https://doi.org/10.35839/repis.5.1.792

Epidemiological characterization of Hepatitis A, Casanare-Colombia, 2013-2019

Caracterización epidemiológica de la Hepatitis A, Casanare-Colombia, 2013-2019

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Abstract

Introduction: Eradication of viral hepatitis -among them, hepatitis A- is a key part of the strategy towards implementation of environmental sanitation and immunization. **Objective**. here was to describe hepatitis A epidemiological trends at the department of Casanare during 2013-2019 timespan. Methods: Cross-sectional descriptive study from the compulsory notification of event to Sivigila. Variable analysis with descriptive statistics included in the event's file by person-place-time with Epi-Info® / Microsoft Excel®. Incidence and hospitalization rates were computed by 100.000 inhabitants. **Results**: 90,5% of cases (152/168) were inhabitants at Casanare; 3,2% of registries (5/152) purged, 6,8% (10/147) discarded y 90,1% (137/147) required analysis; 63,2% (12/19) of municipalities reported cases. Annual average of cases: 19,6±22,7 (r=4, 2017 – 70, 2019). By place/sex: urban 75 (54,7%) men, male/female ratio=1:0,8; mean age=19,3 yr ±13,1 (r=0,7-69,0); 53 (38,7%) in 10-19 yr-old group. By Incidence Rate: general population=5,4; men=5,8; women=5,0; y 10,4 in 10-19 yr-old group. Average TH=6,9/100.000, all alive. **Discussion**: The year 2019 concentrated almost half the reported cases within the study period, similarly to the whole country. It is recommended to keep on surveillance not just on quality of water or the event itself, but to carry on the community education about measures for personal hygiene, food safety and vaccination coverage against hepatitis A.

Keyword: hepatitis A, hepatitis A virus, epidemiology, epidemiological monitoring, Colombia.

Resumen

Antecedentes. La erradicación de las hepatitis víricas, entre estas hepatitis A, hace parte de una estrategia que incluye implementar sistemas de saneamiento y vacunación. **Objetivo**. Describir el comportamiento epidemiológico de la hepatitis A en el departamento de Casanare en el período 2013-2019. **Materiales y métodos**. Estudio descriptivo transversal retrospectivo a partir de la notificación obligatoria del evento al Sivigila. Análisis con estadística descriptiva de las variables consignadas en la ficha de notificación en tiempo, lugar y persona con el paquete estadístico Epi-Info y la hoja de cálculo Microsoft Excel®, con cálculo de la tasa de incidencia (TI) y de hospitalización (TH) por cien mil habitantes. **Resultados**: El 90,5% (152/168) procedente de Casanare, 3,2% (5/152) depurados, 6,8% (10/147) descartados y 90,1% (137/147) objeto de análisis; el 63,2% (12/19) de los municipios notificaron casos. Promedio anual de casos=19,6±22,7(r=4 en 2017 y 70 en 2019); 115(83,9%) urbanos; 75(54,7%) hombres, razón hombre/mujer 1:0,8, edad promedio=19,3±13,1(r=0,7-69,0) años; 53(38,7%) de 10-19 años. TI promedio: población general=5,4; hombres=5,8; mujeres=5,0; y 10,4 en el grupo de 10-19 años. TH promedio=6,9/100.000, todos vivos. **Conclusiones**. En 2019 se concentró casi la mitad de la notificación del período a estudio, siendo los hombres más afectados, situación similar a la del país. Se recomienda continuar las acciones de vigilancia del evento y de la calidad del agua para consumo humano, así como, de información, educación y comunicación a la comunidad en medidas de higiene personal e inocuidad de alimentos y la importancia del cumplimiento de las coberturas de vacunación contra la hepatitis A.

Palabras clave: hepatitis A, virus de la hepatitis A, epidemiología, vigilancia epidemiológica, Colombia.

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Reception date: 14 de octubre de 2020

Approval date: 07 de diciembre de 2020

Quote as: Aranguren S, Castañeda-Porras O. Caracterización epidemiológica de la Hepatitis A, Casanare-Colombia, 2013-2019. Rev. Peru. Investig. Salud. [Internet]; 5(1): 17-26. Available from: http://revistas.unheval.edu.pe/index.php/repis/article/view/792

Introduction

The World Health Organization (WHO) defines viral hepatitis as an inflammation of the liver caused by one of the five types of hepatitis viruses, called type A, B, C, D and E. Hepatitis A, its etiology It is produced by viral infection by the hepatitis A virus (HAV) measuring 25-28 nm, belonging to the Picornaviridae family (1), transmitted mainly when an uninfected (and not vaccinated) person consumes food or water contaminated by feces of a person infected by the virus (fecal or oral route), associated with unsafe food and water, poor sanitation, poor personal hygiene and oral anal sex (2).

In most cases, people make a full recovery and gain immunity against future infections. However, HAV infections can also be serious and life-threatening. It does not cause chronic infections or chronic liver disease and has no specific treatment. Prevention is done by improving sanitary conditions, food safety and vaccination (3).

