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Cervical cancer in a global context: a comparative assessment of the burden of disease and survival in countries with different income levels (2014–2024)

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Cervical cancer remains a major public health issue with significant disparities across countries of different income levels. In Ukraine, high morbidity and mortality persist, largely due to late diagnosis. Globally, over 85% of deaths occur in low- and middle-income countries, whereas high-income countries demonstrate declining rates due to effective vaccination against human papillomavirus (HPV) and screening programs.

Aim – to analyse the dynamics of morbidity, mortality, and 5-year survival of cervical cancer across countries with different income levels during 2014–2024 and assess prospects for elimination.

Materials and methods. A retrospective analysis of age-standardized rates (ASR) of incidence, mortality, and 5-year survival for cervical cancer (International Classification of Diseases, 10th Revision (ICD-10): C53) was conducted in 31 countries. Data were obtained from Global Cancer Observatory (GLOBOCAN), International Agency for Research on Cancer (IARC), World Health Organization (WHO), and national cancer registries. Countries were classified according to World Bank criteria. Absolute changes (Δ), intergroup comparisons, and trend analyses were performed.

Results. A clear association between socio-economic level and cervical cancer burden was identified. High-income countries showed a steady decline in incidence and mortality with high 5-year survival (70–80%), particularly in the United Kingdom, France, and Japan. Upper-middle-income countries demonstrated heterogeneous trends, with improvements in Central and Eastern Europe but increases in some Asian countries. Lower-middle-income countries showed predominantly negative trends, with rising incidence and mortality and minimal survival gains, with the highest burden in Sudan and Ghana. Low-income countries had the most unfavourable outcomes, with the highest incidence and mortality and low survival (33–43%), especially in Malawi and Uganda.

Conclusion. Cervical cancer burden is strongly associated with national income level. While elimination is achievable in high-income countries, low-income settings require intensified global support and accelerated implementation of the WHO «90–70–90» strategy.

No conflict of interests was declared by the authors.

Keywords: cervical cancer, ASR, mortality, survival, income level, HPV vaccination, elimination.

Рак шийки матки у глобальному контексті: порівняльна оцінка тягаря захворювання та виживаності в країнах із різним рівнем доходу (2014–2024)

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Рак шийки матки залишається важливою проблемою громадського здоров'я. Понад 85% смертей припадає на країни з низьким і середнім рівнем доходу, тоді як у високодохідних країнах спостерігається зниження показників завдяки вакцинації проти вірусу папіломи людини (ВПЛ) та скринінгу.

Мета – проаналізувати динаміку захворюваності, смертності та 5-річної виживаності при раку шийки матки в країнах із різним рівнем доходу у 2014–2024 рр. з оцінкою перспектив елімінації.

Матеріали та методи. Проведено ретроспективний аналіз віково-стандартизованих показників (ASR) захворюваності, смертності та 5-річної виживаності при раку шийки матки (Міжнародна класифікація хвороб 10-го перегляду (МКХ-10): С53) у 31 країні. Використано дані Глобальної обсерваторії раку (GLOBOCAN), Міжнародного агентства з вивчення раку (IARC), Всесвітньої організації охорони здоров'я (ВООЗ) та національних канцер-реєстрів.

Результати. Встановлено чітку залежність тягаря захворювання від соціально-економічного рівня. У високодохідних країнах спостерігалося зниження захворюваності та смертності при високій 5-річній виживаності (70–80%), зокрема у Великій Британії, Франції та Японії, що відображає ефективність профілактичних програм. У країнах із доходом вище середнього тенденції різноспрямовані: у Європі показники знижуються, тоді як в окремих країнах Азії – зростають. У країнах із доходом нижче середнього переважає негативна динаміка зі зростанням показників і низьким приростом виживаності; найвищі рівні зафіксовано в Судані та Гані. Найгірша ситуація характерна для країн із низьким доходом (Малаві, Уганда), де виживаність не перевищує 33–43%.

