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language-speaking areas in Veracruz
Mexico: The case of the Huasteco from
the Tantoyuca area**

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Impact of (SARS-CoV-2) COVID 19 on the five main indigenous language-speaking areas in Veracruz Mexico: The case of the Huasteco from the Tantoyuca Area

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Abstract

The importance of the working document is that it allows the analysis of the information and the status of cases associated with (SARS-CoV-2) COVID-19 as open data at the municipal, state and national level, with a daily record of patients, according to a age, sex, comorbidities, for the condition of (SARS-CoV-2) COVID-19 according to the following characteristics: a) Positive, b) Negative, c) Suspicious. Likewise, it presents information related to the identification of an outpatient and / or hospitalized patient, attending to their medical development, identifying: a) Recovered, b) Deaths and c) Active, in Phase 3 and Phase 4, in the five main population areas speaker of indigenous language in the State of Veracruz - Mexico. The data analysis is carried out through the application of a data mining algorithm, which provides the information, fast and timely, required for the estimation of Medical Care Scenarios of (SARS-CoV-2) COVID-19, as well as for know the impact on the indigenous language speaking population in Veracruz. For this purpose, the following study zones are presented: a) Totonacapan Zone, b) Huasteco from the Tantoyuca Zone, c) Otomi from the Inxhualtan de Madero Zone, d) Nahuatl from the Zongolica Zone, e) Nahuatl from the Chicontepec Zone, f) Nahuatl from the Pajapan Zone and g) Popoluca from the Sotepapan Zone. This data article presents the information as of August 1, 2020 corresponding to the Huasteco Area.

Keywords

(SARS-CoV-2) COVID-19, Algorithm (SARS-CoV-2) COVID-19, Mexico, identification of patients, Huasteco Area

Specifications Table

Subject	Infectious Diseases
Specific subject area	Information from the Viral Respiratory Diseases Epidemiological Surveillance System for (SARS-CoV-2) COVID-19 in Mexico corresponding to the Huasteco from the Tantoyuca Zone.
Type of data	Table Figure

How data were acquired	<p>Government of Mexico. Health Secretary. Databases Covid-19 México https://datos.gob.mx/busca/dataset/informacion-referente-a-casos-covid-19-en-mexico/resource/e8c7079c-dc2a-4b6e-8035-08042ed37165</p> <p>Instruments: Software Orange Data Mining version 3.26.0 https://orange.biolab.si</p> <p>Make and model and of the instruments used: Algorithm for the identification of patients according to following characteristics: a) Positive, b) Negatives, c) Suspects. Likewise, it presents information regarding the identification of an outpatient and / or hospitalized patient, attending to their medical development, identifying: a) Recovered, b) Deaths and c) Assets</p>
Data format	<p>The information is presented in raw in CVS format, the Ministry of Health of Mexico since April 14, 2020 published the cases associated with (SARS-CoV-2) COVID-19 as open data. The data processing corresponds to the records on the epidemic (SARS-CoV-2) COVID-19 at 1 August 2020. The treatment of the information is carried out through the application software for data mining Orange version 3.26.0, in which the algorithm for the analysis of information is filtered to present the current scenario in Huasteco from the Tantoyuca Zone in Mexico of the SARS-CoV-2 (COVID 19).</p>
Parameters for data collection	<p>The information is presented at the municipal, state and national levels, with a daily registry of patients, according to age, sex, comorbidities, for the condition of (SARS-CoV-2) COVID-19 according to the following characteristics: a) Positive, b) Negatives, c) Suspects. Likewise, it presents information regarding the identification of an outpatient and / or hospitalized patient, attending to their medical development, identifying: a) Recovered, b) Deaths and c) Assets.</p>
Study area	<p>The municipalities that comprise Huasteco from the Tantoyuca Area are: Naranjos Amatlán, Cerro Azul, Chinampa de Gorostiza, Chontla, Ozuluama de Mascareñas, Panuci, Pueblo Viejo, Tamiahua, Tantoco, Tantima, Tantoyuca, Tempoal, Tuxpan and El Higo.</p>
Description of data collection	<p>This information is filtered to present the current scenario in Huasteco from the Tantoyuca Area in Mexico of the SARS-CoV-2 (COVID 19) in a fast and timely manner, to support public decision-making in health matters.</p>
Data source location	<p>Institution: Universidad Veracruzana / Instituto de Investigaciones y Estudios Superiores Económicos y Sociales Country: México</p>
Data accessibility	<p>Raw data can be retrieved from the Github repository https://github.com/CMedeIR/dataCovid19/edit/master/README.md</p>

Value of the Data

- The Algorithm for the identification of patients (SARS-CoV-2) COVID 19 in Mexico allows to analyze at the municipal, state and national level, the registry of patients, according to age, sex, comorbidities, for condition of (SARS-CoV-2) COVID-19 according to the following characteristics: a) Positive, b) Negative, c) Suspicious, as well as presenting information on the identification of an outpatient and / or hospitalized patient, attending to their medical development, identifying: a) Recovered, b) Deaths and c) Assets, in Phase 3 and Phase 4, in a fast and timely manner, to support public decision-making in health matters.
- Taking into account their strategic roles in public health and researchers can use the data from this study to identify the action scenario for decision-making in the combat of (SARS-CoV-2) COVID 19 in Phase 3 and Phase 4 corresponding to the Huasteco from the Tantoyuca Area.
- The importance of data analysis is that it allows identifying cases (SARS-CoV-2). COVID-19 in Mexico is concentrated daily and knowing the impact on the population and allows preparing action scenarios to make public health policy decisions to combat SARS-CoV-2) COVID-19 in the main five areas that concentrate the speaking population of Nahuatl, Totonaco, Huasteco, Popoluca, Otomi in Veracruz Mexico.

