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## Cervical cancer - is there anything to worry about?

### Research on knowledge and awareness of cervical cancer among Poles

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## **ABSTRACT**

Cervical cancer poses a global health challenge, being one of the most common cancers of the reproductive organs and a leading cause of morbidity and mortality worldwide. The disease, resulting from infection with the human papillomavirus (HPV), tends to develop in advanced stages, significantly complicating effective treatment. Despite advancements in medicine, diagnostics, and therapy, cervical cancer remains a serious public health threat. Periodic surveillance through screening has significantly reduced the incidence of cervical cancer; however, in Poland, there is a notable gap between potentially available preventive measures and their actual utilization by the population. It has been observed that only around 20% of Polish women participate in screening programs, contributing to Poland having one of the highest rates of incidence and mortality from this type of cancer in Europe. This leads to the conclusion that cervical cancer constitutes an unresolved oncological and epidemiological problem in Poland. In the context of these challenges, a crucial aspect is understanding the level of public knowledge about cervical cancer, its risk factors, and available preventive measures. This study focuses on evaluating the societal knowledge regarding the risk factors of cervical cancer, identifying existing gaps, and suggesting potential areas for educational interventions.

**Key words:** cervical cancer, HPV, vaccinations, prevention, cytology, screening

## **Introduction:**

Cervical cancer represents a formidable oncological challenge, standing as the most frequently occurring cancer of the reproductive organs and ranking as the fourth most common cancer in women worldwide <sup>1</sup>. In highly developed countries, there has been a notable decrease in the incidence and mortality rates by up to half over the past 40 years <sup>2</sup>. In contrast, in low to moderately developed countries, due to limited access to treatment services, HPV vaccinations, and preventive screenings, cervical cancer continues to pose a significant public health concern <sup>3</sup>.

## **EPIDEMIOLOGY:**

In Poland, cervical cancer accounts for 3% of malignant tumors among women. Annually, it is diagnosed in 2,500 Polish women, leading to the death of 1,600 women each year. This places Poland with one of the highest rates of both incidence and mortality from this type of cancer in Europe <sup>4</sup>. The peak incidence of this type of cancer in Poland occurs in the sixth decade of life. Unfortunately, in recent years, there has been a growing trend in diagnosing cervical cancer in young, active women between the ages of 35 and 44<sup>5</sup>.

## **RISK FACTORS:**

The primary, though not exclusive, risk factor for cervical cancer is the human papillomavirus (HPV), transmitted through sexual contact. The association between HPV and this cancer is at least 10 times stronger than the link between smoking cigarettes and lung cancer <sup>6</sup>. Almost 80% of sexually active individuals will be infected with HPV during their lifetime, with the majority having a transient nature that resolves within 6–12 months due to immunological intervention. A small percentage, however, leads to persistent infections, causing the development of precancerous and cancerous changes <sup>7</sup>. It has been demonstrated that early age at first sexual intercourse and having multiple sexual partners significantly impact the risk of cervical cancer. Important factors in the carcinogenesis of cervical cancer include oral contraceptives, a high number of childbirths, socio-economic status, and cigarette smoking <sup>8</sup>.

## **PREVENTION:**

Cervical cancer control involves primary prevention through vaccinations to prevent human papillomavirus (HPV) infection and secondary prevention through screening tests to detect and treat cervical precancerous lesions. The conclusion is self-evident: cytology as an ally in the fight against cervical cancer. Therefore, every woman, without exception, should undergo cytological examinations to eliminate cervical cancer worldwide. Screening through cytology can detect early precursors and early stages of cervical cancer. The free examination is targeted at women aged 25 to 59 who have not had cytology performed in the preventive program in the last 3 years. In addition to cytological testing for cervical cancer detection, tests for the presence of HPV DNA are increasingly being used. The best effectiveness in screening is achieved by using both methods simultaneously: liquid-based cytology (LBC) and HPV DNA testing <sup>9</sup>.

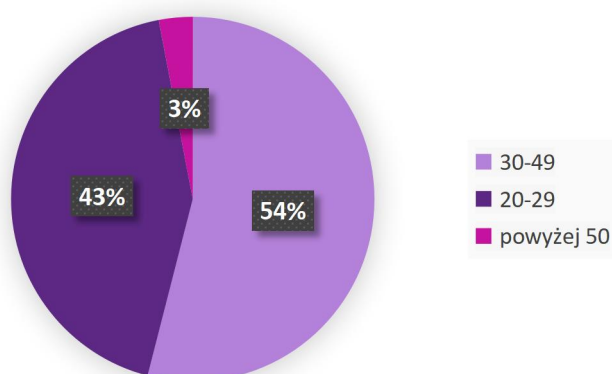
HPV vaccinations are one of the simplest and most effective ways to prevent HPV-related cancers. In Poland, a universal HPV vaccination program started in 2023. The vaccine is intended for girls and boys aged 12 and 13 and is administered in two doses, with a spacing of 6 to 12 months between them. Three HPV vaccines are available in the country: 2-valent, 4-valent, and 9-valent. All of them protect against the most oncogenic types of the virus, i.e., 16 and 18, as well as against precancerous changes and cancers of the reproductive organs <sup>10</sup>. Countries that have implemented universal vaccination programs have reported a decrease in incidence, up to 90%, of genital warts and high-grade cervical lesions <sup>11,12</sup>.

