged 13 to 17 consumed alcoholic beverages in the 30 days prior to the interviews conducted for the National Health Survey of Students, as reported in their findings (IBGE 2021).

Additionally, the global burden of diseases and injuries caused by alcohol consumption can be quantified for a wide range of health conditions based on available scientific evidence linking the role of alcohol use to their development, occurrence, and outcomes. In this regard, in 2019, 2.6 million deaths across the globe were attributed to alcohol consumption, representing 4.7% of all deaths that year, with a higher burden among men.

Globally, it is estimated that 400 million people (or 7% of the world population aged 15 and older) live with alcohol use disorders, and more than half of these (3.7%) live with alcohol addiction.

Healthcare costs represent a substantial part of the direct economic burden of alcohol consumption. According to the Centers for Disease Control and Prevention (CDC), binge drinking is responsible for approximately 249 billion dollars in annual economic costs in the United States alone, with healthcare expenses representing a significant portion of this amount. These expenses include the treatment of alcohol-related diseases and injuries, such as liver cirrhosis, alcohol poisoning, and various cancers (Centers for Disease Control and Prevention 2019).

Furthermore, alcohol-related accidents and injuries contribute to the economic burden by increasing the demand for emergency medical services, hospitalizations, and rehabilitation programs. The World Health Organization (WHO) estimates that alcohol-related injuries account for a substantial proportion of the global burden of trauma, overloading health systems and resources (World Health Organization (WHO) 2023).

Simultaneously, the indirect economic impacts of alcohol consumption are vast and multifaceted. Alcohol misuse has significant implications for productivity and the workforce, resulting in absenteeism, presenteeism, and workplace accidents, as well as being closely linked to an increase in criminal behavior, including violence, domestic violence, and driving under the influence (DUI). The National Institute on Alcohol Abuse and Alcoholism (NIAAA) reports that alcohol is a factor in approximately 40% of violent crimes in the United States, contributing to the social costs of law enforcement, judicial processes, and incarceration (National Institute on Alcohol Abuse and Alcoholism 2023).

Addressing these costs requires a multi-strategy approach that combines public health interventions, regulatory measures, and community initiatives aimed at reducing alcohol misuse and promoting healthier behaviors. For example, among the most cost-effective policies recommended by WHO for tackling alcohol consumption are alcohol taxation, banning and restricting advertising, and limiting the availability of alcoholic beverages, such as by reducing sales hours (World Health Organization (WHO) 2023).

Therefore, estimates of the economic and health burden of alcohol consumption in Brazil can support the advocacy for more robust policies that address this public health problem, such as stricter regulatory and fiscal policies.

2. Objectives

The overall objective of this study is to estimate the direct and indirect costs of alcohol consumption in Brazil. The study also has the following specific objectives: estimating the direct healthcare costs to the Unified Health System and estimating the indirect costs, including those originating from premature deaths, lost productivity due to hospitalizations and medical appointments, and pensions and paid leaves per year.

3. Methods and data analysis

This study was based on estimates from a comparative risk analysis model, and considers the direct and indirect costs attributable to alcohol consumption in Brazil in 2019. The model incorporates variables such as the populational prevalence of alcohol consumption according to sex and age group and the relative risks obtained from meta-analyses on the dose-response relationship between alcohol consumption and various health outcomes. All epidemiological, population, consumption, and cost data were disaggregated by sex and age group (in 5-year intervals, from 15-19 to over 80 years old)

3.1. Variables

3.1.1. Alcohol Consumption

All data used in the model were obtained from public data sources, such as the health information systems of the Unified Health System (SUS), microdata from population surveys, research reports from the Brazilian Institute of Geography and Statistics (IBGE), and data published in scientific literature.

The prevalence of alcohol consumption was estimated using two sources: microdata from the 2019 National Health Survey (PNS 2019) (IBGE 2020) and the national consumption estimates presented in the Global Status Report on Alcohol and Health and Treatment of Substance Use Disorders (World Health Organization (WHO) 2024a). Consumption data were disaggregated into consumption ranges considering 12g intervals, ranging from no consumption to consumption of 72g of alcohol or more per day per person. For the consumption estimates from the WHO report, consumption by sex and age groups was estimated using the distribution found in the PNS 2019, based on the average consumption which the report estimated through data from the alcohol industry.

The PNS 2019 data were extracted from the responses to two questions in the survey questionnaire: the first about the number of days the interviewees usually consumed alcohol per week, and the second reporting the average number of standard alcoholic drinks consumed each day. Weekly consumption was converted into daily consumption, and the amount of alcohol in grams was estimated considering that each standard drink corresponds to an average of 12g of alcohol.

Due to methodological differences in estimating alcohol prevalence and average consumption between the PNS 2019 and the WHO 2024 study, the data on attributable deaths and costs will be presented separately according to the source in the Results section.

3.1.2. Epidemiological and Cost Data

The epidemiological and economic data were extracted for a set of 24 diseases associated with alcohol consumption, with the corresponding International Classification of Diseases (ICD-10) codes detailed in Table 1.

Table 1. Diseases associated with alcohol use and their ICD 10 codes.

Disease	ICD 10 Code
1- Tuberculosis and tuberculosis sequelae	A15–A19.9, B90–B90.9
2- Lower respiratory infections	J09– J22.9, J85.1
3- Esophagus cancer	C15–C15.9
4- Liver cancer	C22–C22.9
5- Laryngeal cancer	C32–C32.9
6- Breast cancer	C50–C50.929
7- Colon and rectum cancer	C18–C21
8- Lip and oral cavity cancer	C00–C08.9
9- Nasopharyngeal cancer	C11–C11.9
10- Other pharyngeal cancers	C09–C10.9, C12–C13.9
11- Ischemic heart disease	I20–I25.9
12- Intracerebral hemorrhage	I60–I62.9, I69.0–I69.2
13- Atrial fibrillation and flutter	I48–I48.9
14- Cirrhosis and other chronic liver diseases due to alcohol use	K70–K70.9
15- Pancreatitis	K85–K86.9
16- Epilepsy	G40–G41.9
17- Traffic accidents	V01–V99
18- Accidental injuries	W00–X29.9, X40–X40., X58.99, X43–X43.9, X46– X48.9
19- Intentionally self-inflicted injury and sequelae	(X60–X64.9, X66–X84.9, Y87.0
20- Interpersonal violence and sequelae	X85–Y08.9, Y87.1, Y87.2
21- Alcohol use disorders	F10, G31.2, X45–X45.9, X65–X65.9, Y15–Y15.9
22- Hypertensive disease	I11
23- Alcoholic cardiomyopathy	I42.6
24- HIV/AIDS	B20

The relative risks associating alcohol consumption with various health outcomes were obtained from meta-analyses based on cohort studies used by the Global Burden of Disease (GBD) study and the WHO report, considering the dose-response relationship between alcohol consumption and the selected diseases (Table 2). Illnesses such as alcoholic cardiomyopathy and alcohol use disorders do not have relative risks listed in this table because they are entirely attributable to alcohol consumption. Due to the absence of a relative risk reference for HIV/AIDS in the WHO report, the average global Population Attributable Fraction (PAF) for alcohol was directly applied to Brazil.

Mortality data by cause were extracted from the Mortality Information System (SIM/SUS) (Ministry of Health 2017b), and economic data on average wages and employment rates were obtained from the Continuous National Household Sample Survey (PNAD Contínua) by IBGE (IBGE 2017).

The calculated direct costs include expenses for treating alcohol-related diseases in terms of hospitalizations and outpatient procedures within the SUS, using data from the Hospital Information System and the Outpatient Information System (SIH/SUS and SIA/SUS, respectively) (Ministry of Health 2017a, 2023a). The indirect costs to society were those related to productivity losses due to premature mortality and workdays lost to hospitalizations and medical leaves covered by social security, as well as costs to the National Social Security Institute (INSS) incurred by leaves and early retirements attributable to alcohol-related diseases (INSS 2024).

Table 2. Relative risks of diseases associated with alcohol consumption.

Disease	Sex	0g/day	12g/day	24g/day	36g/day	48g/day	60g/day	72g/day
1- Tuberculosis and tuberculosis sequelae	Both	1	1.101	1.531	2.058	2.535	2.994	3.507
2- Lower respiratory infections	Both	1	1.013	1.026	1.064	1.127	1.226	1.357
3- Esophagus cancer	Both	1	1.212	1.466	1.815	2.202	2.452	2.669
4- Liver cancer	Both	1	1.067	1.14	1.225	1.31	1.372	1.424
5- Laryngeal cancer	Both	1	1.12	1.304	1.531	1.813	2.144	2.461
6- Breast cancer	Both	1	1.17	1.329	1.433	1.443	1.452	1.476
7- Colon and rectum cancer	Both	1	1.078	1.156	1.237	1.323	1.468	1.616
8- Lip and oral cavity cancer	Both	1	1.293	1.738	2.311	2.991	3.766	4.858
9- Nasopharyngeal cancer	Both	1	1.371	1.839	2.385	3.062	3.803	4.545
10- Other pharyngeal cancers	Both	1	1.472	1.943	2.519	3.199	3.972	4.764
11- Ischemic heart disease	Both	1	1.046	1.315	1.479	1.614	1.705	1.86
12- Intracerebral hemorrhage	Male	1	1.068	1.162	1.31	1.458	1.705	1.971
12- Intracerebral hemorrhage	Female	1	1.031	1.11	1.337	1.614	1.964	2.276
13- Atrial fibrillation and flutter	Both	1	1.066	1.131	1.214	1.312	1.411	1.535
14- Cirrhosis and other chronic liver diseases due to alcohol use	Both	1	1.243	2.055	3.274	4.673	6.274	9.427
15- Pancreatitis	Both	1	1.073	1.228	1.471	1.717	2.217	3.298
16- Epilepsy	Both	1	1.177	1.353	1.585	1.872	2.186	2.48
17- Traffic accidents	Both	1	1.163	1.22	1.288	1.366	1.456	1.552
18- Accidental injuries	Both	1	1.09	1.154	1.168	1.182	1.221	1.266
19- Intentionally self-inflicted injury and sequelae	Both	1	1.107	1.23	1.376	1.545	1.734	1.927
20- Interpersonal violence and sequelae	Both	1	1.129	1.256	1.345	1.396	1.452	1.516
22- Hypertensive disease	Both	1	1	1.11	1.22	1.33	1.44	1.55

Table 3. Input variables used in the model and their sources.

Variable	Institution	Link
Alcohol consumption	PNS (IBGE) WH	http://downloads.ibge.gov.br/downloads_estatisticas.htm?caminho=PNS/2019/Microdados/Dados https://www.who.int/publications/i/item/9789240096745
Relative risks	Literature	Stanaway, J. D. et al. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990–2017: A systematic analysis for the Global Burden of Disease Study 2017. Lancet 392, (2018)
Deaths	SIM(Datasus)	https://datasus.saude.gov.br/mortalidade-desde-1996-pela-cid-10
Hospitalizations	SIH-SUS(Datasus)	https://datasus.saude.gov.br/aceso-a-informacao/morbidade-hospitalar-do-sus-sih-sus/
Outpatient care	SIA-SUS(Datasus)	https://datasus.saude.gov.br/transferencia-de-arquivos/
Social security	INSS	https://dados.gov.br/dados/organizacoes/visualizar/instituto-nacional-do-seguro-social
Population	IBGE	https://www.ibge.gov.br/estatisticas/sociais/populacao/9109-projecao-da-populacao.html
Average wage	IBGE	https://www.ibge.gov.br/estatisticas/sociais/trabalho/9171-pesquisa-nacional-por-amostra-de-domicilios-continua-mensal.html
Employment rate	IBGE	https://www.ibge.gov.br/estatisticas/sociais/trabalho/9171-pesquisa-nacional-por-amostra-de-domicilios-continua-mensal.html

3.2. Modeling of Epidemiological and Economic Burden

In this study, a macrosimulation model using comparative risk assessment was developed and applied to estimate the mortality and costs attributable to alcohol consumption in Brazil. The main outcome measures of this methodology are deaths and direct and indirect costs that could be avoided or delayed through the elimination of the risk factor (alcohol consumption).

The macrosimulation model is methodologically similar to other comparative risk assessment models that parameterize exposure factors for diseases and their respective relative risks in order to estimate the health outcomes attributable to them, such as the Global Burden of Disease (GBD) and the Preventive Risk Integrated Model (PRIME) (IHME 2020) (Scarborough et al. 2014). The model was created using Microsoft Excel and incorporated additional outputs related to the impacts of reducing alcohol consumption on attributable deaths, years of productive life lost, and economic impacts related to premature deaths, healthcare costs, and productivity losses.

The model is based on the parameterization of consumption ranges and the respective relative risks by sex and age group using the Population Attributable Fraction (PAF), which represents the proportional reduction in disease or mortality in the population that would occur if exposure to a risk factor were eliminated or reduced to a minimum—the theoretical minimum risk exposure level (TMREL) (World Health Organization (WHO) 2024b). According to existing evidence, there is no safe level of alcohol consumption, so the minimum exposure to the risk factor for modeling was set to zero.

The PAF estimated for the outcome of mortality, morbidity, or cost (o) in each age group (a) and sex stratum (s) for each counterfactual scenario is represented by the following formula:

$$PAF_{oas} = \frac{\int_{x=0}^m RR_{oa}(x)P_{as}(x)dx - \int_{x=0}^m RR_{oa}(x)P'_{as}(x)dx}{\int_{x=0}^m RR_{oa}(x)P_{as}(x)dx}$$

$$PAF_{oas} = \frac{\int_{x=0}^m RR_{oa}(x)P_{as}(x)dx - \int_{x=0}^m RR_{oa}(x)P'_{as}(x)dx}{\int_{x=0}^m RR_{oa}(x)P_{as}(x)dx}$$

Where:

- **Pas(x)** and **P'as(x)** represent the distributions of alcohol consumption at baseline and in the counterfactual scenario (no alcohol consumption).
- **RRoa(x)** represents the relative risk for each level of alcohol consumption for each outcome (o), by sex and age group.

The model can also be adapted to apply Potential Impact Fractions (PIF), a measure akin to PAF (and calculated using a similar formula), but for which the counterfactual scenario can be any change in exposure (in our case, alcohol consumption), and not solely the TMREL. This would permit, for example, the estimation of the impact of potential policies, such as taxation, on the reduction of alcohol consumption—provided that the changes they cause in the population's consumption patterns are quantified.

3.2. Calculation of Direct and Indirect Costs

Direct costs to the SUS were estimated by multiplying the PAF for each group of diseases by the total costs of outpatient procedures and hospitalizations for each sex and age group (SIA/SUS and SIH/SUS, respectively).

For indirect costs, the cost of premature deaths was estimated using the Human Capital Method (Zhang, Bansback, and Anis 2011), which estimates the productivity losses in the working-age population due to the withdrawal of people from the workforce caused by premature mortality, considering variables such as average salary, percentage of the population employed, and retirement age, and including a discount rate of 3% per year.

Another component of indirect costs was the social security costs related to early retirements and paid medical leaves, calculated by multiplying the PAF for each group of alcohol-related diseases by the total costs for each sex and age group.

Finally, among the indirect costs, absenteeism due to hospitalizations and medical leaves was estimated by considering, respectively, the average length of hospitalization (SIH/SUS) and the average duration of leave for each disease (according to the Social Security Statistical Bulletin), multiplied by the average salary and the percentage of the employed population, then multiplied again by the PAF to obtain the costs attributable to alcohol.

Estimates of presenteeism costs could not be included due to the lack of robust references on this theme that could be incorporated from meta-analyses into the present study (Thørrisen et al. 2019).

The attributable costs were presented in Brazilian Reais (R\$) and in International Dollars (Int\$), calculated using the purchasing power parity between Reais and U.S. Dollars according to the OECD – Organization for Economic Co-operation and Development (OECD 2022).

4. Results

I. ESTIMATES BASED ON THE NATIONAL HEALTH SURVEY (PNS 2019)

I.1. Alcohol Consumption

Alcohol consumption across different consumption levels varies by sex and age, being higher among men and younger adults.

Among men, the lowest prevalence of zero alcohol consumption is found among adolescents (79.3%) and those over 80 years old (75.5%). This prevalence is higher among women while still following a similar pattern (89.7% among adolescents and 95.2% among those over 80 years old).

It is also observed that the prevalence in different levels of alcohol consumption is much higher among men for all age groups (Table 4).

Table 4. Prevalence of alcohol consumption by age group and sex, 2019 (PNS 2019/IBGE).