Data Description

The source of information on the number of registered cases of (SARS-CoV-2) COVID-19 at 1 August 2020 for Mexico comes from the website <https://datos.gob.mx/busca/dataset/informacion-referente-a-casos-covid-19-en-mexico> by the Ministry of Health, with the participation of the National Council for Science and Technology (CONACYT), the Center for Research in Geospatial Information Sciences (CENTROGEO), the National Laboratory for Geo-Intelligence (GEOINT), the Data Laboratory of the National Laboratory for Geointelligence (DataLab), where the registry of COVID-19 cases (SARS-CoV-2) COVID-19 is concentrated, and is the official means of communication and information on the epidemic in [the Huasteco from the Tantoyuca Area in Mexico](#).

The information of the cases (SARS-CoV-2) COVID-19 in Mexico is concentrated on a daily basis since April 19, 2020, communication and official information on the epidemic in Mexico, the data are presented at the municipal, state and national levels, with a daily registry of patients, according to age, sex, comorbidities, for the condition of (SARS-CoV-2) COVID-19 according to the following characteristics: a) Positive, b) Negatives, c) Suspects. Likewise, it presents information regarding the identification of an outpatient and / or hospitalized patient, attending to their medical development, identifying: a) Recovered, b) Deaths and c) Assets. The data processing corresponds to the records on the epidemic (SARS-CoV-2) COVID-19 at 1 August 2020. The treatment of the information is carried out through the application software for data mining and visual programming Orange Data Mining version 3.26.0. Orange Data Mining is a machine learning and data mining suite for data analysis through Python scripting and visual programming. [1]

According to (WHO, 2020) the (SARS-CoV-2) COVID-19 disease pattern presents 4 scenarios identified from the confirmation of Laboratory Diagnosis: a) Not Infected or b) Infected, in this finally, the following categories are observed, taking into account age and specific comorbidities in each case: a) Mild Infection, b) Moderate Infection, c) Severe Infection and d) Critical Infection.

Depending on the category observed in Patients who have a Confirmation of Infected, as in the case of a) or b) it can assume the character of Outpatient, so the strategy is isolation or "quarantine" at home, where the result It is hoped that he will recover. Regarding the Patients who have a Confirmation of Infected, in

categories c) and d) they assume the character of Hospitalized Patient, with a probability of requiring care in Intensive Care Units and requiring Intubation, and where it is hoped to save as many patients as possible.

The importance of the research is that it allows identifying the action scenario for making public health policy decisions to combat CO(SARS-CoV-2) COVID-19, since they consider the following states of process in medical treatment, in order to carry out the Estimate of Scenarios for Medical Care of the (SARS-CoV-2) COVID-19 under the following premises of hospital care:

1. A patient with a positive (SARS-CoV-2) COVID-19 laboratory diagnosis can be considered: a) Outpatient, or b) Hospitalized.
2. If the (SARS-CoV-2) COVID-19 Positive patient is Hospitalized, the following should be considered: a) Enter the Intensive Care Unit or b) Do not enter the Intensive Care Unit.
3. If the (SARS-CoV-2) COVID-19 Positive patient is Hospitalized and Entered into the Intensive Care Unit, the following should be considered: a) The patient requires intubation or b) The patient does NOT require intubation.

Methods

The information is presented in raw in CVS format, the Ministry of Health of Mexico. The data processing corresponds to the records on the epidemic (SARS-CoV-2) COVID-19 at 1 August 2020. The treatment of the information is carried out through the application software for data mining Orange version 3.26.0, in which the algorithm for the analysis of information are developed and it is filtered to present the current scenario in Mexico of the SARS-CoV-2 (COVID 19). In this way, the algorithm that is presented allows us to project the requirements for the use of installed infrastructure in the face of the growing requirement for patient care Positive (SARS-CoV-2) COVID-19, allowing the identification of scenarios at the national, state and municipal levels. The construction of the algorithm is based on the following definitions.

Definition 1: Total Patients to consider in Model (SARS-CoV-2) COVID-19.- It is the number of total patients according to the confirmatory laboratory result or not of (SARS-CoV-2) COVID-19).

Be:

TP SARS-CoV-2 i j = Total patients according to (SARS-CoV-2) COVID-19 confirmatory laboratory result

Which consists of:

TP SARS-CoV-2 i j = (P + SARS-CoV-2 i j) + (P- SARS-CoV-2 i j) + (Px SARS-CoV-2 i j), where: i = State, j = Municipality

Of which:

P+ SARS-CoV-2 i j = Patient with a positive (SARS-CoV-2) COVID-19 result in the State, Municipality

P- SARS-CoV-2 i j = Patient with negative (SARS-CoV-2) COVID-19 result in the State, Municipality

Px SARS-CoV-2 i j = Patient with pending confirmation (SARS-CoV-2) COVID-19 in the State, Municipality

Definition 2: Identification of a suspected (SARS-CoV-2) COVID-19 case.- This is the patient who undergoes an initial qualification according to the initial diagnostic characteristics indicated in the case definitions for surveillance by the World Health Organization for primary care of (SARS-CoV-2) COVID-19 cases.

Be:

CsCOVID 19 (SARS-CoV-2) = Patient with initial classification as a suspected case of (SARS-CoV-2) COVID-19

Where:

Cs (SARS-CoV-2) COVID-19 = Cs (SARS-CoV-2) COVID-19 Type 1 + Cs (SARS-CoV-2) COVID-19 Type 2 + Cs (SARS-CoV-2) COVID-19 Type 3

Of which:

According to the World Health Organization, there are 3 categories (identified as Type 1, Type 2 and Type 3) to identify suspected cases of (SARS-CoV-2) COVID-19, defined below:

1. Cs (SARS-CoV-2) COVID-19 Type 1.- Is a patient with acute respiratory disease (fever and at least one sign / symptom of respiratory disease, with no other aetiology that fully explains the clinical presentation and a history of travel or residence in a country / area or territory that reports local transmission of COVID-19 disease during the 14 days prior to the onset of symptoms.
2. Cs (SARS-CoV-2) COVID-19 Type 2.- He is a patient with an acute respiratory disease, who has been in contact with a confirmed or probable COVID-19 case in the last 14 days before the onset of symptoms.
3. Cs (SARS-CoV-2) COVID-19 Type 3.- Is a patient with severe acute respiratory infection (fever and at least one sign / symptom of respiratory illness (eg cough, shortness of breath) and requiring hospitalization and without another etiology that fully explains the clinical presentation.