**Objective:** The aim of the study was to assess the knowledge and awareness of society regarding cervical cancer, its risk factors, and primary and secondary prevention measures against this cancer.

**Materials and Methods:** The study was conducted from August to November 2023, in the form of an anonymous online survey, consisting of 23 single-choice questions and 1 multiple-choice question. The questions covered both basic information about the respondents and knowledge about the risk factors and prevention of cervical cancer. The study involved 589 adults. The data and statistical values were analyzed using Excel.

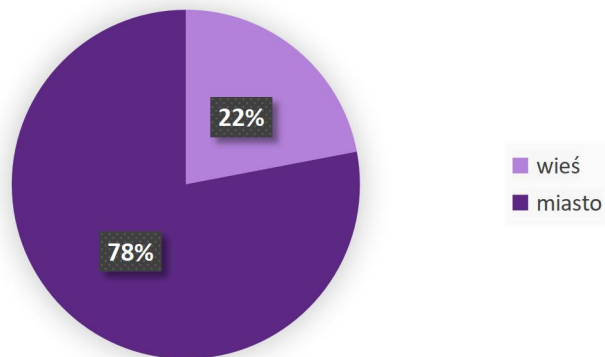
## RESULTS:

The most numerous group of respondents consisted of women aged 30-49 (54%). The option of 20-29 years was chosen by 43% of participants, while individuals above 50 years old constituted 3%.



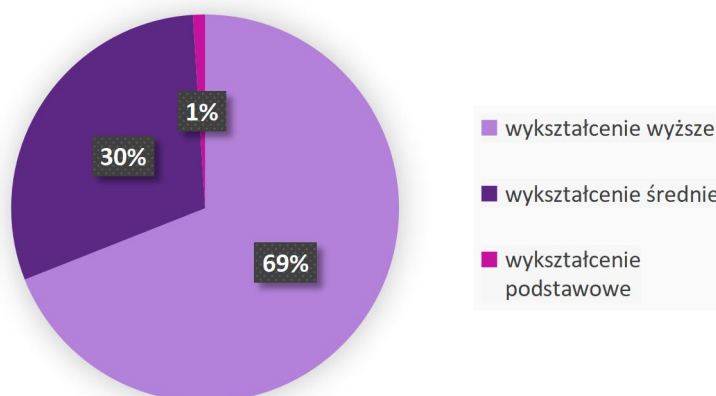
**Figure 1. Age**

Respondents were also divided based on their place of residence. The majority of women who participated in the study came from urban areas, accounting for 78%.



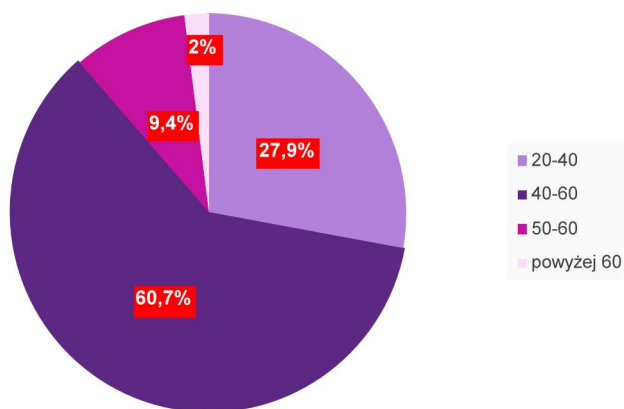
**Figure 2. Place of residence**

Women with higher education constituted the largest group (69%), while those with elementary education represented the smallest group – 1% of the respondents.



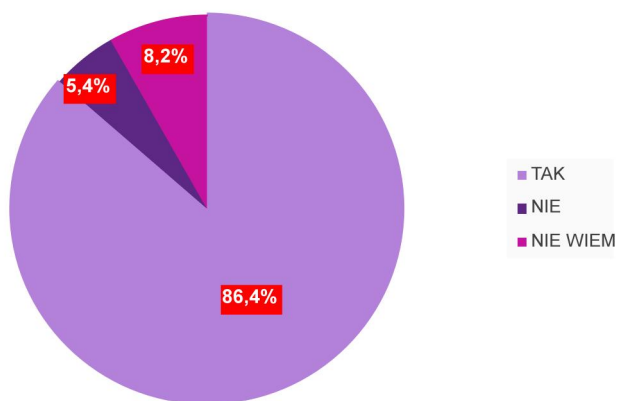
**Figure 3. Education**

The knowledge of women about the peak incidence of cervical cancer performed the worst in the survey. Only 2% of the respondents provided the correct answer. The majority of women selected the option of 40-60 years, with the most numerous group among them being individuals with a moderate level of education. Interestingly, among individuals with higher education, the popular age range selected was 20-40 years.



