



EXECUTIVE SUMMARY

# **AYAHUASCA** **GLOBAL** **CONSUMPTION** **& REPORTED** **DEATHS**

A rough estimate of the number of people drinking ayahuasca worldwide and analysis of fatalities reported in the media.

JUNE 2023





**A Project of**

International Center for Ethnobotanical Education, Research and Service (ICEERS)

**Project Research & Development**

Carlos Suárez Álvarez

**Project Developer**

Jerónimo Mazarrasa

**Editor**

Ricard Faura

**Final Review**

José Carlos Bouso

**Proofreading**

Igor Domsac

**English Translation, Editing & Styling**

Sarah Russo

**Design**

Álex Verdaguer

June 2023

More information:

**info@iceers.org**

[www.iceers.org](http://www.iceers.org)



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**1**

# **INTRODUCTION**

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# **1. Introduction**

For years, a number of concerns have been raised in the field of ayahuasca research that, so far, no one has tried to systematically resolve. The first consideration:

**How many people in the world have taken ayahuasca in their lifetime? How many people take ayahuasca each year? How many servings of ayahuasca are taken each year?**

**And another important question:**

**What do we know about the deaths the media has attributed to ayahuasca?**

It seems that answering the first question by estimating the prevalence of ayahuasca consumption globally is valuable to understand ayahuasca's expansion and its social, economic, and environmental implications. Comparing these numbers alongside an analysis of the deaths the media attributed to ayahuasca would amplify the value of this information collectively. It can also help shed light on the alleged danger of ayahuasca which can be a tool to guide public policies.

With this idea in mind, the authors conducted research between 2021 and 2022 that tried to fill in these gaps of information. This document offers an executive summary with the most significant data we found. We invite anyone interested in following all the data and methodology in detail to request the [full report here](#).

## **1.1 Methodology**

In order to answer the different research questions the following methodology was developed:

### **An estimate of ayahuasca consumption**

This report provides an estimate of the prevalence of ayahuasca use in the Americas, Europe, Australia, and New Zealand. This gathered information was based on reviewing and analyzing national drug use statistics, academic research, and estimates made by researchers in the field. From there, we determined the prevalence rates for eight countries and made a global extrapolation based on that information.

Presently the governments in only four countries worldwide have asked about ayahuasca in their national drug use surveys: Brazil, Colombia, Spain, and the Czech Republic. In the case of the United States, the country's survey on drug use does not specifically ask about ayahuasca. However, we were able to make an estimate with the microdata we had access to. We conducted a survey in the Netherlands thanks to LIAAN (a Dutch association focused on education, harm reduction, and the creation of social cohesion in the ayahuasca field). Collaborating with researchers Juan Scuro in Uruguay and Helle Kaasik in Estonia allowed us to obtain reliable data from both countries. To reach a global estimate of how many ayahuasca drinkers there are, we used these statistics as a starting point and extrapolated them to neighboring countries with similar sociocultural characteristics.

It should be noted that our calculation has not taken into account the consumption in places like India, Japan, China, the African continent, or elsewhere. Although we know that there is also ayahuasca activity in these countries, we were not able to get sufficient information to make an estimate.

In addition to determining the number of people who have had ayahuasca in their lifetime, we wanted to estimate how many take it each year with a focus on 2019. When this research began, 2019 would have been the year of the highest global consumption in history. It is likely that these rates will have been surpassed in 2022.

In addition to the quantitative analysis, we did a qualitative characterization of the typical profile of ayahuasca users. We turned to the *Global Survey of Ayahuasca Drinking (GSAD)* to accomplish this, which is a multidisciplinary research project led by the University of Melbourne in collaboration with ICEERS, Multidisciplinary Association for Psychedelic Studies (MAPS), Psychedelic Research in Science and Medicine (PRISM), MIND Foundation, the University of Campinas, the University of Zurich, Mendel University in Brno, and the Federal University of São Paulo.

The *GSAD* is an online survey created to define ayahuasca drinkers around the world. It collected information from almost 11,000 people from more than 50 countries. Thanks to *GSAD* we have been able to go beyond the “how much” and profile the who, how, when, and where. Although the *GSAD* provides valuable data, it should be noted that the sample is not representative of the general population. This is because the questions were not selected by those who designed the survey, and the people who responded self elected.

### **Deaths attributed to ayahuasca**

We wanted to compare the above data to the deaths that the media associated with ayahuasca. We conducted an exhaustive search in newspapers, magazines, blogs, books, television news segments, scientific articles, and others. We closely examined publications that attributed any death to ayahuasca across various dates and locations worldwide. We tried to clarify from the available information to what extent and in what way ayahuasca had something to do with the reported deaths. For this section we had the participation of Rafael Guimarães dos Santos, who reported several cases of deaths in Brazil and made a preliminary analysis.