	Prevalence of the average alcohol consumption							
Men	0	>0 to <12g	>=12 to <24g	>=24 to <36g	>=36 to <48g	>=48 to <60g	>=60 e <72g	>=72g
15 - 19 years	79.31	16.97	1.98	1.15	0.41	0.10	0.07	0.01
20 - 24 years	50.60	31.76	7.39	3.60	2.63	0.83	0.54	2.65
25 - 29 years	44.58	30.56	11.77	4.92	2.81	1.60	1.39	2.37
30 - 34 years	43.27	33.37	10.41	6.17	2.10	1.80	1.16	1.73
35 - 39 years	43.40	31.88	11.69	6.86	2.02	1.25	1.44	1.46
40 - 44 years	46.55	29.72	11.11	6.31	2.63	1.19	1.05	1.43
45 - 49 years	47.01	31.15	11.58	5.10	1.76	1.45	0.88	1.07
50 - 54 years	47.09	31.67	9.17	6.41	1.97	1.10	0.85	1.74
55 - 59 years	48.00	30.06	9.99	7.52	1.63	1.24	0.47	1.09
60 - 64 years	50.66	30.66	9.56	5.01	1.63	0.90	0.38	1.19
65 - 69 years	54.48	26.25	9.14	4.93	2.24	1.32	0.61	1.03
70 - 74 years	59.69	27.19	6.91	3.21	1.04	1.16	0.28	0.51
75 - 79 years	59.54	25.78	7.16	3.11	2.37	1.14	0.58	0.33
80+ years	72.52	19.24	4.32	2.16	0.77	0.47	0.13	0.40
Women								
15 - 19 years	89.68	7.72	1.53	0.58	0.28	0.13	0.02	0.06
20 - 24 years	77.40	14.34	4.33	2.14	1.11	0.35	0.06	0.27
25 - 29 years	76.43	14.54	5.62	1.81	0.67	0.29	0.27	0.36
30 - 34 years	75.31	16.16	4.61	2.49	0.66	0.30	0.23	0.24
35 - 39 years	78.16	14.01	4.55	1.23	0.75	0.48	0.42	0.41
40 - 44 years	79.82	12.75	3.87	1.94	0.38	0.17	0.62	0.46
45 - 49 years	81.61	12.77	3.42	0.97	0.63	0.15	0.09	0.38
50 - 54 years	82.07	12.38	3.24	1.34	0.22	0.50	0.13	0.13
55 - 59 years	85.98	9.64	2.92	0.90	0.24	0.10	0.03	0.20
60 - 64 years	86.45	9.76	2.72	0.60	0.11	0.05	0.03	0.28
65 - 69 years	87.86	8.58	1.84	0.63	0.83	0.11	0.07	0.09
70 - 74 years	88.26	9.02	2.26	0.23	0.06	0.05	0.01	0.11
75 - 79 years	92.21	5.70	1.43	0.54	0.04	0.06	0.00	0.01
80+ years	95.25	3.47	1.13	0.09	0.04	0.00	0.02	0.00

I.2. Attributable deaths

It was estimated that 47,800 Brazilians died from causes attributable to alcohol consumption in 2019. These alcohol-attributable deaths were significantly higher among men (43,100) than women (4,700), due to differences in alcohol consumption and associated causes of death (Table 5).

A large proportion of these deaths were premature (individuals under 70 years of age), representing 82.5% of alcohol-attributable deaths among men and 78.4% among women.

For the male population, the leading cause of alcohol-attributable deaths was accidents and violence (25.7%), followed by cardiovascular diseases (21.4%) and cancers (14.0%). For the female population, the primary cause of alcohol-attributable death was cardiovascular diseases (24.0%), followed by cancers (24.6%) and accidents and violence (13.4%).

Table 5. Deaths attributable to alcohol consumption in Brazil, by sex, age group and disease group, 2019.

	Respiratory diseases	Cancers	Cardiovascular diseases	Digestive diseases	Epilepsy	Accidents and violences	Alcohol consumption disorders	HIV/AIDS	Total
Men									
15 - 19 years	3	1	4	1	4	353	0	5	391
20 - 24 years	31	13	32	17	18	1,668	2	40	1,880
25 - 29 years	54	21	57	59	25	1,628	5	82	2,077
30 - 34 years	69	40	105	146	30	1,432	12	109	2,273
35 - 39 years	93	93	200	320	41	1,323	23	137	2,794
40 - 44 years	111	219	336	498	40	1,045	39	141	3,241
45 - 49 years	122	417	506	613	41	834	55	132	3,729
50 - 54 years	161	788	880	871	40	746	49	118	4,803
55 - 59 years	164	1,043	1,178	899	35	607	58	87	5,196
60 - 64 years	147	1,042	1,281	752	25	457	46	57	4,707
65 - 69 years	159	959	1,468	667	21	353	26	42	4,454
70 - 74 years	111	566	978	319	13	220	11	23	2,683
75 - 79 years	131	460	1,057	250	13	191	5	13	2,425
80+ years	202	377	1,127	158	13	224	6	9	2,453
Total men	1,559	6,041	9,208	5,571	359	11,083	337	995	43,107
Women									
15 - 19 years	1	1	1	0	1	25	0	4	37
20 - 24 years	6	4	5	2	5	79	0	16	127
25 - 29 years	7	11	8	3	5	73	0	32	160
30 - 34 years	8	33	16	7	6	75	1	53	247
35 - 39 years	11	63	31	16	6	71	2	71	347
40 - 44 years	13	94	55	26	6	60	4	81	438
45 - 49 years	10	108	69	25	4	45	4	66	443
50 - 54 years	12	151	103	33	4	40	8	55	522
55 - 59 years	11	142	109	30	3	29	4	40	468
60 - 64 years	12	137	136	31	3	26	2	27	456
65 - 69 years	16	130	177	34	3	26	4	24	479
70 - 74 years	13	100	129	20	2	25	2	10	344
75 - 79 years	11	63	110	12	1	20	1	5	260
80+ years	27	81	191	12	2	45	0	6	424
Total women	159	1,120	1,142	251	51	638	32	491	4,753

I.3. Direct costs

a. Hospitalization costs

It was estimated that alcohol-attributable hospitalizations in 2019 cost the SUS (Brazil's Unified Health System) R\$394.5 million (equivalent to Int\$122.9 million per year), with 86% (R\$340.8 million or Int\$106.2 million) attributed to men and 14% (R\$53.7 million or Int\$16.7 million), to women.

For both sexes, 20% to 24% of hospitalization costs were incurred by individuals under 40 years old, while around 43% to 45% occurred in those between 40 and 60 years old (Table 6).

For the male population, more than half of the alcohol-attributable hospital costs were due to digestive system diseases (cirrhosis and pancreatitis) and cardiovascular diseases, followed by accidents and violence (18%) and cancers (9%). For the female population, the leading causes of attributable costs were also cardiovascular and digestive system diseases (22% and 20%, respectively), followed by cancers (17%) and accidents and violence (13%).

It is also notable that disorders associated with alcohol consumption represented less than 0.1% of the attributable costs, totaling only R\$219,000 per year and making them the group with the lowest hospital costs among the diseases evaluated. It is likely that these disorders are not frequently registered as the cause of hospitalizations, leading to an underestimation of its real costs.

Table 6. Hospitalization costs attributable to alcohol consumption by sex, age group and disease group, 2019 (R\$- Reais).

	Respiratory diseases	Cancers	Cardiovascular diseases	Digestive diseases	Epilepsy	Accidents and violence	Alcohol consumption disorders	HIV/AIDS	Total
Men									
15 - 19 years	69,927	30,944	76,659	194,305	58,697	1,759,807	0	38,242	2,444,794
20 - 24 years	793,270	158,175	362,278	1,215,650	213,238	8,403,945	0	229,772	12,155,049
25 - 29 years	1,291,659	287,723	549,367	2,427,894	294,217	8,164,010	804	465,285	15,012,979
30 - 34 years	1,404,103	432,182	882,382	2,922,034	269,284	7,683,290	3,860	551,876	16,892,643
35 - 39 years	1,691,803	772,796	1,931,195	4,091,304	311,382	7,078,369	4,148	690,940	20,886,638
40 - 44 years	1,917,646	1,351,176	3,588,745	6,389,747	266,438	6,060,645	22,103	653,108	25,831,105
45 - 49 years	1,433,521	2,512,184	6,280,907	8,750,885	273,579	4,963,091	25,104	603,367	31,301,044
50 - 54 years	1,526,809	4,447,217	11,093,160	15,736,723	324,197	4,717,642	33,355	501,752	44,767,054
55 - 59 years	1,637,346	5,750,901	15,659,264	18,788,968	263,261	3,787,263	22,682	323,149	51,719,340
60 - 64 years	1,168,362	5,451,471	16,415,315	17,075,504	181,698	2,929,907	34,298	187,540	46,883,317
65 - 69 years	1,026,948	4,529,111	15,806,642	11,999,100	157,830	2,201,376	5,578	116,691	37,549,818
70 - 74 years	588,941	2,560,923	8,885,899	2,685,017	99,433	1,378,729	22,582	40,698	17,140,643
75 - 79 years	572,023	1,696,320	6,680,535	845,949	82,592	1,242,588	2,848	24,139	11,797,327
80+ years	539,749	760,191	3,052,624	329,751	53,531	1,248,415	4,185	15,283	6,452,940
Total men	15,662,107	30,741,314	91,264,971	93,452,832	2,849,377	61,619,076	181,547	4,441,842	340,834,691
Women									
15 - 19 years	29,628	19,628	20,902	217,339	32,480	216,819	0	44,322	688,121
20 - 24 years	135,370	78,054	94,888	769,263	81,939	761,352	0	142,240	2,201,320
25 - 29 years	153,900	175,187	113,525	644,834	66,525	690,881	1,433	215,634	2,535,955
30 - 34 years	167,137	415,828	210,638	874,787	66,948	714,708	0	300,003	3,257,536
35 - 39 years	220,271	770,164	435,386	1,095,069	68,797	659,741	1,714	363,004	4,440,389
40 - 44 years	202,942	1,110,861	779,343	1,117,031	73,917	576,151	0	306,715	5,532,541
45 - 49 years	145,226	1,225,802	1,037,741	1,048,229	51,453	473,409	5,625	294,545	5,446,154
50 - 54 years	153,098	1,450,965	1,543,692	1,288,058	55,918	504,909	2,137	201,291	6,448,348
55 - 59 years	105,858	1,169,175	1,660,619	1,161,993	39,170	400,060	2,624	140,802	5,655,931
60 - 64 years	112,067	1,084,339	1,830,766	1,209,118	30,157	402,362	0	88,466	5,556,683
65 - 69 years	119,858	899,456	1,917,643	1,020,862	23,586	393,647	10,325	65,601	5,049,459
70 - 74 years	78,276	543,922	1,181,183	343,504	18,738	388,264	0	23,519	3,167,704
75 - 79 years	53,641	268,151	653,726	81,697	11,233	286,188	2,401	10,224	1,623,996
80+ years	67,002	135,291	369,426	37,008	9,137	404,056	11,058	7,275	2,107,559
Total women	1,744,272	9,346,824	11,849,480	10,908,793	629,999	6,872,547	37,317	2,203,642	53,711,697

b. Outpatient costs

In 2019, outpatient costs attributable to alcohol consumption in Brazil totaled R\$88.9 million, equivalent to Int\$27.7 million per year. Of these costs, 61% (R\$54.6 million or Int\$17.0 million) were incurred by men, and 39% (R\$34.3 million or Int\$10.7 million), by women (Table 7).

Regarding the age distribution of costs in this category, the age group under 40 years old accounted for 6.3% of the costs among men and 14.3% of those among women. The main costs were amounted by the age group between 40 and 60, accounting for 47.0% of outpatient costs among men and 55.7% among women.

For both sexes, most of the costs were associated with cancer treatment, accounting for 92.6% of outpatient costs among women and 82.5% among men. Among these cancer treatment costs, 80% of the costs for women were for breast cancer, while over 50% of the costs for men were for lip, oral cavity, and pharynx cancer, and nearly 30% for colorectal cancer. Following this were outpatient costs related to cardiovascular diseases (10.8% among men and 3.5% among women) and HIV/AIDS (2.9% among men and 2.8% among women).

Table 7. Outpatient costs attributable to alcohol consumption by sex, age group and disease group, 2019 (R\$- Reais).

	Respiratory diseases	Cancers	Cardiovascular diseases	Digestive diseases	Epilepsy	Accidents and violences	Alcohol consumption disorders	HIV/AIDS	Total
Men									
15 - 19 years	717	35,324	2,202	1,026	12,686	2,968	0	31,004	92,102
20 - 24 years	6,126	168,910	15,714	31,687	37,185	11,774	0	126,962	409,219
25 - 29 years	7,783	274,414	28,422	15,166	39,832	12,694	0	180,538	571,480
30 - 34 years	9,463	476,941	49,399	28,681	34,901	11,679	0	196,107	824,959
35 - 39 years	9,170	1,081,842	113,902	61,584	34,637	12,668	360	201,612	1,544,225
40 - 44 years	10,199	2,143,033	231,570	67,980	34,387	11,815	0	201,926	2,744,171
45 - 49 years	8,524	3,922,340	401,904	166,044	28,342	9,488	19	194,687	4,772,967
50 - 54 years	10,208	6,924,338	733,905	164,076	27,685	8,339	0	185,701	8,107,372
55 - 59 years	9,113	8,637,562	1,030,707	182,140	23,533	8,049	360	130,052	10,074,732
60 - 64 years	7,859	8,174,732	1,095,572	135,593	18,538	6,753	119	78,473	9,562,978
65 - 69 years	6,675	6,713,317	1,066,588	112,963	12,514	5,586	79	40,997	8,000,157
70 - 74 years	3,756	3,450,367	574,817	39,456	7,479	91,071	0	22,492	4,210,947
75 - 79 years	2,992	2,161,235	405,374	25,713	5,419	2,725	0	7,462	2,628,270
80+ years	2,106	909,383	137,366	12,395	3,447	2,771	15	3,279	1,078,009
Total men	94,691	45,073,738	5,887,443	1,044,504	320,587	198,380	953	1,601,290	54,621,588
Women									
15 - 19 years	607	18,486	923	570	6,145	1,875	0	18,453	51,845
20 - 24 years	1,812	99,797	3,884	2,358	13,514	4,399	0	44,679	175,486
25 - 29 years	1,785	453,124	6,663	4,059	10,110	3,700	0	66,726	553,094
30 - 34 years	2,350	1,260,878	13,639	4,714	13,237	3,114	0	88,236	1,392,811
35 - 39 years	3,338	2,564,147	33,191	9,231	10,430	3,119	0	123,762	2,756,846
40 - 44 years	2,685	3,902,517	75,798	26,259	12,597	2,472	0	139,047	4,174,229
45 - 49 years	2,120	4,461,251	110,650	11,622	9,091	1,945	792	137,328	4,747,191
50 - 54 years	1,843	5,372,757	184,655	15,026	9,339	1,796	0	117,313	5,718,366
55 - 59 years	1,463	4,184,112	186,058	12,204	6,253	1,441	0	89,199	4,492,129
60 - 64 years	1,389	3,676,896	202,699	11,679	5,020	1,350	0	58,280	3,966,903
65 - 69 years	1,194	2,915,611	198,392	14,289	3,453	1,010	0	33,015	3,175,594
70 - 74 years	505	1,737,235	109,364	5,461	1,938	11,855	0	14,751	1,884,775
75 - 79 years	304	760,495	53,302	2,557	909	579	0	16,202	837,003
80+ years	240	383,950	18,805	1,735	533	782	0	2,608	410,252
Total women	21,634	31,791,254	1,198,022	121,765	102,570	39,439	792	949,599	34,336,526

I.4. Indirect costs

a. Costs of premature mortality

It was estimated that, in 2019, premature deaths represented an indirect cost to the Brazilian economy of approximately R\$9.3 billion per year, equivalent to Int\$2.9 billion per year, due to the removal of individuals of productive age from the workforce (Table 8).

Again, due to the higher number of attributable deaths, combined with the higher retirement age, the costs for men (R\$8.7 billion/year) significantly exceed those for women (R\$595 million/year).

For both sexes, a large portion of the costs of premature mortality attributable to alcohol consumption is concentrated among individuals up to 50 years of age, as shown in Table 8. For the male population, 73.9% of the costs of premature mortality are concentrated in this age group, and for the female population, this percentage reaches 82.9% of attributable costs, representing a significant loss of productivity in age groups that would be at the peak of their working capacity.

Table 8. Costs of premature mortality attributable alcohol consumption by sex and age group in Brazil, 2019.