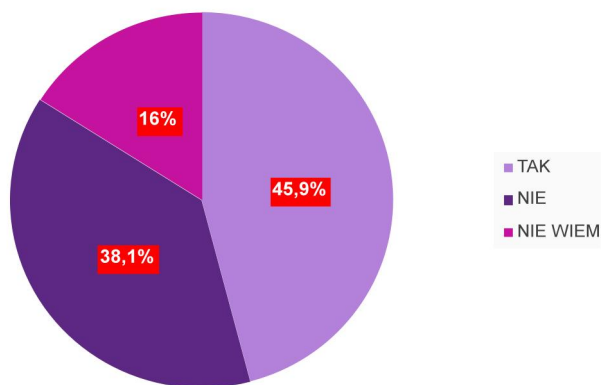
**Figure 4. Do you know at what age the peak incidence of cervical cancer occurs?**

As many as 86.4% of the respondents emphasized that smoking may be associated with the incidence of cervical cancer. Only 5.4% of women denied this statement, with 62.5% of them being individuals aged 30-49.



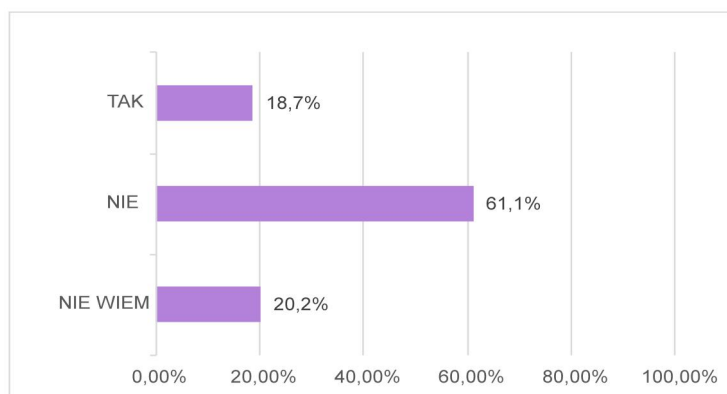
**Figure 5. Do you think smoking cigarettes affects the risk of developing cervical cancer?**

It turns out that only about half of the respondents (45.9%) correctly indicated that early initiation of sexual activity is associated with the risk of developing cervical cancer. 38.1% of women answered negatively. Interestingly, among those who chose the "no" answer, 38.1% were individuals in the age range of 20-29 years.



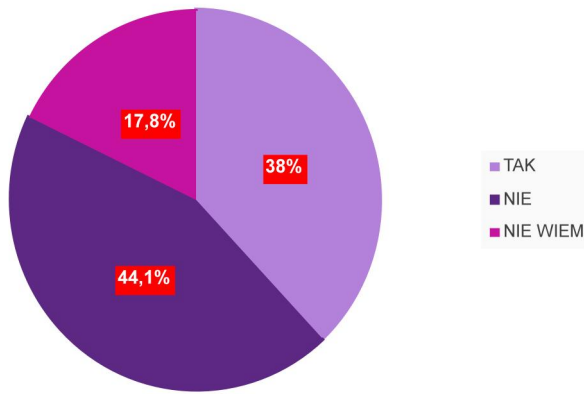
**Figure 6. Do you think early initiation of sexual activity affects the risk of cervical cancer?**

61.1% of the respondents correctly answered that a small number of childbirths does not affect the risk of developing cervical cancer. As many as 20.2% of women selected the answer "I don't know." Women in the age group of 30-49 years provided the best answers to this question.



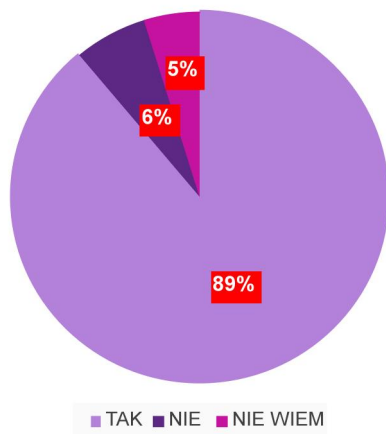
**Figure 7. Do you think a small number of childbirths affects the risk of cervical cancer?**

The question about the correlation between contraception and the risk of cervical cancer posed significant difficulties for women. The correct answer was provided in only 38% of the surveys. As many as 44.1% of respondents claimed that contraception does not affect the development of cervical cancer. 17.8% of the respondents had no knowledge on this topic.



