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Prostate Cancer Trends in Southern Mexico: Statistical Data from 1978 to 2020

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ABSTRACT

Prostate cancer remains the leading cause of cancer-related deaths among men globally. In 2020, Mexico's National Institute of Statistics and Geography reported a mortality rate of 10.89 per 10,000 men aged 60 years and older due to this condition. The purpose of this study was to analyze prostate cancer-related statistical data specific to the southern region of Mexico. Mortality records from 23,527 male patients diagnosed with prostate cancer between 1979 and 2020 were reviewed using sources such as GLOBOCAN 2020, the Mexican Ministry of Health's Information System, Google Scholar, and PubMed. The findings showed that Veracruz reported the highest mortality rate in 2018, exceeding the numbers from Campeche (219), Chiapas (977), Guerrero (724), Oaxaca (1356), Quintana Roo (623), and Yucatán (603). The analysis highlights aging as a major contributing factor to prostate cancer risk and suggests that population growth in different Mexican cities may also influence these trends.

Keywords: Cancer, Prostate, Mexico, Mortality

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Introduction

Cancer stands as a leading cause of mortality around the globe, contributing to a notable reduction in overall life expectancy across populations [1–6]. The prevalence of this disease has been on the rise in both industrialized and developing nations, largely due to contributing factors such as population aging and demographic expansion [7–10]. It's also crucial to recognize that cancer types and their incidence vary across regions. For instance, GLOBOCAN [11] recently reported that, in 2020, there were 9,227,484 new cancer cases among women worldwide. Among these, breast cancer accounted for 24.5% (2,261,419 cases), while colorectal cancer represented 9.4% (865,634 cases). In the male population, totaling 10,065,305 cancer cases, lung cancer comprised 14.3% (1,435,940 cases) and prostate cancer made up 14.1% (1,414,259 cases). Furthermore, data suggest that the incidence of prostate cancer has risen significantly in Europe and North America compared to Central America and other global regions **(Figure 1)** [11].

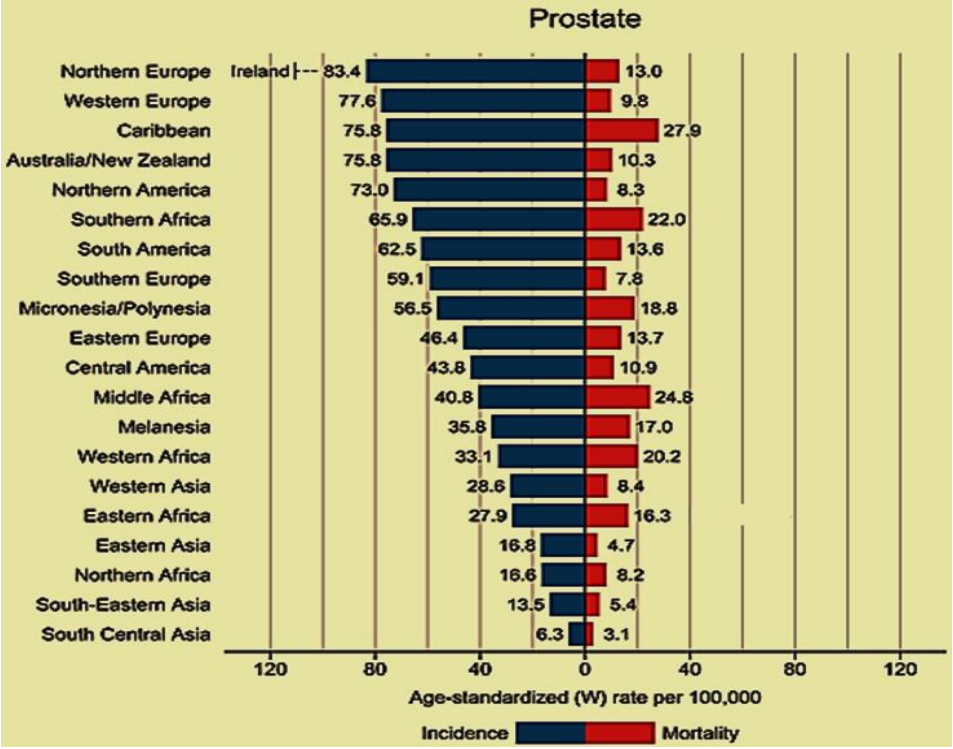


Figure 1. Age-standardized (world incidence) and mortality rates, prostate cancer (Source: GLOBOCAN [11])

