WHERE IN MEXICO IS PEOPLE MORE PRONE TO DEVELOP CLINICAL DEPRESSION

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1.INTRODUCTION

Mental health in Mexico is recognized as one of the main unresolved issues within the government's health policy agenda. Recently, the subject has been gaining relevance due to the increasing prevalence of mental disorders such as depression and its correlation with other issues within the country, such as violence, inequality, and poverty. In fact, depression is quickly becoming the leading cause of disability, work disability, morbidity and mortality in Mexico. Since depression is characterized by negative changes in mood, cognition, and behavior, it does not only affect the individual's physical health but also their professional development. Therefore, decreasing their economic potential productivity. Moreover, discrimination might further prevent patients from accessing the labor market, lowering their household income and making their reinsertion into society more difficult.

It exists different types of depression, each one of them having its own symptoms and causes. For this reason, this project will only concern to clinical depression also known as depressive disorder. Clinical depression is characterized by a persistent feeling of sadness or a lack of interest in outside stimuli. The unipolar connotes a difference between major depression and bipolar depression, which refers to an oscillating state between depression and mania. Instead, unipolar depression is solely focused on the "lows," or the negative emotions and symptoms that you may have experienced.

Although there are multiple risk factors for developing depression, in 2002 a Mexican National Comorbidity Survey employed a comprehensive interview developed by the World Health Organization (WHO), to assess the epidemiological profile of mental disorders in Mexico. Among their results, they found out that several factors increased any individual's risk for depressive disorders including young age, low education, history of trauma, low socioeconomic status, negative life experiences, such as ethnic or sexual discrimination, loss of a loved one, divorce and many more.

Assuming that it is true that these factors increase the risk for depression. It could be implied that if these factors have a different level of prevalence among Mexico's top 100 municipalities, then it would be possible to group all of these municipalities in 3 clusters. Cluster A: "Municipalities with low level of risk factors that can lead to depression". Cluster B:"Municipalities with mild level of risk factors that can lead to depression. Cluster C:"Municipalities with high level of risk factors that can lead to depression".

In overall, this project is a general study targeting a multiple audience. From any individual or family looking for the place in Mexico with the best chances to live a mentally healthy life. Up to an entrepreneur seeking for the place in Mexico where their employees will be more productive along the time, as it has been demonstrated that depression is antagonistically correlated to work productivity.

2.DATA COLLECTION

In order to compare Mexico's top 100 cities it will be necessary to gather as much information about each municipality. To do so, the first step is to know which information would be helpful to the project and then, to choose the right source of data that will provide such information.

There are a number of causes that may increase the chance of depression namely: Abuse, Medications, Conflicts, Death or Loss, Genetics, Stressful Events, Social Vulnerability, Serious Illnesses, Substance Abuse. Each one of these causes can be linked to factors that can increase the chance of depression. For example, the main cause is "Stressful Events" but the factor could be a "divorce" or a "job loss". In the light of this, it must be gathered as much information about factors related to the causes described before.

Mexico's National Institute of Geography and Statistics (INEGI) performs regular surveys around the country around different subjects. Fortunately, their data is stored electronically so that anyone can have access to it either through tables or by doing an URL query through their API. By doing a research on the available information provided by INEGI, it was possible to create a table containing the different causes for depression and the different factors linked to them that are available from INEGI (Table 1).

Moreover, some factors that trigger depression is substance abuse and lack of leisure activities to reduce stress. So it will be used the Foursquare API to get for each municipality and within a 20km radius, the number of venues related to bars & liquor stores. Evidently, these establishments cannot be blamed for the amount and kind of substances their customers consume. However, they can be compared to the number of leisure & recreational related venues such as parks and gym in the same radius. In this way, the idea is to have for each municipality, a ratio

ratio=(Category A Venues/Category B Venues)

Category A= Nightlife Spot-Number (Bar, Brasseur, Bar Lounge, Nightclub, Stripclub)
Category B= Outdoors & Recreation (Sports and track and field, swimming areas, bay, beaches, botanical gardens, bike paths, camping zones, parks, dog parks, fountains, gardens, farms, fields, fishing spots,hills, lakes, mountains, natural parks, play gardens, pools etc)

The hypothesis behind this ratio is that a municipality will have an increased risk of depression if it is easier to have access to alcohol, for example, than it is to have access to a park or gym. Again, the main idea is to compare the different municipalities around this ratio, not to judge the use or misuse of these venues by their customers.

Cause for Depression	Description	Linked Factors to Query from INEGI's API
Abuse	Past physical, sexual, or emotional abuse can increase the vulnerability to clinical depression later in life.	People admitted for breach of trust to state prisons (common law)
		People admitted sexual abuse to state prisons (common law)
		Discrimination
Conflicts	Depression in someone who has the biological vulnerability to develop depression may result from personal conflicts or disputes with family members or friends	Workplace Conflicts
		Persons admitted for breach of obligations of family assistance to state prisons (common law)
		People admitted for other crimes against the family to state prisons (common law)
		People admitted gender-based violence in all its different modalities to domestic violence to state prisons (common law)
		Persons admitted for family violence to state prisons (common law)
Death or Loss	Sadness or grief from the death or loss of a loved one, though natural, may increase the risk of depression.	Natural Deaths
		Deaths by Homicide
		Deaths by Suicide
		Deaths of mother's giving birth (Rate for 100 000 newborns)
Genetics	A family history of depression may increase the risk.	Rate of recently diagnosed people with depression
		Percentage of family members above 7 that claim have felt depression once in their lives
Stressful Events	Events such as moving, losing a job or income, getting divorced, retiring or any other stressful life events.	Number of Divorces
		Percentage of Retired Employees
		People migrating out of the region
		People migrating inside of the region
Social Vulnerability	Vulnerability to multiple stressors and shocks, including abuse, social exclusion and natural hazards	Percentage of homes lacking a proper roof
		Percentage of people non affiliated to social security
		Population with access to water
		Percentage of population between 14-25 with access to school
		Percentage of population between 14-25 that has to go out from their region to go to school
Serious Illnesses	Sometimes depression co-exists with a major illness or may be triggered by another medical condition.	Rate of recently diagnosed people with anorexia or bulimia
		Population mortality breast cancer
		Population mortality prostate cancer
		Population mortality diabetes

Table 1.Causes and Factors increasing the chance of developing clinical depression