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Statistical Data from 1979 to 2022 on Prostate Cancer in Populations of Northern and Central Mexico

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Abstract

For several years, prostate cancer has increased worldwide, resulting in a decrease in life expectancy in men. Recently, the World Health Organization reported that this clinical pathology was associated with an increased mortality rate in patients aged 60 to > 60 years. This investigation aimed to analyze some statistical data on prostate cancer in Central and northern Mexico (45 to 64; 65 and > 65 years) populations using the Information System of the Ministry of Health of Mexico. Statistical data showed a higher mortality degree in Mexico City compared to Hidalgo, Morelos, Puebla, Querétaro, and Tlaxcala. Other data on mortality in regions of Northern Mexico indicate that the population of Nuevo León had a higher mortality degree compared to California, Southern California, Chihuahua, Coahuila, and Durango. These results may be associated with differences in the population size of each region involved in Central and Northern cities, Mexico, or some specific demographic factors of each city. It is important to mention that it is necessary to analyze other types of risk factors related to prostate cancer development in Mexico, to have a good data system that serves as an axis for population clinical diagnosis.

Keywords: Prostate, Cancer statistic data, Central and North Mexico, WHO

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Introduction

Prostate cancer has increased dramatically in recent years, increasing mortality worldwide [1-5]. There are several risk factors to produce prostate cancer such as age [6-9], race [10-14], obesity [15-18], testosterone [19-23], and others. Some data **(Figure 1)** of Age-Standardized mortality Rate worldwide per 100,000, in 2022 year showed the following values for Africa 17.3, Latin America and the Caribbean 13.9, Oceania 11.5, Europe 11.2, Northern America 8.3, and Asia 3.8 (Source, World Health Organization).

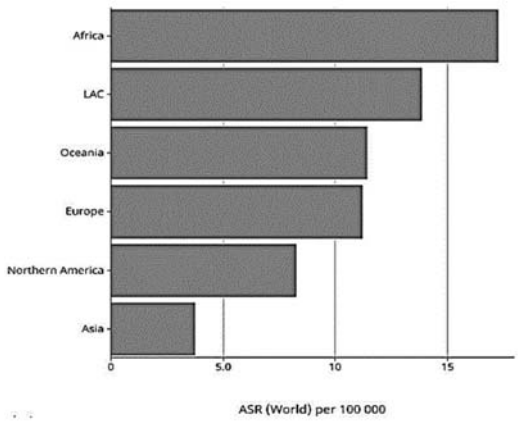


Figure 1. Age-standardized rate worldwide per 100 000, Mortality, Males, in 2022 in continents. *Source*: World Health Organization.

Other data showed that in the United States, there was an incidence of prostate cancer cases in 2022 of 268,490 and a mortality rate of 12.84% (34,500) [24]. Additionally, a study showed increases in the mortality rate from prostate cancer in Canada between 1992 and 2010 [25]. Furthermore, a study carried out on the border between the United States and Mexico showed a Hispanic population (170,640) with prostate cancer problems [26].

On the other hand, a report showed that prostate cancer was the most common cancer in men living in Mérida City, Mexico from 2015 to 2018 [27]. Another study carried out in Mexico from 1990- 2013 showed an incidence of 35.5, and 6.529 deaths [28]. Furthermore, a study indicates that in Mexico from 1980 to 1995, 32,349 deaths were associated with prostate cancer [29]. Other data on prostate cancer incidence in Mexico from 2019 show that the highest percentage of deaths from this clinical pathology occurred among the age groups of 70 to 79 and 80 to 89 years [30]. A recent statistical analysis was conducted on the incidence of prostate cancer in the population of southern Mexico, covering the years 1978 to 2020. The findings revealed that the fatality rate attributed to prostate cancer in Veracruz City surpassed that of other cities in southern Mexico [31].

The objective of this study was to examine statistical data on prostate cancer in Central and Northern Mexico from 1979 to 2022 by utilizing the Information System of the Ministry of Health Mexico.