	Reals (R\$)	Purchasing power parities (Int\$)
Men		
15 - 19 years	183,967,335,97	57,400,104,83
20 - 24 years	847,072,485,67	264,297,187,42
25 - 29 years	953,900,373,51	297,628,821,69
30 - 34 years	989,995,466,50	308,890,941,19
35 - 39 years	1,131,699,852,26	353,104,478,08
40 - 44 years	1,184,478,660,30	369,572,124,90
45 - 49 years	1,172,242,474,30	365,754,282,15
50 - 54 years	1,192,547,247,70	372,089,624,87
55 - 59 years	846,776,814,20	264,204,934,23
60 - 64 years	247,913,644,39	77,352,151,14
Total men	8,750,594,354,79	2,730,294,650,48
Women		
15 - 19 years	13,424,000,31	4,188,455,64
20 - 24 years	43,515,172,56	13,577,276,93
25 - 29 years	54,916,492,53	17,134,631,05
30 - 34 years	78,951,206,13	24,633,761,66
35 - 39 years	100,933,214,17	31,492,422,52
40 - 44 years	110,756,479,71	34,557,403,96
45 - 49 years	90,521,443,41	28,243,820,10
50 - 54 years	73,750,970,45	23,011,223,23
55 - 59 years	28,038,225,33	8,748,276,23
Total women	594,807,204,58	185,587,271,32
TOTAL	9,345,401,559,37	2,915,881,921,80

b. Social Security costs

In 2019, social security costs (considering medical leaves and early retirements paid by the INSS that were attributable to alcohol consumption in Brazil) totaled R\$23.4 million, equivalent to Int\$7.3 million per year. Of this amount, 85.5% (R\$20.0 million or Int\$6.2 million) were associated with men, and 14.5% (R\$3.4 million or Int\$1.1 million), with women (Table 9).

Regarding the age distribution of social security costs, 17.4% of the costs among men were incurred by individuals under 40 years old, with the same age group representing 27.7% of the costs among women. The group between 40 and 60 accounted for 67.9% of the costs in this category among men and 67.4% among women.

Social security costs showed different distributions for the groups of attributable diseases, according to sex. Among men, 25.1% of social security costs were due to cardiovascular diseases, followed by cancers (18.2%), respiratory diseases (10.5%), and digestive system diseases (7.8%). On the other hand, among women, the primary cause of costs was cancers (55.2%), followed by cardiovascular diseases (10.6%) and respiratory diseases (9.5%). Regarding the proportion of costs by disease, it is also notable for both sexes the higher contribution of epilepsy costs, which reached nearly 5% of social security costs.

Table 9. Social security costs attributable to alcohol consumption by sex, age group and disease group, 2019 (R\$- Reais).

	Respiratory diseases	Cancers	Cardiovascular diseases	Digestive diseases	Epilepsy	Accidents and violences	Alcohol consumption disorders	HIV/AIDS	Total
Men									
15 - 19 years	5,189	754	312	0	3,331	2,978	0	279	13,865
20 - 24 years	189,948	11,288	7,586	6,000	48,395	46,035	0	4,512	382,616
25 - 29 years	270,251	33,125	25,358	16,225	80,828	57,300	0	15,285	658,662
30 - 34 years	242,711	72,093	56,656	62,979	90,420	48,978	0	22,541	992,140
35 - 39 years	252,242	132,864	143,654	100,631	114,021	53,656	998	30,005	1,439,771
40 - 44 years	253,090	268,126	313,000	161,608	133,515	42,757	6,480	26,677	2,046,270
45 - 49 years	241,746	493,814	653,926	268,185	130,493	37,825	7,148	18,192	3,026,632
50 - 54 years	272,363	892,576	1,255,050	423,663	166,982	33,854	7,111	20,717	4,352,313
55 - 59 years	234,407	972,264	1,439,689	325,859	116,789	25,278	7,654	12,724	4,154,135
60 - 64 years	110,932	640,161	948,187	166,897	61,180	13,940	2,994	6,727	2,479,765
65 - 69 years	20,279	102,318	164,419	28,957	8,619	1,684	0	1,361	403,118
70 - 74 years	2,252	9,999	15,449	3,663	0	197	0	0	47,054
75 - 79 years	279	2,418	3,514	0	0	0	0	0	6,642
80+ years	9	489	842	0	0	50	0	0	1,623
Total men	2,095,697	3,632,291	5,027,643	1,564,666	954,573	364,534	32,384	159,021	20,004,605
Women									
15 - 19 years	3,100	105	71	120	1,421	528	0	140	5,496
20 - 24 years	39,686	6,357	1,628	2,116	15,014	4,786	0	903	74,901
25 - 29 years	52,271	46,465	5,690	5,704	17,666	6,447	0	1,998	155,823
30 - 34 years	51,100	121,943	14,636	6,070	19,732	6,679	0	6,629	265,503
35 - 39 years	47,403	236,169	35,683	9,814	21,377	6,456	0	6,830	429,774
40 - 44 years	43,336	335,821	70,698	14,194	24,270	5,802	0	12,208	597,793
45 - 49 years	30,865	372,904	82,548	11,501	20,428	4,471	0	7,649	649,847
50 - 54 years	29,689	391,168	90,322	8,036	19,158	3,838	0	7,057	646,207
55 - 59 years	15,316	228,573	39,148	6,038	9,852	1,964	0	5,114	369,539
60 - 64 years	4,788	82,245	11,829	2,007	2,830	391	998	1,503	120,991
65 - 69 years	1,047	25,066	2,817	378	379	177	0	727	33,026
70 - 74 years	255	4,718	498	16	171	82	0	0	5,980
75 - 79 years	55	558	75	11	19	13	0	0	790
80+ years	4	81	8	0	0	8	0	0	114
Total women	318,915	1,852,173	355,651	66,006	152,316	41,640	998	50,758	3,355,786

c. Costs of absenteeism

In Brazil, the costs of absenteeism due to days of medical leave and hospitalizations attributable to alcohol consumption in 2019 totaled R\$299.1 million, equivalent to Int\$93.2 million per year. Of these, 75% (R\$224.3 million or Int\$69.9 million) were associated with men, and 25% (R\$74.8 million or Int\$23.3 million), with women (Table 10).

Regarding the age distribution of absenteeism costs, 20.6% of the costs among men were incurred by individuals under 40 years old, with the same age group representing 21.6% of the costs among women. The age group of 40 to 60 years accounted for 65.1% of the costs in this category among men and 62.2% among women.

For both sexes, the costs of days of absenteeism were highest for cancers, representing 61.3% of costs in this category among men and 40.1% among women. The second highest cause of absenteeism costs for both sexes was accidents and violence, accounting for 10.1% of costs for the male population and 9.0% for the female population. Notably, the absenteeism costs attributable to alcohol consumption disorders among women were twice those among men.

Table 10. Costs of absenteeism attributable to alcohol consumption by sex, age group and disease group, 2019 (R\$– Reais).

	Respiratory diseases	Cancers	Cardiovascular diseases	Digestive diseases	Epilepsy	Accidents and violence	Alcohol consumption disorders	HIV/AIDS	Total
Men									
15 – 19 years	19,372	11,536	11,270	15,452	35,623	511,355	0	30,420	653,137
20 – 24 years	392,248	310,206	59,257	474,535	193,409	2,414,540	78,605	188,576	4,581,717
25 – 29 years	773,833	2,210,487	103,291	937,766	269,834	2,606,980	197,262	415,565	8,331,928
30 – 34 years	883,156	5,204,773	169,234	1,186,104	254,492	2,565,724	454,529	478,704	12,552,243
35 – 39 years	1,080,862	11,604,238	330,142	1,585,502	280,277	2,631,729	453,178	608,786	20,094,898
40 – 44 years	1,205,248	18,550,711	561,729	1,707,344	247,523	2,485,193	1,028,240	576,555	28,738,671
45 – 49 years	1,027,269	25,249,072	875,014	1,928,151	225,237	2,399,933	659,819	490,384	36,023,138
50 – 54 years	1,150,896	31,385,372	1,419,645	1,882,527	236,729	2,413,752	601,991	428,942	44,194,387
55 – 59 years	1,019,175	26,435,211	1,818,479	1,602,132	183,882	1,834,016	387,704	274,613	37,058,672
60 – 64 years	431,774	10,776,513	1,800,618	867,468	130,108	1,081,946	126,461	162,277	17,636,786
65 – 69 years	253,288	4,030,317	1,774,777	548,676	85,093	708,251	42,079	88,196	8,371,716
70 – 74 years	66,443	1,047,282	998,134	186,737	62,047	398,673	5,702	31,020	3,086,299
75 – 79 years	51,600	452,630	779,913	140,421	43,662	340,543	975	15,715	1,899,909
80+ years	18,130	182,160	401,449	58,414	32,928	329,889	1,050	6,408	1,061,750
Total men	8,373,294	137,450,507	11,102,951	13,121,229	2,280,844	22,722,524	4,037,595	3,796,160	224,285,251
Women									
15 – 19 years	9,314	8,843	2,005	5,504	21,206	217,746	15,267	18,457	312,479
20 – 24 years	140,592	120,338	27,465	119,623	136,355	914,270	351,145	65,717	2,097,235
25 – 29 years	201,238	269,827	54,138	187,763	100,661	888,178	1,130,354	114,891	3,285,351
30 – 34 years	237,310	616,297	123,321	302,843	88,697	887,943	1,389,313	169,388	4,476,122
35 – 39 years	267,310	1,392,298	201,773	452,127	89,539	824,336	1,528,641	222,962	5,976,761
40 – 44 years	325,315	2,833,990	303,706	506,659	78,254	744,746	1,374,045	202,798	8,304,065
45 – 49 years	216,358	4,603,437	336,912	360,547	48,194	625,302	1,040,907	168,511	9,955,220
50 – 54 years	256,891	7,735,060	410,014	384,859	45,867	616,233	948,022	147,619	14,699,566
55 – 59 years	194,746	6,906,632	316,027	218,438	30,166	405,706	505,624	91,453	13,608,183
60 – 64 years	116,480	4,559,892	240,935	113,687	22,128	268,612	274,809	55,994	9,382,443
65 – 69 years	37,995	729,405	185,652	36,184	10,323	139,818	4,955	40,216	1,851,004
70 – 74 years	8,860	140,019	108,992	11,119	8,111	82,957	0	14,739	516,880
75 – 79 years	4,041	43,607	63,393	6,315	4,248	46,442	233	8,928	215,550
80+ years	1,393	21,617	43,449	4,003	4,437	42,533	1,690	2,758	139,399
Total women	2,017,843	29,981,260	2,417,784	2,709,669	688,186	6,704,821	8,565,005	1,324,429	74,820,257

II. ESTIMATES ACCORDING TO THE WHO 2024 REPORT

II.1. Alcohol consumption

Considering the prevalence of non-drinkers and alcohol consumers in Brazil based on data from the alcoholic beverage market, as presented in the World Health Organization's Global Status Report on Alcohol and Health and Treatment of Substance Use Disorders (WHO 2024a), a higher level of consumption was estimated than that reported in the 2019 National Health Survey (PNS), which is based on self-reported data from interviewees (Table 11).

For men, the prevalence of those who consumed any amount of alcohol was 26% higher than that estimated from the PNS. However, for women, this number was 2.5 to 3 times higher compared to the PNS data. The average prevalence of alcohol consumption was 59% among men according to the WHO report data and 47% according to the PNS 2019 microdata, while it was 43% according to WHO's indirect estimates and 16% according to the PNS 2019 for women.

Table 11. Prevalence of alcohol consumption by age group and sex, in 2019, estimated from the Global status report on alcohol and health and treatment of substance use disorders.

	Prevalence of the average alcohol consumption							
Men	0	>0 to <12g	>=12 to <24g	>=24 to <36g	>=36 to <48g	>=48 to <60g	>=60 e <72g	>=72g
15 - 19 years	40.20	34.77	11.33	5.53	2.29	0.83	1.38	3.67
20 - 24 years	37.69	26.21	8.47	7.97	3.42	3.32	2.44	10.49
25 - 29 years	30.10	22.66	10.74	10.84	5.35	3.81	2.85	13.65
30 - 34 years	28.44	24.55	12.14	9.25	5.99	3.28	4.24	12.11
35 - 39 years	28.61	24.30	11.17	8.75	6.71	4.02	3.66	12.79
40 - 44 years	32.58	20.81	11.03	9.98	5.35	4.33	3.86	12.06
45 - 49 years	33.16	22.26	12.28	8.36	5.40	5.57	3.58	9.36
50 - 54 years	33.27	24.54	10.65	8.98	3.32	4.02	3.51	11.71
55 - 59 years	34.42	22.51	9.13	10.60	4.60	3.68	3.94	11.13
60 - 64 years	37.77	23.91	9.01	9.59	3.72	4.51	4.17	7.32
65 - 69 years	42.58	18.75	9.36	10.43	3.07	3.02	4.43	8.35
70 - 74 years	49.16	20.44	10.18	8.25	1.92	2.21	2.82	5.01
75 - 79 years	48.97	20.30	8.64	9.54	1.59	1.48	3.20	6.29
80+ years	65.33	17.81	5.13	5.56	0.87	0.35	2.14	2.81
Women								
15 - 19 years	35.50	39.93	5.28	9.51	1.11	3.09	1.55	4.02
20 - 24 years	41.66	30.07	9.90	5.24	2.09	3.02	1.77	6.25
25 - 29 years	38.19	32.19	7.78	7.49	4.60	2.50	1.83	5.42
30 - 34 years	39.80	30.09	9.39	7.17	3.30	2.09	1.95	6.22
35 - 39 years	43.98	30.14	6.90	6.52	3.31	2.10	1.82	5.23
40 - 44 years	46.39	29.44	6.33	6.02	2.01	2.04	2.10	5.67
45 - 49 years	49.99	30.30	6.28	4.49	2.57	1.56	1.30	3.51
50 - 54 years	51.25	28.26	8.11	3.56	2.40	2.08	0.67	3.68
55 - 59 years	60.27	24.23	5.52	3.02	3.13	0.82	0.69	2.32
60 - 64 years	59.93	26.85	4.20	3.00	2.23	1.07	1.03	1.70
65 - 69 years	67.07	20.52	4.11	2.64	1.75	0.73	0.44	2.75
70 - 74 years	68.36	20.51	4.39	2.42	2.08	0.37	1.16	0.73
75 - 79 years	77.08	13.93	3.65	2.03	1.78	0.06	0.43	1.05
80+ years	84.97	10.68	1.41	0.90	1.52	0.08	0.20	0.24

I.2. Attributable deaths

Based on estimates of alcohol consumption from the beverage market, it was estimated that 104,800 Brazilians died from alcohol-attributable causes in 2019. These attributable deaths are significantly higher among men (90,028 deaths, or 86% of the total) than among women (14,762 deaths, equivalent to 14% of the total), due to differences in alcohol consumption and associated causes of death (Table 12).

A large portion of these deaths are premature (individuals under 70 years of age), representing 82.9% of alcohol-attributable deaths among men and 72.4% among women.

Among men, nearly half of the attributable deaths were due to cardiovascular diseases and accidents and violence. Among women, on the other hand, more than 60% of the attributable deaths were due to cardiovascular diseases and cancers.

Table 12. Deaths attributable to alcohol consumption by sex, age group and disease group, 2019.

	Respiratory diseases	Cancers	Cardiovascular diseases	Digestive diseases	Epilepsy	Accidents and violence	Alcohol consumption disorders	HIV/AIDS	Total
Men									
15 - 19 years	9	3	10	2	8	601	0	5	658
20 - 24 years	72	25	67	42	35	2,723	2	40	3,061
25 - 29 years	120	41	114	140	48	2,632	5	82	3,323
30 - 34 years	165	81	223	378	59	2,388	12	109	3,739
35 - 39 years	226	193	425	848	84	2,219	23	137	5,356
40 - 44 years	277	465	734	1,364	84	1,786	39	141	8,179
45 - 49 years	323	914	1,157	1,766	87	1,455	55	132	7,962
50 - 54 years	397	1,628	1,885	2,316	82	1,252	49	118	10,570
55 - 59 years	454	2,315	2,684	2,699	76	1,061	58	87	12,654
60 - 64 years	419	2,323	2,991	2,260	54	799	46	57	10,219
65 - 69 years	429	2,047	3,269	1,884	45	604	26	42	8,986
70 - 74 years	319	1,224	2,326	954	27	376	11	23	5,619
75 - 79 years	360	949	2,335	704	26	316	5	13	4,906
80+ years	568	762	2,444	447	26	353	6	9	4,795
Total men	4,138	12,970	20,664	15,803	741	18,565	337	995	90,028
Women									
15 - 19 years	7	3	5	2	5	86	0	4	115
20 - 24 years	28	15	24	10	19	256	0	16	377
25 - 29 years	32	38	36	16	19	240	0	32	434
30 - 34 years	38	103	70	39	21	236	1	53	608
35 - 39 years	48	190	126	72	22	222	2	71	827
40 - 44 years	55	291	222	116	21	191	4	81	1,077
45 - 49 years	48	354	300	125	17	149	4	66	1,168
50 - 54 years	60	502	452	168	16	134	8	55	1,500
55 - 59 years	59	500	496	161	13	99	4	40	1,461
60 - 64 years	66	499	624	168	12	90	2	27	1,556
65 - 69 years	77	437	724	168	10	81	4	24	1,573
70 - 74 years	74	363	636	121	8	79	2	10	1,324
75 - 79 years	73	251	569	81	6	69	1	5	1,079
80+ years	170	321	895	72	10	154	0	6	1,663
Total women	836	3,867	5,179	1,318	198	2,085	32	491	14,762

I.3. Direct costs

a. Hospitalization costs

Hospitalizations attributable to alcohol consumption in 2019 were estimated to have cost the Brazilian Unified Health System (SUS) R\$903.4 million (equivalent to Int\$281.4 million per year), of which nearly 80% (R\$720.6 million or Int\$224.5 million) were for men and 20% (R\$182.8 million or Int\$56.9 million), for women (Table 13).