Its course is self-limited, its reservoir and source of infection are sick humans and its replication site is the liver, with no chronic carriers of the virus (4). At the beginning of the disease, the presence of specific IgM antibodies is evident, between the first and the sixth week and in 13% of cases up to six months later; while, the presence of IgG antibodies is an indicator of lifelong immunity (5, 6).

According to the WHO, anyone who has not been infected and has not been vaccinated can contract hepatitis A (2); This is how, among the risk groups, the following have been identified: people living in endemic regions of hepatitis A, health personnel, workers in contact with sewage, food handlers, people who have sexual and family contact with infected patients and people with alterations in coagulation factors. As a preventive measure, all people included in risk groups are candidates to be vaccinated against HAV (7). Depending on the context of each country, routine childhood immunization programs may include vaccination against the hepatitis A virus, an intervention that may also be considered appropriate when

outbreaks occur in specific communities (3).

The highest rates of infection occur in childhood or adolescence and may be higher in less developed countries, taking into account the variability of sanitary and hygienic conditions. Person-to-person transmission in community outbreaks is difficult to control with standard measures such as hand washing and immunoglobulin administration to case contacts, where the disease trend due to these conditions is cyclical; that is, HAV is transmitted in community outbreaks until the population of susceptible people is exhausted, followed by several years until a new cohort of susceptible children reaches the age when clinical disease is most common (6).

In most Latin American and Caribbean countries, including Colombia, an intermediate endemicity for Hepatitis A is observed, that is, more than half of the population has already had contact with the virus and has detectable antibodies to the disease (8), with adolescents and adults and low socioeconomic groups being the most affected group (9).

In Colombia, since 1997, the coverage in the surveillance of the event and the adjustments in the definition and configuration of the case have affected the behavior and surveillance of hepatitis A cases (9); the incidence per one hundred thousand inhabitants went from 3.7 in 2000 to 20.2 in 2004, from 20.2 in 2008 to 11.9 in 2012 (8), from 10.2 in 2013 to 2.4 in 2016, from 2.7 in 2017 to 4.7 in 2018 and 7.5 in 2019 (10). This decrease can probably be attributed to the implementation of the hepatitis A vaccine in the Expanded Immunization Plan in 1-year-old children as of 2013 (8), the improvement of sanitary conditions in some regions of the country (9) and epidemiological surveillance (9, 11) where the identification of acute hepatitis A outbreaks is also a fundamental input to focus efforts on the analysis of the surveillance and evaluation of environmental risk factors such as: the quality of water for human consumption, the proper disposal of excreta, as well as the inspection, surveillance and control (IVC) actions in food distributors and handlers (7).

The department of Casanare, in compliance with the national guidelines for the surveillance and control of events of public health interest, among them, hepatitis A complies with the public health surveillance actions of the event; therefore, the objective of this study is to describe the epidemiological behavior of hepatitis A in the department of Casanare during the period 2013-2019.

Methods

Retrospective descriptive study based on the mandatory notification of the event to the Public Health Surveillance System, Sivigila (12) of the Ministry of Health of Casanare (SSC) during the period 2013-2019. It was established as an inclusion criterion that the reported cases came from the department of Casanare during the study period; therefore, all records that came from other departments of the country were excluded.

According to the information recorded in the event notification form, the variables under study were municipality and area of origin, sex, age, type of social security, population group-disabled, displaced, migrants, prison, pregnant, indigent, child population in charge of the Colombian Family Welfare Institute (ICBF), community mothers, population in psychiatric centers, victims of armed violence and others if they do not belong to a specific population group-, ethnicity, initial classification, adjustment and final classification of the case , hospitalization and final condition alive or dead.

The database purification process was carried out by searching for duplicate records, that is, two or more records with the same information in the variables defined as a validation rule: event code, notification date, epidemiological week, type of document, document number and UPGD; repeated cases, that is, those in which two or more records have similar information that differs in at least one of the variables belonging to the validation rule, (13); and, the cases discarded by the laboratory or by typing error; after which the data were transported to the Microsoft Office® Excel spreadsheet for further analysis through the use of descriptive statistics with absolute and relative frequency measures, central tendency -mean, median and mode- and ratio with the Epi Info 7.2.2.2 ™ statistical package.

Based on the national guidelines and the surveillance protocol of the event, after monitoring the initial classification of the case, the adjustment process is carried out to establish the final classification of the case, according to the established criteria for laboratory confirmation, by clinical or epidemiological link, discarded by epidemiological criteria, by laboratory or because it does not meet the case condition or due to typing error for the following reasons: the reported event is wrong, when at least one of the variables of the primary key : event code, year, epidemiological week, provider code, type and identification number were incorrectly entered (9, 11, 14).