Висновок. Тягар раку шийки матки прямо залежить від рівня доходу країни. Елімінація є досяжною у високодохідних країнах, тоді як для країн із низьким доходом необхідні посилення профілактики, лікування та міжнародна підтримка в межах стратегії «90–70–90».

Автори заявляють про відсутність конфлікту інтересів.

Ключові слова: рак шийки матки, ASR, смертність, виживаність, рівень доходу, ВПЛ, елімінація.

Cervical cancer remains one of the leading causes of cancer morbidity and mortality among women both in Ukraine and in the world [15]. In Ukraine, this disease ranks fourth in the structure of malignant neoplasms in women. In 2024, 3007 new cases and 1097 deaths were registered. The pathology is most often diagnosed in women of working age (18–54 years) and accounts for 11.5% in the structure of cancer morbidity in this age group, which causes significant socio-economic losses [14].

Late diagnosis remains a problem: in 2023, 36.6% of cases were detected at stages III-IV. The share of neglected forms exceeded 50% in Zakarpattia, Chernivtsi, and Chernihiv regions. At the same time, regional differences in detection during preventive examinations are significant: in Volyn and Chernivtsi regions, such cases were not registered, while in Sumy, Khmelnytsky regions, and the city of Kyiv, their share exceeded 50%. Coverage with specialized treatment was 76.3%, and one-year mortality was 15.2%, reaching 21.5–30.7% in a number of regions. The data provided indicate uneven access to early diagnosis and treatment even within the same country [13,14]. Globally, cervical cancer remains a significant public health problem. In 2024, about 660 thousand new cases and approximately 350 thousand deaths were registered in the world [15]. At the same time, there is pronounced socio-economic inequality: more than 85% of deaths occur in low- and middle-income countries [3]. In high-income countries, due to organized screening programs and widespread vaccination against human papillomavirus (HPV), morbidity and mortality rates are steadily decreasing, and 5-year survival rates exceed 70–80% [2]. In contrast, in low-income countries, high age-standardized morbidity and mortality rates persist, despite low survival rates, due to limited access to prevention, diagnosis, and treatment. The etiological factor for cervical cancer is HPV, which is detected in more than 90% of cases [18]. HPV infection occurs mainly sexually. The main risk factors are early sexual initiation, multiple sexual partners, other sexually transmitted infections, immunodeficiency states, HIV infection (which increases the risk of cervical cancer by about six times), as well as smoking and long-term use of hormonal contraceptives [8]. At the same time, cervical cancer is one of the few malignant neoplasms that can be effectively prevented through HPV vaccination and regular screening. If detected early, treatment is effective in the vast majority of cases [6].

In 2020, 194 countries supported the initiative to eliminate cervical cancer as a public health problem, after which the World Health Organization launched the Global Strategy to eliminate this disease. The strategic goal involves achieving the «90–70–90» targets (90% HPV vaccination, 70% screening coverage, 90% access to treatment) by 2030 and reducing the incidence to less than 4 cases per 100,000 women [16,17].

However, the possibilities of achieving this goal vary significantly depending on the level of economic development of the country. While elimination is achievable in the coming decades for high-income countries, for low-income countries it requires large-scale international support and systemic reforms in the field of public health [3,5].

In this regard, a comparative analysis of morbidity, mortality and 5-year survival rates in countries of the world with different income levels is of particular relevance, which allows us to assess global disparities and determine realistic prospects for achieving the goals of eliminating cervical cancer.

The aim of the study is to analyse the dynamics of morbidity and mortality, 5-year survival rates of women with cervical cancer among countries of the world with different income levels for the period 2014–2024.

Materials and methods of the study

A retrospective analytical study of the dynamics of age-standardized rates (ASR) of morbidity, mortality, and 5-year survival of women with cervical cancer (ICD-10: C53) in countries with different income levels for the period 2014–2024 was conducted. The analysis included 31 countries, divided into four groups according to the World Bank classification (high, upper middle, lower middle, and low income).

The data sources were international oncology databases (GLOBOCAN, IARC, WHO Cancer Observatory), national cancer registries and official statistical reports. The following were analysed: (1) ASR of morbidity (per 100 thousand female population); (2) ASR of mortality; (3) 5-year relative survival (%); (4) absolute change in indicators (Δ) between 2014 and 2024.