Definition 3: Total Patients to consider in the (SARS-CoV-2) COVID-19 Model .- It is the number of total patients according to the confirmatory laboratory result or not of (SARS-CoV-2) COVID-19).

Be:

TP SARS-CoV-2 i j = Total patients according to confirmatory laboratory result or not of (SARS-CoV-2) COVID-19

Which consists of:

TP SARS-CoV-2 i j = (P + SARS-CoV-2 i j) + (P- ARS-CoV-2 i j) + (Px ARS-CoV-2 i j) , where: i = State, j = Municipality

Of which:

P + SARS-CoV-2 i j = Patient with a positive (SARS-CoV-2) COVID-19 result in the State, Municipality

P- ARS-CoV-2 i j = Patient with negative (SARS-CoV-2) COVID-19 result in the State, Municipality

Px ARS-CoV-2 i j = Patient with pending confirmation (SARS-CoV-2) COVID-19 in the State, Municipality

Definition 4: Positive Patients for (SARS-CoV-2) COVID-19 i j.- It is the number of patients with laboratory results with positive confirmation for (SARS-CoV-2) COVID-19 i j .

It has:

P + SARS-CoV-2 i j = Patient with a positive (SARS-CoV-2) COVID-19 result in the State, Municipality

Definition 5.- Medical Treatment Strategy for a patient with positive laboratory confirmation for (SARS-CoV-2) COVID-19 i j .- It is the Action Plan in Medical Treatment for a patient with positive laboratory confirmation for SARS-CoV-2 in attention to your degree of infection and comorbidities present that is channeled to determine the Physician.

According to the Strategy of Medical Care required for Patients with a Positive SARS-CoV-2 Result, according to their degree of identified infection, they have the following.

Be:

ET P + SARS-CoV-2 i j = Medical Treatment Strategy P + SARS-CoV-2 i j

The medical treatment for a patient with a positive laboratory result for (SARS-CoV-2) COVID-19, based on the Medical Treatment Strategy (ETM P + SARS-CoV-2 ij), based on his degree of infection and present comorbidities, poses two action scenarios : i) Outpatient (SARS-CoV-2) COVID-19 patient or ii) Hospitalized (SARS-CoV-2) COVID-19 patient.

Be:

i) Outpatient COVID19 patient.

P + SARS-CoV-2 i j Outpatient = Positive (SARS-CoV-2) COVID-19 with Outpatient mode in the State, Municipality

ii) COVID19 Patient Hospitalized.

P + SARS-CoV-2 i j Hospitalized = Positive (SARS-CoV-2) COVID-19 with modality Hospitalized in the State, Municipality

where:

Depending on the degree of infection (I1, I2 or I3), the Hospitalized (SARS-CoV-2) COVID-19 Patient may require: i) Access to the Intensive Care Area without Intubation or ii) Access to the Intensive Care Area with Intubation.

Definition 6.- Patients with a Positive (SARS-CoV-2) COVID-19 Result Hospitalized with Access to the Intensive Care area.- It is the number of Patients with a Positive SARS-CoV-2 Result Hospitalized with Access to the Intensive Care area, according to its degree of infection.

Be:

$P + \text{SARS-CoV-2 } i j \text{ Hospital Intensive Care} = \text{Positive (SARS-CoV-2) COVID-19 with modality Hospitalized in the State, Municipality}$

Definition 7.- Patients with a positive (SARS-CoV-2) COVID-19 result Hospitalized with access to the Intensive Care Area with Intubation.- It is the number of Patients with a Positive (SARS-CoV-2) COVID-19 Result Hospitalized with Access to the Intensive Care area with Intubation.

Be:

$P + \text{SARS-CoV-2 } i j \text{ Hospital Intensive Care with Intubation} = \text{Positive (SARS-CoV-2) COVID-19 with Hospitalized modality and intubation in the State, Municipality.}$

Definition 8.- $P + \text{SARS-CoV-2 } i j \text{ Deaths.}$ - Deaths of Patients with a positive result for SARS-CoV-2. Deaths are all those positive to (SARS-CoV-2) COVID-19 where one is indicated in the data record (DATE_DEF other than the value "99-99-9999").

Definition 9.- (SARS-CoV-2) COVID-19 case fatality rate.- It is the proportion of people who die from (SARS-CoV-2) COVID-19 among the Patients with a positive (SARS-CoV-2) COVID-19 result in a given period and area.

Be:

$TL \text{ SARS-CoV-2 } i j = \text{(SARS-CoV-2) COVID-19 case fatality rate}$

Where:

$(\text{SARS-CoV-2) COVID-19 case fatality rate} = [(\text{Deaths of Patients with a Positive (SARS-CoV-2) COVID-19 Result in the State or Municipality}) / (\text{Total of Patients with a Positive (SARS-CoV-2) COVID-19 result in the State or Municipality})] \times 100$

Of which:

$DP+ \text{ SARS-CoV-2 } i j = \text{Deaths of Patients with a positive (SARS-CoV-2) COVID-19 result in the State / Municipality}$

And:

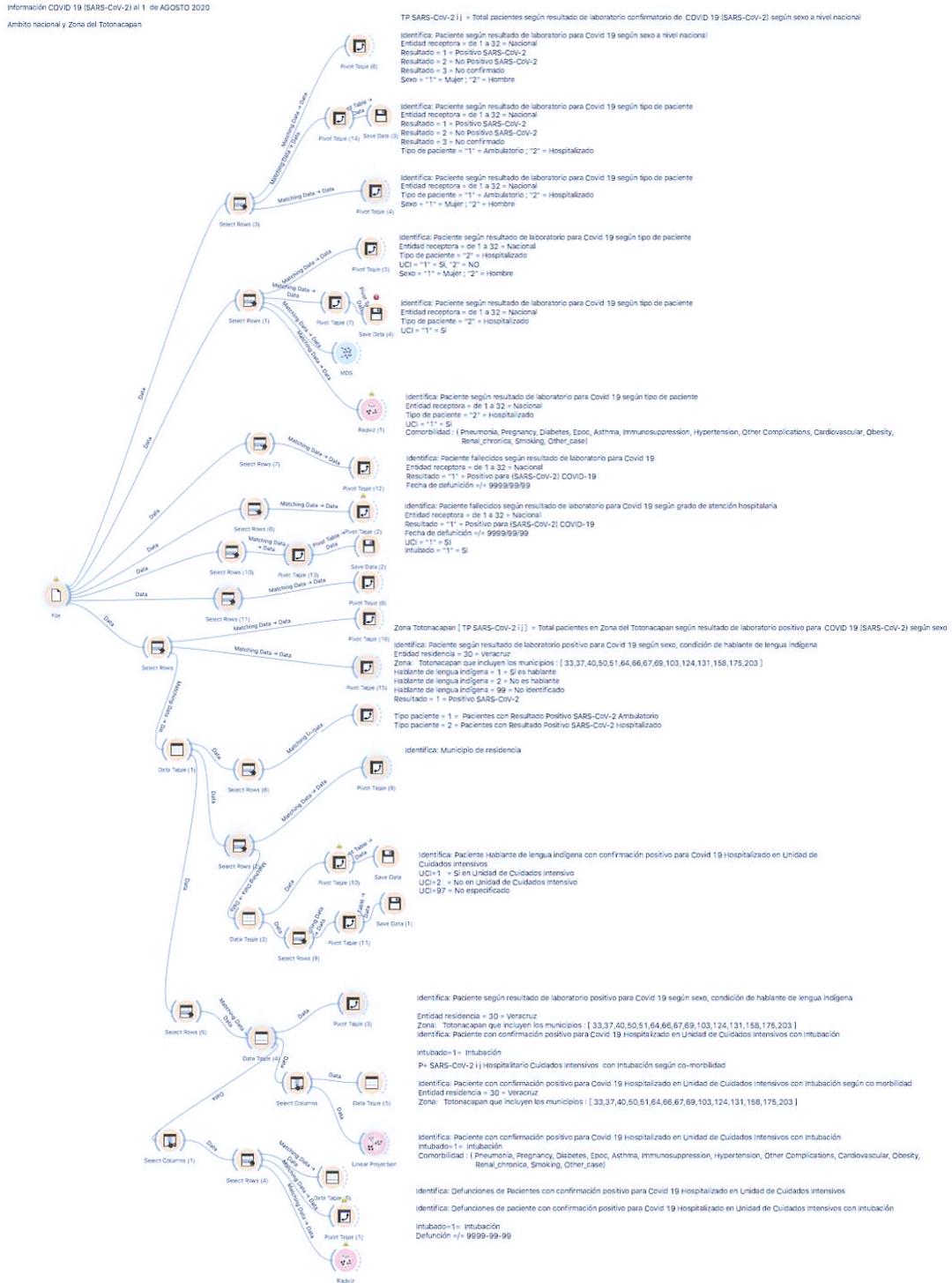
$P+ \text{ SARS-CoV-2 } i j = \text{Total Patients with a positive (SARS-CoV-2) COVID-19 result in the State / Municipality}$

So:

$TL \text{ SARS-CoV-2 } i j = [DP + \text{ SARS-CoV-2 } i j / P + \text{ SARS-CoV-2 } i j] \times 100$

The data processing corresponds to the records on the epidemic (SARS-CoV-2) COVID-19 at 1 August 2020. The treatment of the information is carried out through the application software for data mining Orange version 3.26.0, in which the algorithm for the information analysis are developed. (See Figure 1, below). According to information from the Ministry of Health, the following records are available at the national level:

Figure 1. Algorithm for the identification of patients (SARS-CoV-2) COVID 19 in the Huasteco from the Tantoyuca Area in Mexico Orange Data Mining version 3.26.0



According to information from the Ministry of Health in Mexico, the following records are available at the national level:

1. The total number of cases in Mexico as of August 1, 2020, is 999,697 cases of which, based on the confirmatory or non-laboratory result for (SARS-CoV-2) COVID-19, the following classification is obtained: a) 434,193 patients with a positive result for (SARS-CoV-2) COVID-19, b) 477,733 patients with a non-positive result for (SARS-CoV-2) COVID-19 and c) 87,771 patients with a pending result to determine (SARS-CoV-2) COVID-19. (See table 1)
2. The number of patients with a positive (SARS-CoV-2) COVID-19 result is 434,193 of which: a) 316,860 are care outpatients and b) 117,333 are hospitalized patients. (See table 2)
3. The total number of patients (SARS-CoV-2) COVID-19 hospitalized (include positive and non positive results) is 192,214 of whom 78,088 are women and 114,126 are men. (See Table 3)
4. The total number of hospitalized patients with a positive result for (SARS-CoV-2) COVID-19 is 117,219, of whom: a) 9,400 patients enter the intensive care unit; while b) 107,819 patients do not enter the intensive care unit. (See Table 4)
5. Only 4,874 Hospitalized with a positive (SARS-CoV-2) COVID-19 patients admitted to the intensive care unit required intubation; while 4,526 patients did not require intubation. (See Table 5)
6. Likewise, to date 42,158 deaths from positive (SARS-CoV-2) COVID-19 patients have been registered nationwide, of which 3,486 deaths corresponded to Positive (SARS-CoV-2) COVID-19 patients who were in intensive care and intubation and 38,672 corresponded to (SARS-CoV-2) COVID-19 positive patients who were not in intensive care. (See Table 6).
7. The fatality rate of patients with a positive result for SARS-CoV-2) COVID-19 at nationwide as of August 1, 2020, is estimated at 10.93%. The five states that registered the highest fatality rates as of August 1, 2020 are the following: a) Morelos with a rate of 20.39%, b) Baja California with 19.67%, c) Sinaloa with a rate of 17.46% , d) Colima with a rate of 17: 00% and e) State of Mexico with a rate of 15.37%. For its part, the State of Veracruz registered a rate of 13.20% while Mexico City registered a rate of 9.75% (See Table 7).
8. Figure 1 shows the main comorbidities identified in hospitalized patients with a positive result for (SARS-CoV-2) COVID-19, nationwide as of August 1, 2020.
9. In the State of Veracruz, the total number of cases related to (SARS-CoV-2) COVID-19 as of August 1, 2020 is 34,904 of which: a) 21,582 correspond to patients with positive confirmation for (SARS-CoV-2) COVID-19, b) 10,518 are patients with a negative result for (SARS-CoV-2) COVID-19 and c) 2,804 are patients with results pending confirmation. (See Table 8).
10. In the State of Veracruz, 4.97% of all patients with a positive result for (SARS-CoV-2) COVID-19 are concentrated at the national level as of August 1, 2020. (See Table 1 and Table 8).
11. For its part, in the Huasteco from the Tantoyuca Area the total number of cases related to (SARS-CoV-2) COVID-19 as of August 1, 2020 is 1,723 of which: a) 987 correspond to patients with positive confirmation for (SARS- CoV- 2) COVID-19, b) 534 are patients with a negative result for (SARS-CoV-2) COVID-19 and c) 202 are patients with results pending confirmation. (See Table 9).
12. The percentage of patients with a positive result for (SARS-CoV-2) COVID-19 is 1.92% with respect to the total number of cases registered in the Huasteco from the Tantoyuca Area (See Table 9 and Table 10).