Hospitalization and incidence rates were estimated from the cases reported as numbered, the population projected from the 2005 census (15) as the denominator multiplied by the constant value of 100,000 inhabitants; Specific rates were calculated between 2013 and 2019, by municipality, sex and age group. The vaccination coverage during the period under study for the department and its 19 municipalities was verified with the information registered by the Expanded Immunization Plan (PAI) program and the application of the biological

application was verified in the National System PAIWEB (16).

This research was carried out under international guidelines and recommendations and current national regulations for ethical issues (17), as well as ex officio actions in matters of surveillance and control in public health by the Casanare Health Secretariat, as stipulated in the single regulatory decree of the health sector 780 of 2016 (12).

Resultados

Of the total records, 90.5% (152/168) of the records were from Casanare, 3.2% (5/152) cleared, 6.8% (10/147) discarded and 90.1% (137/147) object of analysis, 63.2% (12/19) of the municipalities of the department reported cases. According to the initial case classification, 39 (28.5%) confirmed by laboratory, 96 (70.1%) confirmed by clinic and 2 (1.5%) confirmed by epidemiological link; and, according to the final case adjustment, 50 (36.5%) confirmed by laboratory, 81 (59.1%) confirmed by clinic and 6 (4.4%) confirmed by epidemiological link (Table 1).

Tabla 1 . Distribución según la clasificación final de casos, Hepatitis A, Casanare, 2013-2019

Municipality	Confirmed by						Total	%
	Laboratory	%	Clinic	%	Nexus	%		
Villanueva	21	42,0	17	21,0	4	66,7	42	30,7
Yopal	18	36,0	18	22,2	1	16,7	37	27,0
Monterrey	4	8,0	23	28,4	0	0,0	27	19,7
Paz de Aripor	2	4,0	8	9,9	1	16,7	11	8,0
Tauramena	1	2,0	9	11,1	0	0,0	10	7,3
Aguazul	1	2,0	2	2,5	0	0,0	3	2,2
Maní	1	2,0	1	1,2	0	0,0	2	1,5
Chámeza	0	0,0	1	1,2	0	0,0	1	0,7
Hato Corozal	1	2,0	0	0,0	0	0,0	1	0,7
Orocué	1	2,0	0	0,0	0	0,0	1	0,7
Sabanalarga	0	0,0	1	1,2	0	0,0	1	0,7
Sácama	0	0,0	1	1,2	0	0,0	1	0,7
Total	**50**	**100,0**	**81**	**100,0**	**6**	**100,0**	**137**	**100,0**

Of the total of 137 cases for analysis in the study period, the average number of cases per year was 19.6 ± 22.7, median 11, mode 9, minimum value 4 in 2017 and maximum 70 in 2019. Regarding the geographical origin, it can be mentioned that 115 (83.9%) from the urban area and 22 (16.1%) from the rural area, of which 3 (14.3%) from the populated center and 19 (90.5%) rural dispersed (table 2).

Table 2. Distribution by year, municipality and area of origin, Hepatitis A, Casanare, 2013-2019

Municipality	2013			2014			2015			2016			2017			2018			2019			2013-2019			
	U	R	T	U	R	T	U	R	T	U	R	T	U	R	T	U	R	T	U	R	T	U	R	T	%
Villanueva	6	1	7	2	0	2	1	0	1	1	0	1	0	0	0	4	0	4	21	6	27	35	7	42	30,7
Yopal	5	0	5	2	0	2	0	0	0	0	0	0	1	0	1	3	0	3	25	1	26	36	0	37	27,0
Monterrey	1	1	2	5	2	7	3	4	7	6	1	7	0	1	1	1	0	1	2	0	2	18	8	27	19,7
Paz de Ariporo	0	0	0	0	0	0	1	0	1	5	0	5	1	0	1	0	0	0	4	0	4	11	0	11	8,0
Tauramena	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	10	0	10	7,3
Aguazul	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	2,2
Maní	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	2	1,5
Chámeza	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0,7
Hato Corozal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0,7
Orocué	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0,7
Sabanalarga	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0,7
Sácama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0,7
Total	**16**	**2**	**19**	**9**	**2**	**11**	**5**	**4**	**9**	**12**	**3**	**15**	**2**	**2**	**4**	**8**	**0**	**9**	**63**	**6**	**70**	**115**	**19**	**137**	**100,0**

*Urbano (U), Rural (R), Total (T)

In relation to sex: 62 (45.3%) of the female sex and 75 (54.7%) of the male sex, male / female ratio of 1: 0.8; the mean age was 18.1 (± 10.5), median and mode 17, minimum value 2 and maximum 69 years. Regarding the distribution by age group 9 (6.6%) from 1 to 4 years old, 21 (15.3%) from 5 to 9 years old, 26 (18.9%) from 10 to 14 years old, 27 (19 , 7%) from 15 to 19 years old, 20 (14.6%) from 20 to 25 years old, 31 (22.6%) from 26 to 59 years old and 3 (2.2%) from 60 years and over. It is necessary to highlight that, of the total number of cases in the group aged 1 to 4 years, 5 (55.5%) born after 2013, of them, 4 (80.0%) with a record of vaccination against hepatitis A, confirmed by clinic; and one (20.0%) without registration and confirmed by the laboratory.

