Impact of COVID-19 in Mexico: A vision

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The current SARS-CoV-2 pandemic is a historical event that has come to change the way of life for humanity; where the population is the main subject of cause and solution. Considering the global variation of propagation, each country has taken different positions, decisions and resources where the time for making different decisions has also been an important factor. In Mexico, the SARS CoV-2 situation has been confronted mainly with government decisions and the actions of the population. The successes or failures have impacted various dimensions of society in each of the states that make up the country. In this research, some impacted life dimensions are analyzed: Social, mental, educational, economic and environmental. It is possible to say that the impact of the pandemic were influenced, among other aspects; by the state of health and nutrition associated with the lifestyle in which the population was at the arrival of the pandemic. This impact is also influenced by commercial activities, which are linked to the economic mobility of those who buy and those who sell. Also, other aspects that have influenced the impact of this pandemic; it is possible to highlight the lack of culture on the part of the population in the use of face masks and the non-obligatory use of it by the leaders. This, added to various other factors, have had a great impact on the number of infected cases and deaths in the country; primarily in Mexico City and the State of Mexico. It is worth mentioning that, despite the negative impact due to the pandemic, there are also positive aspects. Finally, it is possible to say that it is necessary for the population to develop more awareness. The population has a definitive role in containing the pandemic and to incorporate the new changes, in its life in order to precisely preserve

Keywords: Social, mental, educational, economic, environmental, COVID-19.

1 Introduction

Mexico is in a critical phase (more than 100,000 deaths) of the pandemic due to the SARS-CoV-2 virus (UNAM, 2020; Conacyt, 2020) [1-2], after of the first reported cases of COVID in Mexico City (OMS, 2020a) [3]. The localities with the highest number of accumulated cases and deaths have been Mexico City and State of México [2]. The Mexican government implemented some health contingency strategies by COVID-19: suspension of financial activities, social distancing, cancellation of massive events, school closings, non-essential shops, and hand washing (Suarez et al., 2020) [4]. In the New Normality (NN) format (orderly, staggered and regionalized return to economic work activities) it was carried out based on

an "Epidemiological Traffic Light" (Dimas, 2020) [5]. In addition, due to problem of metabolic syndrome in the population (ENSANUT, 2018) [6], one factor that complications the COVID-19 was applied the modification to the Official Mexican Standard NOM-051-SCFI/SSA1-2010 (food labeling) (DOF, 2020) [7]. Also, extraordinary program "today does not circulate" (Infobae, 2020) [8], etc. has been established.

The measures of "stay at home", social distancing, use of face mask, and COVID diagnostic tests, as well as follow-up of sick cases, etc. were not mandatory at the beginning of the pandemic. Of this way, the population depending on their educational, economic, cultural, geographical level, age, etc. complied or not the established recommendations. Later some states made it mandatory, at least the use of face masks. Causing, that the pandemic has not been able to contain and thus health sector workers have a strong physical and mental exhaustion and as well as a large number of deaths (Coria-Lorenzo, 2020; Villasís-Keever and García-Bolaños 2020; Martinez-Fierro et al., 2020) [9-11]. In addition, they did not have the most adequate working conditions in general to face the pandemic, including attacks that at some point have also suffered during the pandemic (Caldera-Villalobos et al., 2020) [12].

Mexico facing, a serious complex problem that has caused a series of impacts in different dimensions of social life, economic, educational, health, environmental, cultural, and political dimensions, among others [13-17]. In this context, some of the impacts that the COVID pandemic has brought in Mexico are detailed below. Impact in a country with more than 100 million inhabitants and divided into 32 locations (INEGI, 2020a; WLE, 2020) [18-19]. The amount of population by state, it is possible to observe in Figure 1a.