According to information from the Ministry of Health, in the [Huasteco from the Tantoyuca Area](#) the following records are available at the national level:

1. The number of patients with a positive (SARS-CoV-2) COVID-19 result is 2,661 of which: a) 1,129 are women and b) 1,532 are men. The total number of women with a positive (SARS-CoV-2) COVID-19, only 11 are women who speak the indigenous language and 1,118 are women who do not speak the indigenous language. On the other hand, the total number of men with a positive (SARS-CoV-2) COVID-19, 8 are men who speak the indigenous language and 1,524 are men who do not speak the indigenous language. (See Table 10).
2. Of the 987 positive cases for (SARS-CoV-2) COVID 19, only 8 correspond to patients who speak an indigenous language and 979 are patients who are not speakers of an indigenous language. (See Table 11)
3. From the 987 patients with (SARS-CoV-2) positive COVID-19, according to their primary hospital care, there are: a) 581 are patients who did not require hospitalization and b) 406 are patients who required hospitalization. From the 963 patients with (SARS-CoV-2) COVID-19 positive who were hospitalized: a) 7 correspond to speakers of the indigenous language and b) 628 are patients who do not speak the indigenous language. The 987 patients with (SARS-CoV-2) COVID-19 positive who were not hospitalized, only 7 were patients speaking the indigenous language hospitalized and 399 were patients who did not speak the indigenous language hospitalized. (See Table 12).
4. From the 8 patients who speak the indigenous language, these come from: Panuco 3 patient and Tantoyuca 5. (See Table 13)
5. From the 7 hospitalized (SARS-CoV-2) COVID-19 positive patients: a) 0 patients enter the Intensive Care Unit; while b) 7 patients do not enter the Intensive Care Unit. Only 2 Hospitalized (SARS-CoV-2) COVID-19 Positive patients required intubation in Panuco. (See Table 14).
6. As of August 1, 2020 there have been 2 deaths of hospitalized patients (SARS-CoV-2) COVID-19 whose results were positive and were indigenous language speakers in the [Huasteco from the Tantoyuca Area](#). (See Figure 2, at the end of the section, where the associated comorbidities of the indigenous language-speaking patients who died in the [Huasteco from the Tantoyuca Area](#), as August 1 2020.

Table 1. Total number of cases in Mexico 1 August 2020,
According to Sex and Result at (SARS-CoV-2) COVID-19

Result	Sex		Total
	Women	Men	
Positive (SARS-CoV-2) COVID-19	203,284	230,909	434,193
No positive (SARS-CoV-2) COVID-19	254,331	223,402	477,733
Pending result	43,466	44,305	87,771
Total	501,081	498,616	999,697

Source: Government of Mexico. Health Secretary. Information from the Epidemiological Surveillance System for Viral Respiratory Diseases 1 August 2020

Table 2. Total number of cases in Mexico as of August 1, 2020, according to
type of patient and result in (SARS-CoV-2) COVID-19

Result	Patient type		Total
	Ambulatory	Hospitalized	
Positive (SARS-CoV-2) COVID-19	316,860	117,333	434,193
No positive (SARS-CoV-2) COVID-19	418,514	59,219	477,733
Pending result	72,109	15,662	87,771
Total	807,483	192,214	999,697

Source: Government of Mexico. Health Secretary. Information from the Epidemiological Surveillance System for Viral Respiratory Diseases 1 August 2020

Table 3. Total number of cases in Mexico as of August 1, 2020, according to sex
and type of patient

Sex	Patient type		Total
	Ambulatory	Hospitalized	
Women	422,993	78,088	501,081
Men	384,490	114,126	498,616
Total	807,483	192,214	999,697

Source: Government of Mexico. Health Secretary. Information from the Epidemiological Surveillance System for Viral Respiratory Diseases 1 August 2020

Table 4. Total number of cases in Mexico as of August 1, 2020, according to type of patient and Intensive care unit

Patient type	Intensive care unit	No Intensive care unit	Total
Hospitalized	9,400	107,819	117,219

Source: Government of Mexico. Health Secretary. Information from the Epidemiological Surveillance System for Viral Respiratory Diseases 1 August 2020

Table 5. Total number of cases in Mexico as of August 1, 2020, according to hospitalized patient in intensive care unit and intubation condition

Patient type	Intubated patient	No Intubated patient	Total
Hospitalized intensive care unit	4,874	4,526	9,400

Source: Government of Mexico. Health Secretary. Information from the Epidemiological Surveillance System for Viral Respiratory Diseases 1 August 2020

Table 6. Number of deceased patients with positive COVID-19 (SARS-CoV-2), nationwide and according to hospital care condition as of August 1, 2020

Patient type	Women	Men	Total
At the national level	14,878	27,280	42,158
Intensive care unit patients with intubation	1,085	2,401	3,486
% Deceased patients requiring care in intensive care units and intubation, by sex	7.3%	8.0%	8.3%

