LEISHMANIASES
## Epidemiological Report on the Region of the Americas

Introduction

The Pan American Health Organization (PAHO), through the Regional Leishmaniases Program and with support from the communicable diseases area at PAHO representative offices, continues to provide technical cooperation to countries where there is transmission of leishmaniases. This is in accordance with the Plan of Action to Strengthen the Surveillance and Control of Leishmaniasis in the Americas 2017–2022 (*1*) (the Plan of Action on Leishmaniasis) and with the objective of achieving the goals set in the PAHO Disease Elimination Initiative: A Policy for an Integrated Sustainable Approach to Communicable Diseases in the Americas (*2*). The goals and targets align with the Road Map for Neglected Tropical Diseases 2021–2030 (*3*) and are adapted to the epidemiological characteristics and other specific features of the Region of the Americas (*1*).

When dealing with vector-borne zoonotic diseases and those at the human-animal-environment interface, such as leishmaniases, it is important to implement integrated approaches across different spheres of disease bio-ecology. In this regard, PAHO approved the Plan of Action on Entomology and Vector Control 2018–2023 (*4*) in 2018 and the One Health: A Comprehensive Approach for Addressing Health Threats at the Human-Animal-Environment Interface in 2021 (*5*). In order for Member States to achieve the commitments made, it is important to undertake joint actions targeting human cases, vectors, and the domestic reservoir, where required.

Figure 1 qualitatively presents the goal of reducing the proportion of cutaneous leishmaniasis cases in children under 10 years of age by 50%, with the average number of cases for the 2012–2015 period as the baseline value. To conduct these analyses, three categories were used to demonstrate progress toward the goals in endemic countries: "Achieved," "Not achieved, but with improvement," and "Not achieved."

On the map, click on a country to access the infographic on cutaneous leishmaniasis in disease-endemic countries in the Region of the Americas.

Figure 1. Qualitative analysis of the goal to reduce the proportion of cutaneous leishmaniasis cases in children under 10 years of age by 50%, Region of the Americas, 2021
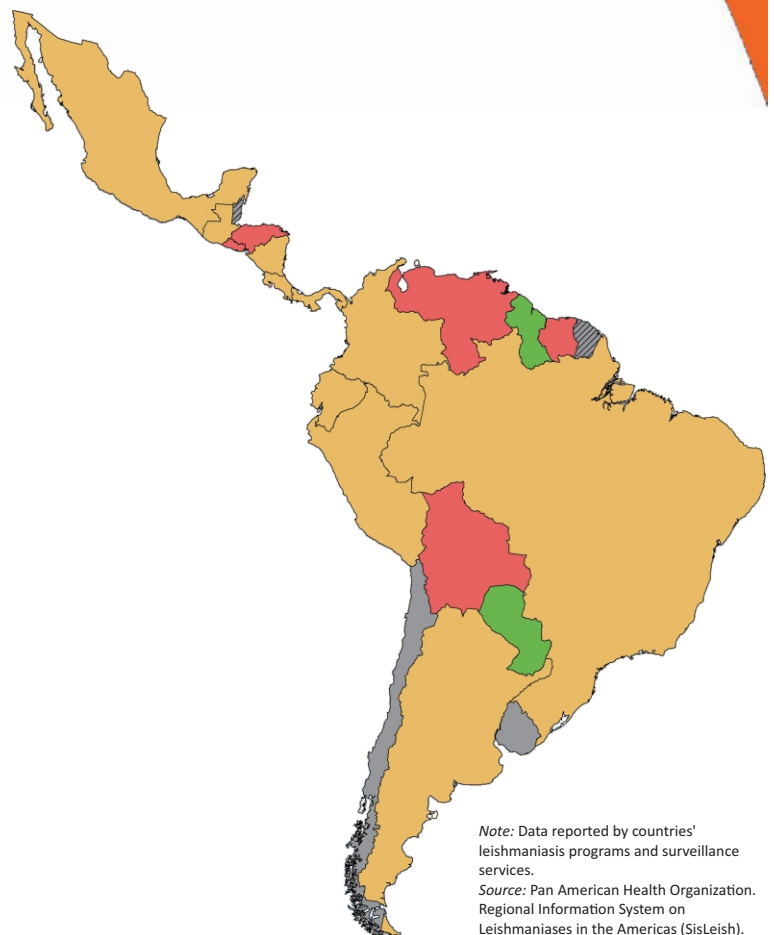
Note: Data reported by countries' leishmaniasis programs and surveillance services.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

- Countries that achieved the goal in 2021
- Countries that did not achieve the goal but have reduced the proportion of cases
- Countries that did not achieve the goal and experienced an increase in the proportion of cases
- Countries with no cutaneous leishmaniasis transmission
- Countries with no data reported to the Pan American Health Organization

Epidemiological scenario

Cutaneous and mucosal leishmaniasis

During the 2001–2021 period, 17 countries in the Region reported to PAHO 1 105 545 cases of cutaneous leishmaniasis (CL) and mucosal leishmaniasis (ML), with an average of 52 645 cases per year (Table 1). The Andean Area and Brazil reported a total of 896 790 cases, corresponding to 40.79% and 37.60%, respectively, of the Region's cases. However, during the same period, the Central American subregion had an average incidence of 32.36 cases per 100 000 inhabitants, 83% higher than the average incidence for the Region (17.67 cases per 100 000 inhabitants).

In the 21 years of the series, there is a trend towards a reduction in cases of CL and ML in the Region of the Americas. However, during the first five years (2001–2005), the trend was increasing, and the highest annual number of recorded cases (67 949) was recorded in 2005. The Andean Area is the subregion in which the trend most closely resembles that of the Region as a whole, as the trends for Brazil and the Southern Cone showed a decrease and the trend for Central America was stable throughout the period (Figure 2 and Table 1).

In 2021, 37 786 cases were recorded in the Region, the lowest number in the period. This is due to a gradual trend towards a reduction in case numbers starting in 2005. When compared to 2021, cases were lower by 44.4% (2005), 31.1% (2012), 24.4% (2017), and 4.8% (2020). In the last five years (2017–2021), the overall reduction of 24% in CL and ML cases is primarily due to the decreases observed in Brazil (14.3%), Colombia (20.5%), Nicaragua (71.2%), and Peru (21.6%) (Figures 2 and 3).

Figure 2. Number of cutaneous leishmaniasis cases reported, Region of the Americas, 2001–2021
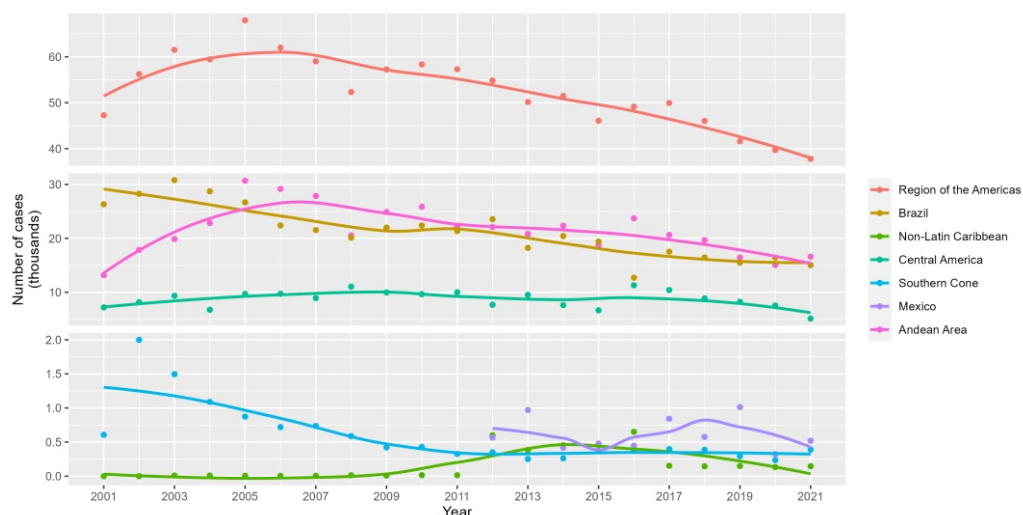
Note: Data reported by countries' leishmaniasis programs and surveillance services for 17 endemic countries in the Region of the Americas. The graphed points correspond to counts of actual cases. The lines correspond to short-term trends, calculated using local regression or LOESS.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