2 Social Impact

COVID-19 reached a Mexican population, characterized by a problem of previous chronic diseases such as hypertension, diabetes, obesity, diseases of the respiratory system and cardiovascular diseases, which has caused greater vulnerability and severity to infection [GOB.MX, 2020; Bello-Chavolla et al., 2020; Parra-Bracamonte et al., 2020; Hernadez-Galdamez, 2020] [20-23]. Due to the prevalence of metabolic syndrome, diabetes, obesity and hypertension (ENSANUT, 2018) [6], society is exposed to a greater risk of the COVID-19 disease. Figure 1 b and Figure 1c show a map of the percentage of the population with obesity and hypertension problems (ENSANUT, 2018) [6]. The states with the highest percentage of the population with obesity (ages 12-19 years) are Campeche, Colima, Quintana Roo, Sonora, Tabasco, Veracruz and Yucatán. In relation to hypertension, the states with the highest percentage of hypertensive population are Campeche, Chihuahua, Coahuila, Sonora, Tabasco, Veracruz, Yucatán. Being hypertension the disease that reaches the highest percentage of the population that suffers from it in the country. Of this way, the population faces a greater risk of mortality due to COVID-19, the mortality rate in Mexico has been at the moment 10% (DGEM, 2020) [24]. In addition to the fact that not all the population has a health system within reach, such as indigenous populations (Diaz de Leon-Martinez et al., 2020) [25]. In Mexico there are percentages of the population between 15 - 29% with extreme poverty in the south of the country (Figure 1d). The states of greatest poverty are Guerrero, Oaxaca and Chiapas (CONEVAL, 2019) [26]. Although it is true, they are the states with the greatest poverty, and the least reach to health systems. They are not the ones with the highest number of accumulated cases or deaths (Figure 1e and Figure 1f). In general, COVID-19 due to SARS-CoV-2 is the leading cause of death compared to the previous year (WHO, 2020) [27].

In Mexico, the current positive cases of COVID-19 are associated with comorbidities mainly of hypertension and obesity with 18.53% and 16.67% respectively. And in cases of deaths, 45.56% with hypertension and 38.57% with diabetes, followed by 23.69% with obesity. Which gives a relationship that 2 out of 10 deaths from COVID-19 suffered from obesity, 4 out of 10 had hypertension and 3 out of 10 had diabetes. This information should highlight the importance of the process of taking care of health and of eating a healthy and healthy diet. In times of COVID-19 and in the future, as preventive health stages. In this way, the Government of Mexico decided to incorporate nutrition subjects at the basic level (GOB.MEX, 2020) [28]. Since the need to re-educate the population is evident, likewise, the development of nutritious and low-carbohydrate basic products is important.
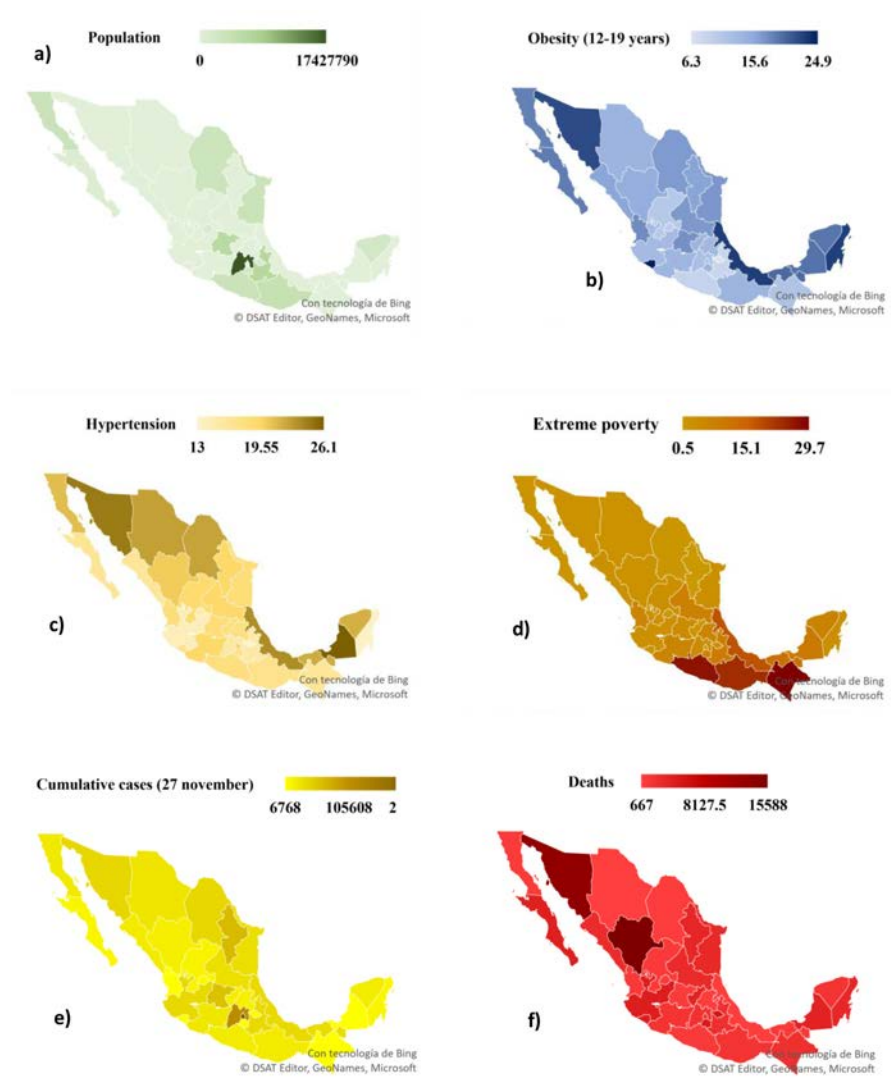
Figure 1: Indicator of Mexico a) Population (number of habitants), b) Obesity (% population 12-19 years), c) Hypertension, d) Extreme poverty (%), e) Cumulative cases, f) Deaths. According to UNAM, CONACYT, ENSANUT, etc. [1,6, 18, 19, 47, 48].