In the context of North America—particularly the United States—prostate cancer remains a significant concern. In 2022, an estimated 268,490 new cases were reported, along with 34,500 deaths, representing 12.84% of cancer-related fatalities [12]. Additionally, research has highlighted an upward trend in both the incidence and mortality rates of prostate cancer in Canada between 1992 and 2010 [13]. Data from the US-Mexico border region also revealed that 170,640 Hispanic Americans were diagnosed with this disease [14]. A study conducted in Mérida, Mexico, using CanReg5 software, identified 532 prostate cancer cases, with an age-standardized incidence rate (ASR) of 29.8 per 100,000 person-years [15]. Moreover, an analysis of the cancer burden in Mexico between 1990 and 2013 reported 29,428 prostate cancer cases, with 6,520 resulting in death [16]. Another investigation, examining 32,349 prostate cancer patients in Mexico from 1980 to 1995, found a notably higher standardized mortality ratio in Baja California Sur (183.28) compared to several southern states: Campeche (83.27), Chiapas (83.60), Guerrero (57.69), Quintana Roo (47.87), Oaxaca (60.49), Veracruz (80.72), and Yucatán (97.23) [17]. These findings underscore regional disparities in prostate cancer mortality within Mexico. Therefore, expanded statistical research is crucial for improving diagnosis and optimizing treatment strategies. Based on this rationale, the objective of the present study is to analyze prostate cancer mortality data across southern Mexico from 1979 to 2020.

Materials and Methods

To examine the incidence and mortality rates of prostate cancer for the year 2020, data were compiled from a variety of international regions using the GLOBOCAN 2020 database [11]. For Mexico-specific statistics, records were accessed through the official data system maintained by the Mexican Ministry of Health [18]. Additionally, supporting information and previous findings were obtained by reviewing the literature on platforms such as PubMed and Google Scholar to provide further context and depth regarding the prostate cancer situation in Mexico.

Results and Discussion

As outlined in **Table 1**, the states of Colima (1,771 cases, 7.54%), Mexico City (1,036, 4.4%), Guanajuato (1,277, 5.43%), Hidalgo (2,188, 9.31%), Jalisco (1,074, 4.57%), and Nayarit (1,357, 5.77%) recorded some of the highest

levels of prostate cancer mortality and incidence nationwide. These figures outpaced those of numerous other Mexican states. Furthermore, a marked rise in prostate cancer cases was detected among individuals aged 65 and above, particularly in regions such as the State of Mexico, Michoacán, Jalisco, and Querétaro. These increases were notably higher than those observed in other central and northern areas, indicating possible geographic and demographic influences on disease prevalence.

Table 1. Mortality values of prostate cancer in central and northern Mexico (1979–2020)

City	45 to 64 years	65 and > 65 years
Aguascalientes	11	200
Chihuahua	47	570
Coahuila	27	522
Colima	5	130
Durango	22	309
Guanajuato	49	985
Hidalgo	18	515
Jalisco	58	1216
Mexico City	131	1638
Mexico State	155	2029
Michoacan	52	1022
Morelos	19	464
Nayarit	15	285
§N. B.C.	308	27
¥N. B.C.	2	70
Nuevo Leon	23	647
Puebla	58	1298
Queretaro	15	269
San Luis Potosi	36	732
Sinaloa	34	498
Sonora	20	416
Tamaulipas	36	612
Tlaxcala	4	279
Zacatecas	14	487