## **1.2 Methodological limitations and indicative value**

It is important to highlight the methodological limitations of this study and, therefore, the results. Determining the number of people who drink ayahuasca globally required making a series of assumptions and extrapolations that would not pass a standard academic review but, in our opinion, have an extensive indicative value.

The analysis of these deaths was largely based on newspaper reports, which makes it difficult to identify the circumstances of these events and establish causes. Our analysis was not able to account for the hypothetical deaths potentially related to ayahuasca but not reported by the media.

A detailed critique of the methodology limitations can be found in the general report. Despite the limitations, we consider this work to be a valuable starting point that can be developed as new data and research become available in the future.

The findings offered in this report should be considered a rough estimate to offer guidance. This information does not accurately represent the reality of worldwide ayahuasca consumption. We are aware of our limitations and invite individuals and research institutions to send us their suggestions and critiques. The ultimate goal would be to use our work as a basis for a deeper, more accurate analysis.

**2**

**PREVALENCE  
OF AYAHUASCA USE  
IN THE WORLD**

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## **2. Prevalence of ayahuasca use in the world**

Our methodology to estimate ayahuasca consumption in the world is based on official statistics available in different countries and, secondly, on estimates made *ad hoc* for this report. We first present information on eight countries, ordered according to the prevalence of consumption compared to the total population: Colombia (0.8%), United States (0.5%), Czech Republic (0.5%), Netherlands (0.42%), Brazil (0.37%), Uruguay (0.33%), Estonia (0.27%) and Spain (0.2%). We then extrapolated this information to find an estimated figure for the Americas, Europe, Australia, and New Zealand. Finally, we analyzed the data for ayahuasca retreat centers in the Amazon and Costa Rica.

### **2.1 Prevalence of consumption by country**

#### **Colombia**

Ayahuasca has been spreading from the jungle to urban centers in Colombia for decades. Therefore, it is not surprising that the *2019 National Survey on Psychoactive Substance Consumption (ENCSPA)* included *yagé* (as ayahuasca is called in Colombia) among the studied substances.<sup>1</sup>

According to the *ENCSPA*, **0.8% of the Colombian population has consumed *yagé* at least once in their lifetime.** This is the highest prevalence of consumption we have found in countries with data available. This implies that **about 300,000 people have consumed *yagé* in Colombia. Data from 2019 shows that almost 60,000 people (0.15% of the population) consumed ayahuasca that year,** amounting to a total of 400,000 servings.<sup>2</sup>

The survey, conducted by the National Administrative Department of Statistics (DANE), also provides sociodemographic information. A breakdown by gender shows that 0.9% of men consumed *yagé* at some time in their lives, while the prevalence among women was 0.6%. This gender balance contrasts with other substances. For cocaine, the prevalence among men is 3.4% compared to 0.9% in women. In regards to cannabis, 12.3% of men use it compared to 4.6% of women. Another significant fact is the age at which consumption usually starts: 26.9 years for *yagé*, compared to 18.2 for cannabis, 19 for cocaine, and age 20 for ecstasy.

The *GSAD* offered data on the people living in Colombia who responded via an online survey. Seventy percent (70%) of those who consumed *yagé* had at least a university degree. Of those, 63.5% held managerial positions or worked in liberal professions. In addition, most people had taken *yagé* five times or less. As we will see below, this sociodemographic profile is very similar to most of the countries that ayahuasca has expanded to.

**About 300,000 people have consumed *yagé* in Colombia.**

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<sup>1</sup> For detailed information on how the various calculations have been made for Colombia, refer to chapter IV of the general report.

<sup>2</sup> "Servings" refers to a ritual experience limited in time, usually one night, in which a person consumes one or several cups of ayahuasca to reach an altered state of consciousness.

## The United States

We believe the United States is the country where the most people in the world have consumed ayahuasca in their lifetime. The *National Survey on Drug Use and Health* does not specifically ask about ayahuasca use because it is not one of the nine default options in the “hallucinogens” section of the survey. The choices are 1) LSD, 2) PCP, 3) peyote, 4) mescaline, 5) psilocybin, 6) ecstasy, “molly”, or MDMA, 7) ketamine, 8) DMT, AMT, foxy or 5-MeO-DiPT and 9) *Salvia divinorum*. However, the respondent was able to specify whether they have used any other “hallucinogens” at the end of the survey. An analysis of this data, collected in the code books, gave us the estimate that **0.5% of the U.S. population (more than 1,300,000 people) has taken ayahuasca at some point in their lives. In addition, we estimated that 200,000 people took ayahuasca in 2019**, which amounted to approximately 1,250,000 total servings of ayahuasca.<sup>3</sup>

