Epidemiological Report

Monitoring and surveillance of outbreaks of Acute Diarrhea Diseases

Historic Series 2010 – 2021

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INTRODUCTION

Acute diarrheal diseases (ADD) correspond to a group of gastrointestinal diseases characterized by a syndrome in which there is a decrease in stool consistency, an increase in the number of bowel movements (at least three episodes in 24 hours), and in some cases, the presence of mucus and blood dysentery. They are self-limited lasting up to days. The clinical condition can progress to mild to severe dehydration. When incorrectly treated or untreated, it can lead to severe dehydration and fluid and electrolyte disturbance with risk of death, especially when associated with malnutrition.[1,3]

Epidemiological surveillance of acute diarrheal diseases (ES-ADD) is part of ES of water and foodborne diseases (ES-DTHA). The occurrence of an outbreak of DTHA is of compulsory notification for the entire national territory initially established by the Decree GM/MS nº 1,943, of October 18, 2001, and updated through the Decree SVS/MS nº 5, of February 24, 2006. The sanitary code of the state of São Paulo (SSP) promulgated by the Law nº 10,083 of September 23, 1998, defines as the duty of every citizen to report to the health authority the occurrence of outbreaks of any diseases or aggravations. Notification is mandatory for doctors and other workers in the sector in the exercise of the profession, as well as for those responsible for hospitals, laboratories, offices and other public and private services.[1-5]

Due to the many possible etiologies and sources of transmission, outbreaks are also called food and waterborne disease outbreaks. Those that constitute a public health event must be immediately notified to the Ministry of Health as provided in the Decree on the Consolidation GM/MS nº 4, of September 28, 2017.[4] In the SSP, it is defined as a situation that may represent a potential threat to public health, with the occurrence of an outbreak or epidemic, a disease or aggravation of unknown cause, and a change in the clinical-epidemiological pattern of known diseases, considering the potential for dissemination, magnitude, severity, transcendence and vulnerability, as well as epizootics or pathogens resulting from disasters or accidents.[1-4]

ES-ADD is also composed of the monitoring of acute diarrheal diseases (MADD) regulated by the Consolidation Ordinance nº 5 of September 28, 2017,[5] which allows monitoring only the occurrence of reported cases in health units elected sentinels by the epidemiological surveillance of the municipal health secretariats. Its main purpose is to monitor behavior and detect changes in the local pattern to identify outbreaks and epidemics in a timely manner.[1,3,5]

DEFINITION OF OUTBREAK OF ACUTE DIARRHEA DISEASES

An ADD outbreak is considered to be two or more cases of the same condition with similar clinical characteristics caused by the ingestion of the same food or water from the same source by those involved in the aforementioned episode. That is to say that it is only possible to conclude and confirm that it is an outbreak when it is possible to identify the common source among the individuals that caused the illness.

Confirmation of the etiological agent of the outbreak by laboratory criteria occurs when it is possible to isolate/identify the same pathogen in biological samples.[2,3] Otherwise, if this association is not identified, the increase in cases will be considered only an aggregate of episodes for which, due to lack or difficulties in the investigation, the cause cannot be determined.

MONITORING OF ACUTE DIARRHEA DISEASES (MADD)

It is a nationwide program aimed at the mass capture of the occurrence of ADD in the community, that is, in the population or in a certain geographic space (municipality, neighborhood, street). The MADD was created in Brazil in 1994 after the arrival of the seventh cholera pandemic in the country in 1991, as a proposal for cities to carry out the Epidemiological Surveillance -ADD.[1]

Implemented in São Paulo from 1999, the MDDA state program is based on syndromic surveillance, which consists of collecting, consolidating, and analyzing data from consultations with diarrheal syndrome, monitoring and recording in a timely manner its tendency continuously to identify any variation and prevent or control outbreaks and epidemics. It is inserted in the health units (sentinel units) with greater capacity to care for acute diarrheal diseases and that are representative of the population of certain geographic areas.[1]

Syndromic surveillance is definitive for local health units that attend to cases in their municipalities, as it represents an important tool for weekly analysis of episodes in the search for a relationship between events (commonplace of diarrhea, common sources of transmission, groups of people involved, severity of the disease). This makes it possible to detect in a timely manner an outbreak or epidemic of notifiable diseases and other unusual health problems, making it possible to investigate their causes as early as possible and thus preventing their spread.[1]

ETIOLOGICAL AGENT

The etiological agents of infectious origin are bacteria and their toxins viruses, opportunistic intestinal parasites, and natural toxins. In general, these agents correspond to more than 250 pathogens.[1,3]

TRANSMISSION MODE

Transmission occurs mainly via the fecal-oral route, both indirectly through water and food and directly through person-to-person contact. Contamination can occur throughout the food chain from primary production to consumption, which includes planting, handling, transport, cooking and packaging, among others.

Cross-contamination can occur in which pathogens naturally present in one food are transferred to another through utensils or appliances used in the preparation without washing and disinfection. Many pathogens are transferred from one person to another via the fecal oral route due to lack of hand hygiene after using the toilet and through bacteria present in infected skin lesions or naturally existing in the membranes and mucous membranes of the nose that can contaminate food. In this case, foods cooked improperly or kept at inappropriate temperatures can lead to the multiplication and production of toxins - bacterial ones, for example, are thermostable and are not destroyed in the cooking of food.[1-3]