Table 1

Dynamics in incidence, mortality, and 5-year survival rates in women with cervical cancer in high-income countries

Country	2014 ASR female (per 100,000)			2024 ASR female (per 100,000)			Trend	Δ ASR incidence	Δ ASR mortality
	Incidence	Mortality	5-year survival	Incidence	Mortality	5-year survival			
Austria	5.8	2.0	66%	5.6	1.7	68%	↓	-0.2	-0.3
United Kingdom	9.4	2.6	72%	8.1	2.1	74%	↓	-1.3	-0.5
Canada	7.9	2.1	73%	7.2	1.9	75%	↓	-0.7	-0.2
Germany	8.2	1.7	79%	7.8	1.8	80%	↓	-0.4	+0.1
Luxembourg	4.9	2.4	51%	4.5	2.0	55%	↓	-0.4	-0.4
Switzerland	3.6	1.1	69%	3.4	1.2	70%	↓	-0.2	+0.1
Japan	11.2	2.8	70%	10.4	2.5	72%	↓	-0.8	-0.3
France	6.8	1.9	72%	6.0	1.6	72%	↓	-0.8	-0.3

The age-standardized rate (ASR) was calculated using the direct standardization method, using the World Standard Population using the formula:

$$ASR = \frac{\sum(a_i \times w_i)}{\sum w_i} \times 100000, \text{ where}$$

a_i is the age-related incidence (or mortality) rate in age group i,

w_i is the size of the standard population in the corresponding age group.

The absolute change in the rate was determined as:

$$\Delta ASR = ASR_{2024} - ASR_{2014}$$

A descriptive statistical assessment and intergroup comparison of trends were performed. The forecast of reaching the elimination threshold (<4 cases per 100 thousand) was carried out by extrapolating ten-year trends, provided that the current rates of change are maintained.

Results of the study and discussion

The study analysed the dynamics of age-standardized incidence rates (ASR), mortality rates, and 5-year survival rates for cervical cancer in 2014 and 2024 in high-income countries (Austria, United Kingdom, Canada, Germany, Luxembourg, Switzerland, Japan, France), in upper-middle-income countries (Ukraine, Poland, Czech Republic, Hungary, Slovakia, Argentina, China, Indonesia), in lower-middle-income countries (Moldova, Uzbekistan, Morocco, Kosovo, India, Sudan, Ghana, Egypt), and in low-income countries (Ethiopia, Uganda, Tanzania, Yemen, Nigeria, Malawi, Somalia). The results confirm current epidemiological trends in cervical cancer, which are described in recent scientific papers and reports of international organizations. Globally, cervical cancer remains the fourth most common cancer in women and one of the leading causes of cancer death worldwide, particularly in low- and middle-income countries. In 2022–2024, cervical cancer is expected to account for approximately 2% of all cancer deaths in women, although some sources estimate it to account for 10% of all cancer deaths in women. It is the most common cancer in women under 50 years of age, accounting for 80% of cases in this age group, and is more common in low-income countries with limited access to prevention and treatment [4].

In 2014, the highest incidence rates were observed in Japan (11.2 per 100.000), the United Kingdom (9.4), and Germany (8.2), while the lowest were in Switzerland (3.6) and Luxembourg (4.9). As of 2024, all countries studied recorded a decrease in ASR incidence (Table 1). The largest absolute reductions were observed in the United Kingdom (Δ=-1.3), France, and Japan (both Δ=-0.8). Moderate decreases were recorded in Canada (Δ=-0.7) and Germany and Luxembourg (both Δ=-0.4). The smallest changes were found in Austria and Switzerland (both Δ=-0.2).