Alcohol-related hospitalizations accounted for 16% of costs among men and 24% among women under 40 years old, while for those between 40 and 60 years old, they accounted for 45% and 42% of the costs for men and women, respectively.

For the male population, 65% of the attributable hospital costs were due to digestive system diseases (such as cirrhosis and pancreatitis) and cardiovascular diseases, followed by accidents and violence (13%) and cancers (9%). For the female population, the main causes of attributable costs were also cardiovascular and digestive system diseases (28% and 30%, respectively), followed by cancers (17%) and accidents and violence (12%).

Table 13. Hospitalization costs attributable to alcohol consumption by sex, age group and disease group, 2019 (R\$- Reais).

	Respiratory diseases	Cancers	Cardiovascular diseases	Digestive diseases	Epilepsy	Accidents and violence	Alcohol consumption disorders	HIV/AIDS	Total
Men									
15 - 19 years	207,952	66,303	175,582	637,712	121,537	2,806,239	0	38,242	4,268,902
20 - 24 years	1,796,534	310,544	739,160	2,932,983	410,036	13,086,906	0	229,772	20,271,746
25 - 29 years	2,841,273	558,466	1,097,052	5,728,558	560,145	12,561,794	804	465,285	25,328,351
30 - 34 years	3,300,906	875,500	1,862,938	7,535,417	538,185	12,136,162	3,860	551,876	29,531,125
35 - 39 years	4,060,705	1,596,538	4,079,161	10,806,606	635,286	11,176,217	4,148	690,940	37,336,720
40 - 44 years	4,729,363	2,857,471	7,749,540	17,457,305	555,849	9,715,540	22,103	653,108	49,279,127
45 - 49 years	3,771,450	5,478,341	14,176,630	25,168,361	589,444	8,065,972	25,104	603,367	64,281,131
50 - 54 years	3,733,952	9,172,085	23,388,462	41,732,618	658,719	7,432,074	33,355	501,752	92,963,163
55 - 59 years	4,436,329	12,740,824	34,943,790	56,246,403	574,233	6,122,537	22,682	323,149	120,803,469
60 - 64 years	3,314,077	12,153,146	37,664,846	51,244,320	398,056	4,744,457	34,298	187,540	113,096,701
65 - 69 years	2,795,329	9,675,738	34,555,831	33,782,051	332,201	3,522,475	5,578	116,691	86,393,880
70 - 74 years	1,717,725	5,536,577	20,786,635	8,015,809	211,097	2,218,267	22,582	40,698	39,380,928
75 - 79 years	1,598,714	3,515,927	14,479,578	2,369,968	167,770	1,952,207	2,848	24,139	24,721,157
80+ years	1,536,058	1,546,194	6,491,424	929,044	106,251	1,914,704	4,185	15,283	12,966,212
Total men	39,840,367	66,083,656	202,190,629	264,587,153	5,858,811	97,455,550	181,547	4,441,842	720,622,611
Women									
15 - 19 years	168,087	74,197	97,510	1,297,980	133,124	693,329	0	44,322	2,614,423
20 - 24 years	645,508	267,880	414,829	4,018,100	313,396	2,328,711	0	142,240	8,261,653
25 - 29 years	729,897	575,846	503,901	3,281,520	257,173	2,117,650	1,433	215,634	8,150,089
30 - 34 years	797,172	1,291,386	946,516	4,571,291	252,620	2,097,919	0	300,003	10,754,772
35 - 39 years	938,330	2,371,420	1,789,507	4,960,263	246,875	1,944,898	1,714	363,004	13,428,271
40 - 44 years	877,313	3,450,404	3,159,192	5,061,975	270,906	1,737,021	0	306,715	16,212,150
45 - 49 years	687,105	3,972,995	4,421,669	5,206,999	195,600	1,462,274	5,625	294,545	17,396,750
50 - 54 years	737,891	4,807,191	6,580,960	6,541,532	213,949	1,565,379	2,137	201,291	21,883,337
55 - 59 years	559,739	4,111,171	7,280,081	6,269,922	157,502	1,275,852	2,624	140,802	20,761,617
60 - 64 years	601,344	3,943,222	8,076,494	6,516,106	123,245	1,308,586	0	88,466	21,446,144
65 - 69 years	585,997	3,039,452	7,523,397	4,993,986	87,178	1,199,650	10,325	65,601	18,090,280
70 - 74 years	461,430	1,984,875	5,543,828	2,072,065	76,132	1,198,564	0	23,519	11,943,182
75 - 79 years	356,329	1,072,937	3,214,133	534,423	49,537	967,700	2,401	10,224	6,458,800
80+ years	425,032	541,666	1,710,668	224,597	39,885	1,365,228	11,058	7,275	5,387,711
Total women	8,571,176	31,504,641	51,262,684	55,550,759	2,417,121	21,262,761	37,317	2,203,642	182,789,181

b. Outpatient costs

In 2019, outpatient costs attributable to alcohol consumption (estimated from indirect data from the alcoholic beverage market) totaled R\$224.0 million, equivalent to Int\$69.8 million per year, of which 52% (R\$115.7 million or Int\$36.0 million) were and 48% (R\$108.3 million or Int\$33.7 million), for women (Table 14).

Regarding the age distribution of outpatient costs, 5.3% occurred among men under 40 years old, with the same age group representing 13.0% of the costs for women. The 40 to 60 age group accounted for 47.1% of outpatient costs among men and 55.0% of costs among women.

For both sexes, the majority of costs were associated with cancer treatment, amounting to 93.4% of outpatient costs for women and 83.5% for men. Among these cancer treatment costs, the majority for women were related to breast cancer, while for men, the highest outpatient costs attributable to alcohol consumption were for lip, oral cavity, pharynx, and colorectal cancers. Cardiovascular diseases followed, representing 11.3% of outpatient costs for men and 4.6% for women.

Table 14. Outpatient costs attributable to alcohol consumption by sex, age group and disease group, 2019 (R\$– Reais).

	Respiratory diseases	Cancers	Cardiovascular diseases	Digestive diseases	Epilepsy	Accidents and violences	Alcohol consumption disorders	HIV/AIDS	Total
Men									
15 - 19 years	2,121	76,362	5,569	3,412	26,267	4,834	0	31,004	155,271
20 - 24 years	14,006	333,051	32,505	76,752	71,504	18,446	0	126,962	681,746
25 - 29 years	17,308	528,335	56,469	36,307	75,834	19,605	0	180,538	923,242
30 - 34 years	22,416	947,443	103,755	75,601	69,752	18,451	0	196,107	1,445,765
35 - 39 years	22,250	2,211,536	237,458	166,192	70,667	19,873	360	201,612	2,950,724
40 - 44 years	25,306	4,505,114	494,373	192,950	71,740	18,747	0	201,926	5,543,099
45 - 49 years	22,478	8,535,201	901,451	484,822	61,065	15,229	19	194,687	10,243,749
50 - 54 years	24,806	14,255,318	1,540,230	448,000	56,252	12,967	0	185,701	16,556,105
55 - 59 years	24,660	19,092,643	2,284,425	569,388	51,332	12,763	360	130,052	22,193,266
60 - 64 years	21,851	18,132,819	2,508,990	419,828	40,613	10,746	119	78,473	21,231,859
65 - 69 years	17,523	14,299,444	2,325,839	333,192	26,340	8,828	79	40,997	17,063,967
70 - 74 years	10,478	7,406,437	1,357,717	121,933	15,878	150,409	0	22,492	9,091,559
75 - 79 years	7,877	4,439,525	883,495	76,532	11,007	4,254	0	7,462	5,435,333
80+ years	5,713	1,826,070	297,789	36,448	6,843	4,226	15	3,279	2,182,476
Total men	238,795	96,589,299	13,030,065	3,041,356	655,094	319,379	953	1,601,290	115,698,160
Women									
15 - 19 years	3,293	75,565	4,300	3,491	25,186	6,091	0	18,453	140,849
20 - 24 years	8,660	334,860	15,385	13,074	51,689	13,390	0	44,679	485,472
25 - 29 years	8,505	1,417,566	26,522	21,088	39,084	11,305	0	66,726	1,595,933
30 - 34 years	11,153	3,696,105	54,247	25,613	49,947	9,143	0	88,236	3,938,432
35 - 39 years	14,097	7,570,812	123,596	42,565	37,429	9,180	0	123,762	7,926,772
40 - 44 years	11,501	11,659,292	280,911	119,902	46,170	7,373	0	139,047	12,270,946
45 - 49 years	9,844	13,890,998	438,979	58,792	34,558	5,976	792	137,328	14,583,847
50 - 54 years	8,763	16,940,088	743,535	77,920	35,731	5,514	0	117,313	17,937,072
55 - 59 years	7,434	13,821,550	774,833	66,435	25,143	4,533	0	89,199	14,794,307
60 - 64 years	7,133	12,525,495	858,365	62,413	20,516	4,348	0	58,280	13,539,428
65 - 69 years	5,481	9,195,399	758,895	73,246	12,763	3,059	0	33,015	10,083,360
70 - 74 years	2,886	5,837,459	506,276	32,023	7,876	38,378	0	14,751	6,440,266
75 - 79 years	1,900	2,769,111	258,672	16,874	4,008	1,949	0	16,202	3,069,712
80+ years	1,455	1,408,586	84,951	10,156	2,325	2,627	0	2,608	1,513,469
Total women	102,104	101,142,886	4,929,465	623,594	392,425	122,865	792	949,599	108,319,864

I.4. Indirect costs

a. Costs of premature mortality

Based on indirect estimates of alcohol consumption, premature deaths resulted in an indirect cost to the Brazilian economy of approximately R\$17.0 billion per year (equivalent to Int\$5.3 billion per year) due to the removal of individuals of productive age from the workforce. Once again, due to the higher number of attributable deaths and the higher retirement age, the costs for men (R\$15.4 billion/year) significantly exceed those for women (R\$1.6 billion/year).

For both men and women, a large portion of the costs of premature mortality attributable to alcohol consumption is concentrated among individuals up to 50 years of age, as shown in Table 15. For the male population, 71.2% of the costs of premature mortality are concentrated in this age group, and, for the female population, this percentage reaches 80.8% of attributable costs, representing a significant loss of productivity in age groups that would otherwise be at the peak of their capacity (Table 15).

Table 15. Costs of premature mortality attributable to alcohol consumption by sex and age group in Brazil, 2019.

	Reals (R\$)	Purchasing power parities (Int\$)
Men		
15 - 19 years	309.801.637,49	96.661.977,38
20 - 24 years	1.379.876.810,63	430.538.786,47
25 - 29 years	1.527.978.238,42	476.748.280,32
30 - 34 years	1.631.266.048,99	508.975.366,30
35 - 39 years	1.911.124.005,12	596.294.541,38
40 - 44 years	2.083.693.638,23	650.138.420,66
45 - 49 years	2.169.043.661,74	676.768.693,21
50 - 54 years	2.203.608.704,15	687.553.417,83
55 - 59 years	1.720.607.984,21	536.851.165,12
60 - 64 years	518.756.271,71	161.858.431,11
Total men	15.455.757.000,68	4.822.389.079,77
Women		
15 - 19 years	412.841.115,58	12.881.159,31
20 - 24 years	129.262.813,9	40.331.611,19
25 - 29 years	148.720.684,75	46.402.709,75
30 - 34 years	194.879.090,94	60.804.708,56
35 - 39 years	241.245.685,18	75.271.664,64
40 - 44 years	273.783.554,52	85.423.885,97
45 - 49 years	239.793.561,18	74.818.583,83
50 - 54 years	213.222.531,90	66.528.091,08
55 - 59 years	88.038.162,61	27.469.005,49
Total women	1.570.230.200,50	489.931.419,81
TOTAL	17.025.987.201,18	5.312.320.499,59

b. Costs to Social Security

In 2019, according to indirect estimates on alcohol consumption, social security costs amounted to R\$47.2 million, equivalent to Int\$14.7 million per year, of which 78% (R\$37.0 million or Int\$11.5 million) were among men and 14.5% (R\$10.2 million or Int\$3.2 million), among women (Table 16).

Regarding the age distribution of social security costs, 16.1% of the costs for men occurred among individuals under 40 years old, with the same age group representing 28.7% of the costs among women. The 40 to 60 age range represented 67.8% of social security costs for men and 66.1% for women.

Social security costs showed different distributions for attributable disease groups by sex. For the male population, 29.9% of the social security costs were due to cardiovascular diseases, followed by cancers (21.2%), respiratory diseases (13.6%), and digestive system diseases (11.9%). For the female population, the main cause of costs was cancers (56.7%), followed by cardiovascular diseases (14.2%) and respiratory diseases (13.8%). Regarding the proportion of costs by disease, it is also noteworthy that epilepsy costs had a higher participation for both sexes, accounting for more than 5% of the total social security costs.

Table 16. Social security costs attributable to alcohol consumption by sex, age group and disease group, 2019 (R\$- Reais).

	Respiratory diseases	Cancers	Cardiovascular diseases	Digestive diseases	Epilepsy	Accidents and violence	Alcohol consumption disorders	HIV/AIDS	Total
Men									
15 - 19 years	14,783	1,535	781	0	6,897	4,838	0	279	30,112
20 - 24 years	422,517	22,017	15,757	14,700	93,059	72,794	0	4,512	712,175
25 - 29 years	585,313	63,855	51,233	38,887	153,885	89,828	0	15,285	1,154,118
30 - 34 years	561,976	146,497	120,307	164,475	180,711	78,747	0	22,541	1,661,797
35 - 39 years	594,295	272,412	302,822	269,258	232,628	86,578	998	30,005	2,387,147
40 - 44 years	613,996	564,925	673,847	446,869	278,542	70,646	6,480	26,677	3,494,793
45 - 49 years	619,569	1,078,823	1,474,471	775,307	281,156	63,488	7,148	18,192	5,458,894
50 - 54 years	644,814	1,847,135	2,643,789	1,130,238	339,281	54,308	7,111	20,717	7,904,108
55 - 59 years	606,017	2,165,504	3,203,130	982,009	254,744	41,879	7,654	12,724	8,218,354
60 - 64 years	295,228	1,437,149	2,175,838	502,684	134,030	23,311	2,994	6,727	5,052,658
65 - 69 years	50,516	219,992	359,370	81,938	18,141	2,793	0	1,361	797,594
70 - 74 years	5,953	21,700	36,347	10,934	0	334	0	0	88,915
75 - 79 years	673	5,267	7,700	0	0	0	0	0	13,747
80+ years	25	1,036	1,838	0	0	82	0	0	3,138
Total men	5,015,674	7,847,847	11,067,231	4,417,298	1,973,075	589,627	32,384	159,021	36,977,549
Women									
15 - 19 years	16,034	400	379	743	5,823	1,712	0	140	25,231
20 - 24 years	175,015	21,816	7,662	11,826	57,425	15,101	0	903	293,068
25 - 29 years	236,296	150,244	26,013	29,726	68,292	20,301	0	1,998	550,271
30 - 34 years	231,620	361,564	62,887	33,229	74,455	20,195	0	6,629	825,519
35 - 39 years	196,834	703,382	138,329	45,358	76,711	19,575	0	6,830	1,248,518
40 - 44 years	180,581	1,009,784	271,010	65,203	88,949	17,965	0	12,208	1,730,420
45 - 49 years	139,399	1,168,252	337,847	57,986	77,657	14,215	0	7,649	1,916,619
50 - 54 years	135,127	1,241,562	377,032	41,425	73,300	12,031	0	7,057	1,975,700
55 - 59 years	74,430	766,937	171,084	32,733	39,616	6,336	0	5,114	1,154,201
60 - 64 years	23,726	286,464	53,184	10,760	11,564	1,298	998	1,503	400,289
65 - 69 years	4,634	79,725	11,154	1,907	1,401	537	0	727	101,112
70 - 74 years	1,391	16,149	2,331	96	693	268	0	0	20,940
75 - 79 years	323	2,121	385	74	86	48	0	0	3,048
80+ years	25	294	36	0	0	29	0	0	409
Total women	1,415,435	5,808,695	1,459,332	331,068	575,972	129,610	998	50,758	10,245,345

c. Costs of absenteeism

In Brazil, using indirect estimates of alcohol consumption, the costs of absenteeism considering days off due to medical leaves and hospitalizations attributable to alcohol consumption in 2019 totaled R\$644.3 million, equivalent to Int\$200.7 million per year. Of this amount, 69.1% (R\$445.1 million or Int\$138.7 million) were incurred by men and 30.1% (R\$199.2 million or Int\$62.1 million), by women (Table 17).