From the distribution according to the type of social security it could be observed that: 66 (48.2%) were contributory, 53 (38.7%) subsidized, 4 (2.9%) special, one (0.7%) exception, 2 (1.5%) undetermined and 11 (8.0%) uninsured.

In relation to specific population groups, one (0.9%) displaced, 3 (2.7%) migrant and 133 (97.1%) others; and, ethnic belonging, 2 (1.5%) indigenous and 135 (98.5%) others; 41 (29.9%) hospitalized and all with a final living condition.

The 68.3% (28/41) of the cases that required hospitalization were notified in 2019, from 7 (58.3%) of the municipalities that reported cases, 46.4% (25/41) concentrated in the municipalities of Villanueva and Yopal; 39 (95.1%) from the urban area; 51.2% (21/41) of the male sex, the average age was 18.1 (± 10.5), median and mode 17, minimum value 2 and maximum 45 years; and, 43.9% (18/41) in the group of 10 to 19 years. Male / female ratio of 1.1, that is, for every man one woman.

Distributed according to the type of social security, 19 (46.3%) contributory and subsidized respectively, one (2.4%) special and 2 (4.9%) uninsured; by population group, all in other groups and without ethnicity. According to the initial case classification, 21 (51.2%) confirmed by laboratory and 20 (48.8%) confirmed by clinic; and, according to the final adjustment of the case, 23 (56.1%) confirmed by laboratory, 16 (39.0%) confirmed by clinic and 2 (4.9%) confirmed by epidemiological link.

The incidence rate of the department by year and municipality of origin is presented in figure 1, by age group and sex in figure 2; and the hospitalization rate per year and municipality in figure 3. Figure 4 shows the behavior of the notification by epidemiological week per year under study.

Figure 1. Incidence rate per 100,000 habitants per year and municipality, Hepatitis A, Casanare, 2013-2019