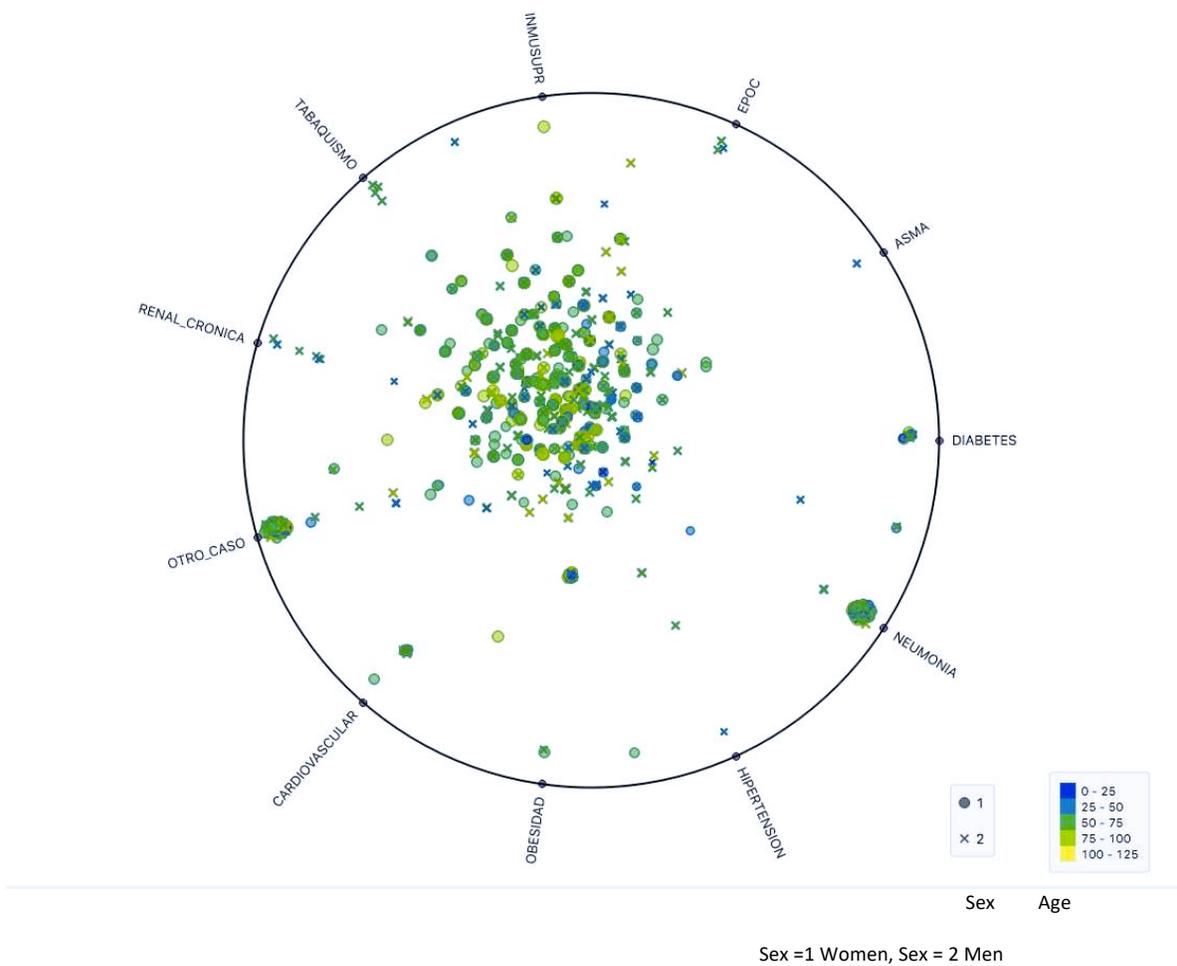
Source: Government of Mexico. Health Secretary. Information from the Epidemiological Surveillance System for Viral Respiratory Diseases 1 August 2020

Table 7. (SARS-CoV-2) COVID-19 fatality rate by state in Mexico
as of August 1, 2020

	Estado	Total deceased	Covid positives 19	Case fatality rate
1	Aguascalientes	257	4,120	6.24%
2	Baja California	2,674	13,594	19.67%
3	Baja California Sur	182	4,498	4.05%
4	Campeche	500	4,588	10.90%
5	Chiapas	645	13,116	4.92%
6	Chihuahua	194	1,875	10.35%
7	Ciudad de México	7,244	74,314	9.75%
8	Coahuila de Zaragoza	967	5,775	16.74%
9	Colima	904	5,317	17.00%
10	Durango	288	4,167	6.91%
11	Guanajuato	1,009	21,378	4.72%
12	Guerrero	1,415	11,032	12.83%
13	Hidalgo	1,033	6,901	14.97%
14	Jalisco	1,549	13,313	11.64%
15	México	8,225	53,513	15.37%
16	Michoacán de Ocampo	780	9,910	7.87%
17	Morelos	836	4,101	20.39%
18	Nayarit	391	3,518	11.11%
19	Nuevo León	1,118	18,032	6.20%
20	Oaxaca	968	10,673	9.07%
21	Puebla	2,446	20,355	12.02%
22	Querétaro	449	3,726	12.05%
23	Quintana Roo	1,015	7,840	12.95%
24	San Luis Potosí	522	9,921	5.26%
25	Sinaloa	2,230	12,774	17.46%
26	Sonora	1,949	17,890	10.89%
27	Tabasco	1,988	21,747	9.14%
28	Tamaulipas	1,008	17,130	5.88%
29	Tlaxcala	713	4,627	15.41%
30	Veracruz de Ignacio de la Llave	2,849	21,582	13.20%
31	Yucatán	875	10,098	8.67%
32	Zacatecas	249	2,768	9.00%
	Total	47,472	434,193	10.93%

Source: Own elaboration with Government of Information from the Mexico. Health Secretary. Epidemiological Surveillance System for Viral Respiratory Diseases as of August 1, 2020

Figure 1 Comorbidities identified in hospitalized patients with a positive result for (SARS-CoV-2) COVID-19, nationwide as of August 1, 2020