Regarding the age distribution of absenteeism costs, 19.2% of the costs for men occurred among individuals under 40 years old, with the same age group representing 19.9% of costs among women. The 40 to 60 age range represented 66.2% of the absenteeism costs attributable to alcohol consumption among men and 63.5% among women.

For both sexes, the costs of days of absenteeism were higher for cancers, representing 66.0% of costs among men and 56.1% among women. As the second largest cause in this category, accidents and violence accounted for 8.2% of the costs for men and 10.5% of the costs for women. It was also notable that the costs attributable to absenteeism due to alcohol consumption disorders among women were twice those among men.

Table 17. Costs of absenteeism attributable to alcohol consumption by sex, age group and disease group, 2019 (R\$- Reais).

	Respiratory diseases	Cancers	Cardiovascular diseases	Digestive diseases	Epilepsy	Accidents and violences	Alcohol consumption disorders	HIV/AIDS	Total
Men									
15 - 19 years	55,136	24,747	27,050	50,990	73,760	816,236	0	30,420	1,095,929
20 - 24 years	870,506	600,176	122,796	1,157,890	371,908	3,772,369	78,605	188,576	7,628,963
25 - 29 years	1,670,165	4,299,092	209,971	2,231,393	513,724	4,039,915	197,262	415,565	14,386,233
30 - 34 years	2,034,052	10,770,446	365,269	3,085,985	508,621	4,086,404	454,529	478,704	23,129,654
35 - 39 years	2,535,138	24,511,242	713,728	4,221,077	571,826	4,204,342	453,178	608,786	39,323,295
40 - 44 years	2,906,000	40,027,932	1,233,420	4,717,319	516,386	4,030,335	1,028,240	576,555	57,384,507
45 - 49 years	2,627,788	55,977,170	2,004,514	5,583,518	485,288	3,973,184	659,819	490,384	74,941,556
50 - 54 years	2,725,822	64,706,784	3,028,726	5,040,899	480,996	3,872,246	601,991	428,942	85,512,740
55 - 59 years	2,643,952	57,504,521	4,112,690	4,852,346	401,090	3,017,888	387,704	274,613	76,642,672
60 - 64 years	1,151,383	23,500,642	4,170,627	2,618,390	285,035	1,769,896	126,461	162,277	35,992,547
65 - 69 years	631,219	8,440,305	3,924,734	1,561,355	179,104	1,136,167	42,079	88,196	16,786,297
70 - 74 years	176,049	2,220,200	2,355,855	562,891	131,727	640,627	5,702	31,020	6,379,393
75 - 79 years	126,060	918,487	1,709,975	400,766	88,691	535,755	975	15,715	3,840,743
80+ years	44,399	367,808	868,546	167,481	65,358	505,977	1,050	6,408	2,036,326
Total men	20,197,667	293,869,552	24,847,901	36,252,300	4,673,514	36,401,342	4,037,595	3,796,160	445,080,855
Women									
15 - 19 years	48,083	34,622	10,578	33,986	86,918	698,427	15,267	18,457	960,005
20 - 24 years	616,092	433,974	138,253	657,417	521,522	2,851,840	351,145	65,717	5,854,611
25 - 29 years	903,743	948,600	278,798	969,867	389,135	2,801,469	1,130,354	114,891	7,871,668
30 - 34 years	1,064,082	2,147,563	625,982	1,609,995	334,686	2,674,875	1,389,313	169,388	10,671,843
35 - 39 years	1,101,736	4,744,336	893,889	2,060,451	321,306	2,478,161	1,528,641	222,962	14,342,257
40 - 44 years	1,344,890	9,927,735	1,325,353	2,309,814	286,802	2,288,890	1,374,045	202,798	20,987,212
45 - 49 years	975,426	16,834,097	1,549,952	1,802,744	183,209	1,974,970	1,040,907	168,511	27,078,493
50 - 54 years	1,180,255	28,628,383	1,851,023	1,969,593	175,494	1,957,171	948,022	147,619	41,005,134
55 - 59 years	960,647	26,762,709	1,470,489	1,181,653	121,297	1,330,149	505,624	91,453	37,357,376
60 - 64 years	583,408	17,948,555	1,111,685	610,763	90,430	895,777	274,809	55,994	25,295,368
65 - 69 years	164,553	2,600,603	745,655	181,599	38,156	429,255	4,955	40,216	4,861,003
70 - 74 years	47,969	529,381	529,486	65,909	32,953	257,869	0	14,739	1,615,002
75 - 79 years	22,694	177,564	325,340	41,537	18,734	158,096	233	8,928	787,328
80+ years	7,606	87,356	217,128	23,632	19,368	144,467	1,690	2,758	517,753
Total women	9,021,185	111,805,479	11,073,612	13,518,961	2,620,011	20,941,418	8,565,005	1,324,429	199,205,054

5. Summary of the estimates

I. ACCORDING TO THE 2019 NATIONAL HEALTH SURVEY (PNS 2019)

Considering alcohol consumption by the Brazilian population based on the 2019 PNS microdata, it is estimated that, in the year of reference, there was a total of R\$10.1 billion (equivalent to Int\$3.2 billion), including direct and indirect costs, attributable to alcohol consumption in Brazil (Table 18).

In terms of direct costs, there were R\$483.5 million (Int\$150.6 million) in costs to SUS, being R\$394.5 million (Int\$122.9 million) for hospitalizations and R\$88.9 million (Int\$27.7 million) for outpatient procedures attributable to this cause.

Indirect costs, which included productivity losses due to premature mortality and absenteeism as well as social security expenses, totaled R\$9.7 billion (Int\$3.0 billion), with R\$9.3 billion (Int\$2.9 billion) for premature deaths, R\$299.1 million (Int\$93.2 million) for absenteeism, and R\$23.4 million (Int\$7.3 million) in costs to the INSS.

II. ACCORDING TO THE INDIRECT CONSUMPTION ESTIMATES BY THE WHO

Considering alcohol consumption by the Brazilian population based on indirect estimates made by the WHO, it is estimated that, in 2019, there was a total of R\$18.8 billion (equivalent to Int\$5.9 billion), including direct and indirect costs attributable to alcohol consumption in Brazil (Table 19).

In terms of direct costs, there were R\$1.1 billion (Int\$351.2 million) in costs to the SUS, with R\$903.4 million (Int\$281.4 million) for hospitalizations and R\$224.0 million (Int\$69.8 million) for outpatient procedures attributable to alcohol consumption.

Indirect costs, which included productivity losses due to premature mortality and absenteeism as well as social security expenses, totaled R\$17.7 billion (Int\$5.5 billion), with R\$17.0 billion (Int\$5.3 billion) for premature deaths, R\$644.3 million (Int\$200.7 million) for absenteeism, and R\$47.2 million (Int\$14.7 million) in costs to social security.

Table 18. Summary of direct, indirect and total costs attributable to alcohol consumption in Brazil, 2019, according to the consumption estimates from the 2019 National Health Survey (R\$– Reais).

	Hospitalizations	Outpatient care	Direct costs	Premature mortality	Social security costs	Absenteeism	Indirect costs	Total costs
Men	340,834,691.07	54,621,588.30	395,456,279.37	8,750,594,354.79	20,004,604.73	224,285,251.15	8,994,884,210.66	9,390,340,490.04
Women	53,711,696.77	34,336,525.87	88,048,222.64	594,807,204.58	3,355,786.43	74,820,257.36	672,983,248.38	761,031,471.02
Total	394,546,387.84	88,958,114.17	483,504,502.01	9,345,401,559.37	23,360,391.16	299,105,508.51	9,667,867,459.04	10,151,371,961.06

Table 19. Summary of direct, indirect and total costs attributable to alcohol consumption in Brazil, 2019, according to the indirect consumption estimates from the WHO (R\$– Reais).

	Hospitalizations	Outpatient care	Direct costs	Premature mortality	Social security costs	Absenteeism	Indirect costs	Total costs
Men	720,622,611.23	115,698,160.43	836,320,771.66	15,455,757,000.68	36,977,549.22	445,080,854.64	15,937,815,404.53	16,774,136,176.20
Women	182,789,180.85	108,319,864.04	291,109,044.89	1,570,230,200.50	10,245,344.73	199,205,054.40	1,779,680,599.63	2,070,789,644.52
Total	903,411,792.09	224,018,024.47	1,127,429,816.55	17,025,987,201.18	47,222,893.95	644,285,909.03	17,717,496,004.16	18,844,925,820.71

6. Discussion

The total costs attributable to alcohol consumption in Brazil, with 2019 as the year of reference, were estimated to range from R\$10.1 billion to R\$17.7 billion, depending on the calculation method used. Most of these costs were indirect (estimated between R\$9.7 billion and R\$17.0 billion per year), particularly due to productivity losses from premature mortality, while direct costs (ranging from R\$483 million to R\$1.1 billion per year) were primarily associated with hospitalizations, which were the largest source of costs to SUS.

Additionally, it was estimated that there were between 47,900 and 104,800 deaths attributable to alcohol consumption during the same period. According to the estimates from the Global Burden of Disease Study (GBD), there were an estimated 52,600 deaths attributable to alcohol consumption in Brazil in 2019 (IHME 2020). This shows that the estimates from this study, particularly considering alcohol consumption according to the PNS 2019, are of similar magnitudes, differing due to variations in modeling structures and data sources such as mortality and exposure (alcohol consumption) and their treatment.

Most deaths and costs attributable to alcohol consumption occurred among men, and, regardless of sex, most occurred in individuals under 60 years of age. The main causes were cardiovascular diseases, accidents and violence, cancers, and digestive system diseases.

National data show that alcohol consumption is lower among women, both in terms of prevalence and quantity consumed, explaining part of the differences found by sex, which are further compounded by differences in patterns of morbidity, mortality and disease treatment in the country.

In this study, it was assumed that there is no safe level of alcohol consumption and that there is a dose-response relationship between consumption and increased risks of associated diseases (Bryazka et al. 2022). Furthermore, evidence reinforces the association between alcohol consumption and both morbidity and mortality from a range of causes including respiratory, cardiovascular, and digestive diseases, cancers, epilepsy, accidents and violence, HIV/AIDS, and disorders directly associated with consumption (World Health Organization (WHO) 2024a).

One of the first studies that addressed costs attributable to alcohol consumption in Brazil estimated direct costs to SUS of approximately Int\$8.3 million in 2014 (Coutinho et al. 2016). Following that, a more recent study estimated considerably higher annual direct costs, at Int\$128.2 million, covering the period from 2010 to 2018, and included an analysis of some of the indirect costs associated with absenteeism from alcohol-related diseases (de Freitas and da Silva 2022). The present study, by including more diseases in the analyses, estimated even higher direct costs to SUS, ranging from Int\$150.6 million to Int\$351.2 million, and included other estimates among indirect costs, with a particular focus on those originating from premature deaths, which represent the largest impact on the total costs attributable to alcohol in the country.

In response to the issue of risk factors for noncommunicable chronic diseases (NCDs), the WHO recommends a set of cost-effective measures, known as “best buys”. Some of the recommended policies for addressing the increase in alcohol consumption and its health consequences in countries around the world include increasing taxes on alcoholic beverages, enacting and enforcing comprehensive bans or restrictions on alcohol advertising, and applying restrictions on the physical availability of alcohol sold at retail by reducing sales hours (World Health Organization (WHO) 2023).

Globally, there has been an increase in the number of countries with national alcohol policies, and many apply taxes on alcohol consumption. Additionally, many countries require labels to be put on alcoholic products, warning of potential dangers such as complications during pregnancy, underage consumption, driving under the influence, and/or cancer. However, new problems arise every day. Alcohol advertising has increased, on the internet and social media (means of communication which remain poorly regulated), as well as through sponsorships promoted by the beer industry at music and even sports events. And despite the implementation of policies raising the legal minimum age for the purchase of alcoholic beverages in national regulations worldwide, the remote purchase sector has grown, with little regulation. Finally, it is noteworthy that, according to WHO, in 2019, many countries reported industry interference in policy development (World Health Organization (WHO) 2024a).

Currently, notable measures among Brazilian regulations on alcohol consumption include the minimum age for purchase and consumption (18 years), specific taxes on alcoholic beverages, regulations on advertising, sales restrictions (such as sales hours and prohibition of sales at certain sports events, and near schools and hospitals), blood alcohol concentration limits for drivers, and warning labels about the risks of consumption during pregnancy and the dangers of binge drinking.

Despite these, in recent decades, there has been an observed increase in alcohol consumption among the adult population and the introduction of alcohol use among adolescents. For example, according to data from Vigitel (Surveillance of Risk and Protection Factors for Chronic Diseases by Telephone Survey), from 2006 and 2023, binge drinking among adults increased from 15.7% to 20.8%, with statistics of consumption among women nearly doubling in this period (Ministério da Saúde 2023b).

Also, according to the PNS of 2013 and 2019, there was an increase in weekly alcohol consumption between surveys, from 23.9% to 26%, driven mainly by women, whose indicator rose from 12.9% to 17% (IBGE 2020). Notably, changes during the COVID-19 pandemic showed an increase in binge drinking in the population, both among men and women, reaching a prevalence of 20.6% in Brazilian capitals (Vital Strategies 2022).

The present moment is particularly important given the discussion of the Tax Reform in Brazil, which presents the possibility of selective taxation on products and services harmful to health and the environment. The proposal currently under discussion includes selective taxation for alcoholic beverages and could strengthen national policies for reduction of consumption in the country, as well as benefit public health and address the negative externalities that alcohol brings to society.

This study includes among its strengths the use of updated data on alcohol consumption for the Brazilian population, including disaggregation by age and sex, a broader set of diseases associated with alcohol consumption, and a larger set of variables for indirect costs compared to previous studies in Brazil. Overall, a more conservative approach was adopted regarding the estimated attributable costs, so the generated estimates are likely an underestimation of the actual figures.

Among the limitations of the study are the possible underestimation of consumption from self-reported data in the 2019 PNS, as well as the overestimation of consumption from indirect data from the beverage market used by the WHO report. Additionally, there are several assumptions incorporated into the statistical model, such as the portability of relative risks obtained from studies in other populations. Furthermore, it was not possible to include all possible direct costs, such as those to primary health care, supplementary health costs, and direct family health expenses, as well as indirect social costs, such as productivity losses due to presenteeism.

7. Conclusion

The epidemiological and economic impacts of alcohol consumption in Brazil are significant and require the strengthening of a set of policies to address this risk factor.

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SUPPLEMENTARY TABLES

Supplementary Table 1. Deaths by diseases associated with alcohol consumption in Brazil by sex and age group, 2019.

Supplementary Table 2. Outpatient costs by diseases associated with alcohol consumption in Brazil by sex and age group, 2019.

Supplementary Table 3. Hospitalization costs by diseases associated with alcohol consumption in Brazil by sex and age group, 2019

Supplementary Table 4. Total days of hospitalization by diseases associated with alcohol consumption in Brazil by sex and age group, 2019

Supplementary Table 5. Social security costs by diseases associated with alcohol consumption in Brazil by sex and age group, 2019.

Supplementary Table 1. Deaths by diseases associated with alcohol consumption in Brazil by sex and age group, 2019.