Materials and Methods

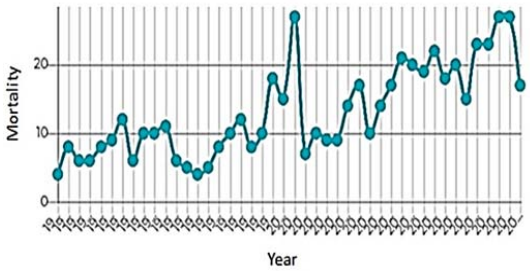
An analysis of prostate cancer incidence and mortality rates from 1979 to 2020 was conducted using data obtained from the World Health Organization. Furthermore, statistical data regarding prostate cancer in Mexico was acquired from the information system of the Health Secretary of Mexico [32]. It is worth mentioning that additional data systems, such as Google Scholar and PubMed, were utilized to present certain statistics on prostate cancer.

Results and Discussion

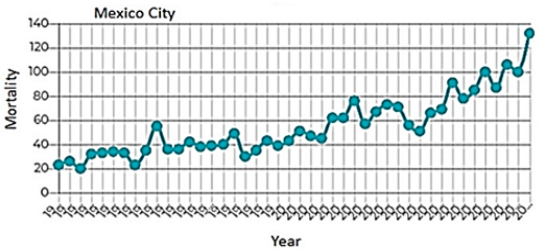
Table 1 and **Figures 2 and 3** show the mortality values recorded in the cities of central Mexico from 1979 to 2022 in patients with prostate problems between 45 and 65 years of age. It is noteworthy that Mexico City had a higher mortality rate compared to Hidalgo, Morelos, Puebla, Queretaro, and Tlaxcala. Besides, Puebla City showed a higher mortality rate (45 and 65 years) in the prostate cancer population in comparison with Hidalgo, Morelos, Queretaro, and Tlaxcala.

Table 1. The mortality rate for prostate cancer population in Central cities, Mexico (1979.2022)

City	45 to 64 years	65 and > 65 years
Mexico	169	2247
Hidalgo	21	556
Morelos	22	418
Puebla	64	1407
Queretaro	15	299
Tlaxcala	5	298



a)



b)

Figure 2. Statistical data on prostate cancer for Hidalgo and Mexico Cities from 1979 to 2022. Source: Health Secretary, General Directorate of Health Information. http://sinaiscap.salud.gob.mx:8080/DGIS/

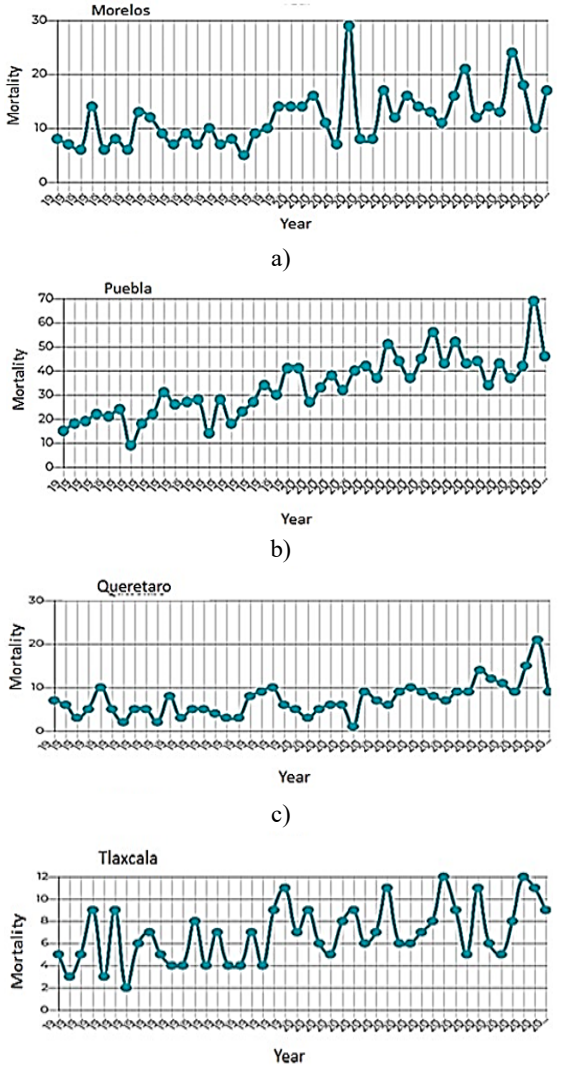


Figure 3. Statistical data on prostate cancer for Mexico, Morelos, Puebla, Queretaro, and Tlaxcala from 1979 to 2022. Source: Health Secretary, General Directorate of Health Information. http://sinaiscap.salud.gob.mx:8080/DGIS/

Other results displayed that mortality from cancer prostate was higher in the Nuevo Leon population (65 and > 65 years) compared with California, South California, Chihuahua, Coahuila, Durango, Sinaloa, and Sonora. However, the Sinaloa population with cancer prostate was higher in comparison with California, South California, Chihuahua, Coahuila, Durango, Nuevo Leon, and Sonora **(Table 2, Figures 4 and 5)**.

