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COMMENTARY

# Cervical Cancer Risks and Outcomes in Hispanic Women

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## Introduction

Cervical cancer is a worldwide threat affecting women, particularly in impoverished communities that lack adequate healthcare. Cervical cancer is a malignant tumor of the lower part of the uterus. Cervical cancer affects women throughout the world from all walks of life. Although it affects all races, there are disparities among ethnic groups depending on geographic location. Certain geographic locations such as the Rio Grande Valley have higher incidence of cervical cancer. The Rio Grande Valley has a large Hispanic population and many of these women do not seek medical care which could prevent or improve cervical cancer diagnosis (1). In 2018 there were 570,000 cases of cervical cancer and 311,000 deaths from it around the world (2). Cervical cancer was the fourth most common disease in women. China and India together contributed more than a third of the global cervical burden, with 106,000 cases and 48,000 deaths in China, and in India 97,000 cases and 60,000 deaths (2). Cervical cancer ranked in the top three cancers affecting women younger than 45 years in 146 (79%) of 185 countries assessed (2). In Texas, it was recorded by the Texas Health and Human Services in 2019 that there were over 1,395 women affected by cervical cancer and an estimated 447 would die from the disease (2).

## Risks

### Human Papillomavirus

Human Papillomavirus also known as HPV is a non-enveloped, double-stranded, circular DNA virus that has been proven to be a leading factor in the development of cervical cancer in women (3). HPV has over 100 subtypes identified, and from those 100 there are many subtypes that are specifically associated with the development of cervical cancer some of them being subtypes 16, 18, 31, 33, 35, 45, 52, and 58 (4) For example, HPV 16 has been shown to affect the genomes of the host (13). Even though HPV is not genetically inherited, recent studies have discovered the variant to be transmitted naturally. The variant has been discovered in European-Asians, Europeans, and Africans (5). HPV also contains viral

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proteins that cause infection and ultimately progress into cancer some being E1-E7 and L1-L2 which again are essential for a viral propagation (3). The virus for the most part is acquired through sexual activity and develops into the body when it enters the epithelium through disruptions of the skin/mucosa and starts infecting the basal stem cells (see Figure 1) (4). But this viral DNA doesn't instantly merge into a person's genome, it remains as an independent episome for a period before that. And even though HPV is a leading factor associated with cervical cancer. It alone cannot cause cancer and there are factors that trigger it to happen such as smoking, pregnancy/childbirth, and the use of oral contraception (4). To prevent certain cancerous lesions and subtypes there is a vaccine that has been shown to be helpful when it comes to the prevention of cancers that HPV can cause, and it is said to be most effective when given during the ages of 9-12 or before teens initiate in sexual activity (4). Prevention of contracting HPV may also include abstinence practicing safe sex.

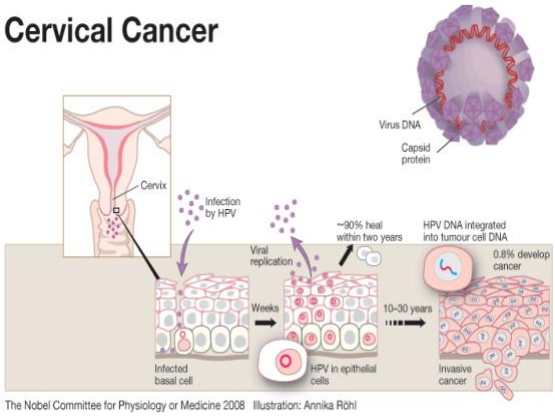

Figure 1

## Smoking

Smoking does not only cause long-term effects with your lungs, but it has more recently been proven to be linked with HPV and cervical cancer. In a study published in the Journal of Epidemiology and Public Health, researchers found that women who were exposed to second-hand smoke had a 73% increase in risk for developing cervical cancer, especially if they were already exposed to HPV (6). Researchers also stated that women that were exposed have a 12.57% more likely chance of having cervical cancer (6). Tobacco products affect the body's immune system, and this makes it harder for women who smoke to fight off infections and viruses that they may contract into their bodies (6). Therefore, avid smokers or women with constant exposure to second-hand smoke who experience frequent HPV infections may be more likely to develop a cancer like Cervical Cancer over time.