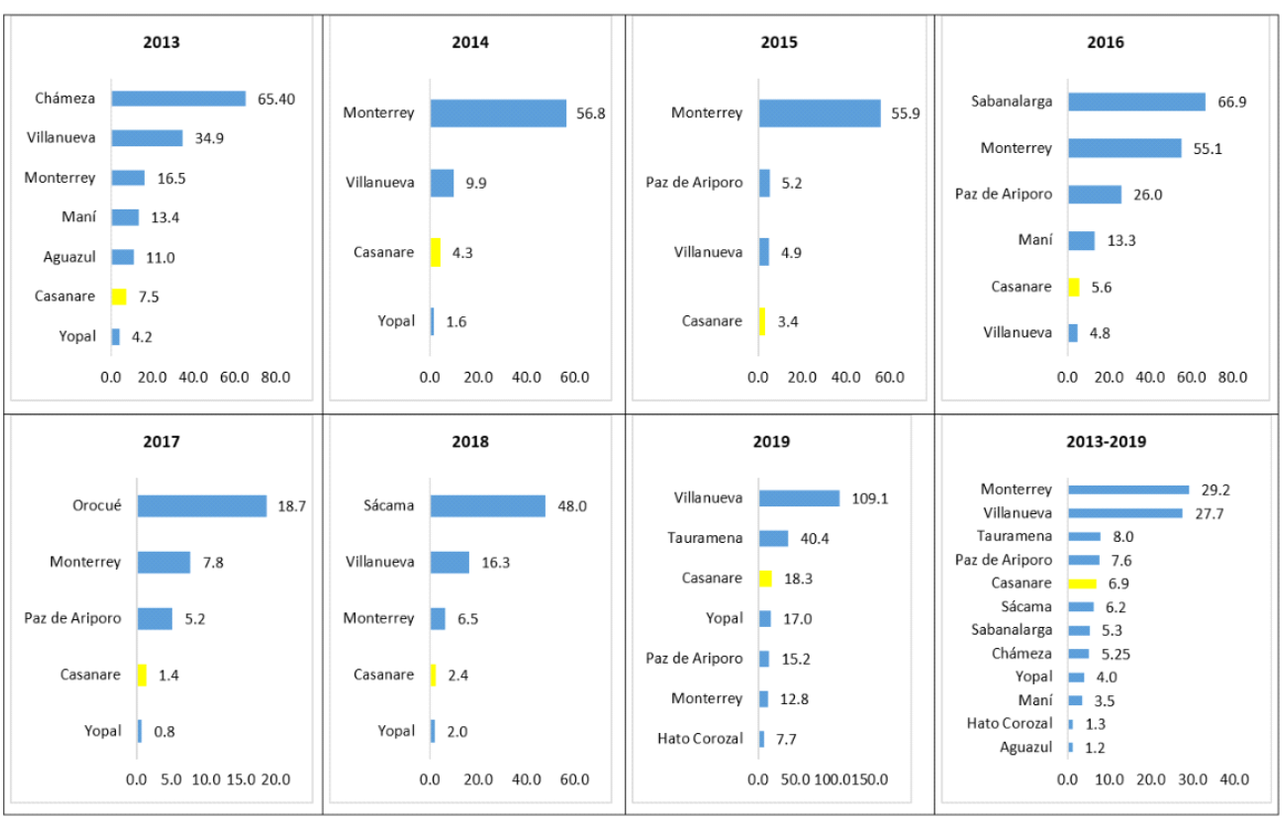
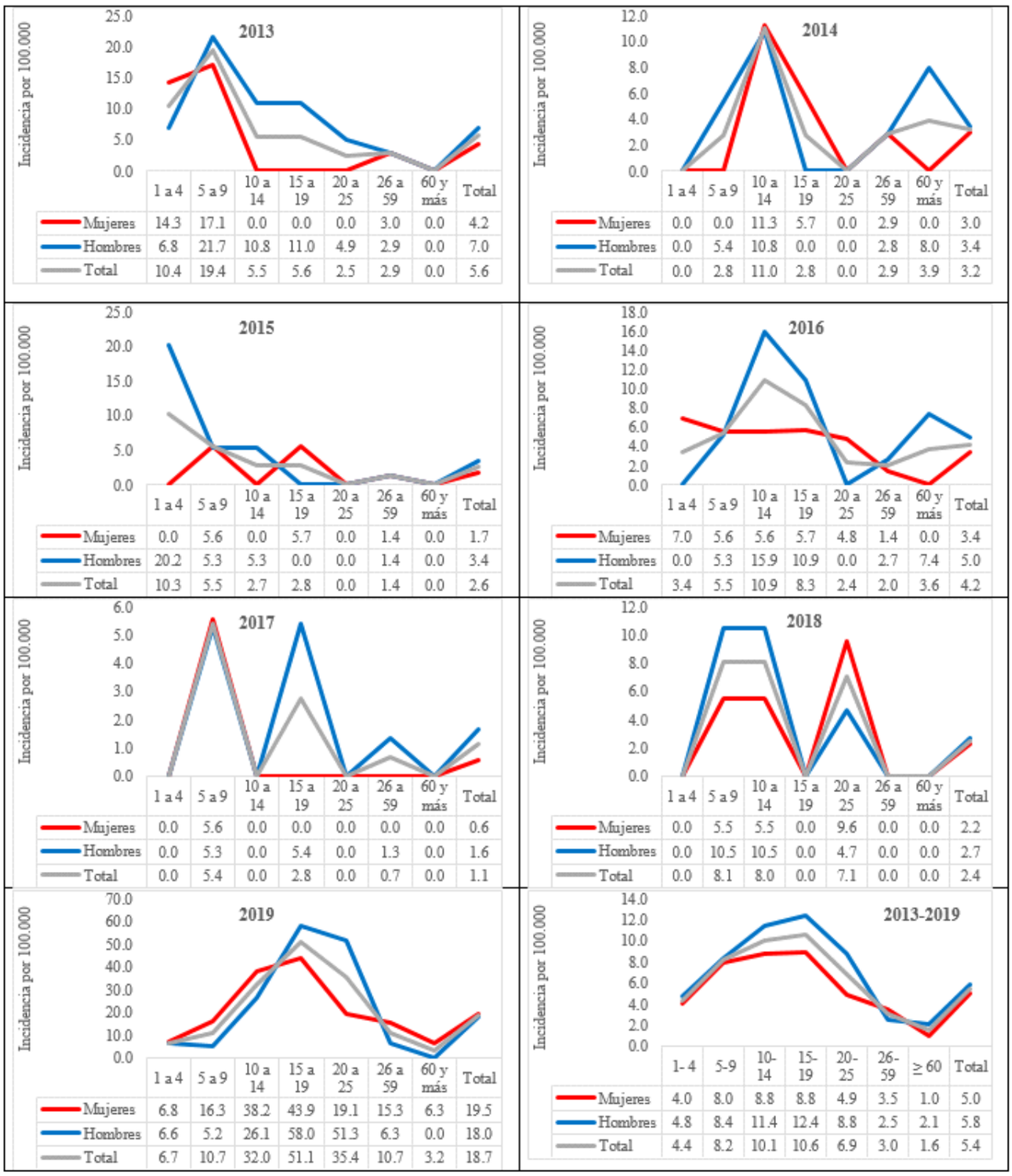


Figure 2. Incidence rate per 100,000 habitants by age group and sex, Hepatitis A, -Casanare, 2013-2019



Discussion

Of the total records in the database during the period under study, one-tenth came from other departments; and, a minimum part was refined because it was repeated or duplicated; Of the total number of cases from Casanare and as a result of the process of follow-up to the cases, according to the surveillance protocol (9), the seventh part of the cases were discarded, for the most part, by the laboratory and a minimal proportion due to typing errors, a percentage increase of 32.5% is evidenced with respect to the number of cases confirmed by laboratory, a decrease of 22.8% in the number of cases confirmed by clinic and a two-fold increase in the number of cases confirmed by epidemiological link .