In 2021, although the number of cases decreased in some countries, other countries showed significant increases when compared to 2020. These countries experienced the following increases: Argentina (85%), Mexico (60.5%), Panama (37.1%), and El Salvador (28.2%) (Table 1). The regional incidence in 2021 was 16.54 cases per 100 000 population, which was the lowest rate recorded in recent years. The countries with the highest incidence rates per 100 000 population were Suriname (200.3), Panama (42.8), the Plurinational State of Bolivia (35.8), Peru (35.4), and Guatemala (33.9). Those with the lowest rates were Guyana (0.8), Paraguay (2.6), Mexico (6.2), Argentina (6.9), and the Bolivarian Republic of Venezuela (8.8).

Despite the decrease in the number of cases in 2021, there was also a 4.4% increase in the number of units at the second administrative level (municipalities, cantons, provinces, districts, etc.) that reported cases and a 15% increase in the proportion of cases at international borders, when compared to the previous year. Figures 3 and 4 present the regional analysis of CL and ML data in 2021, including cases and incidence, broken down to the second subnational administrative level.
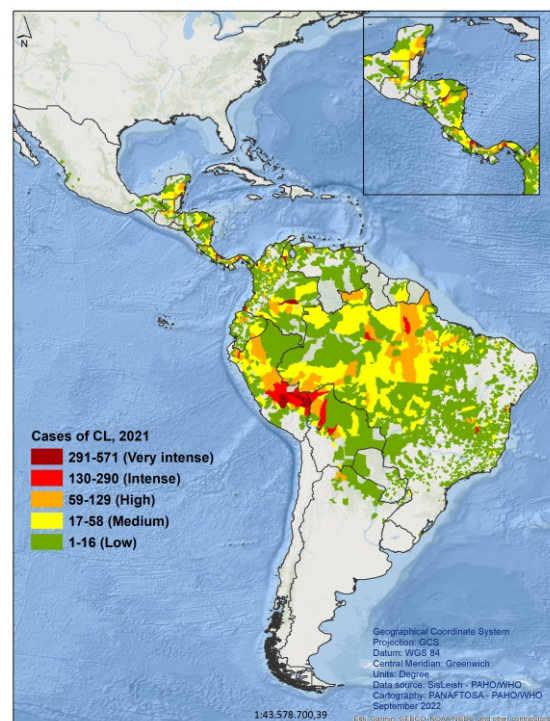
Table 1. Historical series of cases of cutaneous and mucosal leishmaniasis, Region of the Americas, 2001–2021

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Region of the Americas	47 286	56 243	61 518	59 439	67 949	62 017	59 027	52 324	57 265	58 347	57 287	54 842	50 163	51 491	46 074	49 165	49 949	46 041	41 617	39 705	37 786
Argentina	157	748	348	358	282	257	201	208	163	166	140	173	90	138	334	241	306	303	241	182	337
Bolivia (Plurinational State of)	2043	2518	2452	2819	2657	3152	3153	1838	1218	1809	1636	1767	2016	1683	2231	2222	2283	3127	2052	2059	2166
Brazil	26 328	28 268	30 812	28 737	26 685	22 397	21 530	20 123	21 989	22 387	21 306	23 547	18 226	20 418	19 395	12 690	17 526	16 432	15 484	16 432	15 023
Colombia	4130	7038	9267	10 698	18 043	16 241	13 331	9595	15 420	14 818	9684	9757	9353	11 586	7541	10 966	7764	6362	5907	6161	6175
Costa Rica	425	690	948	1061	1676	1870	1807	818	2025	1143	1376	1453	1950	2150	1171	1148	2224	1247	601	528	563
Ecuador	1754	1253	1336	2494	1925	1536	1185	1479	1735	1629	965	1512	873	1175	1479	1197	1632	1237	1104	1047	1251
El Salvador	18	46	24	76	24	46	36	31	ND	4	17	21	16	29	20	13	44	50	230	39	50
Guatemala	ND	1549	1143	870	1243	602	287	494	519	410	549	572	664	258	562	835	775	1044	1167	1121	836
Guyana	ND	ND	10	9	7	6	6	14	9	15	15	7	4	64	132	396	21	27	19	12	3
Honduras	957	1260	1684	797	1574	1300	855	1759	1502	1362	1736	1927	2074	1936	2040	2671	1854	1636	1985	1467	1119
Mexico	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	468	567	970	418	479	447	842	576	1014	324	520
Nicaragua	2924	2200	3716	2103	3521	2125	3719	5826	4047	3497	3235	1884	3035	1649	1925	5423	4343	3722	3321	3443	1251
Panama	2862	2390	1821	1837	1649	3774	2199	2109	1866	3221	3221	1811	1762	1581	930	1198	1164	1143	920	938	1286
Paraguay	450	1251	1148	731	591	463	535	380	259	264	184	177	162	124	122	135	92	84	52	54	53
Peru	5238	7032	6809	6849	8072	8248	10183	7650	6512	7612	11204	6969	6948	6231	5459	7271	6631	6321	5349	4178	5201
Suriname	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	594	382	390	241	255	132	118	130	122	144
Venezuela (Bolivarian Republic of)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1551	2104	1638	1661	2013	2057	2326	2612	2041	1598	1808

Note: Data reported by countries' leishmaniasis programs and surveillance services.
ND: no data.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.
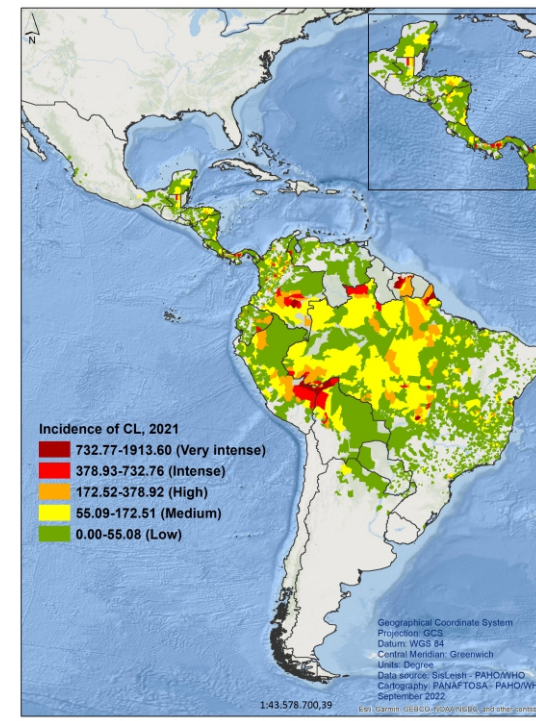
Figure 3. Cutaneous and mucosal leishmaniasis cases, second subnational administrative level, Region of the Americas, 2021

