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Descriptive Analysis of Shigellosis Cases Registered in Armenia in 2016-2019

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Introduction

Shigellosis is a diarrheal disease caused by a group of bacteria called Shigella with four main species: Shigella sonnei, Shigella flexneri, Shigella boydii and Shigella dysenteriae.

Worldwide, Shigella is estimated to cause 80–165 million cases of disease and 600000 deaths annually; 20–119 million illnesses and 6,900–30,000 deaths of those are attributed to foodborne transmission. Shigella spp. is endemic in temperate and tropical climates. Transmission of Shigella spp. is most likely when hygiene and sanitation are insufficient. Shigellosis is caused predominantly by S. sonnei in industrialized countries, whereas S. flexneri prevails in the developing countries. Infections caused by S. boydii and S. dysenteriae are less common globally but can make up a substantial proportion of Shigella spp. isolated in sub-Saharan Africa and South Asia.

Illness typically begins 1–2 days after exposure with symptoms lasting 5–7 days. Disease severity varies according to species: serotype S. dysenteriae serotype 1 (Sd1) is the agent of epidemic dysentery, whereas S. sonnei commonly causes milder, nondysenteric diarrheal illness. However, Shigella of any species can cause severe illness among people with compromised immune systems. Shigellosis is characterized by watery, bloody, or mucoid diarrhea; fever; stomach cramps; and nausea. Occasionally, patients experience vomiting, seizures (young children), or post infectious manifestations, including reactive arthritis, glomerulonephritis, and intestinal perforation. Hemolytic uremic syndrome can occur after infection with Shiga toxin–producing strains, particularly Sd1 [1].

The aim of the study is to explore the prevalence of shigellosis cases registered in Armenia in 2016-2019.

Material and Methods

A descriptive analysis, including mapping of shigellosis cases registered in Armenia during 2016-2019 was carried out. Data were collected from the monthly and annual epidemiological reports of the National Center of Disease Control and Prevention. The data were analyzed by time, place, person. Analysis and mapping performed using Microsoft Excel.

Results and Discussion

During 2016-2019 in Armenia, 2934 cases of shigellosis have been registered, of which 2345 were among children from 0 to 18 years old. Trend over the 2016-2019 years in Armenia is depicted in Table 1. The highest notification rate was noted in children: those under 18 years of age represent 80% of all cases.

Table 1

Reported cases of shigellosis and incidence rates per 100 000 population and among those aged 18 years or below in Armenia, 2016-2019

Year	***Number of Cases***	***Incidence***	***Number of cases (age 0-18 years)***	***Incidence (age 0-18 years)***
2016	728	24.4	587	76.4
2017	682	23	563	73.4
2018	1102	37.2	905	118.3
2019	422	14.3	290	37.9
Total	2934	-	2345	-

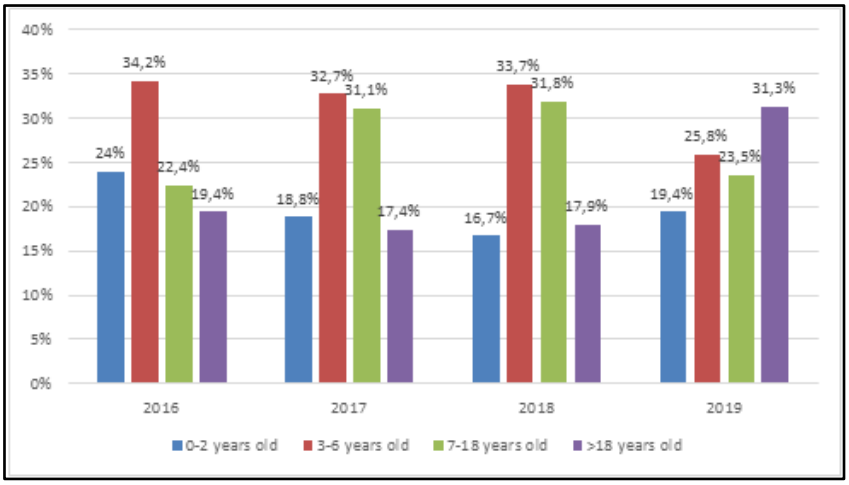
In 2019, Shigella sonnei accounted for 28% of the infections, followed by Shigella flexneri (21%) in Armenia (see Table 2). In other countries, long-lasting outbreaks of Shigella sonnei infection were reported in day-care centers and occasional food-borne outbreaks by Shigella flexneri, also reported among men who have had sex with men.