Figure 3. Hospitalization rate per 100,000 habitants per year and municipality, Hepatitis A, Casanare, 2013-2019

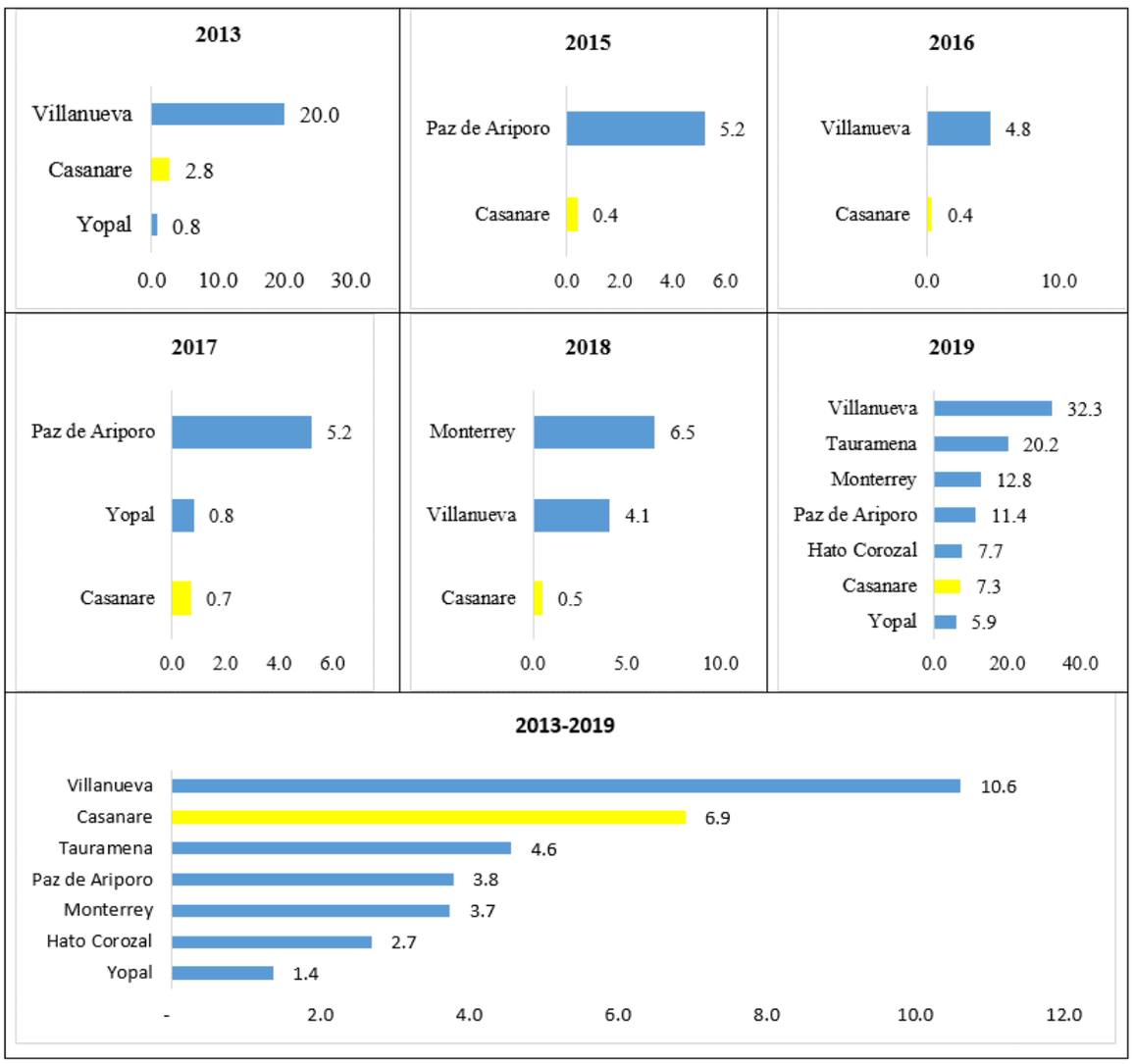
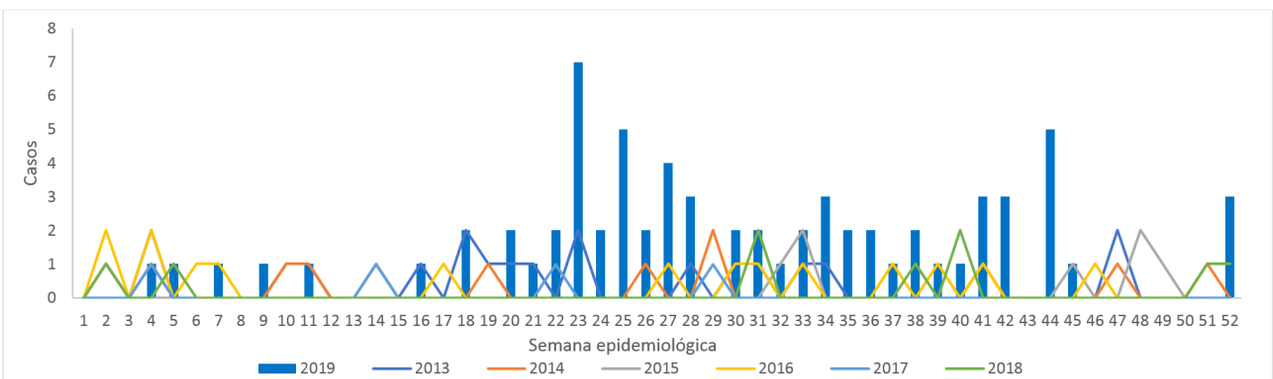