## Use of Oral Contraceptives

Oral contraceptives (OCs) are currently prescribed as an effective way of preventing unwanted pregnancies. However, similar to other medications, OCs come with a plethora of unwanted side-effects. Some of these side effects could lead to cervical cancer. The specific OCs associated with these cervical cancers are implants, vaginal rings, and other progesterone contraceptives (7). According to research on estrogen-progestogen and progestogen-only contraceptives, synthetic steroids stimulate receptors all over the body and may lead to development of cancer. These receptors are very prominent in reproductive tissues. However, immune cells and other tissues are also affected by these hyperactive receptors. The longer the OCs are used, the higher the risk of developing cervical cancer. Moreover, a study conducted over a 10-year span concluded that women who use OC's are at a 95% increase of cervical cancer. It was discovered that OC's not only higher the risk of cervical cancer but also influence its formation (8).

## Diet

Although there is an insignificant amount of information regarding diet and nutrition in relation to HPV and cervical cancer, a western diet is considered a high-risk for cervical cancer. In a study done by the University of Catania where they monitored the dietary patterns, women following a western diet were considered to be high-risk (9). Research indicated women consuming a "western" diet which consisted of a higher intake of red and processed meats and foods such as chips and other snacks were generally associated with a higher risk of developing HPV and other HPV-related cervical lesions (9). Alternatively, women that had a more "prudent" diet that consisted of a higher intake of raw vegetables, legumes, and vegetable soups were less likely to be at risk of developing HPV and other infections (see Figure 2) (9). Dietary antioxidants such as vitamin D and carotenes have also been proven to help fight against/neutralize harmful ROS that may be in a woman's body or on its own (10).

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| | PCA1 | PCA2 |
|---|---|---|
| Potatoes | 0.199 | **0.344** |
| Legumes | -0.049 | **0.832** |
| Vegetable soup | -0.080 | **0.800** |
| Cooked vegetables | -0.030 | **0.373** |
| Raw vegetables | -0.144 | **0.299** |
| Fruit | -0.139 | 0.009 |
| Nuts | -0.047 | -0.050 |
| Milk | -0.081 | 0.020 |
| Yoghurt | -0.100 | 0.027 |
| Curd cheese | -0.100 | -0.046 |
| Ripened cheese | -0.083 | 0.030 |
| Pasta | -0.034 | -0.061 |
| Rice | 0.015 | 0.073 |
| Bread and cereals | 0.025 | -0.035 |
| Wholegrain bread and cereals | -0.081 | -0.013 |
| Breakfast cereals | -0.036 | 0.067 |
| Offal | -0.015 | 0.019 |
| Canned fish | 0.061 | -0.056 |
| Shellfish | -0.002 | -0.058 |
| Fish | -0.051 | 0.040 |
| Eggs | 0.012 | -0.019 |
| Olive oil | **-0.402** | **-0.238** |
| Butter and margarine | 0.136 | 0.160 |
| Sweets and processed sugar | 0.123 | -0.158 |
| Fruit juice | 0.147 | 0.105 |
| Coffee | -0.010 | -0.071 |
| Tea | -0.067 | 0.037 |
| Pizza | 0.122 | 0.008 |
| Wine | 0.009 | -0.003 |
| Beer | 0.058 | -0.113 |
| Alcoholic drinks | -0.130 | 0.013 |
| Plant oil | **0.434** | -0.038 |
| Dipping sauces | **0.734** | -0.007 |
| Snacks | **0.594** | -0.113 |
| Chips | **0.780** | -0.057 |
| White meat | 0.086 | 0.025 |
| Red meat | **0.200** | -0.089 |
| Processed meat | **0.242** | -0.096 |
| Fruit salad | 0.045 | -0.046 |

-1 0 1
Factor loadings

**Figure 2.**
Foods that positively (green) and negatively (red) characterize dietary patterns.
PCA1: Western Diet & PCA2: Prudent Diet.