EPIDEMIOLOGICAL SITUATION

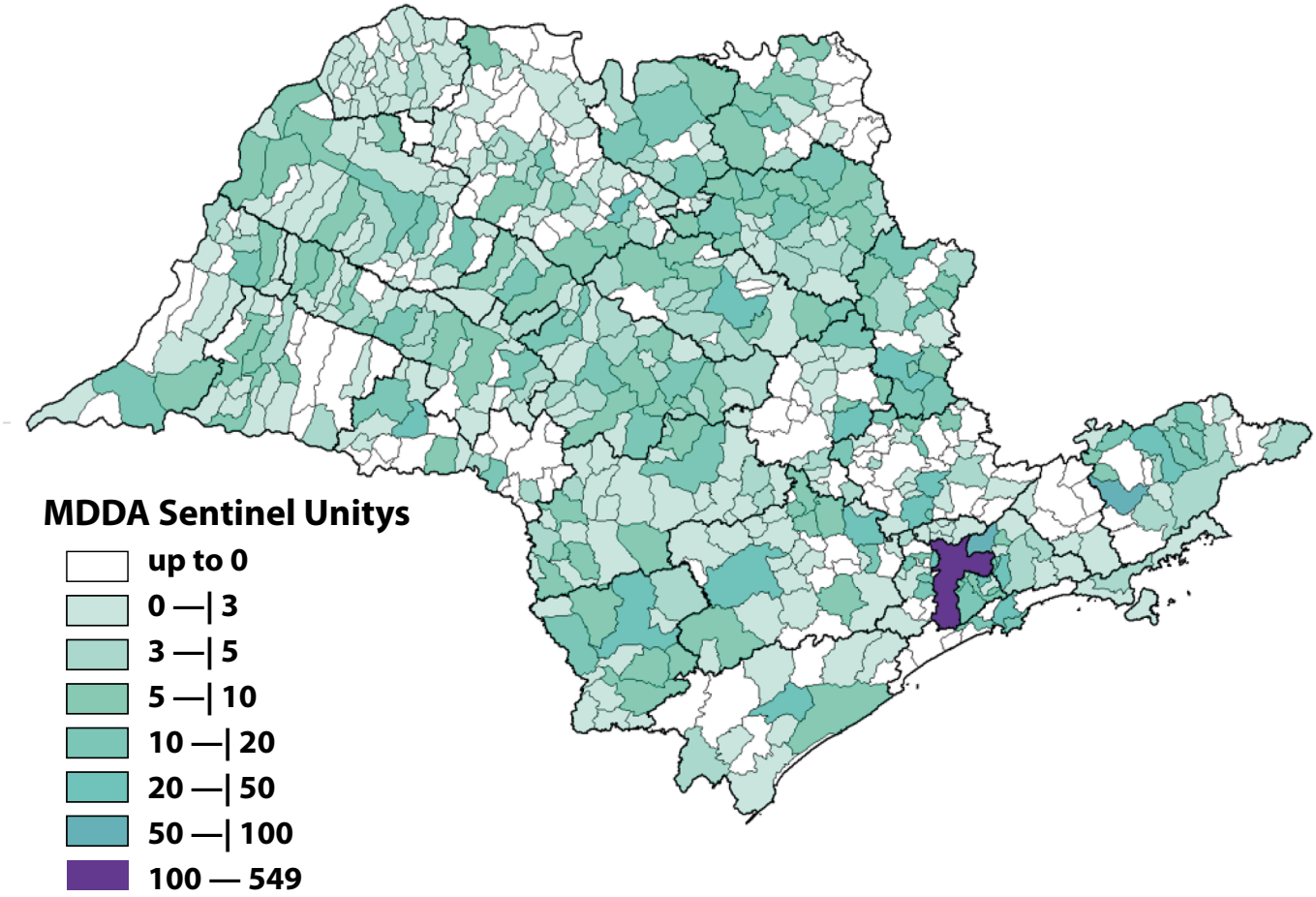
Regarding surveillance of WFD or ADD, monitoring should be understood as a process of elaboration and analysis of routine measurements capable of detecting changes in the environment or in the health of the population, and which are expressed by changes in the behavior of diarrhea. That is, monitoring that can indicate the possible occurrence of a change in the pattern now verified, which may signal the occurrence of outbreak(s). It consists of the collection, consolidation, and analysis of minimum data - age, origin, date of onset of symptoms, care, and treatment plan - of individuals who seek the health unit elected as MADD sentinel.[1,3]

The WS-WFD advocates not only the reporting of individual cases, but also their investigation. It should occur whenever there is evidence of a common source of food that may have generated the event, proceeding with the consolidation and analysis of data from all those exposed so that the risk can be assessed and, possibly, the incriminated foods can be identified. Also, it should make it

possible to identify the uncontrolled critical points that made the outbreak possible. Prevention and control measures must be taken in parallel with the investigation and the situation found.[1-3]

Considering the notification of individual cases of people with acute diarrhea treated by the sentinel reference centers, it is possible to infer that, for the monitoring itself, the SSP had 2,921 units in 2021, in the epidemiological week (EW) 52 (Figure 1), while in 2010 it already accounted for 2,622. It should be noted that this number may vary throughout the year, as the dynamics of health services can lead municipal managers to redefine the places of care.[I]

Figure 1. Spatial distribution of sentinel units that have the MADD implemented, SSP, 2021.*



Source: Sivep DDA/DFWD/ESC/SHD-SP. *Data extracted on June 13, 2022.

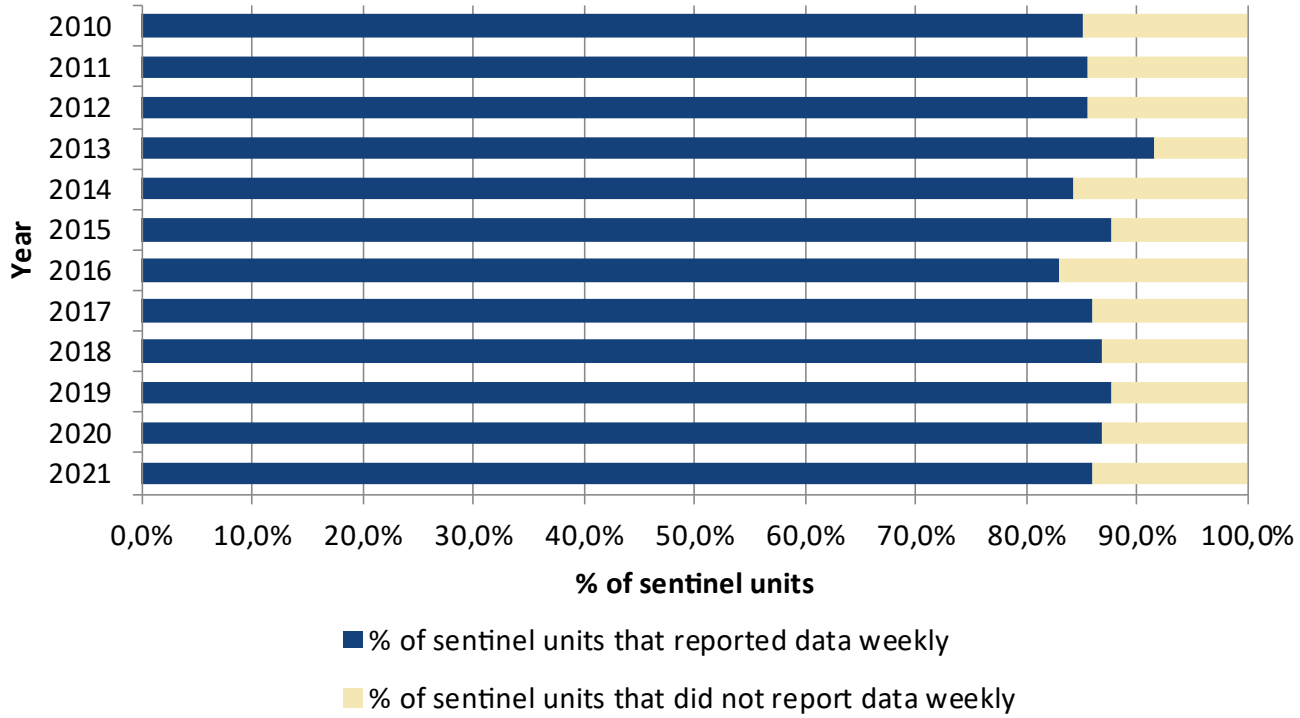
For the municipality to be a sentinel reference, the program defines a minimum number of services with monitoring of acute diarrheal diseases:

- at least one health unit carrying out monitoring in each municipality with less than 30,000 inhabitants;
- at least one health unit carrying out the MADD for every 30,000 inhabitants, in municipalities with a population between 30,000 and 200,000 inhabitants; and
- at least one health unit carrying out the MADD for every 30,000 inhabitants and one more for every 100,000 surplus inhabitants in municipalities with more than 200,000 inhabitants.

It is noteworthy that the choice of units should be based on the representativeness that the health unit has in its geographic area to attend to cases of diarrhea, as well as on its response capacity.

When evaluating the period from 2010 to 2021, regarding the number of units that regularly reported individual cases and outbreaks in the Acute Diarrheal Disease Surveillance System (Sivep DDA), it is observed that over the years about 80% of notifications are presented in accordance with the program (Graph 1).