Figure 4. Behavior of the department's case notification, Hepatitis A, Casanare, 2013-2019



The municipalities of La Salina, Nunchía, Pore, Recetor, San Luis de Palenque, Támara and Trinidad did not report cases during the study period. Among the municipalities that notified cases, Villanueva, Yopal, and Monterrey account for more than three-quarters of the notification, attributable to Villanueva and Yopal, in 2019 -year in which they account for half of the notification for the entire period-, They provide the largest number of cases reported in the department with a similar frequency and Monterrey reports at least one case in each year under study.

According to the area of origin, most are concentrated in the urban area, but it is still striking that, among the cases from the rural area, the dispersed rural area is concentrated, characterized by the dispersed arrangement of houses and farms

agricultural and does not have a layout or nomenclature of streets, highways, avenues and others.

In Colombia, men get sicker than women from hepatitis A (18, 19), a situation that is not unrelated to the department of Casanare, where with a difference of close to five percent, the distribution according to sex is higher in people from the male sex, with a difference close to five percent, a situation that is reflected in the male-female ratio, according to which, also with a minimal difference, men get sick more than women.

The average age of infection was higher than that reported by Rincón et al. (5) of 11.6 years, for Bogotá, Bucaramanga, Cali and Medellín between 2013-2017; By age group, the most affected are adolescents aged 10 to 19, followed by the group aged 20 to 29, coinciding with that reported by the WHO, in areas of intermediate endemicity such as Colombia, where most infections occur in childhood late and in young adults (20).

Regarding the type of social security, as well as how it has been reported for the country (21), almost half is in the subsidized regime, in which the poorest and most vulnerable population of the country in rural and urban areas, without capacity for payment, they have access to health services through a subsidy offered by the State (22) and almost a tenth of it is not insured, a value higher than the 3.5% calculated for the country (21); The two cases that are recognized as indigenous due to ethnicity were from the municipality of Monterrey reported in 2015 and 2016 between 3 and 14 years of age.

It is noteworthy that, of the total of children under 5 years of age, the only case confirmed by laboratory, reported in 2016 and from the municipality of Villanueva, lacked a record of vaccination against hepatitis A, the other four cases were confirmed clinically, that is that is, cases in which the treating physician makes a diagnostic impression of hepatitis A according to the case definition of the event.

In this regard, even when the surveillance protocol establishes among the responsibilities of the actors, that of guaranteeing comprehensive care of the case in accordance with clinical practice, including the required paraclinics, access to adequate diagnosis according to national guidelines, carrying out of individual actions aimed at confirming hepatitis A cases by laboratory and ensuring individual case interventions (9), the obligation to make laboratory confirmation of each and every one of the cases reported in children under one year of age is not explicit since 2013, the year in which vaccination began in Colombia against hepatitis A (8), after which, the vaccination coverage of the department of Casanare ranged between 85.8% in 2013, 93.6% in 2014, 93.5% in 2015, 92.2% in 2016 (16), 89.2% in 2017 and 89.0% in 2018 and 97.6% in 2019 (23-25) the only year in which coverage is useful, that is, greater than or equal to 95%.

The incidence rate of the department per one hundred thousand inhabitants, on average, during the period under study was higher than that of the country of 5.1 / 100,000 (10, 26-31), the lowest in 2016 being 2.4 and the highest in 2013 of 10.2 followed by 2019 with 7.5 cases; And, as in Casanare, in 2019, Colombia registered the highest incidence in the 15 to 19 age group with 18.0 cases, not to mention that for the department it was almost three times higher (10). By municipality, in their order, Monterrey -municipality that reports at least one case each year-, Villanueva, Tauramena and Paz de Ariporo exceed the departmental incidence rate.