Table 2. The mortality rate for prostate cancer population in North cities, Mexico (1979.2022)

City	45 to 64 years	65 and > 65 years
California	33	329
South California	2	77
Chihuahua	50	618
Coahuila	29	548
Durango	23	329
Nuevo Leon	24	701
Sinaloa	39	532
Sonora	24	447
Tamaulipas	40	655

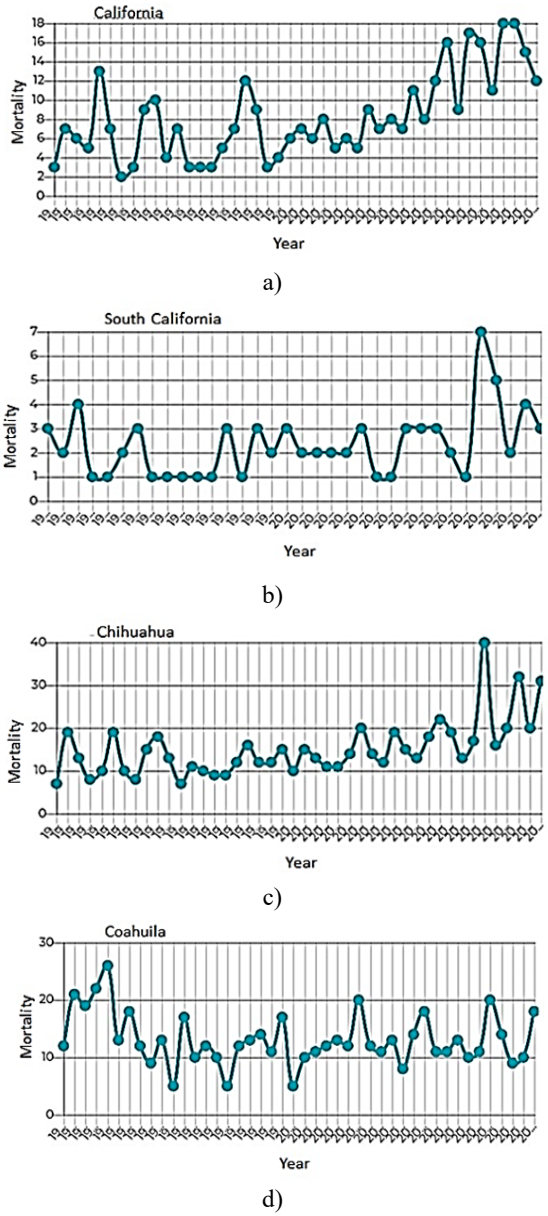


Figure 4. Statistical data on prostate cancer for California, South California, Chihuahua, and Coahuila from 1979 to 2022. Source: Health Secretary, General Directorate of Health Information. http://sinaiscap.salud.gob.mx:8080/DGIS/