## Genetics

Researchers have discovered through several research studies that some genetic aspects may increase the probability of developing cervical cancer. It is considered that 36% of cervical cancer cases may be linked to genetics (11). DECIR 1 is a gene that has been linked to an increased risk of cervical cancer as well as other types of cancer. DICER1 is a rare genetic mutation that makes an individual more prone to the development and growth of tumors. These tumors have been associated with cervical cancer (12). DICER1 syndrome typically affects young females with cervical cancer patients who are in their twenties or younger (13). DICER1 syndrome is not the only genetic link between cervical cancer and women.

## Cervical Cancer Screening

Screening is essential, particularly for younger females to detect cervical cancer. Ages starting from 21 to as much as 65 years old are at critical risk to receive cervical cancer. Papanicolaou screenings is a procedure where tissue is removed from the surface and around the cervix to check for malignant cells. These tests are recommended for females aged 21–29-year-old at least every three years (14). Using Human papillomavirus DNA test and pap smear are tests recommended for early detection and risks of cervical cancer (15).

## Ethnic Differences and Disparities in Hispanic Women

Through research it was found that women from both Hispanic and African American populations run a higher risk of developing cervical cancer. Hispanic women are nearly twice as likely to be diagnosed with cervical cancer as opposed to other populations and furthermore African American women are more likely to die from this disease (15, 16). Access to testing such the pap-smear test is difficult for women of these populations due to lack of access to health care, education, and awareness campaigns (14). According to research, ethnicity is a major factor and a disparity as well to access to health care, therefore the lack of screening tools to detect early signs of cervical cancer is a huge problem in our country. All of the above may contribute to the increase in cervical cancer cases in these populations (14).

Another very important factor as far as ethnic differences and disparities is the issue of health literacy and why it is important for health care facilitators to educate populations of Hispanic women. Research has found that Health illiteracy and cervical cancer screening among Mexican American women needs to be addressed and is essential to improving outcomes (17).

## Culture

In addition to the high prevalence of cervical cancer in Hispanic women, culture and social factors contribute to the lack of understanding of the disease. Due to the lack of understanding of the disease, families and caretakers are unable to communicate and provide awareness about the importance of getting

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tested (18). The Latina women's stigma of privacy especially when it comes to certain healthcare practices is a big factor, therefore putting them at risk (18). Hispanic cultural beliefs such as stigma surrounding sensitive health topics, alternative remedies promoted and consumed, and the gender of the physician may often lead to negative outcomes because they are not well informed of the awareness and dangers of cervical cancer. Lack of education, healthcare services, and additional resources may possibly contribute to negative outcomes for these women (18).

## Stages, Signs, and Symptoms of Cervical cancer progressing

### *Stages of Cervical Cancer*

Through research, it has been discovered that cervical cancer is an abnormal growth of malignant cells located in the cervix and metastasizes as the tumor grows (19). Cervical cancer has four stages, each containing sub-stages (20). Stages are organized by severity, determined by the depth of the tumor and whether it has spread (21).

### *Stage I*

In the initial stage I, the cancer or tumor is limited to the cervix (21). As previously mentioned, cancer has sub-stages known as IA1, IA2, IB1, IB2, and IB3 (21). The difference in sub-stages between IA1 and IA2 is that the tumors in IA1 are less than or equal to 3 mm (⅛ inches) deep (21). Whereas in IA2, the tumor's depth is between 3 mm and 5 mm (⅕ inches). From sub-stage IB1, the tumor is deeper than 5 mm but no more than 2 cm (⅘ inches). The tumor's size in IB2 is between 2 cm- 4cm. Stage IB3 cancer is at least 4 cm in size but is only limited to the cervix (21).

### *Stage II*

Stage II consists of three sub-stages, IIA1, IIA2, and IIB1 (Figure 3). Cancer in sub-stages IIA1 and IIA2 spread beyond the cervix and the uterus, yet it has not reached the parametrium, which is a connective tissue to the pelvis, surrounding the uterus (22). The size of the tumor is no larger than 4 cm (about 1 3/5 inches) in IIA1, and in IIA2, the cancer is 4 cm or larger. Unlike IIA1 and IIA2, cancer in the IIB1 phase has developed in the tissue of the cervix, the parametria, and beyond the cervix and uterus.