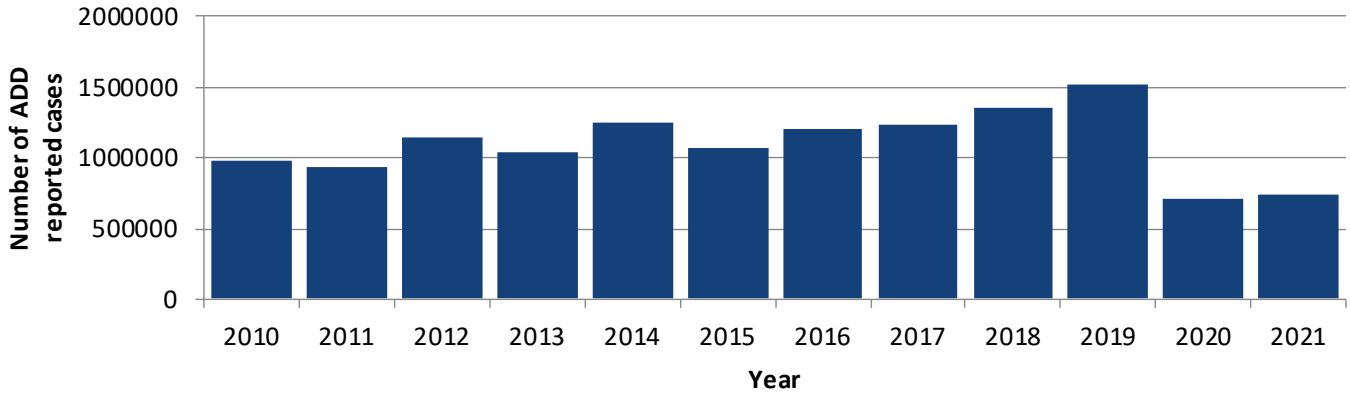
Graph 1. Proportion of health units with MADD implemented and number of units that reported weekly, SSP, 2010 to 2021.*



Source: Sivep DDA/DFWD/ESC/SHD-SP. *Data extracted on June 13, 2022.

Even if regularly reported, the existence or absence of cases by the reporting units is observed. Hence, it can be inferred that the years 2020 and 2021 were the ones with the lowest number of notifications in the analyzed period, respectively, 710,689 and 743,067, while 2019 had the highest number of notifications (1,518,612). The total reported in the Sivep DDA from 2010 to 2021 was 13,175,912 (Graph 2).

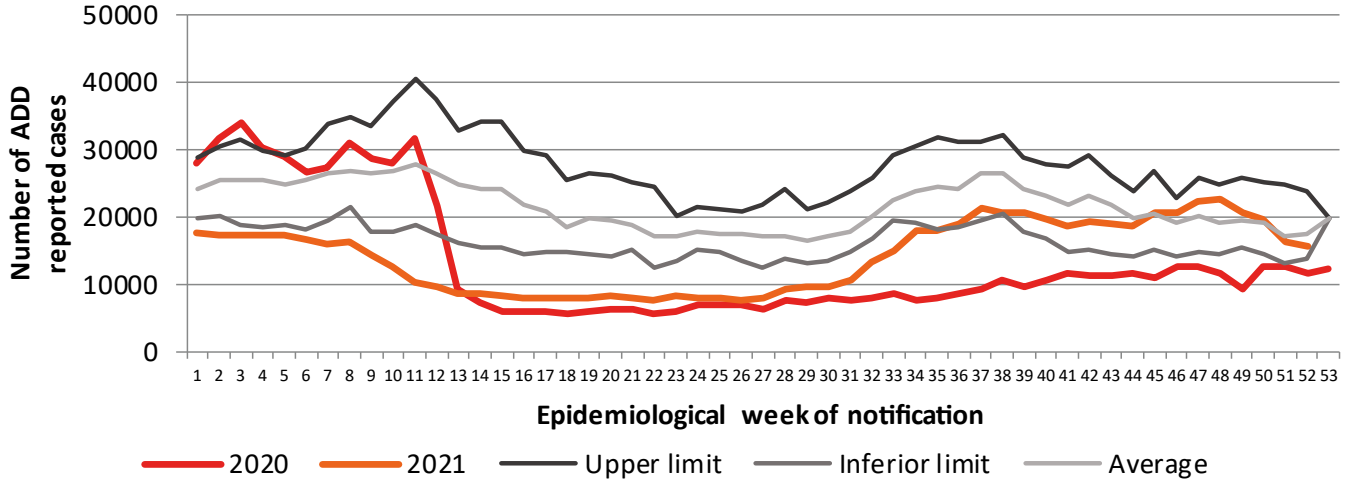
Graph 2. Number of cases of acute diarrheal diseases reported in Sivep DDA, SSP, 2010 to 2021*.



Source: Sivep DDA/DFWD/ESC/SHD-SP *Data extracted on July 28, 2022.

When analyzing its distribution by epidemiological week, it is possible to infer that the cases tended to be concentrated in the first ones of the year (from 1 to 17, months from January to April), a fact that is directly associated with the higher incidence of rainfall in SSP (Graph 3).

Graph 3. Control diagram of acute diarrheal diseases according to cases reported in the Sivep DDA, SSP, 2010 to 2021.



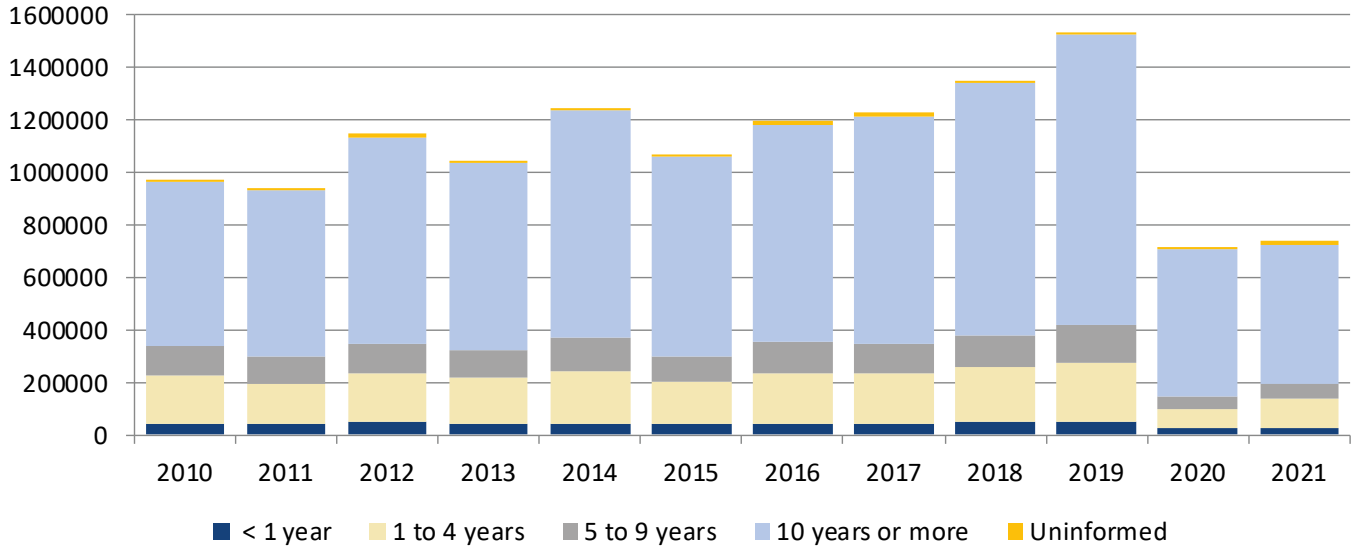
Source: Sivep DDA/DFWD/ESC/SHD-SP *Data extracted on July 28, 2022.