**Figure 8. Do you think contraceptives affect the development of cervical cancer?**

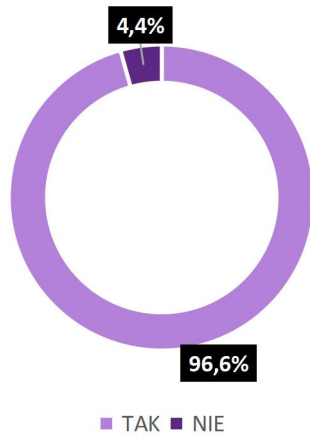
The surveyed individuals, in the vast majority (89%), correctly stated that sexually transmitted diseases affect the risk of developing cervical cancer. In the opinion of 6%, they believe it has no connection, and 5% declared a lack of knowledge on this topic.



**Figure 9. Do you think sexually transmitted diseases can affect the development of cervical cancer?**

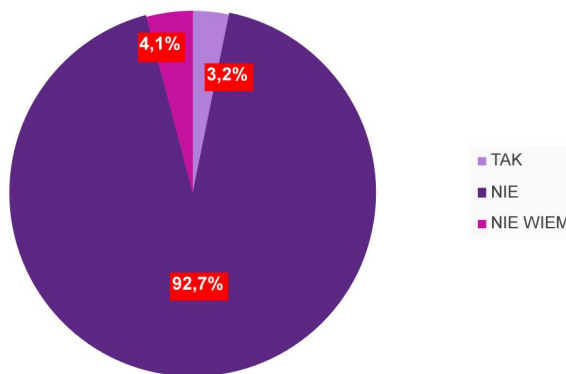
In the survey, questions about the human papillomavirus (HPV) were also included. 96.6% of the respondents stated that the human papillomavirus affects the development of cervical cancer, with only 26 individuals responding negatively, constituting 4.4% of all respondents





**Figure 10. Does the human papillomavirus (HPV) affect the development of cervical cancer?**

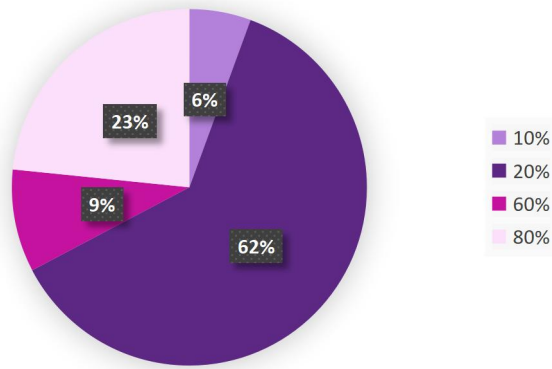
92.7% of the respondents agree with the statement that everyone, not just women, can be infected with the HPV virus. 19 survey participants provided an incorrect answer, while 24 individuals did not know the answer to the question.



**Figure 11. Can only women be infected with the HPV virus?**

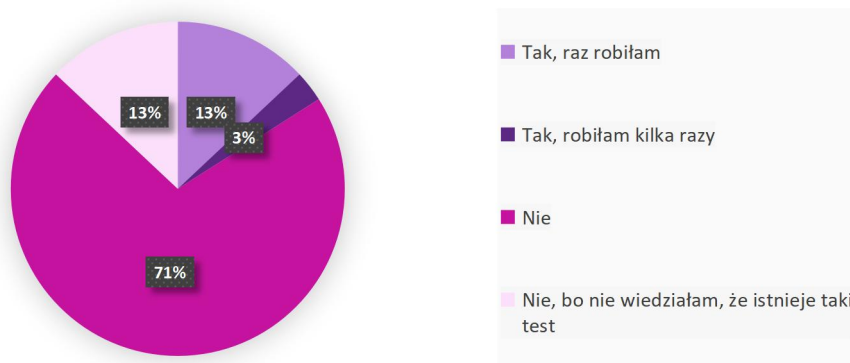
Given that the vast majority of women are aware that both women and men can be infected with the HPV virus, it was decided to investigate whether they have knowledge about the frequency of HPV infection in sexually active individuals.

Only 23.4% of the respondents correctly indicated that about 80% of sexually active individuals become infected with the HPV virus during their lifetime. The most common answer was 20%, selected by as many as 61.7% of the respondents, with the largest group being individuals in the age range of 30-49 years.