### *Stage III*

Stage III cancer has metastasized to the lower area of the vagina and/or walls of the pelvis and has three sub-levels known as IIIA, IIIB, and IIIC (Figure 3) (21). Cancer in IIIA has invaded the lower part of the vagina. On the contrary, the tumor in IIIB can spread to the walls of the pelvis. In this stage, not only can it block one or both of the ureters, but it could also affect the kidneys and cause hydronephrosis (21). Hydronephrosis is a condition where there is an abnormal enlargement of the kidneys, caused by blockage of the ureters or urine leaving the bladder (23). The tumor in IIIC, regardless of the size, can metastasize to the pelvic lymph nodes (IIIC1) or para-aortic lymph nodes (IIIC2).

### *Stage IV*

Ultimately, the last phase of the cancer is Stage IV (21). The severity of cancer has grown and affected other organs, such as the bladder, rectum, and depending on the extremity, the lungs, or bones. Sub-level IVA focuses on cancer growing out of the pelvis, affecting the bladder, and/or rectum. IVB, the other phase of Stage IV, is when the tumor has advanced to other distant organs outside of the pelvis area, such as bones, lymph nodes, and lungs (Figure 3) (24).

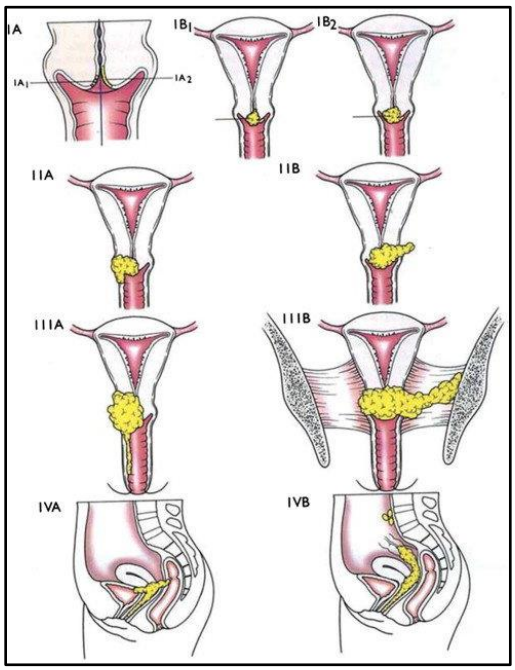


Figure 3
Staging in Cervical Cancer

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## Signs and Symptoms

Regarding the signs and symptoms of cervical cancer, patients undergo specific characteristics as cancer progresses. Some of these signs and symptoms appear early on in certain cancers, yet in cervical cancer, they do not appear till later as the cancer advances and/or is hard to detect (20). Within Stage I, women may find signs of watery or vaginal discharge that is dense and may have a foul odor. Patients can have vaginal bleeding after intercourse, between menstrual cycles, or after menopause, and their menstrual periods may be heavier and last longer than usual (20). These signs are mainly considered within the first stage of cervical cancer. However, as the cancer advances and worsens throughout the body, such as stages II-IV, patients may experience pelvic/abdominal pain, diarrhea or pain and rectal bleeding, fatigue, rapid weight loss of more than 10 lbs., loss of appetite, backaches or swelling in the legs, painful/difficult urination with blood in the urine, and an overall sense of feeling ill (20).

## Trends of Cervical Cancer

### Trends in Incidence

Cervical cancer is one of the most common cancers in females worldwide. In the United States, its incidence and mortality rate has been declining due to the wide scale screenings, pap tests, and/or pap smear tests (25). The screening procedure can find cervical cancer early. Most patients are diagnosed between the ages of 35 and 44 and the average age at diagnosis is 50 years old (26). Patients diagnosed with cervical cancer are also likely to have HPV and most patients have a history of smoking cigarettes.