Cases of CL, 2021
- 291-571 (Very intense)
- 130-290 (Intense)
- 59-129 (High)
- 17-58 (Medium)
- 1-16 (Low)

Note: Data reported by countries' leishmaniasis programs and surveillance services. CL: cutaneous leishmaniasis.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

Figure 4. Incidence of cutaneous and mucosal leishmaniasis per 100 000 population, second subnational administrative level, Region of the Americas,


Incidence of CL, 2021
- 732.77-1913.60 (Very intense)
- 378.93-732.76 (Intense)
- 172.52-378.92 (High)
- 55.09-172.51 (Medium)
- 0.00-55.08 (Low)

Note: Data reported by countries' leishmaniasis programs and surveillance services. CL: cutaneous leishmaniasis.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

Figure 5 shows the map with the risk stratification according to the triennium composite indicator. Although the number of CL cases in the Region declined, there is an increase in the number of municipalities with very intense, intense, and high transmission (Figure 6). This affirms the need to reevaluate and plan surveillance and control actions while considering the transmission stratum.

Figure 5. Cutaneous leishmaniasis composite indicator at the second subnational administrative level, stratified by risk of transmission, Region of the Americas, 2019–2021
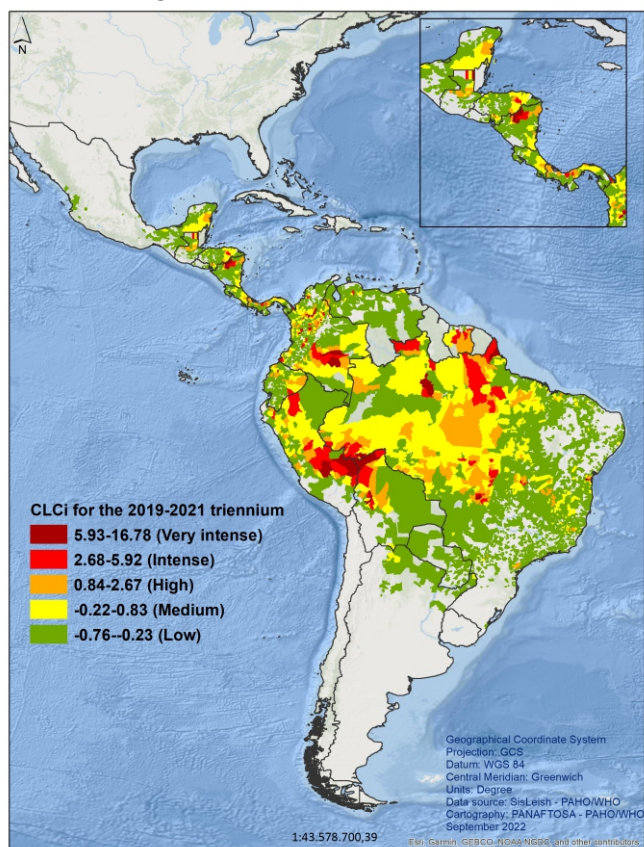
Note: Data reported by countries' leishmaniasis programs and surveillance services. Guyana is not represented in the figure because its political-administrative division is only for the first subnational administrative level (regions).
CLCi: cutaneous leishmaniasis composite indicator, represented by the average number of cases and the incidence of cases per 100 000 inhabitants in the 2019–2021 triennium.
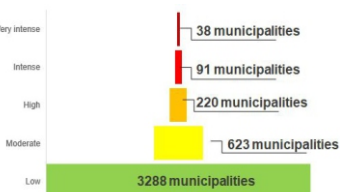*Source:* Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

Figure 6. Number of municipalities classified according to the risk of cutaneous leishmaniasis transmission, Region of the Americas, 2018–2021

Cutaneous leishmaniasis composite indicator, Region of the Americas, 2018–2020 triennium
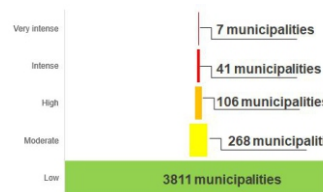
Cutaneous leishmaniasis composite indicator, Region of the Americas, 2019–2021 triennium
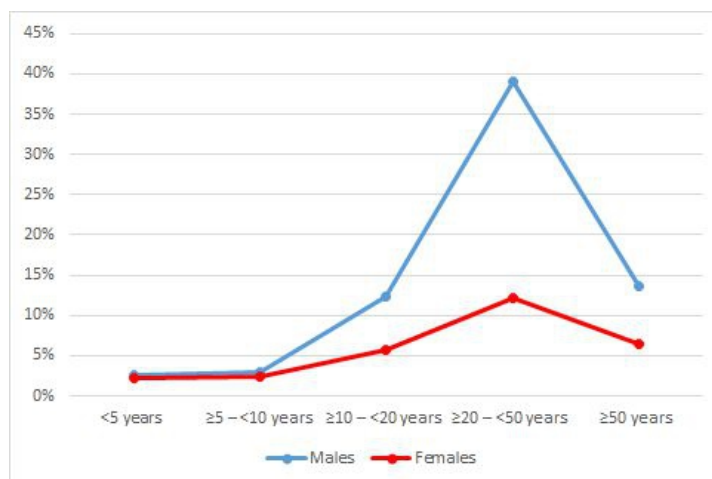

Note: Data reported by countries' leishmaniasis programs and surveillance services.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

Of the total cases reported to the Regional Information System on Leishmaniases in the Americas (SisLeish) (*6*), age and sex variables are available for 99.6% (37 633) and 99.9% (37 768) of reported cases, respectively. In the Region of the Americas, the pattern of CL transmission is predominantly sylvatic: human infection occurs when a person enters the forest or jungle, most frequently for work activities. This pattern is confirmed in men aged 20–50 years, which continues to be the most affected group in the Region (Figure 7). As a high percentage of cases in children under 10 years of age or women may suggest a pattern of domestic transmission, strict surveillance is required. In 2021, the proportion of cases in children under 10 years of age was 10%, the lowest figure reported since 2012, although some countries continue to have high proportions, such as Honduras (19.8%), Costa Rica (20.6%), Nicaragua (22%), Panama (38.9%), and El Salvador (46%) (Figure 8). With regard to sex, 71% of cases were in males. However, seven countries recorded more than 35% of cases in females (Costa Rica, Ecuador, El Salvador, Honduras, Nicaragua, Panama, and Venezuela [Bolivarian Republic of]), reinforcing the need to identify transmission foci and conduct entomological research to identify possible household transmission.
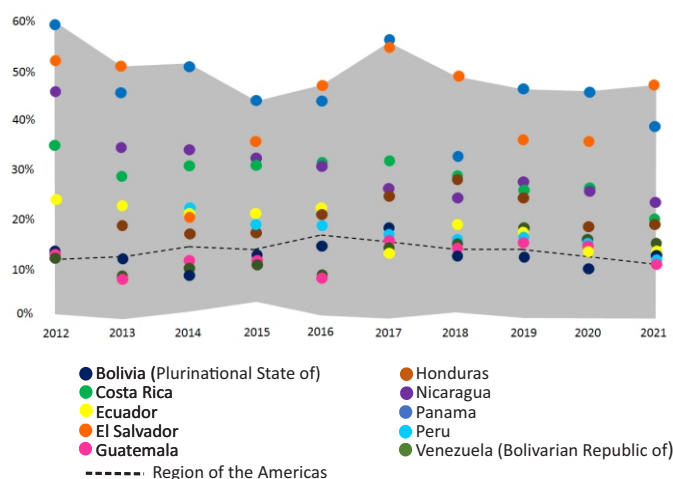
Figure 7. Proportion of cutaneous and mucosal leishmaniasis cases by sex, Region of the Americas, 2020