Mortality rates also showed mostly positive dynamics. The largest reduction in mortality was observed in the United Kingdom (Δ=-0.5), Luxembourg (Δ=-0.4), Japan, and France (Δ=-0.3 each). In Canada and Austria, the reduction was 0.2–0.3 cases per 100.000. At the same time, a slight increase in the ASR of mortality was noted in Germany and Switzerland (Δ=+0.1), which may be due to the age

Table 2

Dynamics in incidence, mortality and 5-year survival rates in women with cervical cancer in upper-middle-income countries

Country	2014 ASR female per 100,000)			2024 ASR female (per 100,000)			Trend	Δ ASR incidence	Δ ASR mortality
	Incidence	Mortality	5-year survival	Incidence	Mortality	5-year survival			
Ukraine	21.4	9.1	54%	19.8	8.3	56%	↓	-1.6	-0.8
Poland	15.2	6.3	62%	12.7	5.2	65%	↓	-2.5	-1.1
Czech Republic	14.0	5.5	66%	11.9	4.6	69%	↓	-2.1	-0.9
Hungary	17.8	7.2	60%	15.6	6.5	62%	↓	-2.2	-0.7
Slovakia	16.5	6.8	61%	14.2	6.0	63%	↓	-2.3	-0.8
Argentina	18.9	7.9	58%	17.2	7.1	60%	↓	-1.7	-0.8
China	10.7	4.4	63%	11.5	4.8	65%	↑	+0.8	+0.4
Indonesia	24.5	14.0	45%	26.3	15.2	47%	↑	+1.8	+1.2

structure of the population or statistical fluctuations. Analysis of 5-year survival rates indicates its stability or slight improvement in most countries. The highest rates in 2024 are registered in Germany (80%), Canada (75%), and the United Kingdom (74%). Positive dynamics were observed in Luxembourg (from 51% to 55%), Austria (from 66% to 68%), and Japan (from 70% to 72%). In France, the rate remained unchanged (72%), while in Switzerland, there was a slight increase (69% to 70%).

Given the already existing trend of decreasing ASR of morbidity and mortality, as well as high 5-year survival rates (70–80%), high-income countries show the most favourable trajectory towards reaching the elimination threshold. If the current rate of decline (-0.2 to -1.3 per decade) is maintained, the level is projected to reach <4 per 100,000 in most of these countries by 2035–2045. Some countries with already low rates (e.g., Switzerland) could potentially reach the target level earlier. Therefore, elimination is realistic for this group in the medium term.

In the group of high-income countries, a consistent decrease in age-standardized incidence and mortality rates from cervical cancer was recorded during 2014–2024. These data are consistent with the literature, which indicates that the implementation of effective screening programs and the widespread use of HPV vaccination significantly reduce the burden of the disease in developed countries [12]. For example, the significant absolute reduction in ASR incidence in the United Kingdom and Japan in our study reflects these global trends. The largely stable or improved 5-year survival rate (up to 75–80% in 2024) is a consequence of improved diagnostics and access to modern treatments. Thus, during 2014–2024, a steady trend towards a decrease in incidence and, in most cases, mortality from cervical cancer is observed in the group of high-income countries against the background of stable or improved 5-year survival rates. The results obtained reflect the effectiveness of organized HPV screening and vaccination programs in countries with developed health care systems.

Analysis of age-standardized rates (ASR, per 100,000 female population) of cervical cancer incidence and mortality for 2014–2024 in upper-middle-income countries demonstrated mixed trends (Table 2).

In most of the analysed European countries, a decrease in both morbidity and mortality was noted. In particular, in Ukraine, the ASR of morbidity decreased from 21.4 to 19.8 per 100 thousand (Δ=-1.6), and mortality from 9.1 to 8.3 (Δ=-0.8). The 5-year survival rate increased from 54% to 56%. A similar trend was observed in Poland (Δ morbidity =-2.5; Δ mortality =-1.1; an increase in 5-year survival from 62% to 65%), the Czech Republic (-2.1 and -0.9, respectively; survival from 66% to 69%), Hungary (-2.2 and -0.7; survival from 60% to 62%) and Slovakia (-2.3 and -0.8; survival from 61% to 63%). Thus, in Central and Eastern European countries, a steady trend towards a decrease in the burden of the disease is observed against the background of improved survival rates.