In this sense, considering the entire period analyzed for the purposes of preparing the control diagram, 2019 was disregarded as it was the year with the highest number of notifications. Thus, the upper and lower limits and the average were estimated from the records from 2010 to 2018. The years 2020 and 2021 were highlighted due to the occurrence of the covid-19 pandemic and for having presented the lowest number of occurrences in the period, so that there is a clear change in the notification pattern in 2020 of the EW 11, with the increase in the volume of cases only in the EW 35, when the incidence beyond the lower limit was perceived (Graph 3).

The observed reduction may be directly related to the improvement of hygiene habits, as frequent hand washing was a preventive measure widely publicized to avoid the contagion of covid-19 and applicable to other diseases, as well as to the reduction in consumption. of food in different places and in restaurants, due to restrictions on the movement of people. In the latter case, there was a great concern on the part of restaurants with the handling of food and its packaging for transport and delivery to the final consumer. In addition, unfortunately, the hypothesis of underreporting cannot be ruled out, since this same circulation restriction impacted, in 2020, the low demand for health services for diseases other than covid-19.

As for the age group of cases reported in the Sivep DDA by the sentinel units, it is evident that the largest number is concentrated between the age of 10 years or more (9,221,012 of the occurrences), followed by 1 to 4 years (2,060,862) (Graph 4).

Graph 4. Diarrhea cases reported in the Sivep DDA according to age group, SSP, 2010 to 2021.



Source: Sivep DDA/DFWD/ESC/SHD-SP. *Data extracted on July 28, 2022.

Thus, it is extremely valid to emphasize the concern regarding the incidence of diarrhea cases, especially in children under 5 years of age since they can more easily progress to severe dehydration.

In the scope of the monitoring program through the Sivep DDA, it is also expected that the sentinel units report the types of treatment adopted for each reported case. Thus, there are three possible ones, varying according to the symptomatology: type A refers to the simplest diarrhea, which does not require drug intervention or hospitalization; type B takes care of hydration, with homemade serum, increased water intake or outpatient care for intravenous hydration, but without hospitalization; and type C concerns the need for clinical support due to severe dehydration.

Although there is a large volume of cases in which the indicated treatment was not described, when analyzed year by year or the entire period in question, type A is the most indicated, followed by treatment C (Table 1).

Table 1. Number of cases reported in the Sivep DDA according to the treatment plan, SSP, 2010 to 2021.*

Notification year	Treatment Plan A	Treatment Plan B	Treatment Plan C	Uniformed Treatmente Plan Grand Total
2010	454,493	221,856	280,483	18,178
2011	447,980	206,950	274,883	10,387
2012	537,692	255,423	337,454	15,643
2013	488,211	224,659	314,919	13,953
2014	562,005	269,282	399,181	18,139
2015	475,217	236,733	341,060	15,514
2016	534,122	261,925	387,273	17,518
2017	518,409	295,607	399,664	18,387
2018	549,015	343,280	439,786	17,116
2019	635,259	375,648	503,369	20,546
2020	302,632	172,532	231,256	7,947
2021	326,471	175,655	214,034	26,897
Total	**5,831,506**	**3,039,550**	**4,123,362**	**200,225**

Source: Sivep DDA/DFWD/ESC/SHD-SP. *Data extracted on July 28, 2022.

ADD OUTBREAKS

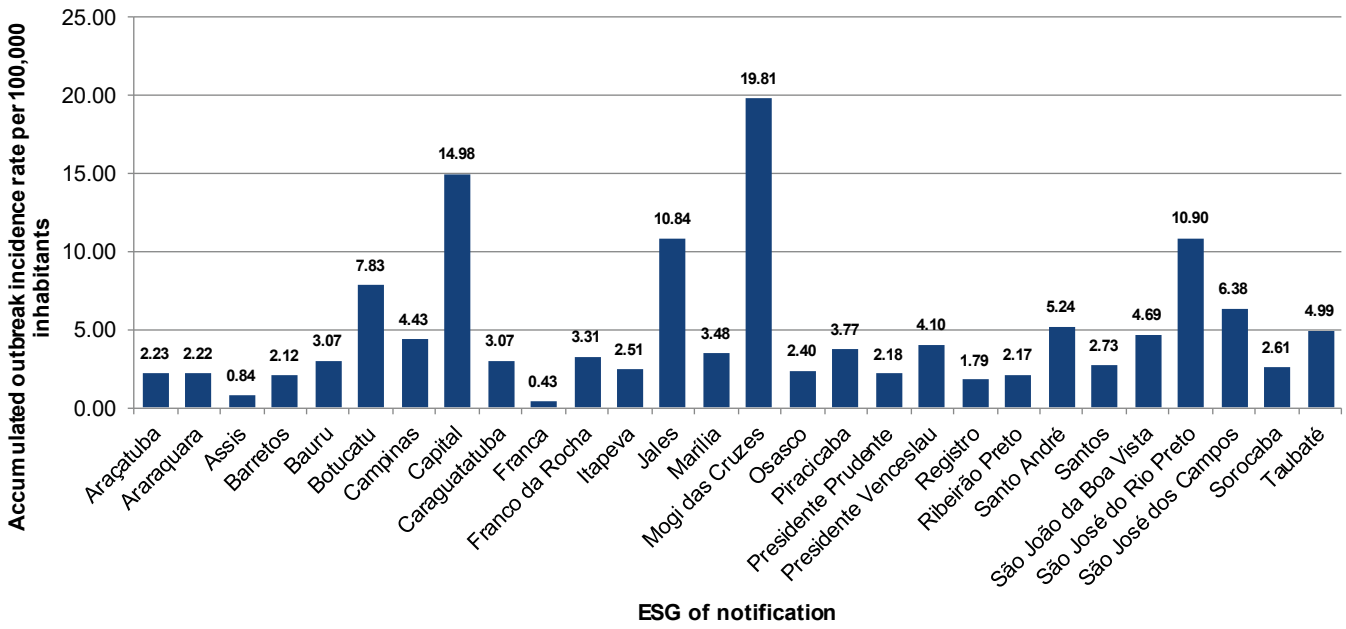
The monitoring of acute diarrheal diseases is extremely important and acts as a valuable instrument for capturing outbreaks, allowing to monitor the increase in the occurrence and the change in the local pattern of ADD. In this sense, ADD surveillance also advocates the notification

and investigation of these events using the Outbreak Investigation Form (ADD), which must be registered in the Notifiable Diseases Information System (Sinan). That is, the sentinel units must simultaneously notify Sivep DDA and Sinan, the latter being the system used by other health services to notify these events.

Thus, in the evidence from a common source that may have generated the outbreak, its immediate notification is oriented. In addition, every reported case must be investigated, starting with the identification of commensals (sick and non-sick), defining the case, incubation period for elaborating hypotheses about the etiological agent and suspected food.

In this sense, based on Sinan, it is possible to infer that from 2010 to 2021, 3,535 outbreaks were reported. Thus, when analyzing the incidence accumulated in the period in its regional distribution, the Epidemiological Surveillance Groups (ESG) of Mogi das Cruzes (19.81/100,000 inhabitants), followed by the capital (14.98/100,000 inhabitants), São José do Rio Preto (10.90/100,000 inhabitants) and Jales (10.84/100,000 inhabitants) (Graph 5) stand out.