The COVID-19 pandemic has caused emotional disorders that led to eating disorders, one of them is the increase in cravings for junk food and / or sweets that is directly related to weight gain. According to the UVM Public Opinion Center (2020) [29], 30% of those surveyed indicate that they eat much more than before the pandemic where are 24% women, and 16% men. This is reflected in people's weight gain, as 47% of people reported that they gained weight. However, other sectors of the population have been concerned with maintaining or creating healthier habits, where 35% of those surveyed indicate that their healthy habits are the same as before, and 32% that they are healthier than before and the 17% of the population underweight.

Food security (access to food) in households was also affected by the pandemic. It has been identified that only 35.9% of the CDMX households had food security, but the most affected population is households with minors where they only obtained 26% of food security, where severe food insecurity affects 18.8% and the moderate to 22.4% of households with a lower socio-economic level. In contrast, these indicators are only 2.2% and 6.1%, respectively, among households with a higher socioeconomic level (UNICEF, EQUIDE and EVALÚA CDMX, 2020) [30]. However, the purchase decision is also important about the foods that poor families can buy, where it is based on more carbohydrates than protein.

For the care of the population, in the case of Mexico City, the government enabled the COVID-19 detection and diagnosis service. According to survey ENCOVID-CDMX (2020) [30] the 7.3% of the households surveyed there was at least one person with symptoms associated with COVID-19, where only about half of these cases were contacted by detection and diagnosis services authorized by the Government of Mexico City (Locatel, SMS and others).

3 Mental Impact

The majority of society lives in a context of uncertainty due to the current situation, affecting their human behavior individually and collectively. This uncertainty, produced by the pandemic itself, is also increased by government decisions, the media (negative news value), false information from social networks, social norms, social and cultural inequality, political preferences, access to scientific information, etc. (Van Bavel et al., 2020) [31]. The response of the population to this is manifested in emotional responses (fear, anxiety and anguish), changes in behavior, beliefs and knowledge, individualistic behaviors, social and individual psychological aspects (González Martín, N. and áceres Nieto, E., 2020) [32] or defensive responses: skepticism, optimism and indifference bias, "reckless behavior" derived from denial or rejection of the situation, among others (Acuna-Zegarra, M. et al., 2020) [33]. Other problems related to mental health are disorders derived from the fear of contracting COVID-19.

The Covid-19 pandemic caused an unprecedented mental health crisis throughout the American Continent, with half of adults stressed (Del Valle, and Juárez, 2018; EL UNIVERSAL, 2020) [34-35]. In Mexico, according to Villavicencio-Ayub (2020) [36] before the pandemic, 25% of the workers presented some mental disorder such as depression, although not all required psychiatric treatment. Due to the pandemic and work at home, among other causes, it is estimated that stress affects 43% of the working population in Mexico.