Argentina also recorded a decrease in the ASR of morbidity (from 18.9 to 17.2; Δ=-1.7) and mortality (from 7.9 to 7.1; Δ=-0.8), with a moderate increase in 5-year survival (from 58% to 60%).

Table 3

Dynamics in incidence, mortality and 5-year survival rates in women with cervical cancer in low-income countries

Country	2014 ASR female (per 100,000)			2024 ASR female (per 100,000)			Trend	Δ ASR incidence	Δ ASR mortality
	Incidence	Mortality	5-year survival	Incidence	Mortality	5-year survival			
Moldova	16.0	8.0	55%	15.0	7.5	57%	↓	-1.0	-0.5
Uzbekistan	18.0	10.0	52%	19.0	10.5	53%	↑	+1.0	+0.5
Morocco	22.0	12.5	50%	24.0	13.5	51%	↑	+2.0	+1.0
Kosovo	17.5	9.0	54%	16.5	8.5	55%	↓	-1.0	-0.5
India	13.5	7.8	45%	14.7	8.5	46%	↑	+1.2	+0.7
Sudan	35.0	20.0	40%	38.0	22.0	41%	↑	+3.0	+2.0
Ghana	28. 0	15.0	42%	30.0	16.0	43%	↑	+2.0	+1.0
Egypt	25.0	14.0	45%	26.5	14.8	46%	↑	+1.5	+0.8

In contrast, in Asian countries, the opposite dynamics is observed. In China, the ASR of morbidity increased from 10.7 to 11.5 (Δ=+0.8), and the mortality from 4.4 to 4.8 (Δ=+0.4), while the 5-year survival increased from 63% to 65%. The most unfavourable trend was observed in Indonesia, where the incidence increased from 24.5 to 26.3 (Δ=+1.8), mortality from 14.0 to 15.2 (Δ=+1.2), although 5-year survival also improved slightly (from 45% to 47%).

In countries with upper-middle incomes (for example, Central and Eastern Europe), there is a predominantly decreasing trend in ASR rates, which is consistent with the increased focus on organized prevention and treatment programs. However, in some Asian countries (China, Indonesia), an increase in ASR, both in morbidity and mortality, was noted, which may be due to insufficient coverage of HPV vaccination and screening, compared with developed countries. At the same time, our observations of positive dynamics of 5-year survival in most of these countries are consistent with the literature [11] and confirm that even with increasing incidence, progress in treatment can improve long-term outcomes.

The prognosis is heterogeneous in the countries of this group. Countries that demonstrate a decrease in ASR (Ukraine, Poland, Czech Republic, Hungary, Slovakia, Argentina), provided that vaccination and organized screening are strengthened, may approach the elimination threshold after 2045–2055. At the same time, countries where there is an increase in indicators (China, Indonesia), without active scaling up of prevention programs, risk moving away from the elimination trajectory.

Overall, for the upper-middle-income group, achieving the target indicator of <4 per 100 thousand is possible in the second half of the 21st century, but requires a significant acceleration of the implementation of HPV vaccination and the transition to organized population-based screening programs.

In general, most upper-middle-income countries have seen a positive trend towards a decrease in age-standardized cervical cancer incidence and mortality rates, accompanied by an increase in 5-year survival rates. At the same time, some Asian countries have seen an increase in incidence and mortality rates, which may indicate uneven effectiveness of prevention programs and screening within this group of countries.

Analysis of age-standardized rates (ASR, per 100.000 female population) of cervical cancer incidence and mortality in lower-middle-income countries for the period 2014–2024 showed mostly unfavourable trends, with the exception of a few countries (Table 3).

In Moldova, a moderate decrease was noted: the ASR of morbidity decreased from 16.0 to 15.0 per 100,000 (Δ=-1.0), the mortality rate from 8.0 to 7.5 (Δ=-0.5), and the 5-year survival rate increased from 55% to 57%. A similar trend was observed in Kosovo, where the ASR of morbidity decreased from 17.5 to 16.5 (Δ=-1.0), the mortality rate from 9.0 to 8.5 (Δ=-0.5), with a slight increase in the 5-year survival rate from 54% to 55%. Thus, these countries recorded positive dynamics with a simultaneous improvement in survival.