Note: Data reported by countries' leishmaniasis programs and surveillance services.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

Figure 8. Countries with the highest proportion of cutaneous and mucosal leishmaniasis cases in children under 10 years of age, Region of the Americas, 2012–2021

- Bolivia (Plurinational State of)
- Costa Rica
- Ecuador
- El Salvador
- Guatemala
- Honduras
- Nicaragua
- Panama
- Peru
- Venezuela (Bolivarian Republic of)
- - - - - - Region of the Americas

Note: Data reported by countries' leishmaniasis programs and surveillance services. Data for Peru are not available for 2012.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

Clinical type was included as a variable in 97% (36 662) of reported cases, an improvement compared to the previous year (94.5%). Of the total cases, 92.6% (34 975) were cutaneous and 4.5% (1687) were mucosal (ML or MCL). The countries with the highest number of ML or MCL cases continue to be Brazil (756), Peru (419), and the Plurinational State of Bolivia (281), which together represent 86% of the cases in the Region. Paraguay had few total cases (20) but continued to have the highest proportion of ML cases (37.7%, which is 18% less than in 2020), followed by the Plurinational State of Bolivia, with 13% of ML/MCL cases (an increase of 35%). A total of 145 cases of atypical cutaneous leishmaniasis (ACL) were reported: 50 from El Salvador, 54 from Honduras, and 41 from Nicaragua. Information on clinical type was not available for Costa Rica or for 43% of cases in Panama (Figure 9).

Figure 9. Proportion of cutaneous and mucosal leishmaniasis cases by clinical type, Region of the Americas, 2021
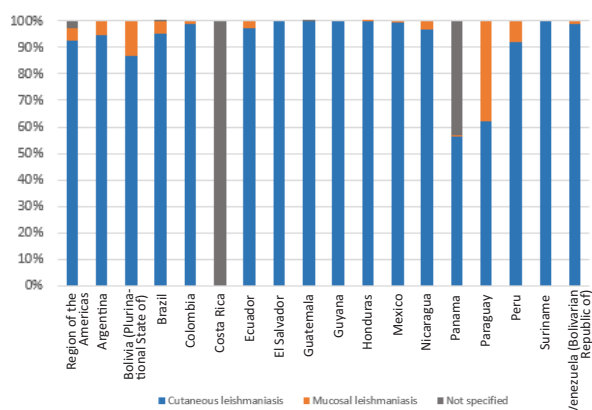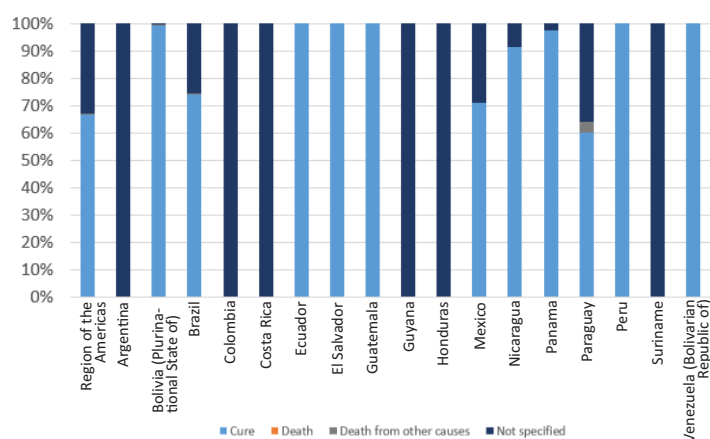

Cutaneous leishmaniasis ■ Mucosal leishmaniasis ■ Not specified

Note: Data reported by countries' leishmaniasis programs and surveillance services. CL: cutaneous leishmaniasis.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

In 2021, the proportion of cases of coinfection of CL and human immunodeficiency virus (HIV) remained the same as in 2020, with a total of 220 cases reported by Argentina (1), Brazil (161), Colombia (48), Honduras (8), Mexico (1), and the Bolivarian Republic of Venezuela (1).

Of the total cases of CL and ML, 81.1% (30 651) were diagnosed by a laboratory, representing a slight increase compared to 2020 (79.8%); 12.7% (4809) were diagnosed through clinical criteria and epidemiological linkage; and 6.2% (2326) lacked this information. Information continues to be unavailable in Costa Rica and Guatemala, as well as for 61% of cases in Panama and 33.8% in Argentina. These countries had the highest proportion of cases diagnosed by clinical-epidemiological criteria: Suriname (41.7%), the Bolivarian Republic of Venezuela (37.2%), Mexico (36%), and Guyana (33.3%).

In the Region of the Americas, there was no follow-up for 33% of cases (12 464), although this represents an improvement of 21% compared to 2020. However, the number of countries that lack information on disease evolution has increased (Argentina, Colombia, Costa Rica, Guyana, Honduras, and Suriname). In Brazil, Mexico and Paraguay, this information was not available in 25.3%, 28.9%, and in 35.8% of cases, respectively. Of the total cases reported in 2021, 66.8% (25 228) progressed to cure, a proportion similar to that of the previous year. There were 16 CL-related deaths, 75% of them in people over age 50 (Figure 10).

Figure 10. Proportion of cutaneous and mucosal leishmaniasis cases by clinical outcome, Region of the Americas, 2021
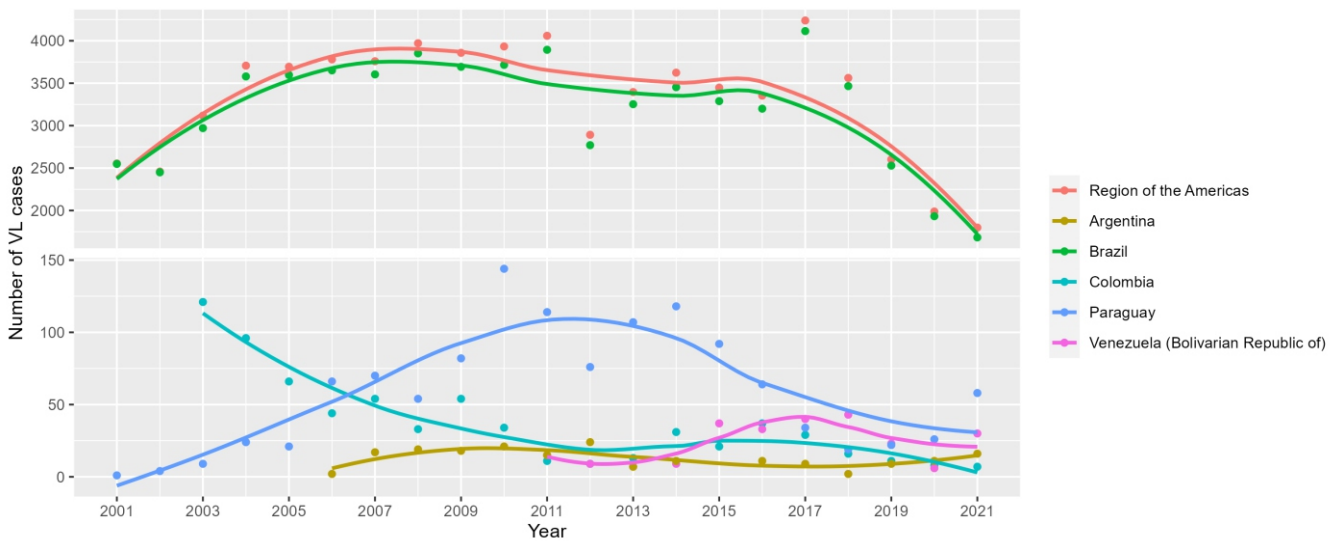