Contreras-Ibañez (2020) [37] indicated that the general average of the global stress index of a mexican sample is 2.71, observing that it has a moderate degree of stress compared to the rest of the world. It was found a negative correlation between stress and age. Young people around 20 years of age presented greater stress than adults over 65 years old. It also indicated that women presented more physical or emotional tension than men. Other factors include the multiple tasks they must do, as well as childcare during the pandemic. It is considered that 6 out of 10 mothers were in charge of guiding their children in their classes and schoolwork [37]. The stress also occurred due to falling ill with COVID-19

The population of Mexico City (the population most affected by the pandemic), according to statistical data indicated different levels of concern about COVID; 65.8% high, 24.6% medium and 9.6% low concern. Regarding to use of face masks, 83.4% of Mexicans and 89.1% of the surveyed capitalists make correct use of the mask (Centro de Opinión pública UVM, 2020) [29] only in some places. There are delegations

and communities where they do not finish adjusting to the use of face masks to be co-responsible for their health and that of others. In fact, as a result of "good end" there was a drastic increase in cases of infected. However, there are still people who do not use the masks, much less stay at home. Being an alarming situation, for Mexico City and the State of Mexico.

Another emotional impact that the population affected by COVID-19 in Mexico has experienced is coping with and recovering from grief in times of pandemic. The critical situation of not being able to perform rituals for the family that dies from COVID-19 or other causes. Nor has accompanying the disease perhaps caused a longer time of mourning (Arlanzón E., 2020) [38]. This can also generate feelings of anger and resentment in some people and / or family members who have lost a loved one to COVID-19 causes. On the other hand, there are people who, due to this pandemic, have learned to value more life and time shared with their families, for which they are grateful and enjoy the treasures that God gives us, which is life, health, love of family and friends, and have allowed themselves to increase and grow spiritually and draw closer to the presence of God, filling them with peace and faith to cope with the times of COVID-19.

Reflection, rediscovery of the common good, human solidarity, philosophy of life (Velázquez, 2020), [39], adaptation, optimization of resources, reeducation and hygiene habits (Nielsen, 2020) [40], were positive aspects developed by some fraction of the population in the face of this pandemic. In social security, there has been a reduction in crimes such as kidnappings, extortion and theft and robbery of vehicles (ONC, 2020; Arciniegas, 2020; Balmori de la Miyar, et al., 2020) [41-43]. All these aspects modify the life of the country's society in the different states. The economic, educational and social differences in the face of this pandemic are highlighted.

4   Educational Impact

Mexico has suspended face-to-face classes at the national level in order to reduce the chains of contagion, this fact is supported by the experience of previous pandemics, which would help reduce it by 15% (OECD, 2020) [44]. For this reason, the government, in addition to translating educational materials into different dialects to make them reach indigenous communities, has implemented strategic models for distance education (Mérida and Acuña, 2020) [45] through television programs, telephone service, radio and platforms. Therefore, the Mexican government seeks to meet the demand of approximately 36 million students (OECD, 2020) [44].

The health emergency has highlighted the educational inequality that exists in Mexico (Lloyd, 2020) [46], generating ethical questions regarding the equity of the implemented model since in Mexico 48.8% of the population is in a state of poverty (CONEVAL, 2019) [47].

On the other hand, in Mexico there are 72 indigenous languages (INEGI, 2015) [48] of which, about a million people do not speak Spanish (INEE, 2018) [49]. In addition, the high cost of mobile devices such as computers and cell phones complicate the education situation, also students are forced to hire an internet service [50]. Likewise, it is estimated that 56.4% of the population has internet, and 43% of the population uses a computer. However, only 76.6% of the urban population and 47.7% of the rural population have access to the internet (IFT, 2020) [51]. It is clear that access to Information and Communication Technologies (ICT), is not equitable and affects students of any educational level; due to the social class condition that determines who can access and learn from online education (INEGI, 2018) [52]. There is a digital divide as a consequence of economic inequality (Winters, N, et al., 2020) [53].

Other interesting aspects that occurred in the educational dimension is that there was an increase in the time dedicated to carrying out educational tasks. Also, there was greater communication with teachers and companionship, increased family coexistence, etc. (MEJOREDU, 2020) [54], depending on the school level.

5   Economic Impact

Another important impact derived from the pandemic in Mexico is seriously in the economic dimension. On March 30, the "agreement declaring a health emergency due to illness caused by the SARS-CoV2

virus (COVID-19)" was published, through which essential and non-essential activities in the economy are defined. In this way non-essential activities had to be stopped during the quarantine. But this provision was not strict as in other parts of the world (OIT, 2020) [55]. However, anyway, there was a decline in the national economy. As in the world, in Mexico the industrial sector is affected, such as manufacturing, accommodation, restaurants, and the street trade, etc. As well as various events that finally had to be canceled were affected (Shrestha et al., 2020) [56].