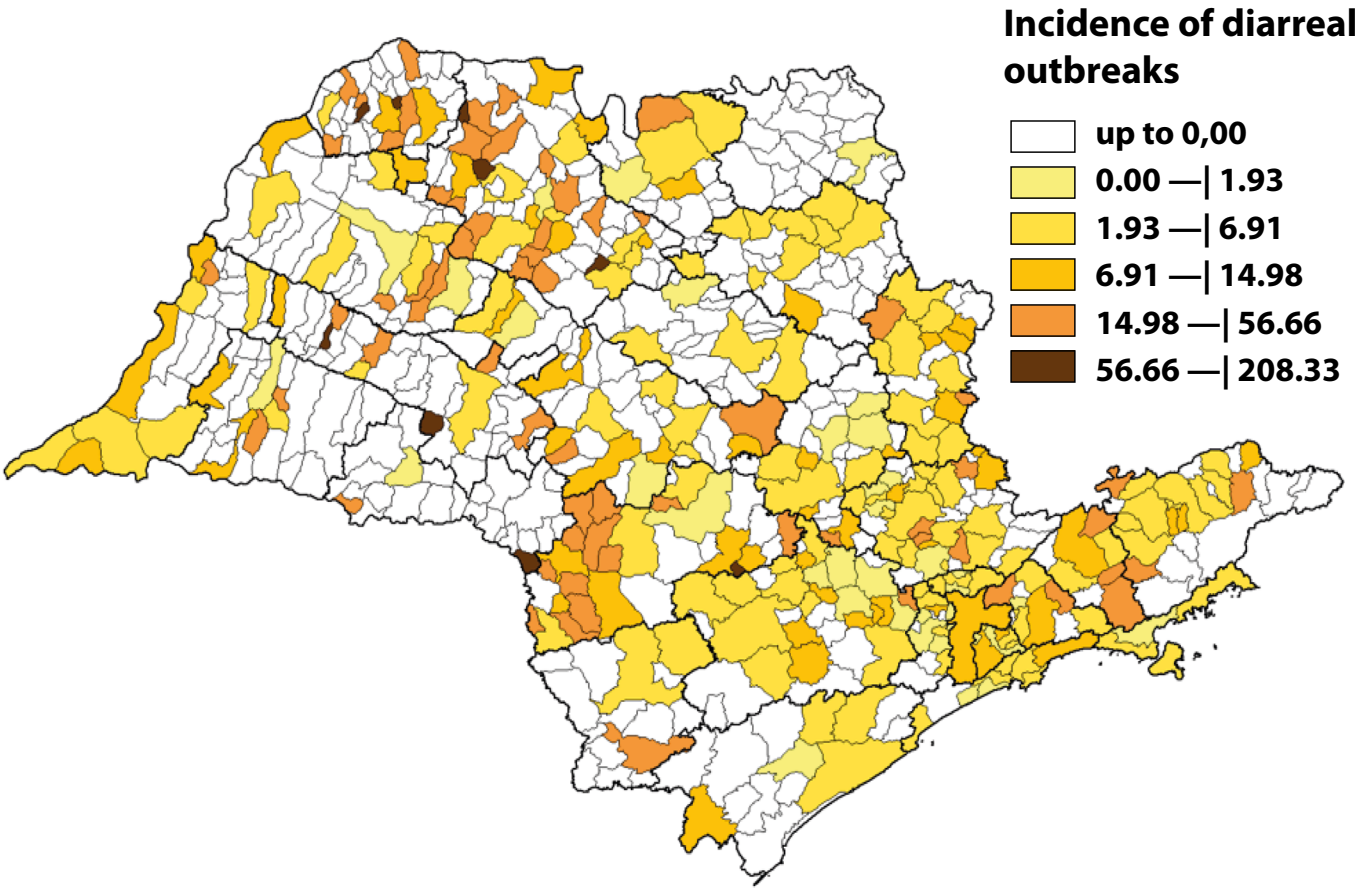
Graph 5. Cumulative incidence of diarrhea outbreaks by reporting ESG of residence, SSP, 2010 to 2021.*



Source: Sivep DDA/DFWD/ESC/SHD-SP. *Data extracted on July 28, 2022.

When observing the accumulated incidence by municipality, it is inferred that the highest is in the city of Santa Salete, followed by Marapoama, Vitória Brasil, Inubiá Paulista and Parisi, respectively with 208.33/100,000 inhabitants, 172.06/100,000 inhabitants, 170 45/100,000 inhabitants, 102.77/100,000 inhabitants and 97.37/100,000 inhabitants. The municipalities of Sorocaba (0.15/100,000 inhabitants), Itapevi (0.42/100,000 inhabitants), Diadema (0.49/100,000 inhabitants), Itaquaquecetuba (0.54/100,000 inhabitants) and Itapecerica da Serra (0. 59/100,000 inhabitants) were the ones with the lowest cumulative incidences of diarrhea outbreaks (Figure 2).

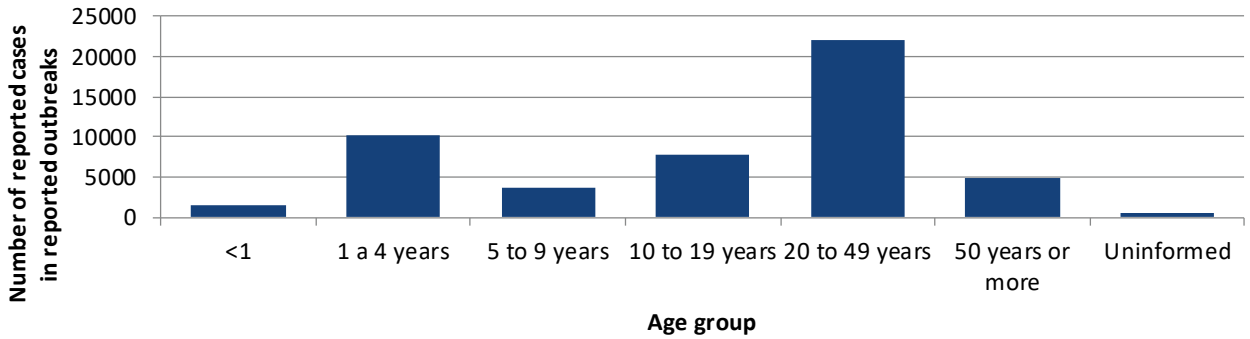
Figure 2. Spatial distribution of cumulative incidence of diarrheal outbreaks, SSP, 2010 to 2021.*



Source: Sivep DDA/DFWD/ESC/SHD-SP. *Data extracted on July 28, 2022.

When looking at the number of people involved in the 3,535 reported outbreaks, it is possible to infer that 50,325 are concentrated in the age group from 20 to 49 years (22,013), both in the analysis of the complete period and year by year (Graph 6).