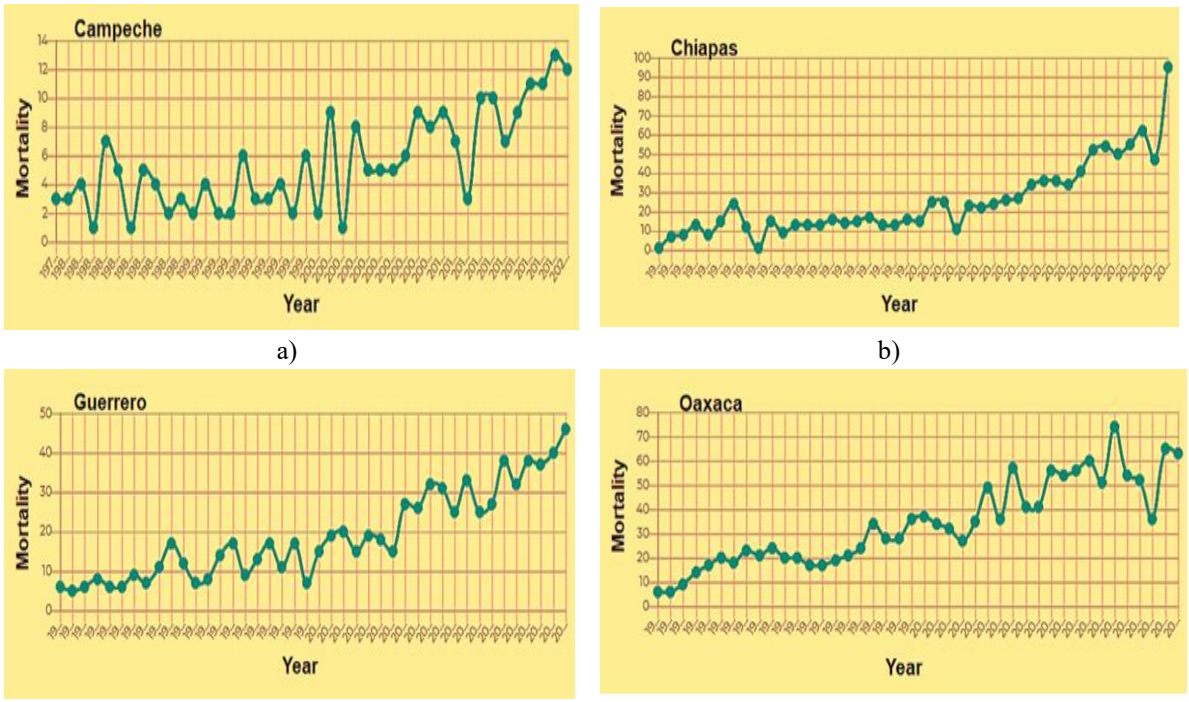
§N. B.C. = North Baja California
¥N. B.C. = South Baja California
Source: Health Secretary, General Directorate of Health Information. http://sinaiscap.salud.gob.mx:8080/DGIS

Several risk factors may contribute to this trend, one of which is the adoption of diets rich in saturated fats [19–23]. This idea is supported by various studies that suggest a connection between high-fat consumption and prostate cancer development [24]. For instance, a longitudinal study involving 25,708 men from Norway found that consuming a fat-heavy diet might increase the risk of developing prostate cancer [25]. Similarly, research on a group of 4,577 men revealed that fat intake could be a contributing factor to higher mortality rates associated with this disease [26]. On the other hand, not all studies support this correlation; one large-scale analysis involving 37,349 participants found no clear association between fat consumption and prostate cancer risk [27]. Taking all these findings into account, it becomes evident that the incidence and severity of prostate cancer are influenced by a range of factors, including race, ethnic background, geographical location, and hormonal variations [28–34]. These variables may help explain differences in mortality rates across cities in central and northern Mexico. To explore this further, a separate investigation was conducted focusing on prostate cancer in southern Mexico, utilizing data from the Mexican Health Secretariat's information system [18]. The statistical findings presented in **Table 2 and Figures 2 and 3** highlight elevated mortality among individuals aged 65 and older in the cities of Chiapas, Veracruz, and Oaxaca. In contrast, Tabasco reported higher mortality rates in the 45–64 age group.