Source: Own elaboration with Government of Information from the Mexico. Health Secretary. Epidemiological Surveillance System for Viral Respiratory Diseases as of August 1, 2020

Table 8. Total number of cases in Veracruz State as of August 1, 2020, According to Sex and Result at (SARS-CoV-2) COVID-19

Result	Sex		Total
	Women	Men	
Positive (SARS-CoV-2) COVID-19	9,250	12,332	21,582
No positive (SARS-CoV-2) COVID-19	5,663	4,865	10,518
Pending result	1,285	1,519	2,804
Total	16,198	18,706	34,904

Source: Own elaboration with Government of Information from the Mexico. Health Secretary. Epidemiological Surveillance System for Viral Respiratory Diseases as of August 1, 2020

Table 9. Total number of cases in Huasteco from the Tantoyuca Area in Mexico as of August 1, 2020, According to Sex and Result at (SARS-CoV-2) COVID-1

Result	Sex		Total
	Women	Men	
Positive (SARS-CoV-2) COVID-19	343	644	987
No positive (SARS-CoV-2) COVID-19	264	270	534
Pending result	86	116	202
Total	693	1,030	1,723

Source: Own elaboration with Government of Information from the Mexico. Health Secretary. Epidemiological Surveillance System for Viral Respiratory Diseases as of August 1, 2020

Table 10. Total number of cases with result positive at (SARS-CoV-2) COVID-19 in the Huasteco from the Tantoyuca Area in Mexico as of August 1, 2020, according to sex, indigenous language speaker status and

Result	Women	Men	Total
Indigenous language speaker	11	8	19
Non-indigenous language speaker	1,105	1,502	2,607
Not specified	13	22	22
Total	1,129	1,532	2,661

Source: Own elaboration with Government of Information from the Mexico. Health Secretary. Epidemiological Surveillance System for Viral Respiratory Diseases as of August 1, 2020,

Table 11. Total number of cases according to the result for (SARS-CoV-2) COVID-19 in the Huasteco of the Tantoyuca area in Mexico as of August 1, 2020, according to sex and condition of speaker of an indigenous language

Result	Positive (SARS-CoV-2) COVID 19	Non Positive (SARS-CoV-2) COVID-19	Pending result
Indigenous language speaker	8	8	3
Non-indigenous language speaker	963	1,044	600
Not specified	16	16	3
Total	987	1,068	606

Source: Own elaboration with Government of Information from the Mexico. Health Secretary. Epidemiological Surveillance System for Viral Respiratory Diseases as of August 1, 2020,

Table 12. Total number of cases with result positive at (SARS-CoV-2) COVID-19 in the Huasteco from the Tantoyuca Area in Mexico as of August 1, 2020, according to primary hospital care condition and indigenous language speaker status

Result	Non Hospitalized	Hospitalized	Total
Indigenous language speaker	1	7	8
Non-indigenous language speaker	576	387	963
Not specified	4	12	16
Total	581	406	987

Source: Own elaboration with Government of Information from the Mexico. Health Secretary. Epidemiological Surveillance System for Viral Respiratory Diseases as of August 1, 2020

Table 13. Total number of cases with result positive at (SARS-CoV-2) COVID-19 in the Huasteco from the Tantoyuca Area in Mexico as of August 1, 2020, according to primary indigenous language speaker status and municipality

Municipality	Speak indigenous language	Non Speak indigenous language	Not specified	Total
Naranjos Amatlán	0	33	0	33
Cerro Azul	0	31	1	32
Chinampa de Gorostiza	0	3	0	3
Chontla	0	0	0	0
Ozuluama de Mascareñas	0	7	0	7
Panuco	3	236	1	240
Pueblo Viejo	0	52	2	54
Tamiauhua	0	8	1	9
Tancoco	0	2	0	2
Tantima	0	0	0	0
Tantoyuca	5	38	1	44
Tempoal	0	29	0	29
Tuxpan	0	498	10	508
El Higo	0	26	0	26
Total	8	963	16	987

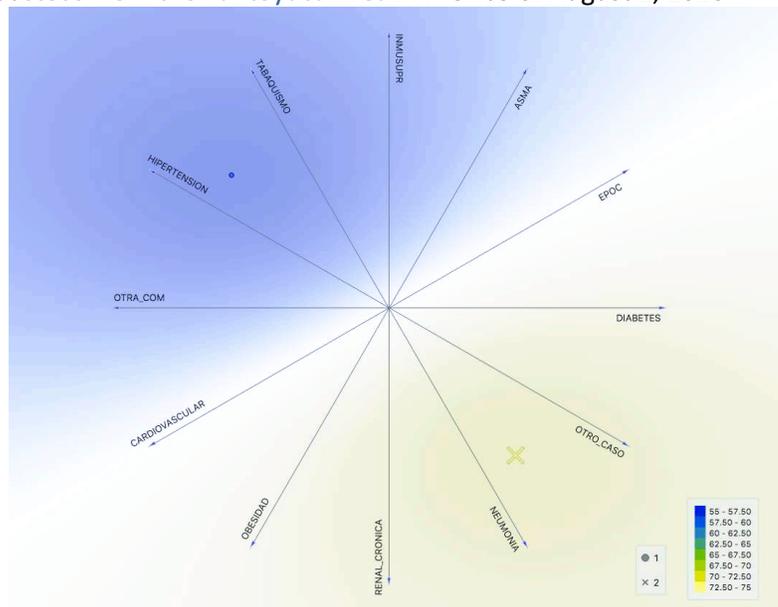
Source: Own elaboration with Government of Information from the Mexico. Health Secretary. Epidemiological Surveillance System for Viral Respiratory Diseases as of August 1, 2020

Table 14. Total number of cases with result positive at (SARS-CoV-2) COVID-19 in the Huasteco from the Tantoyuca Area in Mexico as of August 1, 2020, according to status according to primary hospital care condition in Intensive care unit

Municipality	Intensive care unit	Non Intensive care unit	Not specified	Total
Panuco	0	3	0	3
Tantoyuca	0	4	0	4
Total	0	7	0	7