■ Cure ■ Death ■ Death from other causes ■ Not specified

Note: Data reported by countries' leishmaniasis programs and surveillance services. CL: cutaneous leishmaniasis.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

Visceral leishmaniasis

In the 2001–2021 period, a total of 69 665 new cases of visceral leishmaniasis (VL) were recorded in the Region of the Americas, with an annual average of 2488 cases. In the first period of the series, from 2001 to 2010, there was a growing trend in VL cases throughout the Region, with the exception of Colombia. However, the trend during the second period of the series, from 2011 to 2021, is downward, with 1799 cases in 2021, the lowest number of VL cases recorded in 21 years (Figure 11).

The data reported in 2021 represent a reduction of 9.5% relative to the previous year and 57% relative to the 4228 cases in 2017, the highest figure recorded in the period analyzed. Despite this decrease, some countries recorded a significant increase in the number of cases compared to 2020, such as the Bolivarian Republic of Venezuela (400%), Paraguay (123%), and Argentina (45.5%) (Figure 12).

Figure 11. Number of visceral leishmaniasis cases reported, Region of the Americas, 2001–2021
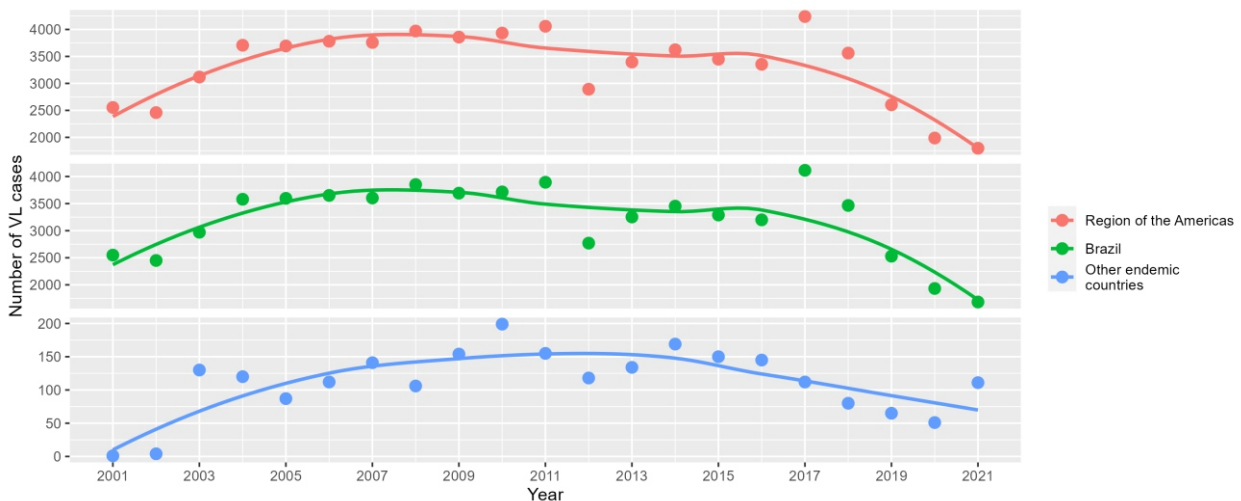

Note: Data reported by countries' leishmaniasis programs and surveillance services for the 11 endemic countries in the Region of the Americas. The graphed points correspond to counts of actual cases. The lines correspond to short-term trends, calculated using local regression or LOESS.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

When analyzing the trend in VL cases for the Region as a whole, in Brazil and the other countries with transmission, a similar trend is observed. However, in the last three years of the series, the curve is less pronounced for the other countries when compared with the trends for Brazil and the Region as a whole (Figure 12).

Figure 12. Number of visceral leishmaniasis cases reported, Region of the Americas, 2001–2021

Note: Data reported by countries' leishmaniasis programs and surveillance services for the 11 endemic countries in the Region of the Americas. The graphed points correspond to counts of actual cases. The lines correspond to short-term trends, calculated using local regression or LOESS.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

In 2021, nine of the 13 countries with VL transmission reported cases to SisLeish. These are distributed in 52 units at the first administrative level and 675 units at the second level. Figures 13 to 15 show the spatial distribution of VL cases, the incidence per 100 000 population, and the estimated case density (within a radius of 50 km). The five municipalities with the highest number of cases continue to be Fortaleza (Department of Ceará), Belo Horizonte (Minas Gerais), São Luís (Maranhão), Araguaína (Tocantins), and Paraupebas (Pará). The five highest incidence rates were also recorded in Brazil, although not in the same municipalities as the previous year, namely the Departments of Tocantins (Couto Magalhães, Carmolândia, and Pau D'Arco), Roraima (Uiramutã), and Goiás (Calvacante). Figure 16 shows the risk stratification for VL in the Region of the Americas at the second subnational administrative level according to the composite indicator for the 2019–2021 triennium.

Figure 13. Visceral leishmaniasis cases at the second subnational administrative level, Region of the Americas, 2021

Figure 14. Incidence of visceral leishmaniasis at the second subnational administrative level, per 100 000 population, Region of the Americas, 2021

Figure 15. Estimation of visceral leishmaniasis case density at the second subnational administrative level (within a radius of 50 km), Region of the Americas, 2021