Many of the activities were temporarily closed, the workforce was unable to find work, which impacted 12 million economically active people. The pandemic also affected informal employment, having a contraction of 8 percentage points that is, it fell from 55.7% to 47.7%, however, this later had some small recovery, but currently due to a drastic increase in cases, again economic activities is in danger; there are festivities and events that are canceled (OIT, 2020) [55].

The commercial opening is one of the most complicated decisions in the country since it has to do with the possible mobility of the population. Having consequences, such as the increase in cases infected by COVID-19. In recent times, this has happened after the commercial activity intensified by the period of "Buen Fin" (November, 9-20) and by purchases at the end of the year. Although it is true, sales intensified, but also, the mobility of the population.

The indicator of Gross Domestic Product (GDP) decreased 17.1% in real terms during the second quarter of 2020 compared to the immediately previous quarter (INEGI, 2020b) [57]. In addition, the loss of 1,117,584 formal jobs from March to July 2020, most of which were permanent jobs (IMSS, 2020) [58]. In August, 92,390 formal jobs were recovered. However, this has implied that more formal jobs have been destroyed in five months than those created in 2019, this means that the reactivation and recovery of formal jobs will not be rapid (OIT, 2020) [55]. Likewise, the closure of 1 million 10 thousand 857 establishments (20.81%) closed their doors permanently, being the small and medium with the highest percentage of permanent closings (21.17%) compared to the micro establishments that had 20.80 percent closings.

Regarding the population and depending on their economy, some of them were able to acquire purchasing habits using online shopping applications, grocery delivery and restaurants (Survey, 2020) [59]. Worth mentioning that much of the population. They do not even imagine what to buy because they have gone through unemployment crisis inside their homes and they barely have to eat. Of this way, in Mexico, social programs with economic support were implemented, in CDMX 45.8% of the people interviewed in the ENCOVID_CDMX [30] reported that at least one person in their household received some support, and priority was given to households with fewer resources and/or with child population.

6 Environmental Impact

During the pandemic, vehicular activity decreased and many people stayed at home and as a consequence the concentration of emissions decreased in several states; especially in the metropolitan area, where there was an improvement in air quality in Mexico City during the first weeks after the quarantine, finding reductions in concentrations of NO^2, SO^2, and PM2.5 (although later the situation tends to reverse) (ECLAC, 2020) [60]. In Mexico City, there was a 2% reduction in pollutants compared to the week before the quarantine (Rodríguez-Urrego and Rodríguez-Urrego, 2020) [61]. In particular, ozone indicators decreased during the blockade period compared to the pre-blockade period and compared with the historical average of the same interval of the last 5 years. (Kutralam-Muniasamy, et al., 2020) [62]. Although the satellite images show the same concentration of ozone with that of the previous year, it is found that ozone precursors did decrease (during March-May 2020) (Peralta, et al., 2020) [63].

Others environmental aspects were also impacted, there was a reduction in the use of plastics during the confinement (Mora, 2020) [64] and on some beaches in Mexico they look cleaner and clearer (Zambrano-Monserrate et al., 2020) [65]. On the other hand, in relation to the increase in garbage generated by the use of protective elements, such as face masks, which has produced another subsequent contamination.