**0.5% of the U.S. population (more than 1,300,000 people) has taken ayahuasca at some time in their lives.**

The information collected by the *GSAD* provides a detailed profile of ayahuasca users in the United States. A majority (66.5%) got a university degree or postgraduate degree. Of those, 62.9% had managerial or professional jobs. As for the number of times they drank ayahuasca in their lifetime, 44.3% took it five times or less, with one time being the most common frequency. This coincides with the pattern of consumption in other countries. Finally, people

from the USA mostly consume in their country (62.2% or 800,000 people). This is followed by Peru (21.2% or 275,000 people) and Costa Rica (6% or 80,000 people) which are the two main destinations of “ayahuasca tourism.”<sup>4</sup>

## Czech Republic

In the Czech Republic the *Prevalence Drug Use 2018* report was conducted from a representative sample of the adult population. According to this survey, it can be stated (with 95% certainty) that **between 0.5% (34,000 people) and 1.5% (99,500) of the Czech population over the age of 15 have tried ayahuasca once in their lifetime**. Between 0.03% (2,300 people) and 0.58% (38,600) had it within twelve months prior to the survey.

Taking a conservative approach, our estimate for the Czech Republic used the lower end of the range. About **34,000 people would have taken ayahuasca sometime in their lives and almost 7,000 people did in 2018, a year that the estimated number of ayahuasca servings was around 20,000.**<sup>5</sup>

## The Netherlands

Drug use surveys in the Netherlands do not ask about ayahuasca. Our consumption rate estimates have been made through our collaboration with LIAAN, a Dutch association previously mentioned. They unite numerous people and organizations offering ayahuasca in a ritual context.

<sup>3</sup> For detailed information on how the various calculations were made for the United States, please refer to Chapter V of the general report.

<sup>4</sup> See section “2.2. Monographic analysis of ayahuasca retreat centers” in the general report for more information

<sup>5</sup> Refer to Chapter VIII of the general report for further information on how the various calculations were made for the Czech Republic.

Thanks to LIAAN, we were able to conduct a survey that allowed us to estimate that **0.42% of the Dutch population (around 60,000 people) over 15 years of age has taken ayahuasca or anahuasca at some point in their lives.**<sup>6</sup> We decided to measure ayahuasca and anahuasca together because it is very common to see ayahuasca ceremonies advertised in the Netherlands when it is actually anahuasca being offered, without informing participants of it.<sup>7</sup>

The percentage of people who would have specifically taken ayahuasca in the Netherlands once in their lifetime is estimated to be 0.28% of the population (or 40,000 people). Of those, an estimated 12,000 people would have taken it in 2019, a year in which about 25,000 servings of ayahuasca and 12,000 of anahuasca were consumed.

The GSAD data helped define the sociodemographic data of people taking ayahuasca in the Netherlands. For example, 87.6% took ayahuasca within their own country. Around 71.6% had a university degree or postgraduate degree. Of those, 64.6% were in liberal professions or held leadership positions. The average age that people in the Netherlands started using ayahuasca was at 36 years old.

## Brazil

Brazil is one of the quintessential ayahuasca countries, both because of the shamanic traditions of its Indigenous peoples reaching the cities, and because of the country having three traditional ayahuasca churches: the União do Vegetal, the Santo Daime and the Barquinha. In addition, there has been an intense development of neo-shamanic ayahuasca approaches.

Perhaps because of its importance, the Brazilian government asked about ayahuasca use in the *Third National Survey on Drug Use in the Brazilian Population*. Therefore, it was reported **in 2015 0.37% of Brazilians (567,000 people) between 12 and 65 years old took ayahuasca once in their lifetime.** The year before the survey was conducted, 0.12% (181,000 people) consumed ayahuasca and 0.08% (118,000 people) did so in the month before the survey.<sup>8</sup>

Our calculations suggest that an approximate total of 2,600,000 servings of ayahuasca were taken in Brazil in 2015 based on the information available. This number is high because ayahuasca churches hold several rituals each month.

**0.37% of Brazilians (567,000 people) between 12 and 65 years old took ayahuasca once in their lifetime.**

## Uruguay

The estimate in Uruguay was counted in collaboration with the anthropologist Juan Scuro, who is highly knowledgeable about the ayahuasca movement in this country of three and a half million people. Scuro put us in contact with people and organizations holding ayahuasca ceremonies on a regular basis. This allowed us to calculate that just over 9,000 people, or **0.33% of the Uruguayan population over 15 years of age took ayahuasca at some time in their lives.** In 2019, 7,000 servings were consumed, which were administered to more than 1,800 different people.<sup>9</sup>

<sup>6</sup> Refer to Chapter VI of the general report for detailed information on how the various calculations were made for the Netherlands.