	Tuberculosis	Lower respiratory diseases	Esophagus cancer	Liver cancer due to alcohol use	Laryngeal cancer	Breast cancer	Colon and rectum cancer	Lip and oral cavity cancer	Nasopharyngeal cancer	Other pharyngeal cancers	Ischemic heart disease	Atrial fibrillation and flutter
Men												
15 - 19 years	38	267	0	0	0	0	19	3	7	0	117	0
20 - 24 years	99	330	10	1	4	1	39	6	7	4	242	0
25 - 29 years	141	396	18	1	5	1	61	10	5	5	343	0
30 - 34 years	197	518	39	4	12	2	122	20	6	10	671	3
35 - 39 years	259	753	90	8	35	4	219	53	12	29	1,265	5
40 - 44 years	324	945	247	15	113	7	349	124	24	93	2,234	15
45 - 49 years	386	1,281	531	32	257	21	563	241	35	221	3,665	33
50 - 54 years	466	1,785	986	72	494	37	991	452	56	384	6,220	63
55 - 59 years	478	2,358	1,400	121	704	48	1,372	640	70	521	8,661	98
60 - 64 years	430	3,053	1,580	168	795	72	1,837	673	38	569	11,020	161
65 - 69 years	384	3,711	1,458	184	749	73	1,989	564	33	475	11,902	211
70 - 74 years	304	4,637	1,151	158	588	65	1,950	415	26	321	11,499	324
75 - 79 years	259	5,543	905	100	421	28	1,674	304	17	206	10,847	486
80+ years	382	18,786	1,178	97	514	53	2,658	455	18	233	20,715	3,168
Total men	4,146	44,362	9,592	961	4,692	412	13,845	3,961	354	3,071	89,402	4,568
Women												
15 - 19 years	24	177	0	0	0	10	12	2	3	0	40	0
20 - 24 years	45	228	3	0	1	30	28	4	4	2	80	0
25 - 29 years	53	220	5	1	2	119	62	7	3	2	123	0
30 - 34 years	61	288	8	2	3	425	131	13	4	4	258	2
35 - 39 years	85	384	17	4	7	911	235	20	5	8	507	4
40 - 44 years	96	496	42	10	14	1,393	370	38	8	15	972	11
45 - 49 years	96	678	96	14	29	1,784	594	56	11	28	1,645	25
50 - 54 years	111	982	194	26	53	2,339	904	95	15	48	2,595	48
55 - 59 years	131	1,394	311	40	83	2,641	1,223	132	19	69	3,892	85
60 - 64 years	129	1,940	346	57	94	2,524	1,482	154	19	73	5,509	129
65 - 69 years	132	2,657	350	68	99	2,356	1,683	156	16	71	6,829	189
70 - 74 years	121	3,644	359	64	90	2,045	1,661	171	15	59	7,756	348
75 - 79 years	119	5,130	355	54	81	1,713	1,697	166	9	53	8,690	600
80+ years	239	26,123	771	68	135	3,525	3,760	469	17	117	26,105	5,144
Total women	1,441	44,341	2,857	409	691	21,818	13,842	1,482	149	549	65,002	6,585

	Cirrhosis and other chronic liver diseases due to alcohol use												TOTAL
		Pancreatitis	Epilepsy	Road crashes	Accidental injuries	Intentionally self-inflicted injury and sequelae	Interpersonal violence and sequelae	Intracerebral hemorrhage	Alcohol use disorders	Hypertension	Alcohol cardiomyopathy	HIV/AIDS	
Men													
15 - 19 years	1	19	76	1,982	1,084	891	6,970	60	19	15	0	38	11,607
20 - 24 years	18	39	103	3,755	1,346	1,436	10,440	90	56	40	2	286	18,354
25 - 29 years	54	90	117	3,303	1,246	1,347	8,038	116	141	64	5	587	16,096
30 - 34 years	166	155	145	3,246	1,339	1,350	6,578	219	324	107	12	778	16,024
35 - 39 years	392	246	202	3,267	1,530	1,365	5,487	407	551	248	23	979	17,430
40 - 44 years	669	298	207	2,980	1,605	1,229	3,984	705	790	412	39	1,009	18,417
45 - 49 years	949	331	225	2,700	1,634	1,083	2,912	1,191	980	647	55	941	20,913
50 - 54 years	1,274	356	217	2,503	1,838	1,018	2,123	1,949	1,088	1,219	49	843	26,483
55 - 59 years	1,464	361	197	2,163	1,785	922	1,510	2,689	1,048	1,696	58	619	30,984
60 - 64 years	1,392	334	154	1,797	1,796	721	1,049	2,972	804	2,414	46	410	34,285
65 - 69 years	1,149	334	133	1,369	1,674	572	735	3,604	639	2,834	26	298	35,101
70 - 74 years	791	300	104	948	1,660	430	468	2,871	360	3,033	11	163	32,577
75 - 79 years	535	258	97	720	1,703	307	321	3,009	198	3,326	5	95	31,364
80+ years	573	424	164	821	4,985	347	171	2,920	180	9,114	6	64	68,025
Total men	9,427	3,545	2,139	31,557	25,224	13,017	50,787	22,803	7,177	25,169	337	7,110	377,659
Women													
15 - 19 years	0	14	46	436	170	319	500	38	4	8	0	29	1,831
20 - 24 years	2	27	69	643	185	355	659	67	10	13	0	113	2,569
25 - 29 years	6	34	68	548	173	309	612	85	20	35	0	230	2,718
30 - 34 years	20	55	74	541	203	319	589	154	46	80	1	382	3,664
35 - 39 years	50	77	84	542	239	358	564	309	74	170	2	509	5,167
40 - 44 years	90	93	84	510	261	320	453	517	95	316	4	578	6,787
45 - 49 years	132	111	82	473	277	325	335	892	105	552	4	471	8,814
50 - 54 years	192	122	79	438	357	293	248	1,286	106	840	8	394	11,775
55 - 59 years	241	159	81	420	446	240	191	1,613	90	1,218	4	287	15,012
60 - 64 years	272	180	79	364	615	190	133	2,081	70	1,731	2	191	18,364
65 - 69 years	284	195	75	365	799	155	111	2,645	48	2,327	4	174	21,788
70 - 74 years	253	213	74	327	1,143	107	85	2,047	31	2,767	2	73	23,455
75 - 79 years	209	233	76	297	1,614	77	84	2,495	24	3,591	1	35	27,401
80+ years	306	643	198	398	7,974	100	56	4,157	34	14,953	0	43	95,334
Total women	2,058	2,158	1,169	6,302	14,455	3,468	4,618	18,388	755	28,601	32	3,509	244,678

Supplementary Table 2. Outpatient costs by diseases associated with alcohol consumption in Brazil by sex and age group, 2019

	Tuberculosis	Lower respiratory diseases	Esophagus cancer	Liver cancer due to alcohol use	Laryngeal cancer	Breast cancer	Colon and rectum cancer	Lip and oral cavity cancer	Nasopharyn- geal cancer	Other pharyngeal cancers	Ischemic heart disease	Atrial fibrillation and flutter
Men												
15 - 19 years	10,149.75	47,772.78	1,855.68	33,272.46	4,862.96	3,278.78	250,885.07	62,099.76	173,874.39	34,127.65	66,487.50	8,259.58
20 - 24 years	19,078.61	67,672.54	7,551.33	17,214.65	1,828.68	5,136.40	614,927.77	108,588.76	165,642.95	26,049.19	113,426.56	6,473.24
25 - 29 years	19,794.34	62,537.56	21,442.05	36,297.03	6,621.06	22,580.53	1,312,836.00	123,696.02	128,522.65	41,612.90	184,812.05	9,919.62
30 - 34 years	27,528.38	63,202.60	85,493.87	53,236.55	29,397.58	184,745.40	2,528,342.72	160,573.92	125,289.20	134,679.56	366,487.52	7,685.41
35 - 39 years	26,358.05	66,269.42	179,669.65	65,121.36	156,483.22	287,047.46	5,067,350.61	496,219.41	271,596.92	345,611.62	877,754.26	14,849.62
40 - 44 years	31,745.09	66,168.65	740,539.30	68,549.67	399,941.43	308,832.20	8,499,925.31	1,043,846.15	321,758.69	1,144,591.97	1,897,703.28	19,693.23
45 - 49 years	28,475.02	74,425.35	1,857,154.88	164,063.88	1,221,161.03	400,443.12	13,604,736.88	2,123,471.96	410,307.79	2,644,457.52	3,656,669.41	26,102.25
50 - 54 years	32,470.61	81,605.11	3,513,329.01	267,708.88	2,679,530.67	674,603.50	20,919,314.01	3,780,427.89	535,618.91	4,506,118.60	6,516,835.15	46,109.73
55 - 59 years	29,394.05	97,817.63	5,007,328.35	424,244.11	3,489,661.13	808,455.66	27,880,187.27	4,939,222.03	569,453.41	5,897,728.98	9,440,764.12	68,964.51
60 - 64 years	27,214.71	115,400.93	5,463,800.43	417,939.63	4,366,514.99	940,957.96	32,033,537.07	4,889,109.11	603,811.29	5,624,689.41	11,496,012.87	98,077.22
65 - 69 years	20,337.31	109,340.78	4,431,075.46	450,717.20	3,710,742.39	936,856.52	31,160,999.20	3,646,376.17	529,937.94	3,842,287.21	10,789,292.66	107,490.10
70 - 74 years	15,078.82	104,597.08	3,093,425.79	289,363.41	2,538,943.35	848,595.73	24,038,231.01	2,218,040.25	277,586.14	2,321,271.60	8,211,220.99	98,995.32
75 - 79 years	9,587.80	84,989.63	2,044,515.28	154,241.97	1,443,604.30	525,354.58	15,394,415.62	1,231,509.21	118,908.95	1,055,980.27	5,157,394.06	86,824.98
80+ years	8,281.24	147,654.78	1,330,228.94	95,774.77	1,016,236.05	457,655.01	11,041,515.10	994,647.86	36,935.33	619,049.09	2,991,986.42	107,905.39
Total men	305,494	1,189,455	27,777,410	2,537,746	21,065,529	6,404,543	194,347,204	25,817,829	4,269,245	28,238,256	61,766,847	707,350
Women												
15 - 19 years	14,790.20	56,373.45	1,557.16	62,075.17	294.33	92,406.87	98,582.04	36,039.35	166,884.59	32,888.70	51,831.94	7,780.22
20 - 24 years	14,124.46	69,493.52	3,172.50	29,172.15	7,662.79	993,629.65	514,805.18	79,863.59	93,455.80	9,729.46	80,393.76	8,335.21
25 - 29 years	13,525.19	62,872.96	17,778.79	46,715.52	5,491.36	6,377,955.90	1,424,996.66	131,983.23	84,391.07	30,976.75	138,262.83	8,193.50
30 - 34 years	19,223.37	70,070.60	29,653.75	26,784.39	19,574.18	18,897,727.96	3,075,571.36	199,700.09	68,513.53	32,630.13	295,033.60	12,246.68
35 - 39 years	29,305.14	74,440.72	51,014.87	63,046.63	26,414.91	43,285,573.65	6,282,286.53	296,681.06	141,058.93	98,002.45	770,281.93	20,005.30
40 - 44 years	22,475.05	81,294.27	174,864.14	114,339.83	86,992.22	69,767,305.65	10,104,449.17	466,862.07	185,576.14	191,597.45	1,853,543.38	27,197.37
45 - 49 years	24,104.38	94,500.40	332,142.25	177,676.42	188,772.51	93,128,263.83	15,672,791.55	543,185.34	193,192.02	371,661.54	3,637,362.25	34,537.11
50 - 54 years	19,660.75	108,983.33	723,045.51	210,903.32	328,315.41	109,965,752	23,683,798.99	899,390.81	299,256.60	724,930.00	6,270,145.13	54,646.92
55 - 59 years	21,593.07	123,567.65	1,467,128.93	345,818.72	582,399.89	106,361,030.5	28,554,300.06	1,223,469.48	243,669.95	827,370.49	8,447,067.99	71,597.54
60 - 64 years	22,518.75	127,463.91	1,410,503.51	375,515.85	682,506.22	97,291,430.74	31,434,115.82	1,153,028.15	176,216.12	841,176.42	10,308,170.27	91,978.52
65 - 69 years	17,269.10	115,593.61	1,295,318.04	369,140.10	678,561.60	80,105,390.50	27,601,968.77	1,176,378.01	134,433.18	803,513.14	9,908,131.04	95,779.31
70 - 74 years	8,962.80	100,186.54	1,256,154.78	227,113.90	318,607.31	54,584,728.21	20,001,632.23	989,503.23	124,343.48	511,205.10	7,704,355.20	92,042.27
75 - 79 years	6,779.51	95,999.33	699,108.22	134,473.28	289,233.11	34,042,786.33	13,364,697.07	647,647.27	45,360.33	312,067.74	5,031,288.22	76,658.60
80+ years	7,429.52	165,779.14	603,094.16	77,745.68	213,742.53	28,402,694.64	11,030,871.32	863,454.77	42,512.50	272,950.48	3,026,402.89	122,870.29
Total women	241,761	1,346,619	8,064,537	2,260,521	3,428,568	743,296,676	192,844,867	8,707,186	1,998,864	5,060,700	57,522,270	723,869

	Cirrhosis and other chronic liver diseases due to alcohol use	Pancreatitis	Epilepsy	Road crashes	Accidental injuries	Intentionally self-inflicted injury and sequelae	Interpersona l violence and sequelae	Intracerebral hemorrhage	Alcohol use disorders	Hypertensio n	Alcohol cardiomyop athy	HIV/AIDS	TOTAL
Men													
15 - 19 years	341.99	35,139.78	258,443.61	7,842.57	67,249.29	360.47	37,780.84	23,713.85	5,701.59	68,223.07	0.00	221,455.55	9,608,240.97
20 - 24 years	40,626.98	42,882.29	210,945.07	4,892.83	91,050.34	35.94	59,399.09	43,481.28	8,517.52	50,130.60	0.00	906,873.20	11,356,490.82
25 - 29 years	8,218.50	46,342.18	186,326.56	495.91	83,636.45	33.00	57,373.21	34,120.82	8,841.70	62,809.76	0.00	1,289,556.23	12,233,960.13
30 - 34 years	12,933.64	112,259.02	169,921.55	23.47	89,471.45	11.00	47,020.06	38,119.36	12,235.33	100,790.41	0.00	1,400,763.23	14,299,531.23
35 - 39 years	30,623.01	233,053.53	169,813.52	0.00	107,079.68	0.00	44,626.18	36,083.00	20,762.59	139,818.45	360.00	1,440,084.65	18,337,377.21
40 - 44 years	15,728.84	357,825.27	177,086.89	0.00	119,987.59	0.00	35,105.60	42,524.92	32,921.41	195,938.31	0.00	1,442,328.12	24,363,491.92
45 - 49 years	149,635.43	537,539.54	157,346.03	0.00	110,701.25	0.00	23,161.33	47,629.30	28,768.15	278,592.82	18.55	1,390,619.82	35,407,656.31
50 - 54 years	88,358.17	694,216.30	148,290.67	0.00	103,542.39	0.00	16,172.98	62,967.05	32,770.29	411,599.24	0.00	1,326,432.71	52,403,289.87
55 - 59 years	89,918.61	948,460.86	133,181.10	0.00	109,212.95	0.00	11,900.17	65,283.81	27,566.95	558,704.50	360.00	928,943.08	66,713,624.28
60 - 64 years	61,501.65	852,057.41	116,113.22	0.00	104,818.16	0.00	7,313.77	70,048.97	18,324.24	686,905.71	119.48	560,518.05	72,769,089.28
65 - 69 years	42,676.34	697,752.97	77,563.16	0.00	89,444.56	0.00	6,728.32	55,993.78	11,602.73	699,686.67	79.34	292,836.30	64,927,243.11
70 - 74 years	12,333.45	394,755.05	61,002.04	1,065,232.38	76,922.52	28,161.87	2,019.04	47,970.74	6,130.80	560,516.68	0.00	160,656.85	48,768,347.91
75 - 79 years	4,701.47	240,156.62	40,786.84	0.00	54,324.42	0.00	1,964.88	38,088.53	5,073.90	384,222.15	0.00	53,299.62	29,614,603.08
80+ years	1,901.50	211,746.61	42,819.35	0.00	88,291.64	0.00	965.37	25,341.50	1,937.08	309,869.85	15.15	23,421.18	21,178,232.21
Total men	559,500	5,404,187	1,949,640	1,078,487	1,295,733	28,602	351,531	631,367	221,154	4,507,808	953		
Women													
15 - 19 years	2,289.27	23,641.87	223,972.62	5,818.84	54,504.85	97.44	64,344.12	9,950.32	4,469.13	64,495.53	0.00	131,806.94	9,101,296.95
20 - 24 years	2,303.40	37,808.85	191,159.05	2,278.18	70,246.03	22.00	55,627.79	10,030.25	3,734.96	79,316.62	0.00	319,134.91	11,251,288.11
25 - 29 years	3,503.17	60,502.42	137,405.72	1,264.77	62,901.69	31.00	41,268.40	12,155.02	5,136.00	103,794.56	0.00	476,616.48	17,767,092.99
30 - 34 years	3,339.33	76,059.73	178,061.46	12.47	58								

Tabela Suplementar 3. Custos hospitalares ao SUS por doenças associadas ao consumo de álcool no Brasil segundo sexo e grupo etário, em 2019.