According to the above described, in a synthesized way, Figure 2 presents a rich vision of the impacts on the different dimensions of life in Mexico. It is presented according to the perception of fellow students and
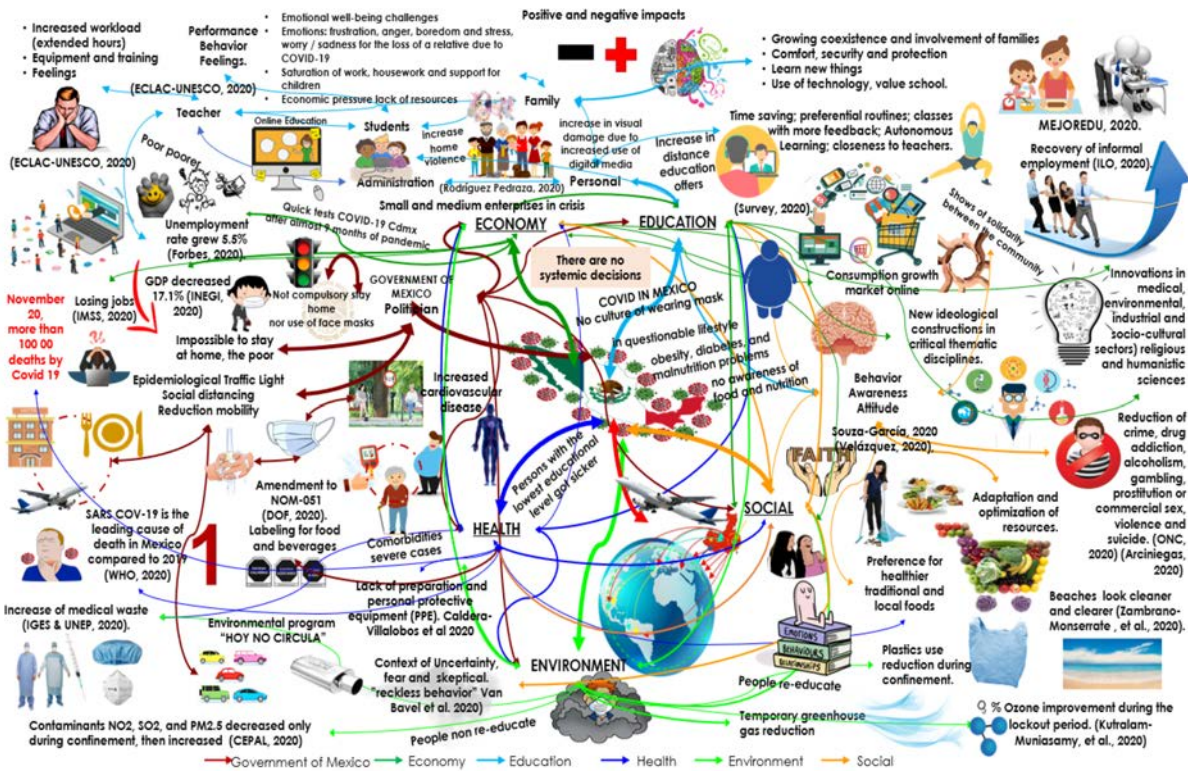
Figure 2: Impacts of Sars-Cov 2 in Mexico. according to UNAM, CONACYT, ENSANUT, etc. [1,6, 18, 19, 47, 48].

evidence reported in the literature. It can be seen that there are positive and negative impacts. Because although it is true it has been a tragedy, there are also positive aspects in this situation that are worth rescuing and it is possible to observe in Figure. As mentioned, there are positive aspects related to the environment, the opportunity to spend more time with the family, etc.

Finally, it is interesting to observe the behavior of some indicators of the country, such as Cumulative cases (November 27), Deaths, Population, Homes with internet, Occupation in commerce, Diabetes > 20, Hypertensive>20, Obesity (12-19), Poverty (%) (2018), Education, Tobacco consumption (10-19), Alcohol consumption (> 20), etc.