<sup>7</sup> Anahuasca is a generic term for any "ayahuasca analog" that instead of the usual formula (*Banisteriopsis caapi* and *Psychotria viridis* or *Diplopterys cabrerana*) combines other plants that share similar active principles, most frequently *Peganum harmala* and *Mimosa hostilis* (popularly known as *jurema*) or various types of acacia (*Acacia* spp.).

<sup>8</sup> Refer to Chapter VIII of the general report for further information on how the calculations for Brazil were made.

<sup>9</sup> Refer to chapter VIII of the general report for detailed information on how the various calculations for Uruguay were made.

## Estonia

We owe our estimate of ayahuasca use in Estonia to the researcher Helle Kaasik, who has a deep knowledge of the movement in her country. Estonia is sparsely populated, which undoubtedly expedites this estimate.

According to Kaasik, **about 3,000 people in Estonia (of 1,109,500 inhabitants in total) would have taken ayahuasca at some time in their lives, which amounts to 0.27% of the Estonian population over 14 years of age.** According to Kaasik, about 6,000 servings would have been administered to a total of 600 people in 2019.<sup>10</sup>

## Spain

The *EDADES* survey is conducted periodically in Spain to investigate the current landscape of drug use. It has asked about ayahuasca three times. The first one collected data from 2018, reporting 0.1% of the population consumed ayahuasca at some point.

Our analysis focused on 2019 when the prevalence of consumption reached 0.2% according to *EDADES*. This means that around **62,000 people between the ages of 15 and 64 took ayahuasca at some time in their lives. According to our estimates, more than 12,000 people would have taken ayahuasca at least once during 2019, a year where more than 60,000 servings were consumed.**<sup>11</sup>

**According to our estimates, in Spain more than 12,000 people would have taken ayahuasca at least once during 2019.**

The data from the latest survey from 2022 indicates 0.3% of the population between 15 and 64 years old would have taken ayahuasca one time in their lives (equivalent to almost 100,000 people). This demonstrates an increasing trend in ayahuasca consumption as compared to past surveys.

The *EDADES* report also provides valuable sociodemographic information, such as 28 years being the average age to start using ayahuasca (the highest of all the studied substances, with the exception of

hypnotics). This suggests a greater maturity for those who decide to start using ayahuasca. In comparison, the average age to start alcohol and tobacco is 16 years, 18 years for cannabis, or 20 years for hallucinogens.

Several sources agree that, unlike most drugs, there is a gender balance in the rate of consumption. The education level of ayahuasca consumers in Spain is high, with 60% of those taking it having liberal professions or being in positions of leadership.<sup>12</sup> Furthermore, according to the *GSAD*, 80% of those who take ayahuasca prefer to do so in ritual contexts.

<sup>10</sup> Chapter VIII of the general report contains detailed information on how the calculations for Estonia were conducted.

<sup>11</sup> Chapter VII of the general report has detailed information on the various calculations for Spain.

<sup>12</sup> *Global Survey of Ayahuasca Drinking (GSAD, 2019)*; ICEERS technical report *Ayahuasca in Spain (2020)*; Santiago López-Pavillard's doctoral thesis *La vida como proceso de sanación (2015)*.

## Table summarizing the prevalence of use in analyzed countries

PREVALENCE OF LIFETIME USE AND NUMBER OF SERVINGS IN 2019 FOR COUNTRIES WITH OFFICIAL STATISTICS OR DATA BASED ON ROUGH ESTIMATES					
COUNTRIES	USED USED AT LEAST ONCE EVER		TOOK AYAHUASCA IN 2019		NUMBER OF SERVINGS 2019
	Population > 15 years old		Population > 15 years old		
	%	No. of people	%	No. of people	
Colombia	0.80	305,780	0.15	57,330	405,323
USA	0.50	1,337,650	0.07	200,650	1,252,060
Czech Republic <sup>1</sup>	0.50	34,000	0.10	6,800	18,840
Netherlands <sup>2</sup>	0.42	61,825	0.08	12,365	37,095
Brazil <sup>3</sup>	0.37	567,000	0.12	181,000	2,628,000
Uruguay	0.33	9,250	0.07	1,850	7,000
Estonia	0.27	3,000	0.05	600	6,000
Spain <sup>4</sup>	0.20	62,375	0.04	12,475	61,127
<b>TOTAL</b>		<b>2,380,880</b>		<b>473,070</b>	<b>4,415,445</b>

Source: independent preparation for the Netherlands, Estonia, and Uruguay. Other estimates from the *National Survey on Drug Use and Health* for the United States, *Encuesta Nacional de Consumo 2019* for Colombia, *Prevalence Drug Use 2018* for the Czech Republic, and the *Third National Study on Drug Use in the Brazilian Population* for Brazil.