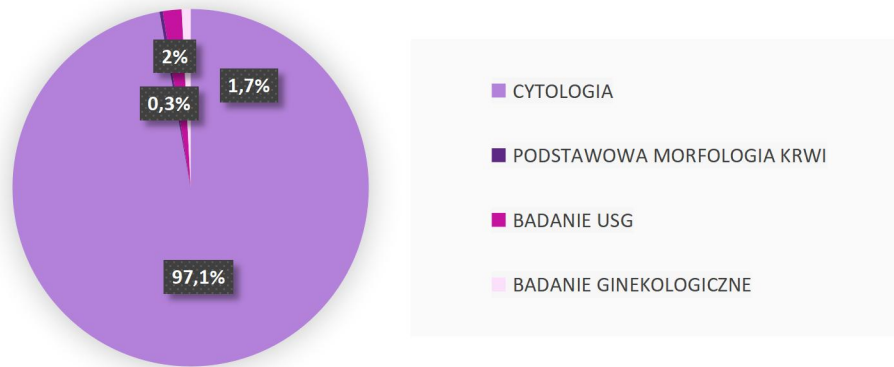
**Figure 12. What proportion of sexually active individuals becomes infected with the HPV virus during their lifetime?**

The surveyed individuals were also asked whether they had ever undergone a test for the presence of HPV. It can be inferred that tests for the presence of HPV are not widely popular; only 13% of respondents had the test once in their life, and 3% had it multiple times. 71% had not undergone such a test, and 13% did not know that such a test existed.



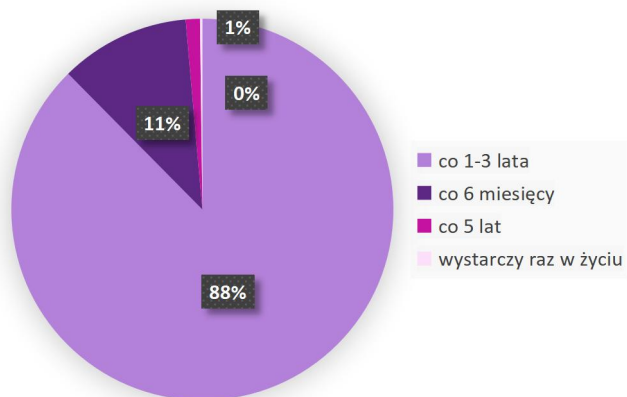
**Figure 13. Have you ever had an HPV test?**

Regarding the cytological smear test from the cervix, a significant 97.1% of the respondents correctly indicated it. Only 1.7% of the surveyed individuals mentioned transvaginal ultrasound, and 0.5% indicated gynecological palpation examination. Two respondents chose a complete blood count (morphology).



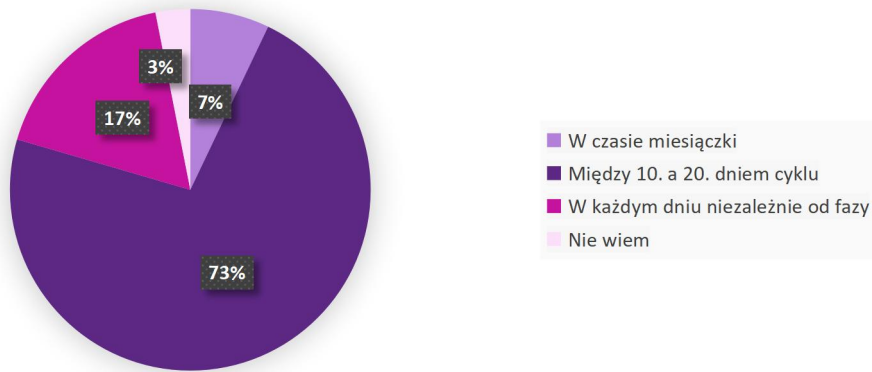
**Figure 14. What screening (preventive) test is used to detect cervical cancer?**

The correct answer, that cytology should be performed every 1-3 years, was chosen by  $\frac{3}{4}$  of the respondents. 10.71% selected the answer every 6 months. A few indicated that the test should be done every 5 years or only once in a lifetime.



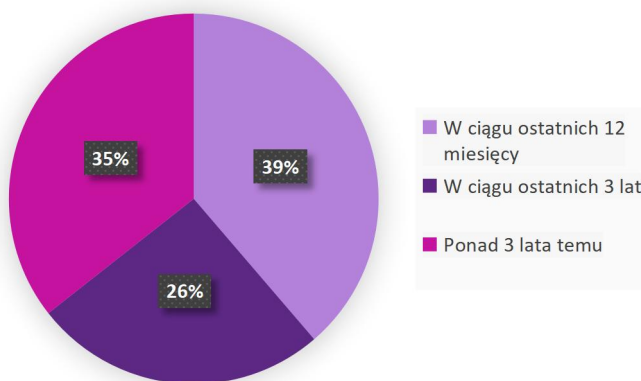
**Figure 15. How often should we do a Pap smear according to the polish society of gynecologists and obstetrician ?**

72.4% of women correctly marked that screening should be done between the 10th and 20th day of the menstrual cycle. In the opinion of 17.4%, it does not matter, 7.1% think it should be done during menstruation, and 3.1% declared a lack of knowledge on this matter.