By year, in 2014 none of the reported cases was hospitalized, the highest proportion was concentrated in 2019 followed by 2013; By municipality, Chámeza, Maní, Orocué, Sabanalarga and Sácama also did not report cases that required hospitalization; Villanueva and Yopal concentrated more than half of the hospitalized cases, mostly from the urban area; more than half in the 10-25 age group; mostly affiliated with the contributory and subsidized regimes with the same proportion; a little more than half confirmed by laboratory, without ceasing to draw attention that despite being hospitalized, laboratory confirmation was not made of all the cases that were admitted confirmed by clinical and epidemiological nexus.

The hospitalization rate per one hundred thousand inhabitants of the department (10, 26-31), on average, was higher than that of the country of 1.5 cases; With the exception of Villanueva, all the municipalities with cases that required hospitalization had a lower rate than the department.

The epidemiological curve of the notification by year under study and epidemiological week shows the increase in cases in 2019 from week 18 with at least 2 cases per week, and peaks in weeks 23, 25, 27 and 44 with more than 4 cases reported in each one, during which the municipalities of Villanueva and Yopal contribute all of the reported cases, which could be considered as an outbreak, defined in the event surveillance protocol as the episode in which two or more more confirmed cases, or one confirmed and one probable, and where the existence of an epidemiological link is confirmed (9), but only three family nuclei are identified in the municipality of Villanueva, one reported in epidemiological weeks 22 and 23 of three cases , one confirmed by laboratory and two by epidemiological link; and another, in week 34 of two confirmed cases, one by laboratory and the other by epidemiological link.

On the other hand, when verifying the results of the water analysis, the risk index of water quality for

human consumption (IRCA) of zero points when it meets the acceptable values for each of the physical, chemical and microbiological characteristics and one hundred points For the highest risk (32), in 2019, Yopal and Tauramena (with 10 cases) registered a value of 2.4% and 4.0% corresponding to the level without risk between 0-5.0%; and, Villanueva obtains a value of 5.2% (33), very close to the lower limit of the indicator established between 5.1-14%, that is, a low level of risk susceptible to improvement that, added to the increase in the number of cases indicates the need to continue monitoring not only the event and water quality, as well as education to the community in personal hygiene and food safety measures.

Epidemics associated with contaminated food or water can appear explosively, can be prolonged and persist for months in the population through human-to-human transmission. The causative viruses survive in the environment and can resist the methods of inactivation and control of pathogenic bacteria commonly used in food production (2). In the case of hepatitis A, transmitted mainly when an infected and unvaccinated person eats or drinks something contaminated by feces from a person infected with HAV, closely associated with lack of drinking water, poor sanitation and poor personal hygiene (3) , training on food safety for people who work in the production, preparation and consumption of food, at any level -artisan, industrial and family- is, among others, a measure to mitigate or reduce diseases transmitted by food or water, and therefore HA (34).

Likewise, in addition to the sanitary control measures in force in the country, established in Colombia since 2007 (32, 35), Báez et al., Recommend evaluating the possibility of integrating the detection of HAV as an indicator of the quality of drinking water in the municipalities where the risk occurs, if there is a suspicion of the presence of the virus in the supply source of the drinking water plant, carry out the disinfection process as rigorously as possible, since any deficiency in said process generates the risk of contamination microbiological and viral for the population; take preventive measures such as emergency chlorination, disinfection of water for human consumption and education of the population in a municipality where there is no treatment plant (36).

In other words, to reduce the transmission of hepatitis A, measures should emphasize the priority of all settings and align with initiatives to address goal 6 of the 2030 Agenda for Sustainable Development (37), which includes among its goals : achieve universal and equitable access to drinking water at an affordable price for all; achieve access to adequate and equitable sanitation and hygiene services for all and end open defecation, paying special attention to the needs of women and girls and people in vulnerable situations; and, to support and strengthen the participation of local communities in improving water and sanitation management.

Additionally, universal vaccination of 12-month-old children with a single dose against hepatitis A to reduce the disease rate by 80% or more (38); and, as a prophylactic measure, educate the community in general on the causes of the disease and the actions to eradicate it; and, specifically, hand washing before eating and after using the toilet, correct washing of fruits and vegetables, proper cooking of food and avoiding defecation in the open air; and invite educational institutions to include health training in their institutional educational projects as a promotion and prevention strategy aimed at children, adolescents and young people, on whom the health levels and quality of life of women will depend to a great extent. future generations (39).

The authors report that a possible limitation for epidemiologically characterizing any event of interest in public health that is subject to surveillance in Colombia is the high turnover of human talent inherent in the form of contracting and constitutionally established changes of government, which could affect follow-up and timely notification of hepatitis A cases; as well as that the surveillance protocol of the event does not establish the obligatory nature of laboratory confirmation of all probable or clinically confirmed cases or epidemiological nexus.

Funding Source

This study was carried out as a result of the activities contemplated in the Contracts for the provision of professional services 0596 and 0881 of 2020 between the department of Casanare and the authors.

Contribution of the authors

All authors participated in the entire research process.

Interest conflict

We declare no conflict of interest.

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