Supplementary Table 3. Hospitalization costs by alcohol-related diseases in Brazil by sex and age group, 2019.

	Tuberculosis	Lower respiratory diseases	Esophagus cancer	Liver cancer due to alcohol use	Laryngeal cancer	Breast cancer	Colon and rectum cancer	Lip and oral cavity cancer	Nasopharyn- geal cancer	Other pharyngeal cancers	Ischemic heart disease	Atrial fibrillation and flutter
Men												
15 - 19 years	938,273.34	5,240,576.58	6,823.83	49,122.35	2,929.82	537.85	362,977.04	46,780.33	130,981.20	25,708.68	502,781.99	2,000,284.43
20 - 24 years	2,752,449.48	5,973,906.61	57,007.70	42,768.86	1,454.54	7,970.23	509,676.74	94,390.26	143,984.34	22,643.13	952,800.63	1,889,112.79
25 - 29 years	3,650,082.02	6,655,416.14	43,787.38	66,000.56	25,542.34	13,930.27	879,547.23	159,428.98	165,649.92	53,633.92	1,550,859.45	2,023,355.23
30 - 34 years	4,317,866.98	6,935,611.42	133,914.53	118,122.53	100,132.92	24,067.90	1,479,615.05	191,447.67	149,378.71	160,574.57	3,596,797.72	2,567,783.30
35 - 39 years	5,195,381.68	8,648,950.33	316,066.97	189,529.08	158,733.57	44,746.67	2,586,679.01	396,517.74	217,026.97	276,170.45	10,038,654.16	4,200,794.94
40 - 44 years	6,175,985.42	10,180,594.98	741,996.36	237,523.43	553,575.49	32,105.91	4,104,534.08	651,703.25	200,883.23	714,601.77	22,705,747.15	5,260,340.95
45 - 49 years	4,858,947.64	11,745,170.16	1,797,506.73	505,799.64	1,132,209.63	140,457.43	6,615,969.36	1,318,590.79	254,784.66	1,642,101.90	47,911,195.36	6,637,881.15
50 - 54 years	4,662,033.56	14,279,336.67	3,047,588.86	979,905.17	2,597,490.38	190,710.97	10,488,188.21	2,315,566.05	328,074.23	2,760,061.97	86,212,955.03	9,797,567.60
55 - 59 years	5,248,788.26	17,948,077.50	4,266,828.70	1,590,819.90	3,430,819.07	208,798.11	14,370,881.74	3,179,318.21	366,550.36	3,796,297.68	126,846,287.80	14,863,668.57
60 - 64 years	3,513,656.00	23,084,120.02	4,290,749.10	1,997,032.28	4,368,448.23	175,482.82	16,260,996.20	3,227,825.00	398,640.56	3,713,460.41	152,108,483.00	19,915,090.43
65 - 69 years	2,304,742.00	25,932,815.59	3,661,690.75	1,988,603.50	3,634,479.07	221,085.47	16,765,928.51	2,392,705.67	347,738.54	2,521,260.01	138,392,424.50	23,045,678.81
70 - 74 years	1,278,666.94	28,406,339.49	2,627,643.96	1,459,283.64	2,388,185.43	156,465.91	13,806,581.47	1,800,577.06	225,340.92	1,884,378.96	104,694,637.20	23,825,176.11
75 - 79 years	770,430.56	28,068,303.93	1,322,357.50	776,453.93	1,538,580.97	159,099.17	9,959,694.26	1,155,469.70	111,566.92	990,778.79	66,972,806.72	21,522,240.11
80+ years	588,699.74	54,939,320.21	871,770.90	513,794.20	992,743.35	85,085.86	7,803,523.50	1,063,168.13	39,479.77	661,694.75	43,934,775.69	28,956,786.17
Total men	46,256,004	248,038,540	23,185,733	10,514,759	20,925,325	1,460,545	105,994,792	17,993,489	3,080,080	19,223,367	806,421,206	166,505,761
Women												
15 - 19 years	501,757.72	5,272,155.98	9,341.59	48,063.74	2,846.76	328,261.84	161,701.54	23,311.83	107,948.27	21,273.85	89,136.13	1,441,323.83
20 - 24 years	1,066,931.96	5,051,480.44	17,584.89	53,177.97	11,162.85	671,705.97	387,170.66	73,162.47	85,614.20	8,913.09	426,761.29	1,733,932.25
25 - 29 years	1,202,456.64	5,001,459.58	37,598.49	94,585.98	29,470.86	1,950,487.46	944,892.26	85,887.86	54,917.34	20,158.07	656,827.32	1,671,639.14
30 - 34 years	1,330,762.20	5,410,984.07	41,923.11	135,438.75	27,599.48	5,091,683.72	1,739,796.66	217,050.65	74,466.20	35,465.14	1,581,171.56	2,278,018.59
35 - 39 years	1,784,850.18	6,492,663.28	114,460.42	257,707.89	54,962.50	10,579,666.93	3,401,365.29	311,064.99	147,897.86	102,753.88	4,296,890.21	3,081,768.63
40 - 44 years	1,562,478.22	7,563,760.60	180,188.56	415,628.16	77,515.37	16,541,990.16	4,881,377.54	433,565.94	172,341.04	177,932.92	10,854,546.45	3,643,280.22
45 - 49 years	1,394,689.04	9,292,272.53	321,835.46	453,423.20	193,335.03	21,007,409.98	7,709,840.69	494,617.06	175,917.98	338,429.86	22,304,189.16	6,205,330.87
50 - 54 years	1,441,774.40	11,210,274.24	723,961.25	767,431.98	358,576.83	22,730,174.85	11,838,523.23	666,395.97	221,731.63	537,130.72	38,024,947.94	7,116,220.16
55 - 59 years	1,058,512.84	14,853,873.12	1,052,623.19	1,064,809.62	655,888.46	20,989,023.57	14,572,789.20	1,012,608.16	201,674.16	684,775.65	58,683,408.23	10,988,247.66
60 - 64 years	976,073.92	19,555,430.70	1,239,517.27	1,101,521.23	649,933.99	18,903,782.71	16,612,538.12	1,093,101.42	167,057.58	797,457.67	74,065,887.78	13,999,537.12
65 - 69 years	861,172.14	21,536,944.06	934,208.98	1,173,434.18	644,434.36	15,248,723.76	15,253,955.44	1,136,227.88	129,844.94	776,089.00	76,963,056.74	15,905,300.17
70 - 74 years	633,840.40	24,035,118.83	811,297.91	924,360.10	413,804.79	10,395,046.40	11,575,860.42	1,014,733.91	127,514.03	524,239.98	65,844,230.64	17,054,259.28
75 - 79 years	393,359.64	27,014,149.32	542,977.12	576,684.47	252,034.43	6,668,894.59	9,388,336.25	825,184.34	57,794.78	397,613.68	46,401,813.94	17,480,353.20
80+ years	393,615.56	67,263,546.56	443,362.63	411,136.19	187,529.98	5,227,698.51	8,252,457.67	979,500.82	48,226.07	309,634.31	38,061,752.24	27,930,500.72
Total women	14,602,275	229,554,113	6,470,881	7,477,403	3,559,096	156,334,550	106,720,605	8,366,413	1,772,946	4,731,868	438,254,620	130,529,712

	Cirrhosis and other chronic liver diseases due to alcohol use	Pancreatitis	Epilepsy	Road crashes	Accidental injuries	Intentionally self-inflicted injury and sequelae	Interpersona l violence and sequelae	Intracerebral hemorrhage	Alcohol use disorders	Hypertensio n	Alcohol cardiomyop athy	HIV/AIDS	TOTAL
Men													
15 - 19 years	1,660,276.46	152,359.89	1,195,804.42	22,856,327.82	31,481,199.03	348,723.86	7,106,540.26	1,338,186.12	0.00	126,772.49	0.00	273,158.12	84,032,187.90
20 - 24 years	1,868,579.09	386,660.54	1,209,654.32	40,485,207.51	49,238,386.99	728,703.23	11,639,222.87	1,612,094.70	0.00	276,293.35	0.00	1,641,229.15	130,278,262.06
25 - 29 years	2,954,915.35	687,861.01	1,376,292.59	31,990,112.33	43,730,159.48	549,124.45	9,449,914.97	1,728,364.80	0.00	282,624.52	803.72	3,323,465.21	119,846,405.87
30 - 34 years	3,788,322.68	1,226,564.04	1,311,067.45	28,130,530.37	45,121,615.93	598,303.59	9,151,227.00	2,389,788.93	0.00	315,046.58	3,860.32	3,941,974.04	124,302,934.23
35 - 39 years	5,437,231.27	1,377,104.72	1,526,604.53	24,344,372.00	46,398,956.14	485,017.00	7,258,931.83	3,581,089.45	0.00	501,895.04	4,147.92	4,935,285.51	136,380,627.99
40 - 44 years	9,091,491.36	1,727,913.20	1,372,091.70	21,492,779.47	43,947,112.83	464,813.45	5,770,609.98	5,210,941.77	0.00	808,562.03	22,103.14	4,665,053.77	153,533,814.71
45 - 49 years	14,246,006.92	1,792,160.90	1,518,810.53	17,546,597.45	40,144,252.01	449,336.89	4,036,313.88	7,328,950.01	0.00	1,213,470.41	25,103.65	4,309,763.59	183,643,555.69
50 - 54 years	24,200,792.03	1,487,633.12	1,736,495.85	15,772,009.01	39,719,768.04	323,939.82	3,524,030.33	8,861,880.98	0.00	1,539,533.22	33,355.14	3,583,942.49	244,408,126.73
55 - 59 years	31,965,745.09	1,714,056.36	1,489,858.57	11,938,348.91	35,748,206.31	260,416.18	2,297,494.96	11,270,912.31	0.00	2,027,147.13	22,682.43	2,308,206.82	302,347,081.97
60 - 64 years	33,142,880.64	1,208,172.98	1,138,054.50	8,716,801.54	32,334,424.58	195,326.19	1,748,659.24	11,545,472.18	0.00	2,119,475.16	34,298.05	1,339,568.01	330,791,420.12
65 - 69 years	21,804,661.18	1,187,818.63	978,218.24	6,460,726.08	26,326,630.84	114,374.22	1,118,971.63	11,241,938.46	0.00	2,314,222.58	5,577.55	833,505.74	296,813,223.57
70 - 74 years	7,078,914.09	810,068.07	811,024.08	3,746,954.03	21,934,608.16	125,366.15	869,292.06	9,855,600.67	0.00	1,712,024.12	22,581.84	290,701.46	232,107,708.82
75 - 79 years	1,876,957.18	570,496.57	621,665.54	2,765,682.46	20,514,186.69	83,277.41	445,857.88	7,083,200.83	0.00	1,265,517.74	2,847.73	172,423.72	170,234,554.31
80+ years	1,216,644.10	782,503.99	664,896.14	3,057,709.94	34,291,064.25	58,606.37	463,415.23	6,314,328.44	0.00	1,534,503.92	4,185.42	109,165.29	190,571,918.35
Total men	160,333,417	15,111,374	16,950,538	239,304,159	510,930,571	4,785,329	64,880,482	89,362,750	0	16,037,088	181,547	31,727,443	2,699,291,822
Women													
15 - 19 years	2,953,461.73	348,479.56	1,183,824.61	5,307,356.37	8,203,696.45	390,427.39	813,172.03	507,058.16	0.00	228,889.94	0.00	316,586.94	36,154,478.27
20 - 24 years	3,422,890.45	836,929.34	1,159,011.25	8,226,748.17	11,998,574.96	378,130.22	1,173,572.35	1,056,977.69	0.00	438,159.31	0.00	1,016,003.19	47,870,382.97
25 - 29 years	2,664,941.76	809,163.01	904,128.04	6,558,766.06	11,347,706.13	344,294.46	1,014,321.42	1,261,024.69	0.00	406,103.19	1,433.11	1,540,242.44	47,121,875.31
30 - 34 years	3,768,685.19	856,708.38	900,592.90	5,963,764.13	12,439,757.27	276,290.24	1,188,806.90	2,592,259.06	0.00	580,518.05	0.00	2,142,875.20	57,383,615.45
35 - 39 years	4,494,700.75	1,129,562.98	962,268.45	5,799,581.20	12,770,096.76	377,921.09	1,171,843.96	5,410,580.55	0.00	819,602.65	1,713.55	2,592,883.04	74,768,408.04
40 - 44 years	4,719,896.98	886,035.28	1,090,117.80	5,021,297.11	13,239,943.38	321,996.02	716,326.45	8,131,083.81	0.00	1,016,630.56	0.00	2,190,819.21	91,693,514.78
45 - 49 years	6,400,033.44	1,043,626.91	956,545.52	4,172,954.65	13,872,310.83	288,591.36	712,847.34	11,389,363.08	0.00	1,238,341.82	5,625.18	2,103,893.34	119,037,325.33
50 - 54 years	8,374,233.83	1,111,368.41	1,072,018.81	3,971,781.24	16,580,188.70	284,107.28	586,646.82	14,418,269.21	0.00	1,407,667.84	2,137.21	1,437,795.75	151,383,419.30
55 - 59 years	10,641,510.06	1,096,654.11	1,009,622.75	3,368,704.27	18,458,716.14	245,822.77	484,991.60	15,664,420.98	0.00	1,505,313.24	2,624.21	1,005,729.40	185,127,583.39
60 - 64 years	12,044,833.28	1,098,091.14	833,179.67	2,610,122.79	21,497,059.07	211,668.61	373,457.65	15,615,397.42	0.00	1,565,452.25	0.00	631,901.35	210,520,609.73
65 - 69 years	9,672,219.25	983,680.47	657,149.63	2,501,999.43	23,539,931.66	146,080.46	395,903.40	12,477,954.98	0.00	1,835,753.94	10,324.63	468,579.37	207,117,222.84
70 - 74 years	5,036,719.69	810,599.41	670,271.73	2,308,315.11	26,813,216.15	55,025.31	284,829.60	9,780,830.40	0.00	1,806,961.11	0.00	167,993.10	183,966,159.30
75 - 79 years	1,599,943.71	635,834.15	577,882.34	2,080,503.61	30,010,287.25	39,568.94	210,809.28	7,187,192.47	0.00	1,749,578.27	2,401.00	73,029.74	156,162,104.52
80+ years	1,194,242.58	1,015,726.03	809,101.60	3,319,701.22	72,476,291.63	124,677.44	355,564.50	7,627,618.19	0.00	2,978,709.08	11,058.49	51,966.24	242,116,126.25
Total women	76,988,313	12,662,459	12,785,715	61,211,595	293,247,776	3,484,602	9,483,093	113,120,031	0	17,577,681	37,317	15,740,298	1,810,422,825

Supplementary Table 4. Total days of hospitalization by alcohol-related diseases in Brazil by sex and age group, 2019.