<sup>1</sup> Data referring to 2018.

<sup>2</sup> Data include consumption of ayahuasca and anahuasca, since anahuasca is usually offered as if it were ayahuasca.

<sup>3</sup> Data refers to 2015 and the population between 14 and 65 years old.

<sup>4</sup> Data refers to the population between 15 and 64 years of age.

## 2.2 Ayahuasca consumption worldwide

We estimated the number of ayahuasca drinkers in the Americas, Europe, Australia, and New Zealand based on existing official statistics for Brazil, Colombia, Spain, and the Czech Republic, and estimates obtained for the United States, Estonia, the Netherlands, and Uruguay.

**In America, Europe, Australia, and New Zealand, an estimated more than four million people took ayahuasca at least once in their lifetime.**

The extrapolation was made by comparing those countries that did not have statistics to those in social, cultural, and geographic proximity. For example, we applied Uruguay's prevalence of 0.33% in Paraguay, Argentina, and Chile. We applied a consumption frequency of 0.2% to all European nations for which we lacked data to avoid inflating the statistics. This 0.2% was the prevalence of consumption in Spain in 2019 and the lowest of the four European nations we had data for. We made the following estimates following this conservative approach:

- » **More than three million people would have taken ayahuasca at least once in their lifetime across the Americas (North, South, and Central).** More than 600,000 people would have participated in 2019, a year in which around five million servings were consumed.
- » **In Europe, just under one million people would have taken ayahuasca at least once in their lifetime.** Almost 200,000 people did so in 2019 when around half a million servings were consumed.

- » **Around 120,000 people in Australia and New Zealand would have taken ayahuasca at least once in their lifetime.** More than 15,000 people did so in 2019, with an estimated almost 70,000 servings.

The sum of these figures gives an overall estimate of ayahuasca consumption:

**In America, Europe, Australia, and New Zealand, an estimated more than four million people took ayahuasca at least once in their lifetime.** And 820,000 people did ayahuasca in 2019, with around five and a half million servings being consumed.

GLOBAL ESTIMATE OF LIFETIME PREVALENCE OF USE AND NUMBER OF SERVINGS IN 2019			
COUNTRIES	USED AT LEAST ONCE EVER	USAGE IN 2019	NUMBER OF SERVINGS
	Population > 15 years old Number of people	Population > 15 years old Number of people	2019
America <sup>1</sup>	3,178,160	619,826	5,182,537
Europa <sup>2</sup>	938,312	187,661	511,616
Australia and New Zealand	123,068	17,030	68,910
<b>TOTAL</b>	<b>4,239,540</b>	<b>824,517</b>	<b>5,763,063</b>

<sup>1</sup> With the exception of the Caribbean island countries.

<sup>2</sup> Excluding Serbia, Bosnia-Herzegovina, Montenegro, Belarus, Ukraine, Moldova and Russia. Including Israel.

As we mentioned previously, there are limitations in this study. We invite interested people to read the full report, which details the methodology used to estimate each piece of data.

Finally, we would like to outline the typical ayahuasca user profile worldwide, according to the *Global Survey of Ayahuasca Drinking*, which surveyed almost 11,000 people from more than 50 countries:

- » **The average age to start drinking ayahuasca is 30 years old.**
- » **62% of the survey respondents have a Bachelor's, Master's, or doctoral degree.**
- » **60% have liberal professions or work in leadership roles.**
- » **94% take ayahuasca in ritual contexts under the guidance of a specialist,** either a shaman or an ayahuasca church leader.

These data suggest a very different consumption pattern and profile from those who consume other types of psychoactive substances. As we have seen in the case of cannabis or alcohol in Colombia and Spain, the starting age is younger and happens outside a ritual context, which entails a greater risk of abuse.

## 2.3 Monographic analysis of ayahuasca retreat centers

In an attempt to characterize the global consumption phenomenon, we devoted special attention to ayahuasca tourism. We used 2019 as a reference year. We wanted to determine how many tourist establishments were operating in Amazonian countries, the number of people they received, and how many servings they offered. We included Costa Rica in our analysis where numerous ayahuasca retreat centers have opened in recent years, in addition to the Amazonian countries of Brazil, Colombia, Ecuador, and Peru.