Table 2

Proportion of shigellosa serogroups in Armenia in 2019

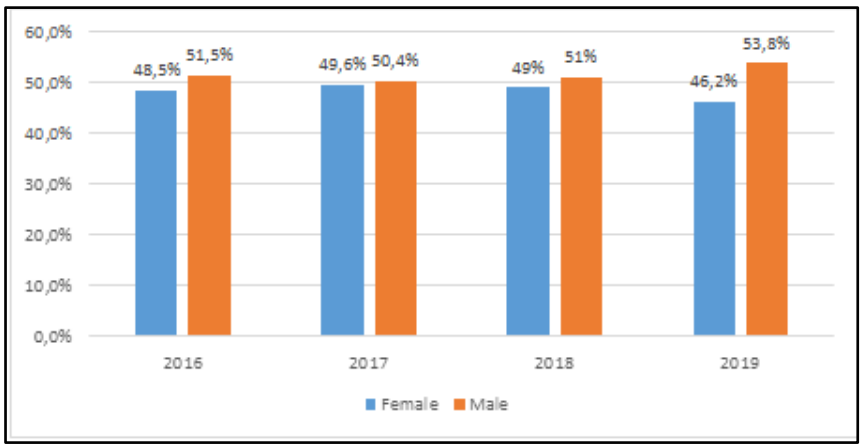
Type	***Number of Cases***	***Proportion***
Unspecified shigellosis	186	44%
Shigella Sonnei	118	28%
Shigella Flexneri	88	20.9%
Other shigellosis	29	6.9%
Shigella Dysenteriae	1	0.2%
Shigella Boydii	0	0%

Regarding the age distribution of shigellosis cases 2016-2019, 569 (19.4%) cases were reported among toddlers from 0 to 2 years old, 952 (32.4%) cases in the age group 3 to 6 years old, 824 (28.1%) cases in the age group from 7 to 18 years and 589 (20.1%) cases in the age group >18 years old (see Graph 1). Of interest, the relative proportion of affected adults has lately increased: in 2019, one out of three cases was over 18 years.



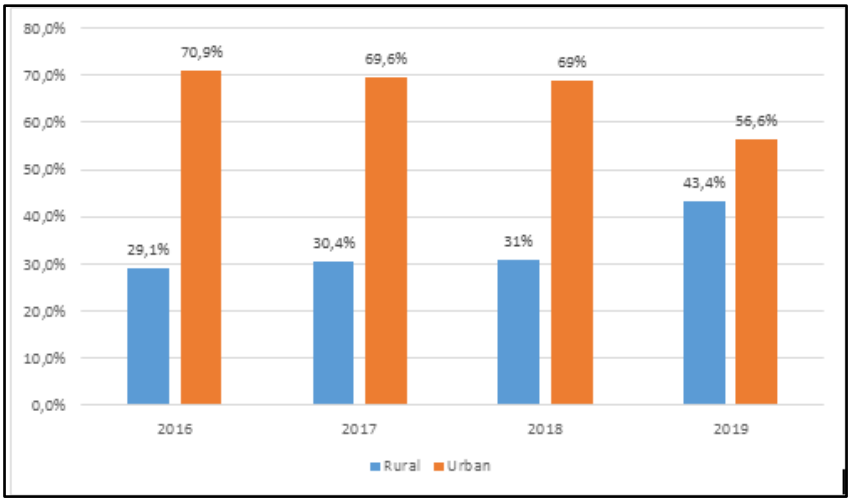
Graph 1. Proportion of confirmed shigellosis cases reported by age group, Armenia, 2016-2019

When considering the sex distribution, shigellosis incidence is slightly higher among men, with 48.6% (1426) of shigellosis cases being females (see Graph 2). In 2019 an increase in the number of male cases is noted compared to previous years.