Figure 16. Stratification of visceral leishmaniasis risk at the second subnational administrative level according to the visceral leishmaniasis composite indicator, Region of the Americas, 2019–2021
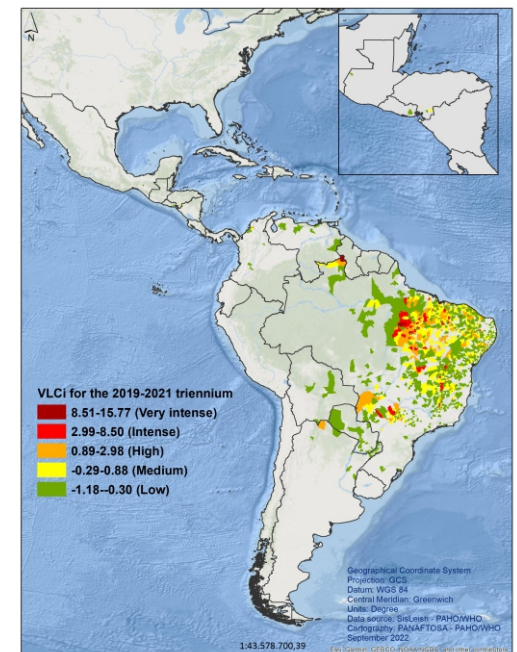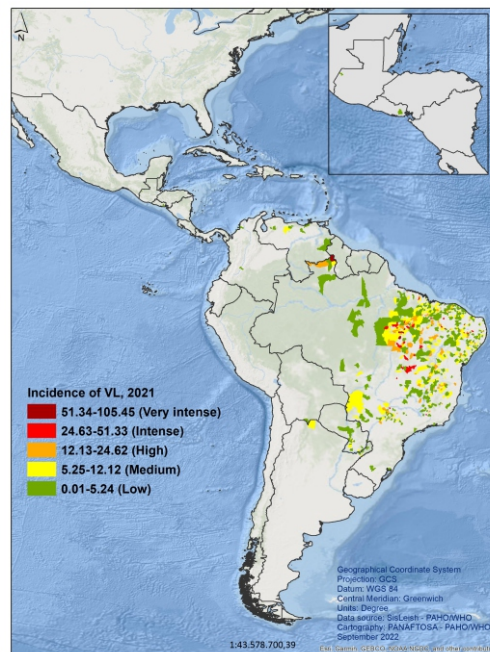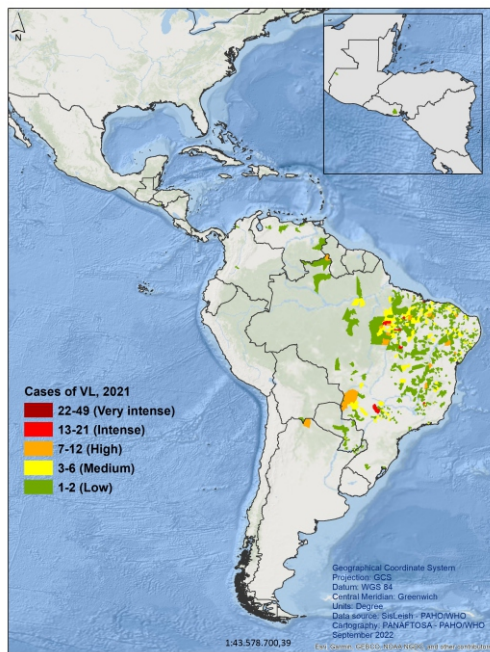
Note: Data reported by countries' leishmaniasis programs and surveillance services. VL: visceral leishmaniasis. LCIv: visceral leishmaniasis composite indicator, represented by the average number of cases and the incidence of cases per 100 000 population in the 2019–2021 triennium.
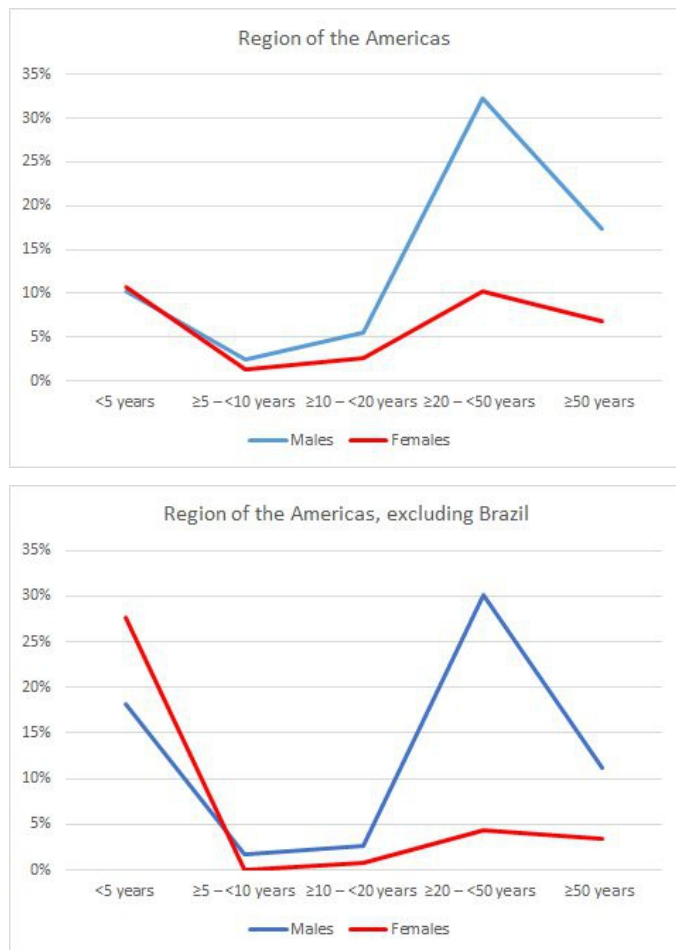*Source:* Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

During this period, VL cases were recorded in 1371 municipalities, with the following results for second-level units: six have very intense transmission (all in Brazil), 49 have intense transmission (all in Brazil), 156 have high transmission (one in Argentina, Colombia, and Paraguay and the rest in Brazil), 365 have moderate transmission (two in Colombia, Honduras, and the Bolivarian Republic of Venezuela, four in Paraguay, and the rest in Brazil), and 795 have low transmission, distributed across 10 countries (Argentina, Bolivia [Plurinational State of], Brazil, Colombia, El Salvador, Guatemala, Honduras, Mexico, Paraguay, and Venezuela [Bolivarian Republic of]). Uruguay was not included in the triennium composite indicator as the calculation considers units at the second administrative level and Uruguay is not coordinated at that level.

The sex variable was included in 100% of reported cases, 68.2% of which were male. The age group variable was available in 99.7% of cases. The most affected age group continues to be men between 20 and 50 years of age, with an incidence three times higher than for women, followed by men over age 50 and children under 5 years of age.

In 2021, Brazil accounted for 93.5% of reported cases. When conducting the analyses that exclude Brazil, it was possible to observe a slightly different profile for the other countries that reported cases in this period. The most affected group is children under 5, with 45.7% of cases, with females 1.5 times more affected than males, followed by people 20–50 years old and those over age 50; in these groups, males were eight and three times more likely to be affected, respectively (Figure 17).

Figure 17. Proportion of visceral leishmaniasis cases by age group and sex, Region of the Americas and Region of the Americas excluding data for Brazil, 2020

Note: Data reported by countries' leishmaniasis programs and surveillance services.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

During the first period of the 2012–2016 series, there was a growing trend in VL-HIV coinfections in the Region. Starting in 2018, cases of coinfection declined, although the proportion of coinfected cases increased to 15.45% in 2021, the highest recorded in that 10-year period. In total, 278 cases of coinfection were reported in Brazil (264) and Paraguay (14), representing a proportion of 15.70% and 24.13%, respectively (Figure 18).

Figure 18. Proportion of visceral leishmaniasis and human immunodeficiency virus coinfection and number of visceral leishmaniasis cases, Region of the Americas, 2012–2021
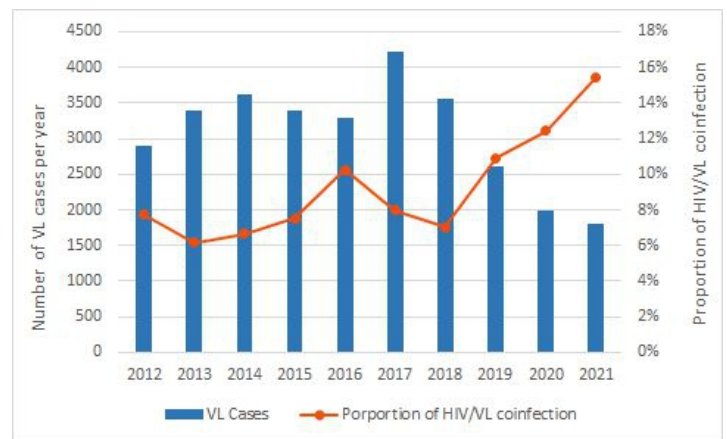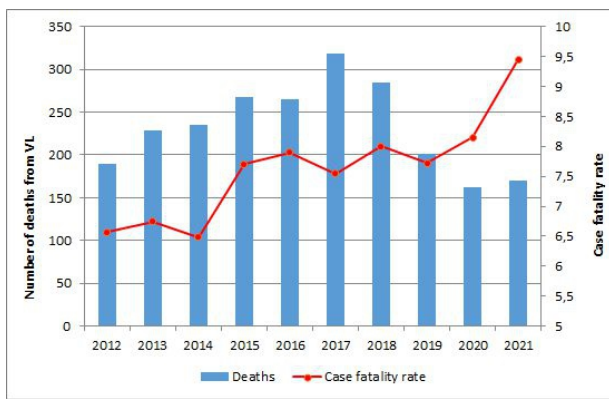