## Establishments

The first thing we did was search specialized internet pages (*Aya Advisor, Retreat Guru*) as well as Facebook and Google to create an initial list of establishments operating that year. The result indicated that **in 2019 there were at least 232 centers specialized in ayahuasca retreats, most of them being located in Peru.**

RETREAT CENTERS IN AMAZONIA AND COSTA RICA		
COUNTRY	Number of centers	%
Peru	173	74.6
Costa Rica	20	8.7
Colombia	14	6.0
Ecuador	13	5.6
Brazil	7	3.0
Bolivia	5	2.2
<b>TOTAL</b>	<b>232</b>	<b>100</b>

Source: independent collaboration.

It is not surprising that Peru is where most of the centers are located, due to its history of ayahuasca traditions and because the city of Iquitos is an epicenter for ayahuasca tourist retreats. In Colombia, there are safety issues in the traditional ayahuasca zones which has prevented developing this type of business. On the other hand, it is common for *taitas* to travel and facilitate ceremonies in urban environments. These types of tourist centers do not seem to have a large presence in Brazil, perhaps because ayahuasca churches have been the most common network for approaching this medicine.

## Number of visitors and servings

We identified the centers operating in 2019 and asked each of them two questions: how many people visited their establishment that year, and how many servings were offered during the course of the retreat? Thirty-five centers responded that saw a total of 9,436 people and offered 32,083 experiences. Each retreat usually lasts a week where ayahuasca is normally taken three to four times.

To estimate the total number of people who visited tourist retreat centers, we extrapolated the data from these 35 establishments to the 232 (according to our estimates) operating in 2019. Our results indicated that the **232 retreat centers in the Amazon and Costa Rica would have received 62,000 people in 2019, providing around 210,000 experiences.**

On the other hand, the *GSAD* allowed us to characterize ayahuasca tourists, with 61.6% of those surveyed having a university degree or higher. Of those, 59.6% held managerial or liberal professions. Regarding the frequency of consumption, 42.6% of people who took ayahuasca at retreat centers had consumed it between one and five times in their lifetime, while 81.4% took it 25 times or less. Only 18.6% drank ayahuasca more than 25 times.

**3**

**DEATHS  
ATTRIBUTED  
TO AYAHUASCA**

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### **3. Deaths attributed to ayahuasca\***

Various publications around the world linked 58 cases of death to ayahuasca consumption between 1994 and 2022, even though in many cases ayahuasca did not play even an indirect role. In this regard, one of the most significant cases is the death written about by journalist Hamish MacDonald for *The Sydney Morning Herald* entitled, “The death of Dawson-Clarke, a bleak warning about the dangers of the hallucinogenic drug ayahuasca.” After five paragraphs discussing ayahuasca and its dangers, the reader learns that the young man died from an adverse reaction to a tobacco infusion. In many of the analyzed newspaper reports, we have found similar strategies blaming ayahuasca even if it was doubtful that it had anything to do with it. Perhaps it is because an “exotic hallucinogenic drug” attracts attention.

Despite the sensationalism, our exhaustive case-by-case review has allowed us to reach one central conclusion:

**To date worldwide, no forensic examination or toxicological analysis has determined the combination of *Banisteriopsis caapi* and *Psychotria viridis* or *Diplopterys cabrerana* has caused poisoning leading to death.**

However, there are sixteen cases in which people took ayahuasca and died shortly thereafter. Autopsies were not conducted in any of the cases, so it is impossible to know if other factors were involved. For example, the typical ayahuasca formula may have been supplemented with other plants (such as *Brugmansia* spp., known as *toé* and other names), which is a solanaceous plant that contains scopolamine, a highly toxic active ingredient. The deceased may have taken contraindicated medicines or drugs or had a serious cardiovascular problem. In two other cases, the autopsy determined that the cause of death was a “heart attack.” At least one of those who died had a serious heart condition. Finally, there are four other cases where the person had consumed ayahuasca but there were other circumstances that could have caused death. Autopsies were done in three of the four cases, but the cause of death was not clear.

In 35 cases, the deaths were due to homicides, suicides, intoxication by other substances, beatings, and drowning. There was insufficient information to establish any hypothesis in one of the cases.

**To date worldwide, no forensic examination or toxicological analysis has determined the combination of *Banisteriopsis caapi* and *Psychotria viridis* or *Diplopterys cabrerana* has caused poisoning leading to death.**

\* For this section we had the participation of Rafael Guimarães dos Santos, who reported several cases of deaths in Brazil and made a preliminary analysis.

### 3.1 Classification of deaths according to the possible cause

The following table classifies the deaths according to probable cause. The color key indicates whether the deceased took ayahuasca in the hours prior to death (34 cases), had not taken ayahuasca at all (15), or if there wasn't sufficient information to determine if they had or not (9).