Table 2. Mortality percentage of prostate cancer in southern Mexico (1979–2020)

City	45–64 years	65 and > 65 years
Campeche	13	219
Chiapas	73	977
Guerrero	64	724
Oaxaca	74	1356
Quintana Roo	156	150
Tabasco	655	623
Veracruz	132	2018
Yucatan	22	603

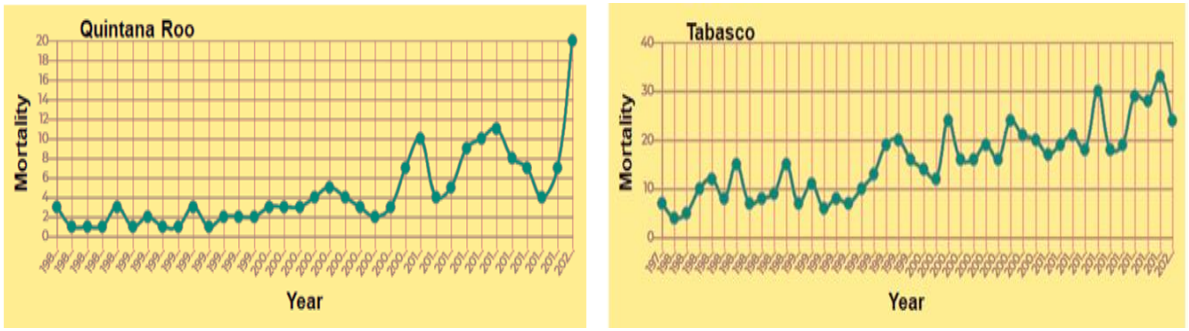
Source: Health Secretary, General Directorate of Health Information. http://sinaiscap.salud.gob.mx:8080/DGIS



a) b)

c) d)

Figure 2. Statistical data on prostate cancer in Campeche, Chiapas, Guerrero, and Oaxaca from 1979 to 2020 (Source: Health Secretary, General Directorate of Health Information, http://sinaiscap.salud.gob.mx:8080/DGIS/)



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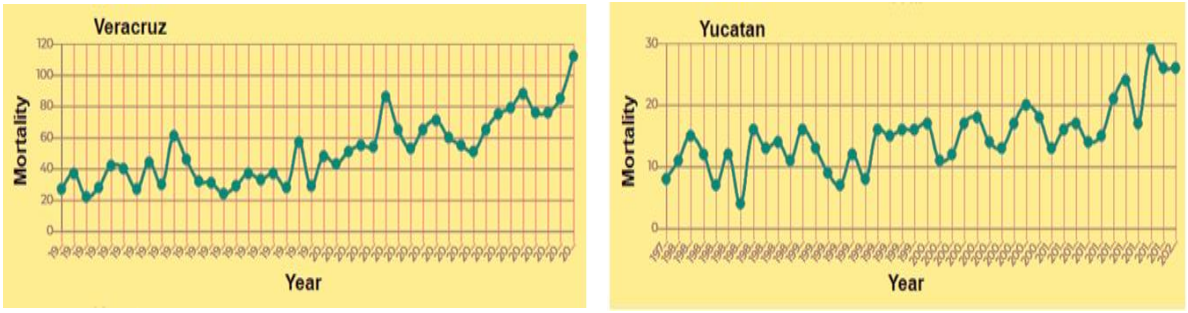

c) d)

Figure 3. Statistical data on prostate cancer Quintana Roo, Tabasco, Veracruz, and Yucatan from 1979 to 2020 (Source: Health Secretary, General Directorate of Health Information, http://sinaiscap.salud.gob.mx:8080/DGIS/)

These findings point to advanced age as a significant risk factor in the development of prostate cancer. This correlation is further reinforced by multiple studies that demonstrate a strong association between aging and the onset of this disease [35–40]. Nonetheless, the varying mortality rates observed across different cities may be influenced by additional factors, such as disparities in sample sizes across studies or limited access to early diagnosis—especially in rural areas. Such gaps can lead to incomplete or inconsistent records, complicating efforts to achieve accurate diagnoses and reliable statistical reporting on prostate cancer within Mexico. Therefore, the data provided by the Mexican health sector plays a critical role in supporting accurate diagnoses and effective control strategies for managing this condition across the population.

Conclusion

This study presents statistical insights into the incidence and mortality rates of prostate cancer in southern Mexico. The findings indicate that age is a significant risk factor for the development of prostate cancer. Additionally, the increase in population size across various cities in Mexico may contribute to the observed trends in prostate cancer incidence and mortality.

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Conflict of Interest: None

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Ethics Statement: None

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