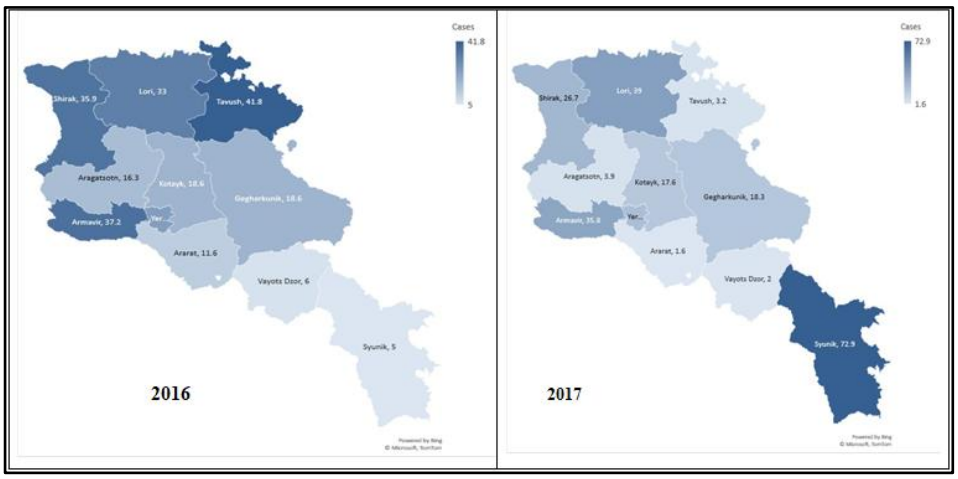
Graph 2. Proportion of confirmed shigellosis cases among females and males, Armenia, 2016-2019

In Armenia shigellosis occurs predominantly in urban areas: during 2016-2019, only 944 (32.2%) of shigellosis cases resided in rural areas (see Graph 3).



Graph 3. Confirmed shigellosis cases reported in rural and urban areas, Armenia, 2016-2019

Still, shigellosis is ubiquitous in Armenia, with cases in the capital Yerevan and in every "marz" (administrative regions). Distribution of confirmed shigellosis cases per 100 000 population by marz/region and by year 2016-2019 is presented below in Figure.



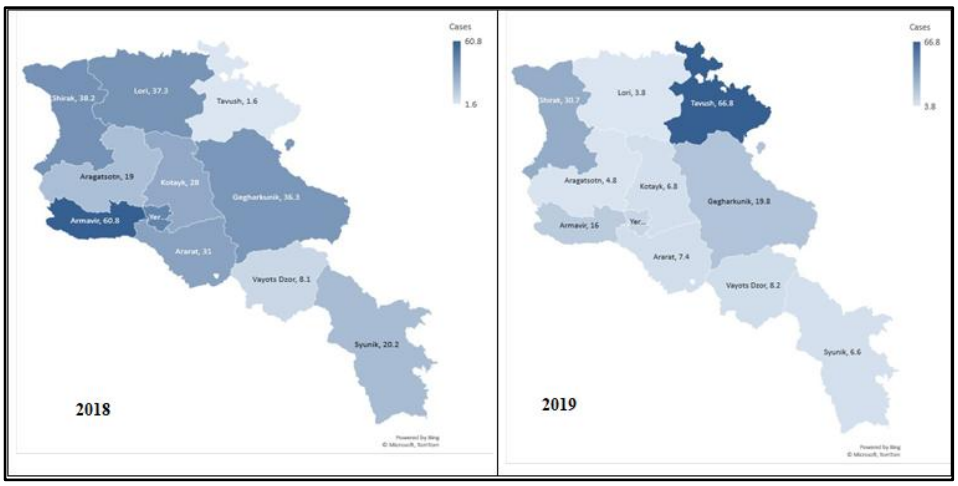
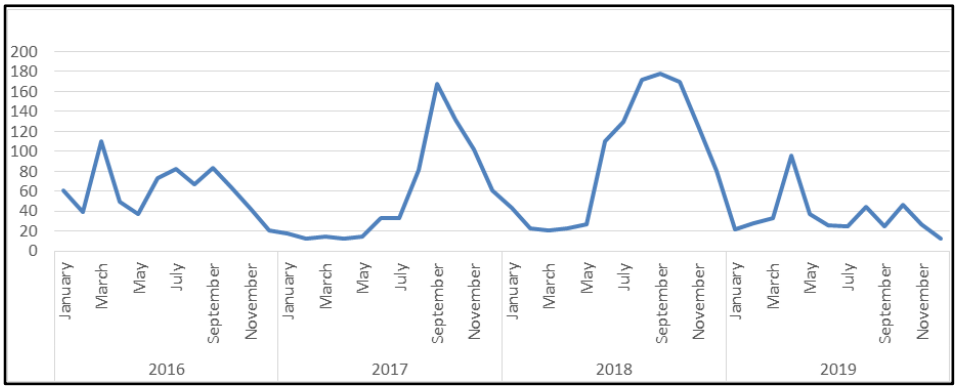


Fig. Distribution of confirmed shigellosis cases per 100 000 population by marz/region and by year 2016-2019 Armenia.