Through a principal components analysis, the relationships between the vectors representing each of the mentioned variables are observed (Figure 3). In this representation, the vectors with the smallest angle formed between them are the ones that are most correlated. Then, it is observed how the vector that represents the variable of accumulated cases of infected by COVID-19 and number of deaths by state, correlate more with the amount of population with occupation in trade that has to do with the mobility of people and by the other hand, with the educational level and the size of the state's population. In this way, one could think about the importance of stopping economic activity to reduce the cases that are currently occurring in Mexico, mainly in Mexico City, since the most correlated cases are infected by covid-19 and deaths is this indicator. According to those that are being considered in this research work. Another important factor is the educational level of the people, which could be related to their discipline to adjust to the regulations of the new normal, their type of employment, perhaps they had the opportunity to work from home and then they are less likely to be infected and possibly die. Of course, not counting that people in the health sector are the most damaged and the one with the highest number of deaths.
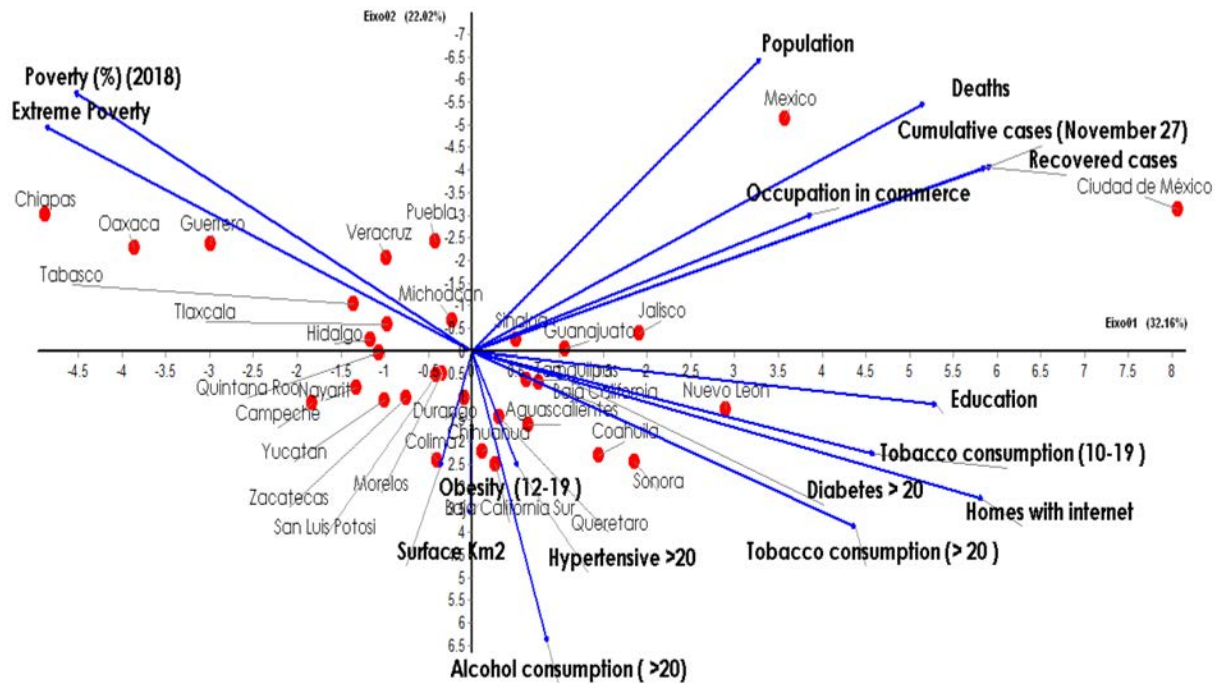
Figure 3: Impacts of Sars-Cov 2 in Mexico.) according to UNAM, CONACYT, ENSANUT, etc. [1,6, 18, 19, 47, 48].

7 Conclusion

The facts alert society to adapt to a new world, new habits, customs, thoughts.

There is the importance of looking inward and outward. This means being co-responsible for the other and the other (neighbor) and environment and also being responsible for oneself. So, constantly reprogram yourself, learn to develop more resilience, grow spiritually and also nutritionally stronger.

An unprecedented fact that teaches and transforms.-A fact that impacted life, and changed all its dimensions. Where a perspective from 50 years ago: *transdisciplinarity*.

Today it could support the formation of current and future students, where self-knowledge is greatly rescued, which will be a current and future support for all students. Know yourself.

"When I was a young man, I wanted to change the world.
I found it was difficult to change the world, so I tried to change my nation.
When I found I couldn't change the nation, I began to focus on my town. I couldn't change the town and as an older man, I tried to change my family.
Now, as an old man, I realize the only thing I can change is myself, and suddenly I realize that if long ago I had changed myself, I could have made an impact on my family. My family and I could have made an impact on our town. Their impact could have changed the nation and I could indeed have changed the world."   Unknown monk, c. 12th century [66]

We believe that there is still time to stop the most serious impacts of this pandemic. Hernandez and Dominguez (2020) [67] mention, act as if you and me, and all had COVID-19, because many of us could be atypical and then infect. In this way, in countries where insufficient tests are carried out, such as Mexico (which has recently been promoted in Mexico City), it could help to contain the pandemic. The population of Mexico City should be aware and there should be leaders who guide the best path and attitudes of all to achieve survival.

Acknowledgments

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