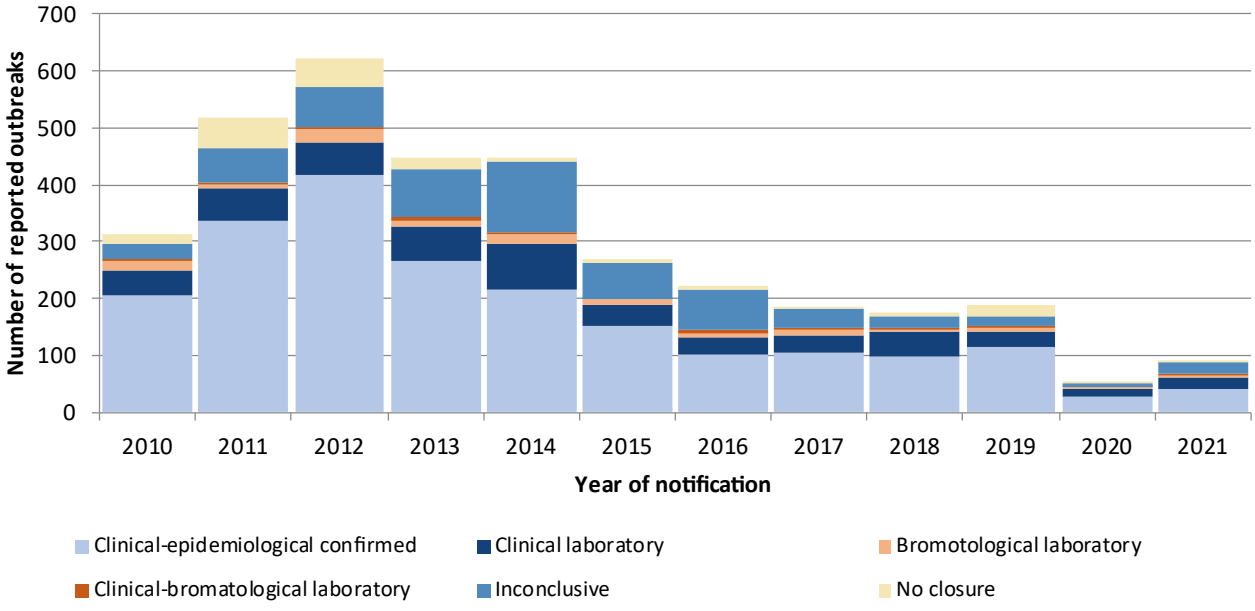
Graph 6. Number of people involved in reported outbreaks by age group, SSP, 2010 to 2021.*



Source: Sivep DDA/DFWD/ESC/SHD-SP. *Data extracted on July 28, 2022.

It is observed that the number of notifications showed a significant decrease in the years 2020 and 2021. Since most cases were confirmed by clinical-epidemiological criteria, the factors that led to the reduction of outbreak notifications may be directly related to those that also resulted in the lowest volume of information on acute diarrhea cases captured by the MADD. When considered according to the closing criteria, it is noticeable that, over the years, the largest volume is closed by clinical-epidemiological criteria, followed by the laboratory by clinical sample (Graph 7).

Graph 7. Outbreaks of diarrhea reported on Sinan according to the termination criterion, SSP, 2010 to 2021.*



Source: Sinan/DFWD/ESC/SHD-SP. *Data extracted on July 29, 2022.

This is because there is still a low volume of outbreaks whose collected samples are sent for analysis. Thus, in the entire analyzed period, only 35.35% of the cases were collected, with 2021 being the year with the highest percentage, 57.8% (Table 2).

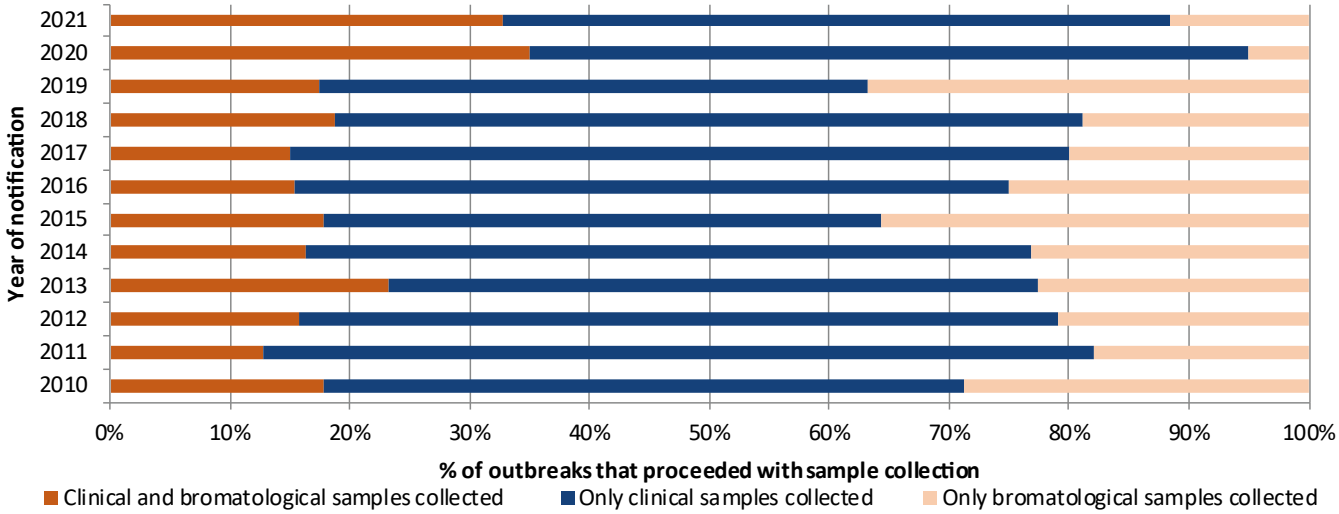
Table 2. Diarrhea outbreaks reported on Sinan according to sample collection status, SSP, 2010 to 2021.*

Notification year	Outbreaks with samples collected	% Outreaks with samples collected 25,4% por 25.4%	Outbreaks without samples collected	% outbreaks without samples collected	Total outbreaks per year
2010	129	41.3%	183	58.7%	312
2011	156	30.1%	363	69.9%	519
2012	158	25,4%	465	74.6%	623
2013	146	32.7%	300	67.3%	446
2014	203	45.4%	244	54.6%	447
2015	101	37.3%	170	62.7%	271
2016	84	37.8%	138	62.2%	222
2017	80	42.8%	107	57.2%	187
2018	69	39.0%	108	61.0%	177
2019	57	30.3%	131	69.7%	188
2020	20	37.7%	33	62.3%	53
2021	52	57.8%	38	42.2%	90
Total	**1.255**	**35.5%**	**2.280**	**64.5%**	**3.535**

Source: Sinan/DFWD/ESC/SHD-SP. *Data extracted on July 29, 2022.

The samples collected can be clinical, that is, feces from patients, preferably in the acute period of onset of symptoms. It is also recommended the timely collection of bromatological samples, that is, of the foods that can be suspected and even of the water. In this sense, it is important to emphasize that for an epidemiological investigation to be completed properly, the sample often becomes a vital instrument for the proper closure of the case, as it is not always possible to make inferences about the possible source of contamination through the data. statisticians. Thus, when this procedure is observed, it is also noted that most clinical samples are collected separately, with a smaller number of bromatological samples (Graph 8).

Graph 8. Percentage of samples collected for investigation of reported diarrhea outbreak by sample type, SSP, 2010 to 2021.*



Source: Sinan/DFWD/ESC/SHD-SP. *Data extracted on July 29, 2022.

Still on this collection, the importance of joint work between epidemiological and health surveillance is reinforced. In an investigation of this nature, within the competences of each one of them, when the work takes place in a cooperative and integrated manner, there is a greater chance that the collection of water and/or suspect food will occur in an appropriate and timely manner. And this increases the possibility of the correct closure of the outbreak.

From this perspective, when observing the ADD outbreaks with samples collected by ESG, it is inferred that between 2010 and 2021 the highest percentages were recorded in Barretos (100.0%), Jales (89.3%) and São José do Rio Preto (78.3%) (Table 3).

