

Evolution of COVID-19 infection in Mexico until 28 March, 2020: a descriptive ecological study

ABSTRACT

Aims: To describe the number of confirmed cases of COVID-19 in Mexico.

Study design: Ecological descriptive study.

Place and Duration of Study: Registries of confirmed cases for COVID-19 in Mexican population during February and until 28 March 2020, 13:00 PM, from National System of Epidemiological Surveillance/ General Direction of Epidemiology/ Secretary of Health, Mexico.

Methodology: Accord to database of confirmed cases of COVID-19 by Secretary of Health in Mexico, it was collected data on age, gender, source of infection (travel to USA, European or Asian countries). It was included 848 registries.

Results: The first confirmed case in Mexico was 20 February 2020 and the frequency are arising at the end of February and throughout March. The early confirmed cases were imported cases for travel to USA, Italy, Germany, Spain, France and Singapore. No one travelled to China. Now, there are confirmed cases infected for contact with a case.

Conclusion: The frequency of confirmed cases of COVID-19 are higher and the health authorities in Mexico are waiting that the peak of the epidemiological curve is in late March and early April

Keywords: SARS-CoV-2; COVID-19; infection; population

1. INTRODUCTION

On December 31, 2019, a case of pneumonia occurred in Wuhan, China, and it was reported at the office of the World Health Organization (WHO) in China; due to the increase in cases, in one month, the WHO declared a Public Health emergency of international interest on January 30, 2020.

SARS-CoV-2 is a new coronavirus that has not been identified in humans and the infection can be asymptomatic or manifest as a disease with a clinical picture, 2 to 14 days after exposure, and manifests itself with fever, dry cough, respiratory distress, and some cases diarrhoea and vomiting.

The virus was identified and characterized by Zhu et al., and also, confirmed that SARS-CoV-2, uses the same cell entry receptor, angiotensin-converting enzyme 2, as SARS-CoV, which is highly expressed in airway epithelial cells.

Severe cases can manifest with pneumonia, severe acute respiratory syndrome, kidney failure.

As the infection spreads to other countries, infected persons infect their contacts and health services must discriminate, based on clinical data and epidemiological history, the performance of the diagnostic test.

It is a pandemic with 571,678 confirmed cases and 26,494 deaths until 28 March 2020 and cases have been reported in 201 countries^{4,5}.

In Mexico, the first confirmed cases were people who had traveled to the United States of North America or Europe; none travelled to China⁶.

The objective was to describe the evolution of the number of cases in Mexico per day and by source of contagion, until 28 March 2020.

2. METHODOLOGY

An ecological study was designed with data published by the National Epidemiological Surveillance System (SINAVE) of the General Directorate of Epidemiology of the Ministry of Health in Mexico until 28 March 2020⁶.

The variables collected were: age, gender, trip to a country with high risk, date of beginning of clinical data and the state of residence of the patient. All cases were confirmed with the real-time RT-PCR test.

For statistical analysis, descriptive statistics were used, using the program STATA 13.0 © (Stata Corp., College Station, TX, USA).

3. RESULTS AND DISCUSSION

According to what SINAVE reported, until March 28, 2020, there were 2,623 suspected cases of which COVID-19 was confirmed in 848, of which 16 deaths have been reported; 7 of them occurred in Mexico City, 1 in Durango, 1 in Hidalgo, and 3 in Jalisco, 1 in Michoacán, 1 in Quintana Roo and 2 in San Luis Potosí⁵.

Of the 848 confirmed cases, the age range was from 0 to 88 years, with a mean of 42.45 ± 15.59 years. This was calculated based on all confirmed cases.

Table 1 shows the distribution by gender and status of confirmed cases. The States with higher frequency of confirmed cases were Ciudad de México, Nuevo León, Jalisco, Yucatán, Estado de México, Quintana Roo and Puebla.

Table 1 Distribution by gender and Mexican States, confirmed cases of COVID-19 (n=848)⁶

	n	(%)
Gender		
Male	487	(57.43)
Female	361	(42.57)
States		
Aguascalientes	19	(2.24)
Baja California	20	(2.36)
Baja California Sur	9	(1.06)
Campeche	3	(0.35)
Ciudad de México	177	(20.87)

Chiapas	6	(0.71)
Chihuahua	6	(0.71)
Coahuila	15	(1.77)
Colima	2	(0.24)
Durango	7	(0.83)
Estado de México	85	(10.02)
Guerrero	10	(1.18)
Guanajuato	37	(4.36)
Hidalgo	12	(1.42)
Jalisco	82	(9.67)
Michoacán	17	(2.00)
Morelos	4	(0.47)
Nayarit	5	(0.59)
Nuevo León	64	(7.55)
Oaxaca	12	(1.42)
Puebla	52	(6.13)
Querétaro	25	(2.95)
Quintana Roo	33	(3.89)
Sinaloa	14	(1.65)
San Luis Potosí	20	(2.36)
Sonora	10	(1.18)
Tabasco	27	(3.18)
Tamaulipas	6	(0.71)
Tlaxcala	4	(0.47)
Veracruz	23	(2.71)
Yucatán	38	(4.48)
Zacatecas	4	(0.47)
Total	848	(100.00)