	Tuberculosis	Lower respiratory diseases	Esophagus cancer	Liver cancer due to alcohol use	Laryngeal cancer	Breast cancer	Colon and rectum cancer	Lip and oral cavity cancer	Nasopharyngeal cancer	Other pharyngeal cancers	Ischemic heart disease	Atrial fibrillation and flutter
Men												
15 - 19 years	196,281	3,720	2,372	14,136	279	47	49,896	8,574	24,007	4,712	53,337	85,422
20 - 24 years	638,180	22,553	15,717	7,533	326	651	72,449	12,898	19,674	3,094	121,972	83,562
25 - 29 years	897,144	78,261	8,277	14,462	2,232	1,023	113,648	21,573	22,414	7,257	176,611	93,188
30 - 34 years	1,062,734	172,147	20,879	23,390	11,904	2,232	163,777	22,318	17,414	18,719	340,666	105,371
35 - 39 years	1,299,889	346,804	45,803	31,109	27,017	3,209	271,705	47,292	25,885	32,939	809,768	172,007
40 - 44 years	1,490,264	498,444	141,317	41,804	82,260	2,883	428,414	92,567	28,533	101,501	1,637,393	227,064
45 - 49 years	1,158,293	706,397	345,223	86,817	182,051	8,882	673,148	197,097	38,084	245,454	3,160,347	321,787
50 - 54 years	1,178,242	789,633	579,077	162,940	340,806	16,136	1,084,636	317,786	45,025	378,788	5,556,497	465,103
55 - 59 years	1,236,555	847,434	782,565	249,013	478,077	26,087	1,437,811	409,787	47,245	489,310	7,747,253	680,496
60 - 64 years	716,766	683,890	783,867	249,431	506,861	15,717	1,621,257	401,872	49,632	462,334	9,418,127	928,997
65 - 69 years	457,291	468,591	719,324	254,267	444,317	22,088	1,653,436	312,324	45,391	329,105	8,782,318	1,080,544
70 - 74 years	212,556	224,414	498,863	230,877	277,146	19,902	1,374,802	195,816	24,506	204,930	6,757,060	1,094,448
75 - 79 years	149,594	133,411	264,451	134,667	179,354	36,364	950,620	135,622	13,095	116,292	4,607,133	1,016,837
80+ years	89,468	81,935	234,598	88,491	149,222	10,463	791,075	129,008	4,791	80,292	3,491,900	1,487,009
Total men	10,783,256	5,057,635	4,442,334	1,588,939	2,681,852	165,683	10,686,674	2,304,533	405,696	2,474,726	52,660,383	7,841,836
Women												
15 - 19 years	152,492	1,879	1,734	8,092	217	12,211	18,822	3,401	15,749	3,104	16,113	42,341
20 - 24 years	495,807	10,296	4,010	9,032	650	25,831	33,670	5,249	6,142	639	33,670	66,799
25 - 29 years	696,998	20,050	4,588	8,129	1,264	103,468	81,936	7,711	4,930	1,810	52,240	57,153
30 - 34 years	825,646	30,889	6,467	14,993	1,228	274,132	153,287	18,010	6,179	2,943	124,530	65,643
35 - 39 years	1,009,894	54,696	17,522	27,962	3,829	548,878	260,873	25,708	12,223	8,492	311,379	108,634
40 - 44 years	1,157,798	71,279	26,481	48,157	6,864	869,685	392,195	33,951	13,495	13,933	723,299	124,927
45 - 49 years	899,887	101,553	56,286	56,972	17,449	1,047,828	608,523	44,382	15,785	30,367	1,335,904	226,011
50 - 54 years	915,386	101,589	97,290	101,372	32,514	1,217,335	886,629	52,263	17,389	42,125	2,206,168	277,781
55 - 59 years	960,689	97,109	148,193	123,807	47,977	1,145,696	1,114,735	86,204	17,169	58,295	3,211,401	378,792
60 - 64 years	556,862	97,579	159,537	147,868	60,404	1,108,449	1,258,592	90,242	13,792	65,835	3,947,092	537,678
65 - 69 years	355,273	72,760	145,014	146,603	48,013	892,554	1,175,067	88,442	10,107	60,410	4,158,471	667,230
70 - 74 years	165,137	41,943	122,471	131,322	38,548	615,857	888,291	78,995	9,927	40,811	3,588,350	730,741
75 - 79 years	116,221	32,406	88,150	90,751	22,435	429,080	728,031	53,589	3,753	25,822	2,691,172	764,628
80+ years	69,508	19,039	88,078	86,741	24,783	432,512	732,836	77,236	3,803	24,416	2,717,762	1,360,723
Total women	8,377,598	753,067	965,819	1,001,802	306,176	8,723,514	8,333,487	665,383	150,444	379,002	25,117,550	5,409,079

	Cirrhosis and other chronic liver diseases due to alcohol use	Pancreatitis	Epilepsy	Road crashes	Accidental injuries	Intentionally self-inflicted injury and sequelae	Interpersonal violence and sequelae	Intracerebral hemorrhage	Alcohol use disorders	Hypertension	Alcohol cardiomyopathy	HIV/AIDS	TOTAL
Men													
15 - 19 years	3,720	58,126	329,599	4,077,115	5,684,282	76,913	1,183,962	195,723	0	46,222	0	132,667	12,231,112
20 - 24 years	22,553	145,316	326,530	7,063,502	8,252,858	122,344	1,831,814	176,843	0	53,988	0	802,561	19,796,917
25 - 29 years	78,261	241,852	471,241	5,835,782	7,704,425	108,859	1,520,490	199,257	0	76,913	465	1,730,442	19,404,077
30 - 34 years	172,147	461,987	471,009	5,427,178	8,236,815	121,461	1,412,747	291,003	0	107,510	1,581	1,958,111	20,623,100
35 - 39 years	346,804	578,658	533,506	4,898,183	8,681,039	105,511	1,203,632	439,016	0	164,567	744	2,480,642	22,545,731
40 - 44 years	498,444	697,468	542,574	4,277,813	8,560,090	100,024	942,994	649,898	0	268,543	3,953	2,361,739	23,675,984
45 - 49 years	706,397	669,568	584,099	3,642,981	8,187,943	84,725	704,862	994,470	0	346,711	7,022	2,040,882	25,093,242
50 - 54 years	789,633	616,975	623,253	3,146,165	7,856,483	65,427	575,961	1,353,133	0	550,711	7,719	1,750,856	28,250,985
55 - 59 years	847,434	649,758	524,764	2,470,040	7,261,875	55,569	446,084	1,739,742	0	678,822	8,882	1,124,766	30,239,368
60 - 64 years	683,890	487,377	490,911	1,706,075	6,326,787	49,989	244,270	1,835,441	0	785,262	5,301	670,312	29,124,367
65 - 69 years	468,591	461,476	326,856	1,195,169	5,047,544	27,250	186,795	2,050,973	0	822,928	1,721	380,704	25,539,000
70 - 74 years	224,414	322,717	313,649	685,657	3,951,283	17,531	100,907	1,719,049	0	779,264	3,534	137,317	19,370,643
75 - 79 years	133,411	285,144	203,674	518,393	3,368,021	15,578	58,684	1,196,006	0	577,635	605	69,565	14,164,158
80+ years	81,935	300,722	253,477	510,116	5,630,016	15,113	51,570	1,289,938	0	803,956	651	28,366	15,604,108
Total men	5,057,635	5,977,146	5,995,141	45,454,169	94,749,461	966,291	10,464,771	14,130,491	0	6,063,033	42,176	15,668,930	305,662,791
Women													
15 - 19 years	1,879	121,712	270,338	3,167,543	4,416,164	59,754	919,830	58,526	0	58,923	0	80,708	9,431,531
20 - 24 years	10,296	266,075	250,721	5,487,691	6,411,712	95,050	1,423,151	84,646	0	114,089	0	284,464	15,119,691
25 - 29 years	20,050	303,936	183,345	4,533,866	5,985,630	84,573	1,181,281	116,004	0	123,735	361	494,326	14,067,384
30 - 34 years	30,889	328,792	212,246	4,216,418	6,399,248	94,364	1,097,574	227,167	0	186,343	0	702,490	15,019,475
35 - 39 years	54,696	359,030	248,951	3,805,438	6,744,369	81,972	935,111	371,675	0	251,733	1,192	938,218	16,182,475
40 - 44 years	71,279	322,181	314,341	3,323,467	6,650,403	77,709	732,619	577,129	0	281,935	0	810,545	16,643,673
45 - 49 years	101,553	336,378	247,723	2,830,261	6,361,278	65,823	547,613	821,962	0	342,701	1,698	691,326	16,789,265
50 - 54 years	101,589	366,436	248,409	2,444,281	6,103,765	50,831	447,469	1,005,920	0	421,602	903	603,068	17,742,114
55 - 59 years	97,109	372,903	289,666	1,918,994	5,641,809	43,172	346,566	1,091,469	0	479,478	1,120	368,315	18,040,668
60 - 64 years	97,579	334,030	241,581	1,325,464	4,915,331	38,837	189,775	1,194,901	0	538,112	0	237,138	17,156,676
65 - 69 years	72,760	309,717	167,268	928,536	3,921,477	21,170	145,122	1,201,801	0	859,497	3,071	172,832	15,623,193
70 - 74 years	41,943	250,758	174,313	532,693	3,069,783	13,620	78,396	1,062,567	0	801,188	0	65,245	12,542,897
75 - 79 years	32,406	214,847	135,440	402,744	2,616,642	12,103	45,592	934,425	0	800,683	145	39,523	10,280,588
80+ years	19,039	316,292	243,496	396,313	4,374,004	11,741	40,065	1,566,286	0	1,408,989	1,048	12,211	14,026,922
Total women	753,067	4,203,087	3,227,839	35,313,709	73,611,617	750,719	8,130,165	10,314,475	0	6,669,008	9,538	5,500,408	208,666,553

Supplementary Table 5. Social security costs by alcohol-related diseases in Brazil by sex and age group, 20199.

	Tuberculosis	Lower respiratory diseases	Esophagus cancer	Liver cancer due to alcohol use	Laryngeal cancer	Breast cancer	Colon and rectum cancer	Lip and oral cavity cancer	Nasopharyngeal cancer	Other pharyngeal cancers	Ischemic heart disease	Atrial fibrillation and flutter
Men												
15 - 19 years	103,529	10,644		998			4,223			4,990	3,046	
20 - 24 years	785,915	176,404		3,398		998	32,305	8,644		11,573	44,125	5,855
25 - 29 years	870,952	298,392	7,170	16,437	2,640	5,781	126,201	23,134	1,901	10,222	112,317	16,241
30 - 34 years	826,052	364,485	18,242	10,788	998	19,181	240,274	58,152	2,972	30,015	329,998	32,558
35 - 39 years	858,616	386,201	36,352	31,382	25,521	28,393	554,107	74,439	4,926	57,137	963,824	53,399
40 - 44 years	887,903	548,258	91,956	61,529	64,205	64,641	913,248	169,156	17,670	137,016	2,320,001	100,007
45 - 49 years	951,442	530,870	203,601	127,856	177,023	101,086	1,652,200	346,517	44,904	262,877	5,502,909	191,005
50 - 54 years	1,007,058	678,738	444,436	217,548	451,264	121,674	2,451,425	576,941	121,402	435,831	10,533,359	312,792
55 - 59 years	919,911	634,587	605,235	365,991	572,165	88,181	2,770,228	652,598	141,170	455,562	12,564,357	478,097
60 - 64 years	490,892	438,962	411,291	253,720	527,726	46,796	1,982,326	465,781	113,756	326,720	9,544,821	324,290
65 - 69 years	84,321	82,987	76,359	49,164	71,373	6,013	391,077	72,310	10,399	43,664	1,593,303	58,674
70 - 74 years	13,804	10,002	3,341	5,107	1,996		81,057	9,567	1,932	5,988	203,586	19,120
75 - 79 years	1,607			1,415	998		14,780	5,153			42,595	
80+ years		998			998		5,690	1,410			17,439	
Total men	7,802,002	4,161,528	1,897,983	1,145,333	1,896,908	482,746	11,219,142	2,463,801	461,032	1,781,596	43,775,679	1,592,039
Women												
15 - 19 years	99,838	11,267		998		998				998	2,878	
20 - 24 years	427,745	111,027		6,748		52,646	16,888	7,172		9,452	18,449	
25 - 29 years	535,293	237,939	1,728	10,089	998	585,995	109,067	39,398		15,801	76,332	
30 - 34 years	519,552	333,440		13,185	4,039	1,783,193	234,358	44,285		12,403	248,093	18,249
35 - 39 years	479,449	388,086	7,720	28,763	10,371	3,863,698	520,614	63,863		28,219	705,779	20,846
40 - 44 years	446,015	441,359	17,939	56,609	14,621	5,874,841	792,314	86,390	3,098	28,930	1,522,603	36,236
45 - 49 years	431,409	493,988	38,402	70,743	15,475	7,636,861	1,228,796	113,104	4,230	33,739	2,436,650	60,459
50 - 54 years	431,853	456,912	77,347	92,312	40,889	7,811,630	1,644,176	121,312	8,483	65,504	2,683,151	85,177
55 - 59 years	304,925	369,228	96,097	98,804	51,401	5,465,010	1,676,070	150,625	17,794	42,897	1,497,085	120,613
60 - 64 years	105,647	130,387	59,336	57,474	24,423	1,963,454	681,931	67,060	2,418	36,798	468,023	67,519
65 - 69 years	19,288	54,070	13,035	32,354	4,990	658,216	239,795	16,050	3,587	4,176	113,368	17,460
70 - 74 years	7,984	11,525		3,023		133,781	60,927	2,994	2,511	4,568	30,871	3,992
75 - 79 years	1,996	7,618		1,996		20,991	12,974	1,996			3,992	2,994
80+ years		4,182				5,988	3,992					1,996
Total women	3,810,995	3,051,027	311,604	473,098	167,207	35,857,303	7,221,904	714,249	42,121	283,486	9,807,273	435,542

	Cirrhosis and other chronic liver diseases due to alcohol use	Pancreatitis	Epilepsy	Road crashes	Accidental injuries	Intentionally self-inflicted injury and sequelae	Interpersonal violence and sequelae	Intracerebral hemorrhage	Alcohol use disorders	Hypertension	Alcohol cardiomyopathy	HIV/AIDS	TOTAL
Men													
15 - 19 years			67,864	43,207	23,379	2,362	24,456	11,269	998	3,250		1,996	8,491,273
20 - 24 years	3,186	26,418	274,535	218,756	118,246	6,303	154,396	30,909	66,818	43,565		32,225	10,788,639
25 - 29 years	7,880	53,320	378,100	184,883	157,331	10,231	187,500	86,624	155,828	73,963		109,175	11,381,757
30 - 34 years	51,072	152,806	440,228	146,473	174,142	9,757	152,713	132,440	386,537	167,432		161,010	12,457,646
35 - 39 years	83,533	241,977	559,009	147,499	219,515	15,834	157,567	192,504	598,137	246,648	998	214,324	14,012,585
40 - 44 years	170,045	294,720	687,569	122,573	169,753	19,561	134,890	301,798	812,790	534,876	6,480	190,549	16,221,944
45 - 49 years	370,426	331,008	724,451	99,841	182,805	17,356	124,369	508,610	1,140,710	749,925	7,148	129,942	20,951,056
50 - 54 years	566,062	393,836	894,404	96,050	173,394	4,641	106,396	659,356	1,216,654	1,281,191	7,111	147,981	28,864,810
55 - 59 years	494,969	281,447	660,937	52,754	153,532	6,181	88,376	578,182	944,616	1,630,548	7,654	90,889	30,425,041
60 - 64 years	295,510	130,570	383,196	46,088	74,455	2,451	49,494	369,811	474,601	1,376,770	2,994	48,053	22,395,377
65 - 69 years	48,189	21,575	53,420	1,996	13,653	1,045	6,679	62,704	63,362	284,216		9,720	6,323,630
70 - 74 years	9,683	998		998			1,560	8,827	13,564	70,344			2,758,770
75 - 79 years								3,422		13,470			1,568,098
80+ years							998	1,732		13,602			1,666,919
Total men	2,100,553	1,928,675	5,123,713	1,161,119	1,460,204	95,723	1,189,393	2,948,189	5,874,615	6,489,801	32,384	1,135,865	188,307,544
Women													
15 - 19 years		6,986	51,779	19,014	7,692	998	2,994	2,994		2,307		998	8,107,142
20 - 24 years	1,007	38,477	212,371	58,432	31,293	11,387	17,808	28,231	3,319	66,175		6,449	9,700,866
25 - 29 years	1,996	97,230	240,090	53,222	69,759	12,738	30,129	74,796	17,400	126,576		14,272	10,870,220
30 - 34 years		116,041	265,433	62,332	56,869	10,161	32,707	110,593	34,939	227,745		47,353	12,883,969
35 - 39 years	2,100	166,905	299,005	61,670	69,034	14,917	28,435	185,712	61,496	266,410		48,785	15,933,478
40 - 44 years	21,864	165,229	357,929	49,046	89,112	15,639	22,356	302,850	84,716	404,563		87,197	18,776,218
45 - 49 years	26,526	191,226	379,768	32,484	93,596	14,946	25,114	398,219	113,608	512,324		54,636	21,368,205
50 - 54 years	23,810	125,012	367,277	27,687	101,320	3,996	20,564	514,426	88,157	808,952		50,408	22,150,417
55 - 59 years	30,319	108,976	253,949	21,425	62,257		16,003	334,902	57,942	718,533		36,528	17,356,624
60 - 64 years	9,649	43,236	78,178	2,994	11,720		5,851	140,015	10,778	528,235	998	10,737	9,384,470
65 - 69 years	1,996	7,162	10,561		11,308		998	23,190	1,008	189,738		5,195	5,291,797
70 - 74 years		998	6,104		1,996		2,994	2,831		57,882			3,212,072
75 - 79 years		998	998				998	1,996		18,215			2,073,640
80+ years							998			7,265			2,666,929
Total women	119,267	1,068,476	2,523,442	388,306	605,957	84,782	207,950	2,120,756	473,364	3,934,922	998	362,558	159,776,047