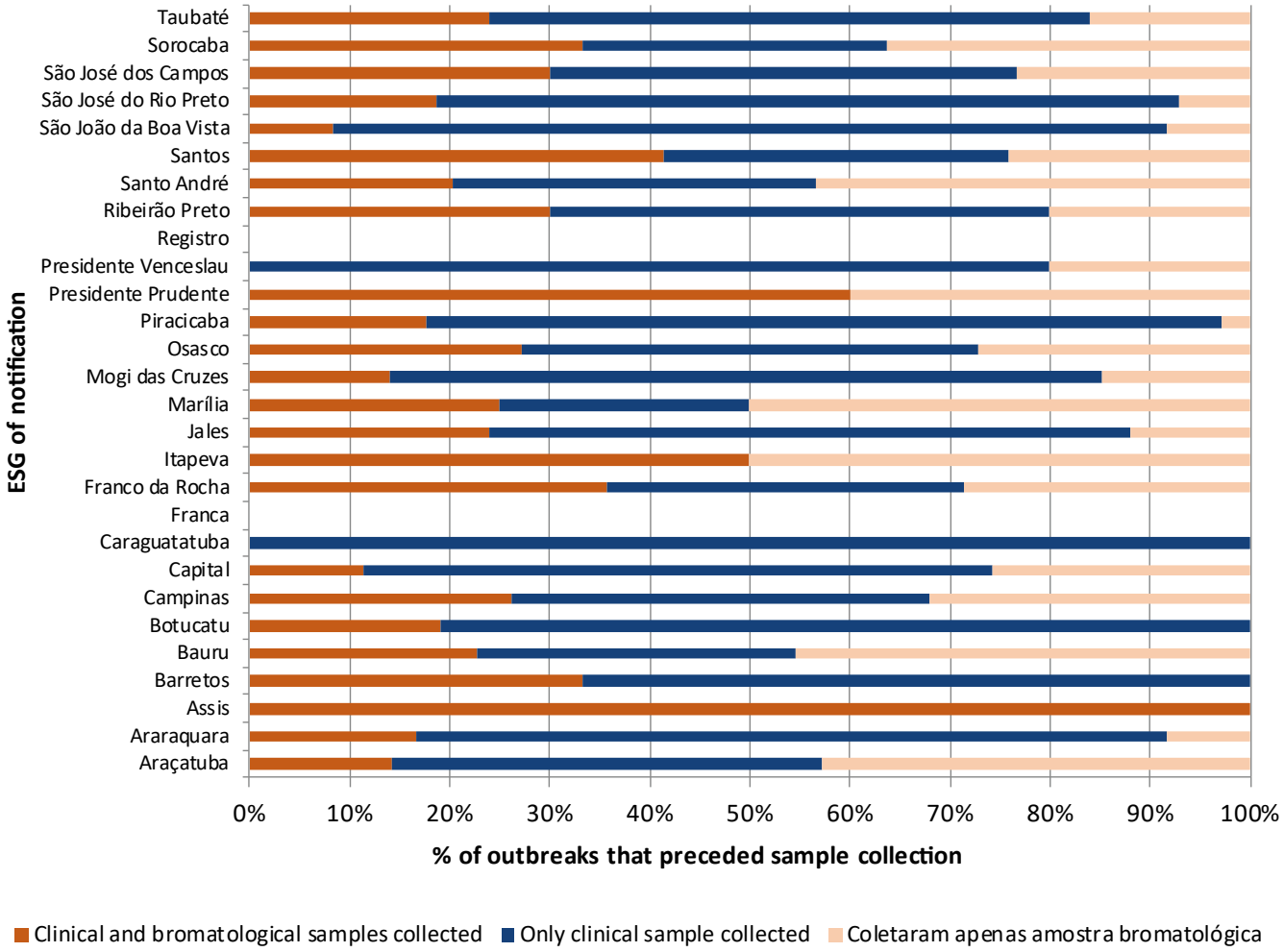
Table 3. Diarrhea outbreaks reported on Sinan according to sample collection status by reporting surveillance group, SSP, 2010 to 2021.*

Notification GVE	Outreaks withouit samples collected	% Outreaks withouit samples collected	Outreaks withouit samples collected	% Outreaks withouit samples collected	Total outbreraks GVE
Araçatuba	7	41.2%	10	58.8%	17
Araraquara	12	54.5%	10	45.5%	22
Assis	1	25.0%	3	75.0%	4
Barretos	9	100.0%	0	0.0%	9
Bauru	22	62.9%	13	37.1%	35
Botucatu	21	44.7%	26	55.3%	47
Campinas	103	51,0%	99	49.0%	202
Capital	522	29.4%	1.256	70.6%	1.778
Caraguatatuba	3	30.0%	7	70.0%	10
Franca	0	0.0%	3	100.0%	3
Franco da Rocha	14	70.0%	6	30.0%	20
Itapeva	2	28.6%	5	71.4%	7
Jales	25	89.3%	3	10.7%	28
Marília	8	36.4%	14	63.6%	22
Mogi das Cruzes	121	20.5%	469	79.5%	590
Osasco	11	15.3%	61	84.7%	72
Piracicaba	34	58.6%	24	41.4%	58
Presidente Prudente	5	50.0%	5	50.0%	10
Presidente Vencesla	5	41.7%	7	58.3%	12
Registro	0	0.0%	5	100.0%	5
Ribeirão Preto	20	62.5%	12	37.5%	32
Santo André	69	48.9%	72	51.1%	141
Santos	29	58.0%	21	42.0%	50
São João da Boa Vist	12	31.6%	26	68.4%	38
São José do Rio Pret	112	78.3%	31	21.7%	143
São José dos Campos	30	43.5%	39	56.5%	69
Sorocaba	33	57.9%	24	42.1%	57
Taubaté	25	46.3%	29	53.7%	54
Total de surtos	**1.255**	**35.5%**	**2.280**	**64.5%**	**3.535**

Source: Sinan/DFWD/ESC/SHD-SP. *Data extracted on July 29, 2022.

As for the outbreaks reported by region, it is noteworthy that only ESG Assis collected clinical and bromatological samples, while ESG Caraguatatuba was limited to clinical samples (Graph 9).

Graph 9. Percentage of samples collected for investigation of reported diarrhea outbreak by sample type according to ESG of notification, SSP, 2010 to 2021.*



Source: Sinan/DFWD/ESC/SHD-SP. *Data extracted on July 29, 2022.

It is understood that often the bromatological collection may not be available. One cannot fail to mention the difficulty, already reported by the municipalities, in carrying out the collection of feces from the people involved in the outbreaks. Since this action is essential to qualify the epidemiological investigation, it is recommended to speed up the collection process, which must be started within 48 hours after notification. It is also important to report the occurrence of an outbreak to the DTHA Division quickly, so that the investigation can be supported, including the impossibility of proceeding with the collection of samples in a timely manner.

Due to the low volume of samples collected, the process of identifying the etiological agent causing the outbreak, or even its causative source, becomes even more difficult. In many cases, even if the collection has been carried out, it is not possible to identify the pathogen. Hence the importance of laboratory surveillance not only for the investigation of diarrhea outbreaks.

Thus, when it was possible to proceed with the analysis of the materials sent, different etiological agents were evidenced over the years, such as bacteria, parasites, viruses and even toxins. Thus, it can be said that in samples collected in the investigated outbreaks, the viruses were more frequently isolated, highlighting norovirus and rotavirus. Next are the bacteria, the most identified being *Salmonella spp., Escherichia coli* and *Shigella spp.* (Table 4).