Note: Data reported by countries' leishmaniasis programs and surveillance services. VL: visceral leishmaniasis; HIV: human immunodeficiency virus.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

All reported VL cases included the confirmatory criterion, with 89% (1601) of cases diagnosed by laboratory testing and 11% (197) by clinical-epidemiological criteria. Of the patients with follow-up information available, 68.1% progressed to cure, 9.45% to death due to VL, and 3.56% to death due to other causes. No follow-up was carried out for 18.9% of patients. Despite representing an improvement of 22% compared to the previous year, the high percentage of patients without follow-up information is still striking: the highest proportion was observed in Paraguay (27.6%), followed by Brazil (19.1%), and Colombia (14.3%).

The case fatality rate (9.45%) was the highest reported since 2012. This was 3.5 times higher than the global rate, and there were 170 deaths (Figure 19). This rate primarily reflects Brazil, where the reported case fatality rate was 9.7% and the number of deaths represented 96.4% of the total deaths in the Region (Figure 18). For both sexes, the groups with the highest case fatality rates were those over 50 years of age (18%), followed by people aged 20 to 50 (8%), both with a small difference by sex. The third most affected group was children under 5 years of age (6%), followed by patients aged 10–20 (4%), both with higher mortality in females (Figure 20).

Figure 19. Number of deaths and case fatality rate for visceral leishmaniasis (VL), Region of the Americas, 2012–2021

Figure 20. Case fatality rate for visceral leishmaniasis by age group and sex, Region of the Americas, 2021

Note: Data reported by countries' leishmaniasis programs and surveillance services.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.
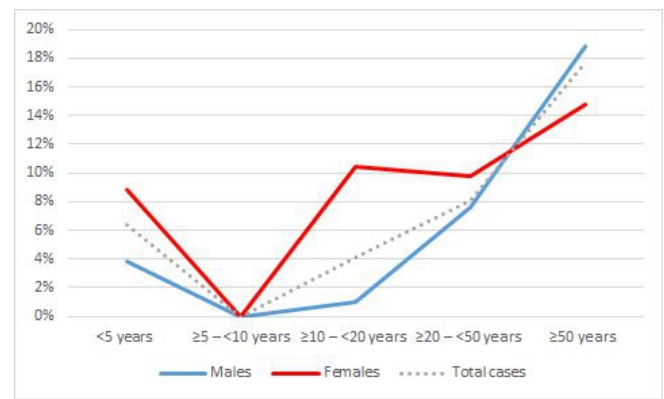
Preliminary analysis of the goals of the Plan of Action on Leishmaniasis in the Region of the Americas

The Plan of Action to Strengthen the Surveillance and Control of Leishmaniasis in the Americas 2017–2022 (*1*) was published in 2017, based on the guidelines of the World Health Organization (WHO) Global Leishmaniasis Program and adapted to the epidemiological and specific characteristics of the Region. The purpose of the Plan of Action on Leishmaniasis is to support PAHO countries and territories in achieving the commitment made in the framework of the first mandates approved by the World Health Assembly and the PAHO Directing Council, as expressed in resolutions WHA 60.13 (May 2007) (*8*), WHA 66.12 (May 2013) (*9*), CD49.R19 (October 2009) (*10*), and CD55.R9 (September 2016) (*11*). The plan details the main lines of action to strengthen leishmaniasis surveillance, diagnosis, treatment, and control in the Region. It also presents the main process indicators to assess progress, namely, epidemiological and operational indicators to monitor the disease and progress in the quality of the surveillance and services provided.

Regional goals were established for CL and VL in order to reduce morbidity and mortality due to leishmaniases in the Region of the Americas. These goals were based on data reported to SisLeish from 2012 to 2015. As the end of the plan period approaches, this epidemiological report presents a preliminary analysis of these goals, based on the data reported in 2021.

Goal 1: Reduce fatality by visceral leishmaniasis by 50% in the Region by 2022

This goal was not reached for the Region as a whole. The case fatality rate in 2021 (9.45%) was approximately three times higher than the established goal (3.44%) and there was an increase of 37% relative to the baseline (2012–2015). However, when analyzing data from the 13 countries with VL transmission individually, six countries (46.15%) reported no deaths from the disease in 2021 (Argentina, Bolivia [Plurinational State of], Colombia, El Salvador, Guatemala, and Uruguay) and four countries (30.79%) reported no VL cases in the period. This means 10 countries (76.92%) reached the goal in these individual-level analyses. Of the three countries that did not reach the goal, two countries (Paraguay and Venezuela [Bolivarian Republic of]) reduced the fatality rate relative to the baseline.

Goal 2: Reduce visceral leishmaniasis incidence in the Region by 2022: in countries with expanding and stable transmission, by 50%; and in countries with sporadic transmission, no increase in incidence

The incidence of VL for the Region in 2021 was 2.19 cases per 100 000 population, representing a 30% reduction from baseline. However, the goal of 2.17 cases per 100 000 population has not yet been reached. When analyzing the data for individual countries, it is observed that two countries (Brazil and Colombia) reached their goals and two countries (Argentina and Venezuela [Bolivarian Republic of]) did not. Although Paraguay did not reach the goal, incidence was below the baseline. For countries with sporadic transmission, it was not possible to assess progress towards the goal, as it is not possible to calculate the baseline (Table 2).

Table 2. Analysis of the goal of reducing visceral leishmaniasis fatality by 50% and reducing incidence according to the country's epidemiological scenario, Region of the Americas, 2021

Epidemiological scenario	Region or country	Reduce fatality by visceral leishmaniasis by 50% in the Region of the Americas by 2022				Reduce the incidence of visceral leishmaniasis in the Region of the Americas by 2022. according to the epidemiological scenario[a]			
		Baseline	Goal for 2022	Scenario in 2021	Progress toward the goal in 2021	Baseline	Goal for 2022	Scenario in 2021	Progress toward the goal in 2021
	Americas	6.89%	3.44%	9.45%	🔴	4.35	2.17	2.19	🔴
Expanding	Argentina	1.04%	0.52%	0%	🟢	1.1	0.55	2.37	🔴
	Brazil	6.92%	3.46%	9.74%	🔴	4.53	2.27	2.26	🟢
	Paraguay	6.61%	3.30%	5.17%	🟠	3.35	1.67	1.68	🟠
Stable	Colombia	0.00%	0.00%	0%	🟢	3.83	1.92	1.21	🟢
	Venezuela (Bolivarian Republic of)	11.64%	5.82%	10%	🟠	1.16	0.58	1.28	🔴
Sporadic	Bolivia (Plurinational State of)	-	0.00%	0%	🟢	-	-	4.54	⚪
	Costa Rica	-	-	-	🟢	-	-	-	⚪
	El Salvador	0.00%	0.00%	0%	🟢	-	-	0.46	⚪
	Guatemala	0.00%	0.00%	0%	🟢	-	-	2.3	⚪
	Honduras	0.00%	0.00%	-	🟢	-	-	-	⚪
	Mexico	0.00%	0.00%	-	🟢	-	-	-	⚪
	Nicaragua	-	-	-	🟢	-	-	-	⚪
	Uruguay	-	0.00%	0%	🟢	-	-	0.75	⚪