Source: SINAVE/DGE

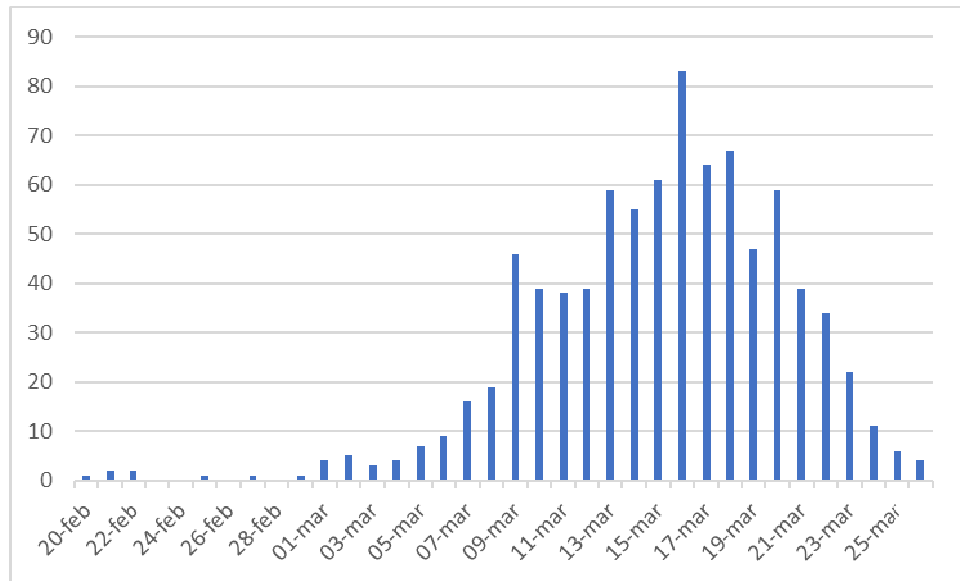
The source of most cases was traveling to the USA and Spain, but there are already cases due to contact with a sick patient, which increases the possibility of the infection spreading.

Table 2 Distribution by source of infection⁶

Source	n	(%)
Contact with a case	347	(40.92)
Travel		
Italy	20	(2.36)
USA	215	(25.35)
Spain	209	(24.65)
Germany	10	(1.18)
France	45	(5.31)
Singapore	2	(0.24)

Source: SINAVE/DGE

The first confirmed case in Mexico was on 20 February 2020 and thereafter the largest number of confirmed cases were from 7 to 22 March 2020 (Figure 1). The first cases were imported, but now community cases are increasing. The decrease in confirmed cases on 21 to 28 March 2020 may be artefacts due to delayed delivery of diagnostic test results.



Source: SINAVE/DGE

Figure 1 Distribution of confirmed cases by day (n=848)⁶

DISCUSION

The sample of 848 confirmed cases predominated the males. At the beginning, the source of COVID-19, were travel to Europe or USA.

20 March 2020, many governments of the Mexican states ordered the closure of schools at all levels and by March 25, 2020, public parks, mass shows, and gatherings of more than 10 people had already been closed. Any activity that gathered more than 10 people was cancelled. People do not go to restaurants.

In countries from America until 28 March 2020, the worst situation is in USA with 122,653 confirmed cases and 2,112 deaths, Canada with 5,655 cases and 61 deaths, Brazil 3,904 cases and 114 deaths, Chile with 1,909 cases and 6 deaths. In countries from Central America, the number of cases are menores than Mexico⁷.

Handwashing campaigns have been launched with soap and water and / or disinfectant gel, do not wave, cover nose and mouth with the elbow when coughing or sneezing. Isolation at home with practically no social activity has been recommended.

All with the aim of reducing the transmission of the COVID-19.

The spread of COVID-19 infection is just over a month after it started in Mexico. Measures taken by governments and residents are expected to prevent the further spread of COVID-19 infection.

CONCLUSION

The dissemination of COVID-19 is higher and the Ministry of Health from Mexico, are waiting that the last week of March will be the peak of cases in epidemiological curve.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

REFERENCES

- 1 World Health Organization. Rolling updates on coronavirus disease (COVID-19). Updated 27 March 2020. 2020. Cited: 29 March 2020. Available in: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>
- 2 Chotani RA. 2019-novel Coronavirus (COVID-19) Facts & Misconceptions. Just in Time lectures. Supercourse on Epidemiology, Internet and Global Health. 2020. Cited 24 March 2020. Available in: <http://www.pitt.edu/~super1/lecture/lec56501/001.htm>
- 3 Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019 [published online ahead of print January 24, 2020]. N Engl J Med. <https://doi.org/10.1056/NEJMoa2001017>
- 4 World Health Organization. Coronavirus disease 2019 (COVID-19). Situation Report – 68. 2020. Cited: 29 March 2020, Available in: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200328-sitrep-68-covid-19.pdf?sfvrsn=384bc74c_2
- 5 Unidad de Inteligencia Epidemiológica y Sanitaria. Secretaría de Salud. Comunicado técnico diario nuevo Coronavirus en el Mundo (COVID-19). 2020. Cited: March 29, 2020. Available in: https://www.gob.mx/cms/uploads/attachment/file/544031/Comunicado_Tecnico_Diario_COVID-19_2020.03.28.pdf
- 6 Sistema Nacional de Vigilancia Epidemiológica. Dirección General de Epidemiología, Secretaría de Salud. Casos confirmados a enfermedad por COVID-19. 2020. Cited 29 March 2020. Available in: https://www.gob.mx/cms/uploads/attachment/file/544029/Tabla_casos_positivos_COVID-19_resultado_InDRE_2020.03.28.pdf

7 Pan American Health Organization. Number of COVID-19 cases in the region of the Americas as of 28 March 2020 at 02:00 pm. Cited: 29 March 2020. Available in: <file:///C:/Users/super/Downloads/covid-19-cumulative-cases-03.29.20.pdf>

UNDER PEER REVIEW