Researchers for cervical cancer once stated that cervical cancer was one of the most common cancerous deaths for women in the United States. The cervical cancer rate has dropped significantly with women now taking pap tests/pap smear tests (26). People younger than 20 years old rarely develop cervical cancer; however, the risk does go up for women in their mid 30s. Many older women do not realize that the risk of developing cervical cancer is still going up as they age (26).

### Trends in HPV

Every year, about 19,400 women may experience cancers caused by HPV including cervical cancer. In recent years, the HPV test has been approved as another screening test for cervical cancer because almost all cervical cancer patients are caused by HPV. Many of the patients that found out they had HPV was because of their symptoms, for example, pelvic pain during intercourse, vaginal bleedings between periods or after menopause, and watery, blooding vaginal discharge (27). HPV is the most common infection of the reproductive tract this can be due to the fact that this virus can be transmitted during intercourse. Some cervical cancers come from an HPV infection of gland cells in the cervix and are called adenocarcinomas. Most women find out they have HPV when they get an abnormal Pap test result. If present, the test can determine whether the HPV is a low- or a high-risk type. Studies show that even though there is no treatment for the virus itself, there are treatments for the health problems that HPV causes, for instance, cervical precancer treatment is available. Women who get routine Pap tests and follow-ups can identify problems before the cancer develops. Additionally, the HPV vaccine can be administered starting at the age 9, through 26 years (28).

### History of Cigarette Usage

Women who smoke are about twice as likely as those who do not smoke to be diagnosed with cervical cancer. When someone smokes, they and people around them are exposed to many cancer-causing chemicals that affect organs other than the lungs. These dangerous substances can be absorbed through the lungs and carried throughout the bloodstream and go around the body. Tobacco by-products have been found in the cervical mucus of women who smoke and who have been diagnosed with cervical cancer (29). Studies show that these substances can damage the DNA of cervix cells and may contribute to the development of cervical cancer (30). It has also been studied that smoking can weaken your immune system which also makes you more likely to be affected by HPV(31). Patients that are diagnosed with cervical cancer tend to have a history of smoking. Smoking has been known to impact the immune system cells that are important in fighting the HPV virus, allowing the virus to promote precancerous lesions and cancer of the cervix and genital areas (32).

### Prevention and Treatment

Cervical cancer is a very common cancer in women, especially in Latin women, however there are

various ways to treat this cancer. In fact, cervical cancer rates for Latino women are 44% higher than any other race (15). One reason for the higher incidence of cervical cancer is that Latinas are less likely to get regular Pap tests due to lack of financial resources (15). Since they cannot afford to attend the doctor regularly and be screened for cervical cancer, the cancer can grow undetected and cause damage, which can be fatal. Spreading awareness can increase screening and mortality can be reduced. Early education is also important. Parents should talk with their children about these topics regarding their reproductive system. Since it may be difficult for parents to broach the topic of the reproductive system, there should be programs at school to teach students more about their bodies. After students gain this knowledge, they can help educate others which will spread further awareness and maybe in the future, the rates of cervical cancer in Latina women may go down. The most accessible way women can prevent cervical cancer is by taking the HPV vaccine. It is usually given to children between the ages of 11 to 12 years old (33). If women still develop cervical cancer, there are surgical options available such as cervicectomy surgery or radical trachelectomy surgery. The difference between these two options is very crucial. Radical trachelectomy allows the patient to still be able to reproduce by removing only the cervix unlike in the cervical surgery where both the cervix and the uterus are removed (34).

## Conclusion

The mortality and morbidity of cervical cancer may not be a preventable disease in areas where healthcare is not accessible. However, pap tests, which are a screening tool for cervical cancer, can be used for early detection. Cervical cancer is prevalent in women, but health literacy and awareness may be some factors that also need to be addressed in communities where it is not as accessible, as is the case in South Texas. In conclusion, cervical cancer has various treatments but many people, especially in cities of South Texas are not fully educated to understand the repercussions of cancer as well as the stigma that comes with the culture. More studies for how to deliver education to communities that lack the knowledge of how cervical cancer can be prevented, access to healthcare and disparities for the low-income families are needed.

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