Notes: The Plurinational State of Bolivia and Uruguay have no baseline, as the first cases were reported in 2020 and 2018, respectively.
[a] It is not possible to assess the achievement of the 2021 goals for countries with sporadic transmission, since it is not possible to define the baseline.
Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

Goal 3: Reduce deaths due to cutaneous and mucosal leishmaniasis by 90% in the Region by 2022

At the regional level, the progressive goal of five deaths by CL in 2020 and two deaths in 2022 was not reached. In 2021, a total of 16 deaths by CL were reported in the Region, which represents a value 3.2 times higher than the goal of a 70% reduction by 2020 and 8 times higher than the goal of a 90% reduction by 2022. Notably, 15 of the 17 countries with transmission met the goal by reporting no deaths by CL (Table 3).

Goal 4: Reduce the cutaneous leishmaniasis proportion in children under 10 years of age by 50% in the Region by 2022

The regional proportion of CL cases in children under 10 years of age was 10.1%, meaning that the goal (6.05%) was not reached in 2021. However, despite not reaching the regional goal, there was a 16.7% reduction in the proportion relative to the baseline. Notably, only two countries reached the goal; among those that did not, 10 showed progress, with a reduction in the CL proportion in children under 10 years of age relative to their individual baselines.

Table 3. Analysis of the goal of reducing deaths by cutaneous and mucosal leishmaniasis by 90% and reducing the cutaneous leishmaniasis proportion in children under 10 years of age by 50% by 2022, Region of the Americas, 2021

Region or country	Reduce deaths by cutaneous and mucosal leishmaniasis by 90% in the Region of the Americas by 2022				Reduce the cutaneous leishmaniasis proportion in children under 10 years of age by 50% in the Region of the Americas by 2022			
	Baseline	Goal for 2022	Scenario in 2021	Progress toward the goal in 2021	Baseline	Goal for 2022	Scenario in 2021	Progress toward the goal in 2021
Americas	16.75	2	16	🔴	12.10%	6.05%	10%	🟠
Argentina	0	0	0	🟢	3.75%	1.87%	2.1%	🟠
Bolivia (Plurinational State of	0	0	0	🟢	11.24%	5.62%	11.5%	🔴
Brazil	16.25	2	14	🟠	7.20%	3.60%	5.7%	🟠
Colombia	0	0	0	🟢	9.06%	4.53%	7.6%	🟠
Costa Rica	0	0	0	🟢	31.95%	15.97%	20.6%	🟠
Ecuador	0	0	0	🟢	22.49%	11.25%	11.9%	🟠
El Salvador	0	0	0	🟢	39.52%	19.76%	46%	🔴
Guatemala	0	0	0	🟢	10.78%	5.39%	10.3%	🟠
Guyana	0	0	0	🟢	13.66%	6.83%	0%	🟢
Honduras	0	0	2	🔴	13.49%	6.74%	19.8%	🔴
Mexico	0	0	0	🟢	5.72%	2.86%	5.2%	🟠
Nicaragua	0	0	0	🟢	36.79%	18.39%	22%	🟠
Panama	0	0	0	🟢	49.25%	24.62%	38.9%	🟠
Paraguay	0.25	0	0	🟢	4.89%	2.45%	0%	🟢
Peru	0.25	0	0	🟢	13.88%	6.94%	11.3%	🟠
Suriname	0	0	0	🟢	2.17%	1.09%	5.6%	🟠
Venezuela (Bolivarian Republic of)	0	0	0	🟢	9.89%	4.94%	13.3%	🔴

Source: Pan American Health Organization. Regional Information System on Leishmaniases in the Americas (SisLeish). Washington, DC: PAHO; 2022 [accessed 2 September 2022]. Limited access.

At the regional level, none of the goals set for 2022 had been met in 2021. However, it was individually verified that in different countries, some of the goals were met or showed considerable improvement. The end of the current Plan of Action on Leishmaniasis in 2022 and the approval of PAHO document CD57/7 in 2019 (*2*) and the WHO 2030 road map (*3*), as well as PAHO documents CD56/11 on entomology actions in public health in 2018 (*4*) and CD59/9 on the "One Health" approach in 2021 (*5*), affirmed the need to update the Plan of Action on Leishmaniasis considering the progress made and the challenges identified in the Region. It is necessary to continue supporting countries and establishing technical cooperation in order to continue strengthening leishmaniasis surveillance, prevention, control, and treatment. The new plan is currently being prepared for presentation, discussion, and approval by PAHO Member States.

Final considerations

For the 2001–2021 period, the regional analysis shows a trend towards a reduction in cases of cutaneous leishmaniasis since 2005 and visceral leishmaniasis since 2011, but these trends have become more significant in the last five years.

When the trends are analyzed individually for each country in which CL is endemic, it can be observed that, for the 2010–2021 period, Argentina, the Plurinational State of Bolivia, El Salvador, and Guatemala show a rising trend in CL cases, while the other countries show a downward trend. The regional trend needs to be assessed at the most local level and may be related to different factors, including the environment; a decrease in susceptible people due to better interaction between host organisms, vectors, reservoirs, and parasites; and improvements in disease surveillance, care, and control actions. Despite the decrease in CL cases in the Region, analysis of risk stratification according to the composite indicator for the 2018–2020 and 2019–2021 trienniums shows an increase in municipalities with very intense, intense, and high transmission (349 municipalities) in the most recent period compared to the previous period (156 municipalities). This highlights the importance of maintaining surveillance and control actions, which were generally suspended or postponed due to the COVID-19 pandemic.

With the exception of Argentina, all endemic countries showed a downward trend in VL cases, without the expected cyclical pattern observed in previous periods. In 2021, Brazil registered 93.5% of VL cases in the Region, the lowest figure for the entire period. Analyses of VL excluding Brazil showed a different age profile, in which the most affected group is children under 5 years of age (45.7% of cases).

The high VL fatality rate remains a challenge that demands great efforts from countries, managers, and health personnel to ensure access to diagnosis and treatment, as well as adequate and early clinical and therapeutic management. In 2022, PAHO published the second edition of the *Guideline for the Treatment of Leishmaniasis in the Americas* (*7*), with specific recommendations for cutaneous, mucosal, and visceral forms. The GRADE methodology was used and different population subgroups, *Leishmania* species, local and systemic interventions, and special groups such as VL-HIV coinfection were evaluated during analysis of the evidence.

Preliminary analyses of the goals and indicators for monitoring leishmaniasis surveillance, care, and control actions show that the objectives were not achieved at the regional level. However, with respect to the goals of reducing VL incidence and CL cases in children under 10 years of age, progress is observed for the 2017–2021 period of the Plan of Action on Leishmaniasis. Also, several countries achieved or advanced in their goals when compared to the baseline. This demonstrates the commitment and effort of the Ministries of Health to improving the quality of leishmaniasis surveillance, care, and control. The next edition of this epidemiological report will present data for 2022 and a detailed analysis of the goals and indicators of the Plan of Action on Leishmaniasis.

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