Shigellosis in Armenia seems to follow a seasonal pattern, with peaks in late summer around September, as depicted in graph 4. However, in 2016 and 2019, the highest number of cases occurred around March. For the period 2016-2019, no clear trend can be detected in the annual number of reported shigellosis cases.



Graph 4. Distribution of confirmed shigellosis cases by months, Armenia, 2016-2019

In recent years, no fatalities from shigellosis have been recorded in Armenia.

In Armenia no reported shigellosis cases associated with foreign travel.

In 2016-2019, 10 outbreaks of shigellosis to a total of 329 cases (11% out of the 2934 cases) were recorded in 6 marzes of Armenia (see Table 3).

Table 3

Detected shigellosis outbreaks and source, Armenia, 2016-2019

N	Place	Number of cases	Source	Additional information
2016 (41/728=5.6%)				
1	Tavush	21	Foodborne	Food production
2	Kotayk	20	Foodborne	Food contamination at kindergarten among pupils
2017(128/682=18.8%)				
1	Syunik	35	Waterborne	Contaminated drinking water in the village
2	Syunik	48	Foodborne	Food pollution at school among 6-10 years old pupils
3	Lori	37	Waterborne	Drinking water pollution in the village
4	Lori	8	Foodborne	Food pollution at kindergarten among pupils
2018 (47/1102=4.3%)				
1	Yerevan	33	Foodborne	Food pollution at kindergarten among pupils
2	Gegharkunik	14	Waterborne	Drinking water pollution in the village
2019 (113/422=26.8%)				
1	Tavush	80	Waterborne	Drinking water contamination in the village
2	Yerevan	33	Foodborne	Food contamination at Mental Health Center

While shigellosis is a relatively uncommon disease in the EU/EEA, it remains of concern in Armenia with an over ten-fold higher morbidity. In 2016, 728 shigella confirmed cases were reported in Armenia with an incidence rate of 24.4 cases per 100 000 population, whereas the 29 EU/EEA countries reported 5 631 with an overall notification rate of 1.5 cases [2]. The highest notification rate was noted in children: those under 18 years of age. Shigellosis incidence is slightly higher among men with 1426 of shigellosis and in 2019 an increase in the number of male cases is noted compared to previous years. Shigellosis in Armenia seems to follow a seasonal pattern, with peaks in late summer around September, and in 2016 and 2019, the highest number of cases occurred around March. For the period 2016-2019, no clear trend can be detected in the annual number of reported shigellosis cases.

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Дескриптивный анализ случаев шигеллеза, зарегистрированных в Армении в 2016-2019гг.

А.Р.Папоян

Представлены результаты изучения распространенности случаев шигеллеза, зарегистрированных в Армении в 2016-2019гг. Проведен дескриптивный анализ случаев шигеллеза, включая картографирование. Случаи шигеллеза проанализированы по годам, месяцам, типу населенного пункта, возрасту, полу, а также серотипу возбудителя. Описаны вспышки шигеллеза, зарегистрированные в 2016-2019гг.

2016-2019 թվականների ընթացքում Հայաստանում արձանագրված շիգելոզի դեպքերի դեսկրիպտիվ վերլուծություն

Ա.Ռ.Պապոյան

Ներկայացված են 2016-2019 թվականների ընթացքում Հայաստանում արձանագրված շիգելոզի դեպքերի տարածվածության ուսումնասիրության արդյունքները: Իրականացվել է շիգելոզի դեպքերի նկարագրական վերլուծություն, այդ թվում՝ քարտեզագրում: Շիգելոզի դեպքերը վերլուծվել են ըստ արձանագրման տարիների, ամիսների, բնակավայրի տիպի, տարիքի, սեռի, ինչպես նաև հարուցչի շճատեսակի: Նկարագրված են 2016-2019 թվականների ընթացքում արձանագրված շիգելոզի բռնկումները:

References

1. https://wwwnc.cdc.gov/travel/yellowbook/2020/travel-related-infectious-diseases/shigellosis
2. European Centre for Disease Prevention and Control. Shigellosis. In: ECDC. Annual epidemiological report for 2016. Stockholm: ECDC, 2018.