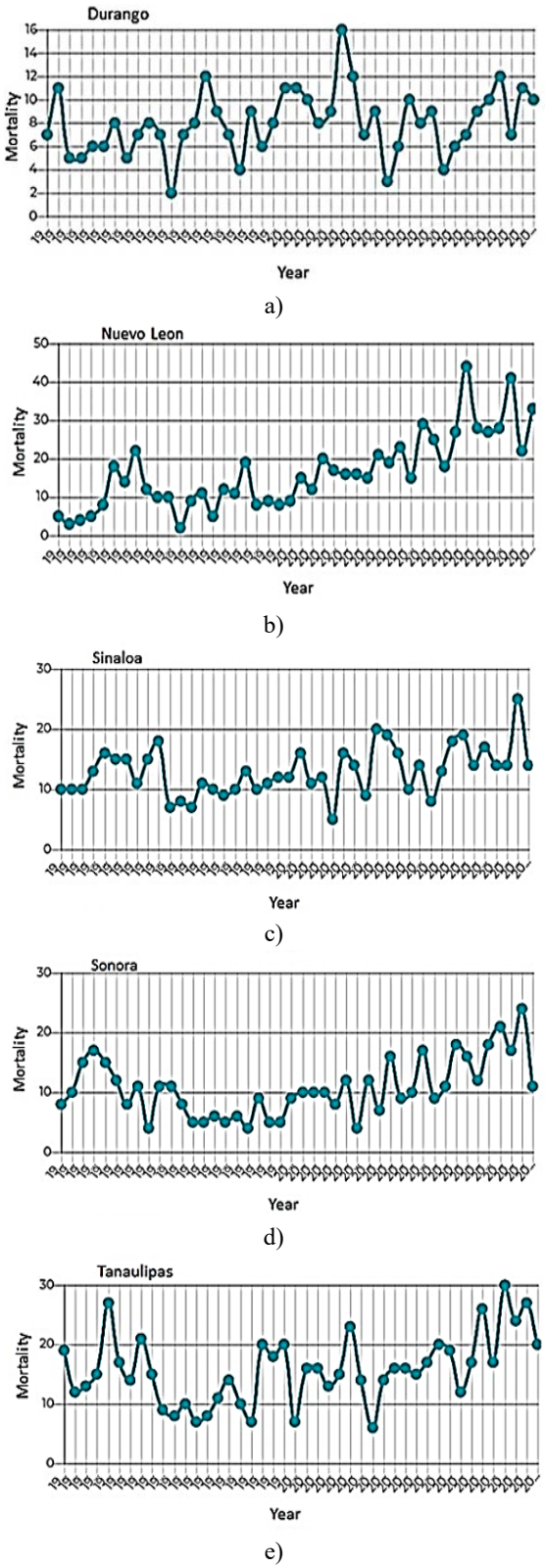


Figure 5. Statistical values on prostate cancer for Durango, Nuevo Leon, Sinaloa, Sonora, and Tamaulipas from 1979 to 2022. Source: Health Secretary, General Directorate of Health Information. http://sinaiscap.salud.gob.mx:8080/DGIS/

All these data indicate variations in mortality degree in different populations of Central and Northern Mexico. This phenomenon could be due to several factors, such as population size or other risk factors such as obesity. This hypothesis is supported by some studies conducted from 1997 to 2002 in 639 participants to evaluate the relationship between body mass index and prostate cancer. The results showed 450 deaths from any cause and 134 deaths from prostate cancer. Additionally, this study indicates that weight gain >5% was associated with a higher rate of prostate cancer [33]. Another study from 1986 to 2012 displayed an association between obesity and the risk of prostate cancer progression in 5,158 men with prostate cancer [34].

On the other hand, some studies suggest that prostate cancer may be associated with higher fat consumption within the diet [35]. For example, a prospective population-based report on 25,708 Norwegian men showed that a high-fat diet may be related to prostate cancer [36]. These data suggest that fat intake could increase prostate cancer levels, resulting in an increased degree of mortality in the worldwide population. However, some studies indicate that other factors are related to prostate cancer rates, such as race, ethnicity [37, 38], geography [39], lifestyle [40-44], and testosterone concentration [45-48]. In this way, in the literature, some reports indicate that geographical conditions could condition the mortality degree from prostate cancer in different populations worldwide. This hypothesis could be supported by some studies that indicate that men who live in disadvantaged areas do not have the necessary services for a good life expectancy, which can increase prostate cancer levels. Another study involved 2,779 men with prostate cancer and 1,606 men without a cancer diagnosis, recruited in New Zealand, the US, and Taiwan. In this study, the relationship between prostate cancer with some demographic aspects and lifestyle was analyzed using multiple and univariate linear regression models; the results showed an association between different demographic factors and prostate cancer [49]. Contrary to these data, other studies showed that prostate cancer increased in the United States and some Scandinavian countries, compared to different developing countries [50].

Conclusion

This study examines the correlation between the death rate and prostate cancer in central and northern Mexico from 1979 to 2022, utilizing data from the Mexican Ministry of Health's information system. Statistical results showed that aging and possibly demographic factors are some risk parameters for prostate cancer development in Mexico. Furthermore, it is important to mention that the population

size of each region could condition the mortality rate for this clinical pathology.

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Conflict of interest: None.

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Ethics statement: All procedures in this study were performed by protocols for the Pharmacochemistry Laboratory of the University Autonomous of Campeche.

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