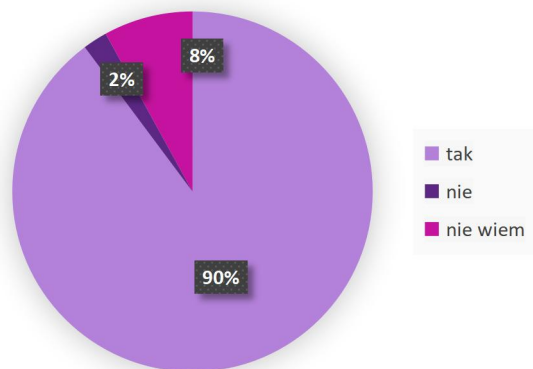
**Figure 16. When should a cytological examination be performed?**

38.7% of respondents claim to have had a Pap smear within the last 12 months, while 25.7% have been screened within the last three years. A significant 35.6% of women admit that their last Pap smear was done over 3 years ago, with the largest group among those aged 30-49.



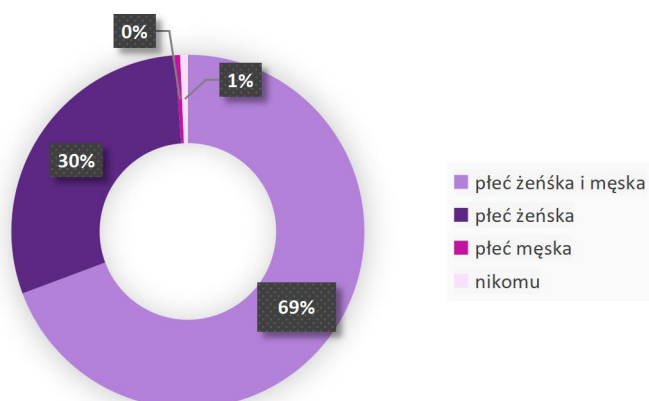
**Figure 17. When was the last time you had a cytological examination?**

In the study conducted for the purpose of this work, questions about knowledge of HPV vaccinations were included. The majority of respondents, as many as 89.8%, correctly indicated that HPV vaccinations are administered in Poland. 8% selected the answer "I don't know," with the main group among them being individuals with intermediate education. 2.2% of respondents answered "no".



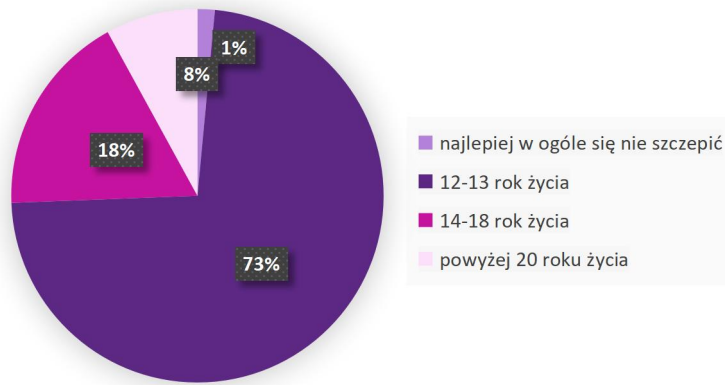
**Figure 18. Are HPV vaccinations administered in Poland?**

Regarding the question of who is recommended to receive the HPV vaccine, the correct answer was chosen by 69.3% of respondents. Incorrect answer options were selected by 29.5% of respondents, suggesting that only women should be vaccinated, and 0.5% thought it should be only men. 0.7% of respondents stated that they have no knowledge on this subject.



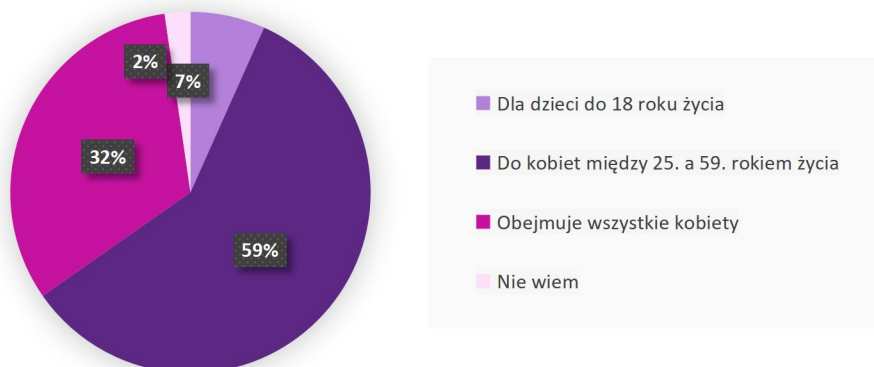
**Figure 19. To whom is the HPV vaccine recommended?**