CLASSIFICATION OF DEATHS ACCORDING TO POSSIBLE CAUSE		
CAUSE OF DEATH	NO. OF CASES	DECEASED PEOPLE
Possible adverse reaction to ayahuasca	16	Chris Jhiri, Alfonso Geovani D'Rose, Ernest Villaroman, Celine René Margarite Briset, Ramsés Márquez Duyperon, Jhon Willian Rangel Cano, Christina Melissa Jenkins, Juan Fredy Ruiz, Aldemar Mendoza, José Alberto Renoga, anonymous Colombian woman, anonymous Latvian woman, Armando Hurtado, Matthew Mellon, Tinne, anonymous man (unknown nationality)
Suicide	14	Denis Claude Yves Pointereau, Malcolm Rossiter, an anonymous man from Hungary, Emanuel, Jenny Spencer, Johanns Gerardus Nikkenjanp, Nelson Deschenes, anonymous Argentinean man, Kevin Furnas, Laudelino de Souza, Daria Yuzhaya, Yamandú Alcalde, Jambo Veloso, João Coelho de Almeida
Homicide	8	Unai Gomes, Arnaldo da Silva Franquino, Habib Makhmalchi, Phil Walsh, Glaucio Vilas Boas, Raoni Vilas Boas, anonymous Chilean baby, Jake Cawte
Concurrent causes	4	Lindsay Poole, Kyle Nolan, J. van den Hoek, Micael Amorim Macedo
Tobacco intoxication	4	Jane Maiangowi, Jennifer Logan, Maria Virginia Saiz, Matthew Dawson-Clarke
Drowning	3	Garth Dickson, Alexandre Viana Silva, Rian Brito
Heart attack	2	Fernando Queiroz Tavares, Luis Acevedo
Possible scopolamine intoxication	2	Emiliano Eva, Denis Tronchoni
Scopolamine intoxication	1	Henry Miller
Cervical fracture	1	Leslie Allison
Hyponatremia (water overdose)	1	Brandon Begley
Probable intoxication by synthetic 5-MeO-DMT	1	Anonymous man from the USA
Undetermined cause	1	Fabrice Etienne Pierre Champion
<b>TOTAL</b>	<b>58</b>	

Source: independent collaboration.

**Blue:** had consumed ayahuasca in the hours prior to death.

**Orange:** had not consumed ayahuasca in the hours prior to death.

**Black:** was not determined if they had consumed ayahuasca or not in the hours preceding their death.

However, although autopsies were performed and made public in nine cases, **the basic and most common formula ayahuasca is made of (with *Banisteriopsis caapi* and *Psychotria viridis* or *Diplopterys cabrerana*) did not cause death by acute intoxication in any of these situations.**

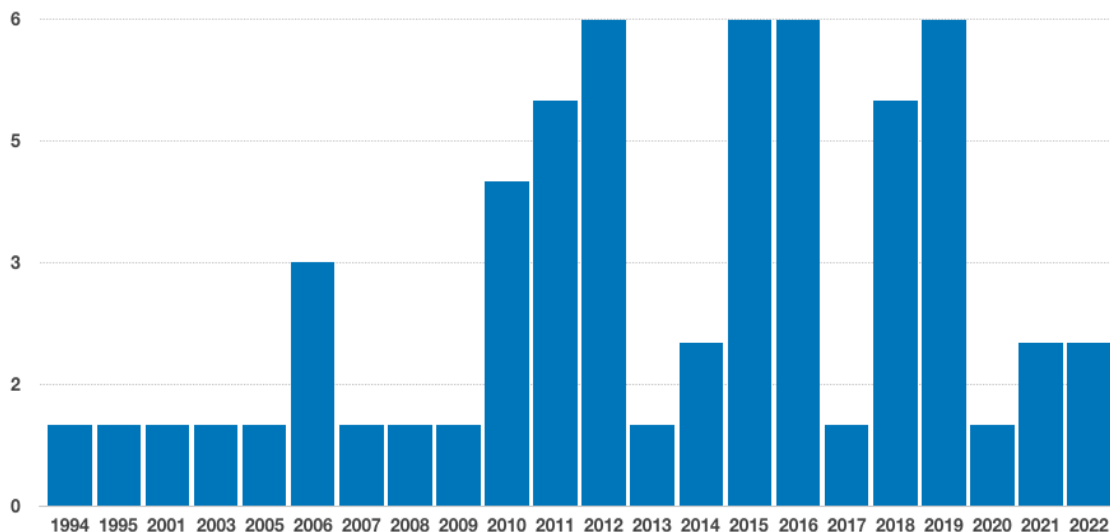
AUTOPSY RESULTS OF PEOPLE WHO TOOK AYAHUASCA IN THE HOURS PRIOR TO DEATH		
CAUSE OF DEATH	No. of cases	Cases
Undetermined cause	2	Lindsay Poole, Kyle Nolan
Heart attack	2	Fernando Queiroz Tavares, Luis Acevedo
Tobacco intoxication	1	Jane Maiangowi
Scopolamine intoxication	1	Henry Miller
Cervical fracture	1	Leslie Allison
Hyponatremia (water overdose)	1	Brandon Begley
Probable synthetic 5-Meo-DMT poisoning	1	Anonymous man from the USA
<b>TOTAL</b>	<b>9</b>	