Source: Own elaboration with Government of Information from the Mexico. Health Secretary. Epidemiological Surveillance System for Viral Respiratory Diseases as of August 1, 2020

Figure 2 Comorbidities identified in hospitalized patients with a positive result for (SARS-CoV-2) COVID-19, in the Huasteco from the Tantoyuca Area in Mexico of August 1, 2020

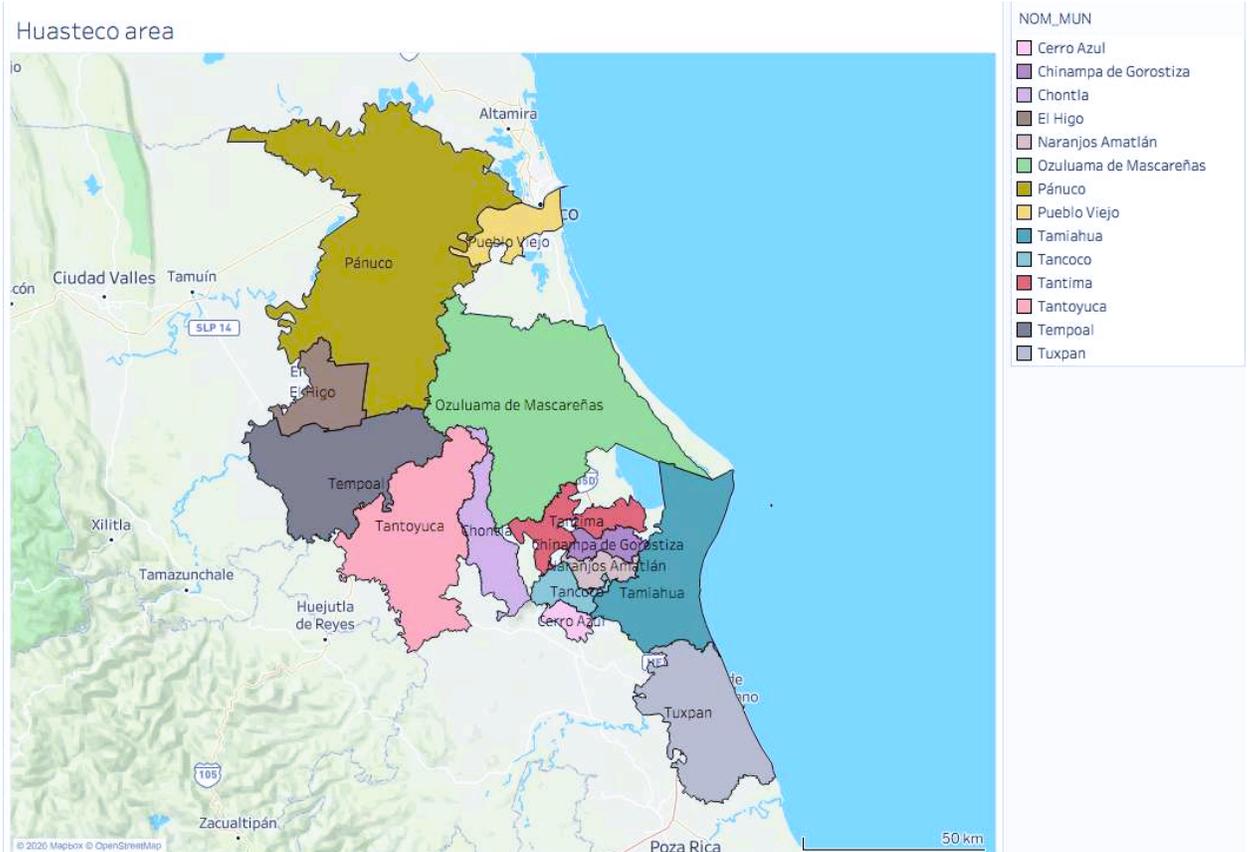


Sex Age

Sex =1 Women, Sex = 2 Men

Source: Own elaboration with Government of Information from the Mexico. Health Secretary. Epidemiological Surveillance System for Viral Respiratory Diseases as of August 1, 2020

Map 1 Huasteco from the Tantoyuca Area



Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships which have, or could be perceived to have, influenced the work reported in this article.

References

- [1] Demsar J, Curk T, Erjavec A, Gorup C, Hocevar T, Milutinovic M, Mozina M, Polajnar M, Toplak M, Staric A, Stajdohar M, Umek L, Zagar L, Zbontar J, Zitnik M, Zupan B (2013) Orange: Data Mining Toolbox in Python, *Journal of Machine Learning Research* 14(Aug): 2349–2353.
<https://dl.acm.org/doi/pdf/10.5555/2567709.2567736>
- [2] Government of Mexico. Health Secretary. Databases Covid-19 México.
<https://datos.gob.mx/busca/dataset/informacion-referente-a-casos-covid-19-en-mexico>
- [3] Software Orange Data Mining version 3.26.1 <https://orange.biolab.si>

[4] World Health Organization. (2020). Laboratory testing for coronavirus disease (COVID-19) in suspected human cases. Interim guidance. 19 March 2020. Recuperado de: <https://www.who.int/publications-detail/laboratory-testing-for-2019-novel-coronavirus-in-suspected-human-cases-20200117>

[5] Medel-Ramírez, Carlos and Medel-Lopez, Hilario, Data Mining for the Study of the Epidemic (SARS-CoV-2) COVID-19: Algorithm for the Identification of Patients (SARS-CoV-2) COVID 19 in Mexico (June 3, 2020). Available at SSRN: <https://ssrn.com/abstract=3619549> or <http://dx.doi.org/10.2139/ssrn.3619549>

[6] INEGI, (2010). Catálogo de metadatos geográficos. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad. División política municipal, 1:250000. 2010. Palabras clave: 2010, Área Geoestadística, División, Límite, Municipios. Fecha de publicación: 04-07-2011, del metadato 20-07-2017. Available at : <http://www.conabio.gob.mx/informacion/gis/>

Reference to a dataset:

[7] Raw data can be retrieved from the Github repository <https://github.com/CMedelR/dataCovid19/>