The majority provided the correct answer - 72.9% of respondents are aware that the best age for HPV vaccination is between 12-13 years old. 17.6% of respondents believe that the optimal age for vaccination is between 14-18 years old, and 8% think that vaccination should be done after the age of 20. A few respondents (1.5%) indicated the option that it's best never to get vaccinated.



**Figure 20. At what age is it best to get vaccinated against HPV?**

In the question about the Population Program for the Prevention and Early Detection of Cervical Cancer, the correct answer was given by only 58.6% of respondents. Meanwhile, 32.4% of women believe it is intended for all women. A wrong answer was also chosen by 6.7% of respondents, stating that it was created for teenagers, and 2.3% declared a lack of knowledge on this subject.

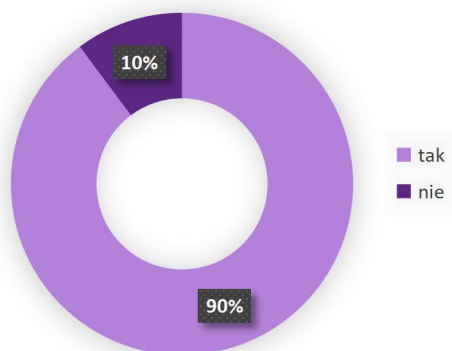


**Figure 21. Whom is the Population Program for the Prevention and Early Detection of Cervical Cancer directed to?**

The last questions addressed aspects of where patients learned about preventive examinations for cervical cancer and vaccinations against HPV, and why, in their opinion, women in Poland do not undergo regular check-ups.

More than  $\frac{3}{4}$  of women (89%) answered affirmatively that they have knowledge about preventive examinations for cervical cancer and the HPV vaccine. 10.2% of respondents are

not fully aware of the knowledge regarding cervical cancer prevention, and the most numerous group that chose this option consists of young people aged 20-29.



**Figure 22. Did you know about preventive examinations for cervical cancer and vaccinations against the HPV virus?**

Women mainly learn about cervical cancer prevention from social media, the internet, and radio. Only 13.9% of respondents received information from a specialist doctor, or a primary care doctor (6.5%).

SOCIAL MEDIA	53,2%
SPECIALIST DOCTOR	13,9 %
TV,RADIO	11,2%
PRIMARY DOCTOR	6,5%
MIDWIFE, NURSE	2,9%
STUDIES	0,9%
MOM	0,7%
Other:conferences, friends,books, articles	10,7 %

**Figure 23. Where do you get information about cervical cancer prevention and vaccinations?**

As many as 68.7% of respondents believe that Polish women do not attend screening cytology because they think that if they have no symptoms, there is no need for diagnostic tests. 15.6% of women are afraid to hear a bad diagnosis. 9.7% of respondents believe that due to their age, they have a lower risk of cervical cancer. 5.1% chose the answer related to lack of time, and 0.9% of women think that Polish women have insufficient knowledge about cervical cancer prevention.



**Figure 24. Why women do not attend screening for cervical cancer ?**

## DISCUSSION AND CONCLUSIONS

The results of the study indicate an average level of knowledge among respondents regarding the risk factors and primary and secondary prevention of cervical cancer. Women aged 30-49 demonstrate the highest level of knowledge. Despite the global trend of increasing incidence among women aged 35-49, the main peak occurs in the sixth decade of life, a fact recognized by only 2% of the respondents. According to the study conducted in 2020, "Research on the knowledge of women about the risk factors for cervical cancer" <sup>13</sup>, 75.9% of respondents consider HPV as one of the risk factors for cancer. Only 24.6% of women associated early onset of sexual activity with cervical cancer, and 15.1% correctly addressed the correlation between contraception and carcinogenesis. The analysis of our own research revealed that women are aware that smoking, a high number of births, and sexually transmitted diseases have a significant impact on the development of cancerous changes. Unfortunately, more than half of the respondents (54.1%) are unaware of the danger associated with early onset of sexual activity. This is a particularly serious issue when



combined with a lack of proper education and HPV vaccinations. Most Polish women of reproductive age choose to use contraception (72%), among them, those opting for oral contraception constitute 30% of the respondents <sup>14</sup>. The analysis indicates that nearly two-thirds of the respondents are unaware that oral contraception is one of the factors contributing to the incidence of cervical cancer.