Source: independent collaboration.

### 3.2 Deaths attributed to ayahuasca and other variables

A secondary analysis of the information highlights **80% of the deaths attributed to ayahuasca reported by the media occurred between 2010 and 2022, coinciding with peak ayahuasca consumption worldwide.**

**Number of deaths attributed to ayahuasca annually by the media worldwide**



An important statistic relating to the globalization of ayahuasca is that those who died represented 19 nationalities. As for the countries in which the deaths occurred, it should be noted that:

- » **Two out of every three reported deaths occurred in Amazonian countries:** Brazil, Colombia, Ecuador, and Peru.
- » **Peru was the country where most deaths were reported, accounting for 30% of the total.** These 17 cases were connected to tourist retreat centers and 16 occurred between 2010 and 2019 at the height of the ayahuasca tourism boom.
- » **In the United States and the Netherlands, 15% of deaths were attributed to ayahuasca by the media.**

# **4 FINAL CONSIDERATIONS**

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## **4. Final considerations**

This study has methodological limitations which have been previously pointed out. However, we believe the following findings and estimations offer a valuable resource for understanding the rapid process of ayahuasca globalization.

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### **> The number of people who have consumed ayahuasca in their lifetime**

**More than four million people in America, Europe, Australia, and New Zealand have reportedly taken ayahuasca at some time in their lives.**

Our calculation does not take into account those taking ayahuasca in Asia, Africa, most of Oceania, or some Eastern European countries. We know that people are consuming ayahuasca in these areas, but we lack significant evidence to be able to make our estimations.

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### **> The number of people who consumed ayahuasca in 2019**

**Around 800,000 people took ayahuasca in America, Europe, Australia, and New Zealand in 2019.**

We estimate the number of ayahuasca tourists who traveled to retreat centers in Amazonian countries and Costa Rica was around 60,000 people in 2019.

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### **> The number of servings in 2019**

**Around five and a half million servings of ayahuasca were taken in the Americas, Europe, Australia, and New Zealand in 2019.**

Five million of them were reportedly taken in the Americas, of which 2,600,000 were done in Brazil. Slightly more than 200,000 servings were reportedly taken at ayahuasca retreat centers in Amazonian countries and Costa Rica.

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### **> Characterizing people who consume ayahuasca**

**The typical profile of people who take ayahuasca stands out for their age, medium to high purchasing power, university education, and having liberal profession jobs.**

This profile is recurring in different analyzed surveys and research. In addition, the majority of people who take this plant medicine do so under the guidance and supervision of specialists in different ritual contexts (traditional, therapeutic, religious, or spiritual).

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### **About ayahuasca fatalities**

**No forensic examination or toxicological analysis anywhere in the world has ever attributed a death by intoxication to the most common ayahuasca recipe (with *Banisteriopsis caapi* and *Psychotria viridis* or *Diplopterys cabrerana*).**

The deaths that the media reported were indirectly from ayahuasca could have been avoided by incorporating safety standards when admitting participants, supervising the experience and integrating it afterward, or offering psychological follow-up if necessary.

Based on our preliminary analysis, the ratio between the deaths directly or indirectly attributed to ayahuasca and the number of people taking it worldwide seems to be very low. However, we are aware that the available information is limited. It does not allow us to rigorously

establish this ratio, although doing so could be useful to compare it with other substances. That comparative task is available for other researchers to pursue in the future.

We must point out ayahuasca's great therapeutic and spiritual potential, as suggested by its long history in shamanic and religious contexts and its accelerated global expansion. We want to honor the Indigenous Amazonian peoples who are the source of this knowledge and have developed and generously shared ayahuasca and associated shamanic rituals. Today, these peoples face extraordinary challenges that threaten their ecosystems and knowledge systems. It is the responsibility of the millions of people worldwide who benefit from the rapid global expansion of this Amazonian medicine to support their integrity and empowerment.



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