Table 4. Distribution of outbreaks according to identified etiologic agent, SSP, 2010 to 2021.*

ETIOLOGICAL AGENT/ NOTIFICATION YEAR	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
BACTERIA												
Aeromonas sp		1								1		
Bacillus cereus	3	2		5	5	3		1	2			
Campylobacter							1					
Clostridium botulinum												1
Clostridium perfringens	2	2	2	3	2	1	1	2	1			1
Clostridium sulfito redutor			1			1						
Coliformes	3	2	2	1	4	3	3	1	1	2		
Cryptosporidium spp	2	1										
Edwardsiella sp					1							
Escherichia coli	1	2	3	1	2	2	1	2	2	2	1	2
Escherichia coli enteroagregativa (EAEC)							2					
Escherichia coli enteroinvavisa (EIEC)	1	3										
Escherichia coli enteropatogenica (EPEC)	1	2		2	3	3			1			2
Escherichia coli enterotoxigenica (ETEC)		1	1							1		
Pseudomonas spp				1								
Salmonella agona									1			
Salmonella enteritidis	6	6	6	3	1			1	1			
Salmonella oranienburg				1								
Salmonella panama			1									
Salmonella spp	5	2	7	2	4	2		2		1		2
Salmonella typhi								1				
Salmonella typhimurium	1											
Shigella boydii										1		

(To be continued)

ETIOLOGICAL AGENT/ NOTIFICATION YEAR	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Shigella flexneri	1	1		2								
Shigella sonnei		1		1	4	3						
Shigella sp	1				1			3				
Staphylococcus								1				
Staphylococcus aureus		2	1	2		2		2				
Staphylococcus coagulase	3		1	1			1					
PARASITES												
Entamoeba coli	1											
Entamoeba histolytica						1						
Giardia lamblia	2	1		1	2	1						
Helmintos trichocephalus trichiurus	1											
Toxoplasma gondii									2	2		
SCOMBROIDE TOXIN			2	1	1		1					
VIRUS												
Norovirus	6	11	25	14	16	15	15	13	9	3	5	7
Rotavirus	11	16	16	16	16	7	13	4	5	4	4	1
Hepatitis A virus		1			2		1	2	3			
PROTOZOARUIES AND VIRUSES	2											
PROTOZOA, BACTERIA AND VIRUS	1											
MOR THAN ONE VIRUS					5				1			1
MOR THAN ONE BACTERIA	3		1	4	2		1	1		1		
BACTERIA AND VIRUS	3	1	2	1	4			1	1			
UNIDENTIFIED ETIOLOGICAL AGENT	252	461	552	384	372	227	182	150	147	170	43	73

Source: Sinan/DFWD/ESC/SHD-SP. *Data extracted on July 29, 2022.

Given the above, with the investigation beyond the definition of the etiological agent causing the outbreaks, it is also sought to define the source of contamination. Therefore, in most of the 3,535 reported outbreaks, the causing source was not identified or informed, among those in which it was possible to identify it, unsuitable food stands out (Table 5).

Table 5. Distribution of outbreak cases according to the source causing the outbreak, SSP, 2010 to 2021.*

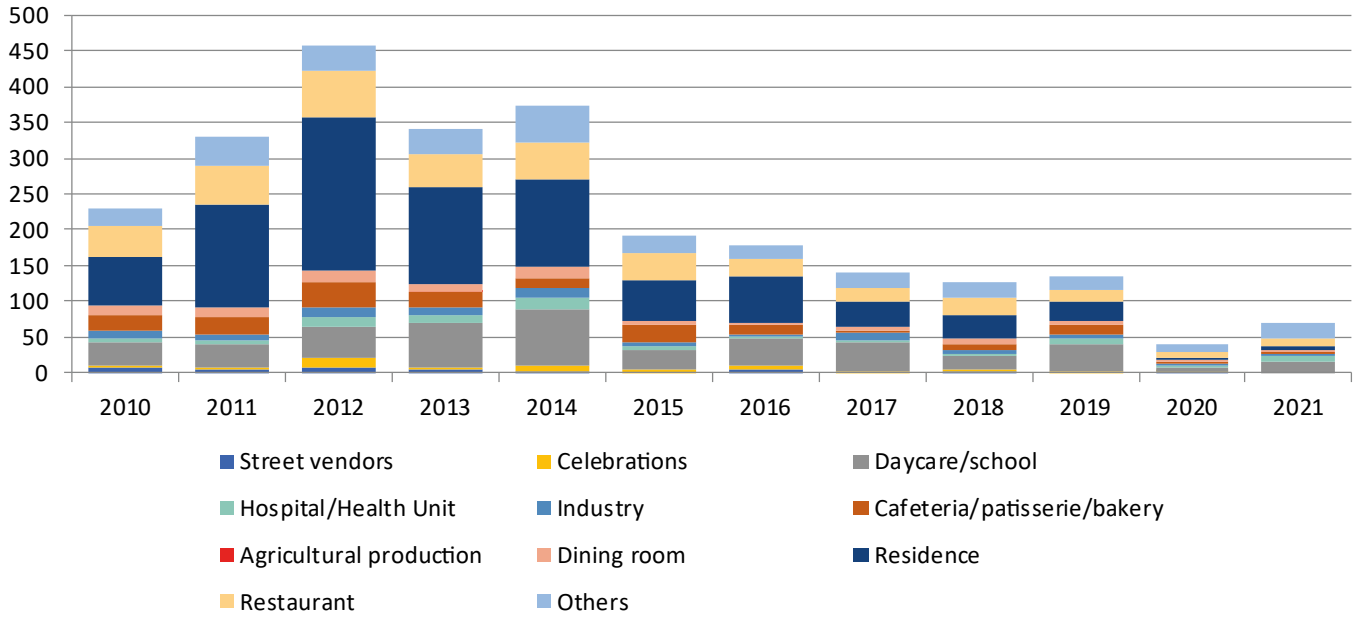
NOTIFICATION YEAR	FOOD	WATER	WATER AND FOOD	NOT INFORMED OR NOT IDENTIFIED
2010	37	3		272
2011	35	7		477
2012	51	12		560
2013	49	8		389
2014	55	19		373
2015	41	15		215
2016	34	5		183
2017	23	7	2	155
2018	16	7	1	153
2019	12	6		170
2020	7	1		45
2021	12	1		77

Source: Sinan/DFWD/ESC/SHD-SP. *Data extracted on July 29, 2022.

In this sense, the importance of integrated work with health surveillance is highlighted once again, since in many cases transmission occurs due to problems related to food handling, not only by sick handlers or unfavorable hygiene conditions. Hence, it is essential to carry out an educational action to change behavior, with emphasis on hygiene measures. In addition, recommendations for stopping the outbreak should be adopted, which may be related to disinfection procedures at the place where food is prepared or even its interdiction, when necessary.

However, it is important to emphasize that procedures aimed at hygiene and reducing the possibilities of food contamination during preparation should also be adopted in a domestic environment. This is because, over the years analyzed, it was possible to observe most of the reported outbreaks took place in the home (25.5%), followed by daycare/schools (12.2%) and restaurants (11, 5%) (Graph 10).

Graph 10. Distribution of sites with most food consumption involved in outbreaks in the SSP, 2010 to 2021.*



Source: Sinan/DFWD/ESC/SHD-SP. *Data extracted on July 29, 2022.

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