Results indicate that women correctly associate the presence of the human papillomavirus (HPV) with the possibility of developing precancerous and cancerous changes. They are aware that both women and men can be infected with the virus. Unfortunately, only 23.4% of women are aware that up to 80% of sexually active individuals will be infected with this virus. Similar results were obtained in the study "Knowledge of women and men about human papillomavirus infection, HPV-related diseases and the available vaccine" <sup>15</sup>, where nearly 94% correctly answered that both sexes can be infected with the virus, and less than 20% of respondents indicated that 80% of sexually active individuals would be infected.

It is also worth mentioning that the human papillomavirus causes not only cervical cancer but also cancers of the penis, vagina, vulva, anus, oral cavity, and throat. Vaginal cancer is often of secondary origin, caused by squamous cell metastases from the cervix. From our own analysis, only 16% of respondents have undergone an HPV test at least once in their lifetime, and one-third of women have never heard of such a test. Every day, 10 Polish women are diagnosed with cervical cancer, and 5 die as a result. This often happens because they consult a doctor too late. A cervical smear is the most effective and readily available method for detecting cervical changes. From our own research analysis, it can be inferred that most women know that cytology should be performed between the 10th and 20th day of the menstrual cycle every 1-3 years. Unfortunately, 35.6% of women report that their last cytology was done over 3 years ago, with the largest group among those aged 30-49, where an increase in incidence has been observed in recent years.

Vaccines against the human papillomavirus (HPV), along with the growing arsenal of screening tests for the presence of HPV, can radically change public health and achieve the ultimate goal of eliminating cervical cancer <sup>16</sup>. Vaccination of both girls and boys positively affects the reduction of HPV infections in the general population. Respondents largely correctly answered that HPV vaccinations are performed in Poland and are aimed at both boys and girls aged 12-13, before sexual initiation, when it is most effective. Poland is among the countries where HPV vaccinations are not mandatory in the vaccination schedule. The percentage of vaccinated girls in Poland is estimated at 7.5–10% <sup>17</sup>. According to data from

the National Health Fund, 485,903 women participated in the Population Program for the Prevention and Early Detection of Cervical Cancer in 2019, and in 2021 there was already a decrease to 385,618 women. From our own research, it is evident that as many as 41.4% of respondents are unaware that this program is intended for women aged 25-59. According to the study "Health Information Source Characteristics Matter: Adapting the Dissemination of an HPV Vaccine Intervention to Reach Latina and Vietnamese Women" <sup>18</sup>, women seek knowledge about cervical cancer prevention from various sources, including the internet, social media, health classes, mothers, and doctors. Privacy, avoiding information overload, interpersonal engagement, and receiving health information from trusted sources were crucial when receiving information about the HPV vaccine. On the other hand, the study "HPV knowledge gaps and information seeking by oral cancer patients"<sup>19</sup> found that the internet was the most frequently used source of information, although most patients trusted information from doctors, and only one-third of respondents used doctors as a source of information.

Our own research analysis showed that the majority of respondents obtain information about cervical cancer preventive measures from social media, radio, and television. Only 20% of respondents heard about vaccinations from a specialist or primary care doctor. This is significant as Polish women's knowledge about cervical cancer is insufficient, highlighting the need for awareness campaigns led by healthcare professionals.

When asked about the reasons for infrequent Pap smears among Polish women, respondents mainly cited the belief that if they have no symptoms, there is no need for diagnostic tests. Unfortunately, this misconception is detrimental because cervical cancer can develop for years without any noticeable symptoms. Women typically consult a doctor only when severe pain and life-threatening bleeding occur, and by then, the cancer is often in an advanced stage. Therefore, regular preventive screenings, including Pap smears, are crucial. Additionally, 15.7% of women fear visiting a gynecologist due to the fear of receiving a negative diagnosis, and nearly 10% of respondents believe that their age reduces the risk of cervical cancer, indicating a lack of up-to-date knowledge about the increasing incidence among young, sexually active women.

## **SUMMARY**

The knowledge of women participating in the study regarding the risk factors and primary and secondary prevention of cervical cancer is insufficient. Currently, cervical cancer prevention in Poland yields unsatisfactory results, and the country holds a top position in

Europe's unfortunate statistics on cervical cancer incidence. The government and charitable organizations should intensify campaigns aimed at increasing awareness and promoting regular screening practices for cervical cancer. Healthcare professionals, both specialists and primary care doctors, should facilitate patients' access to high-quality information about cervical cancer. Educational campaigns, workshops, and informational materials from an early age can provide essential information about cervical cancer incidence. It is crucial to reach different age groups and communities to ensure broad outreach for these initiatives. By adopting appropriate health behaviors, avoiding risk factors, getting vaccinated against HPV, and regularly undergoing screenings, women can prevent cervical cancer.

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