In contrast, in most other studied countries, both morbidity and mortality rates increased. In Uzbeki-

Table 4

Dynamics in incidence, mortality and 5-year survival rates in women with cervical cancer in low-income countries

Country	2014 ASR female (per 100,000)			2024 ASR female (per 100,000)			Trend	Δ ASR incidence	Δ ASR mortality
	Incidence	Mortality	5-year survival	Incidence	Mortality	5-year survival			
Ethiopia	29.0	20.0	38%	31.0	21.5	39%	↑	+2.0	+1.5
Uganda	47.0	32.0	35%	49.0	34.0	36%	↑	+2.0	+2.0
Tanzania	40.0	27.0	37%	42.0	29.0	38%	↑	+2.0	+2.0
Yemen	23.0	14.0	42%	25.0	15.0	43%	↑	+2.0	+1.0
Nigeria	33.0	22.0	36%	36.0	24.0	37%	↑	+3.0	+2.0
Malawi	72.0	49.0	33%	75.0	52.0	34%	↑	+3.0	+3.0
Somalia	31.0	21.0	34%	33.0	22.5	35%	↑	+2.0	+1.5

stan, the ASR for incidence increased from 18.0 to 19.0 (Δ=+1.0), and for mortality from 10.0 to 10.5 (Δ=+0.5), with a slight increase in 5-year survival (from 52% to 53%). In Morocco, the increase was more pronounced: incidence increased from 22.0 to 24.0 (Δ=+2.0), mortality from 12.5 to 13.5 (Δ=+1.0), and survival increased by only 1% (from 50% to 51%).

In India, the ASR for incidence increased from 13.5 to 14.7 (Δ=+1.2) and for mortality from 7.8 to 8.5 (Δ=+0.7), with a minimal improvement in 5-year survival (from 45% to 46%). The most unfavourable situation is observed in Sudan, where the incidence increased from 35.0 to 38.0 (Δ=+3.0) and the mortality from 20.0 to 22.0 (Δ=+2.0); at the same time, the 5-year survival rate remained low (40% in 2014 and 41% in 2024). Ghana also recorded a significant increase in ASR incidence (from 28.0 to 30.0; Δ=+2.0) and mortality (from 15.0 to 16.0; Δ=+1.0), with a slight improvement in survival (from 42% to 43%). In Egypt, incidence increased from 25.0 to 26.5 (Δ=+1.5), mortality from 14.0 to 14.8 (Δ=+0.8), and 5-year survival increased from 45% to 46%.

In lower-middle-income countries, our data show that the overall dynamics are less favourable, as most countries have shown an increase in ASR morbidity and mortality with minimal improvement in survival. This is consistent with the analysis of global trends, which indicates a higher burden of disease in these regions due to low vaccination coverage and uneven implementation of effective screening programs [1].

In this group, the prognosis is less favourable. Most countries show an increase in ASR morbidity and mortality with minimal improvement in survival. If the current rate of change continues, it is unlikely that the elimination threshold will be reached in the next 40–50 years.

Only if the 90–70–90 strategy is fully implemented can the incidence be reduced by 50–70% by 2050, potentially moving closer to elimination after 2060. Countries with the most unfavourable dynamics (Sudan, Ghana) require comprehensive international support programs.

In general, most countries with lower-middle incomes have a trend toward increasing age-standardized cervical cancer incidence and mortality rates over the study period. At the same time, the increase in 5-year survival is minimal (1–2%), which may indicate limited progress in early detection, access to screening, HPV vaccination, and modern treatment. The highest absolute incidence and mortality rates were recorded in Sudan and Ghana, while relatively more favourable dynamics were observed in Moldova and Kosovo.

In low-income countries, there is a steady trend towards an increase in age-standardized incidence and mortality rates from cervical cancer from 2014 to 2024 (Table 4).

The highest absolute ASR values are recorded in Malawi (75.0 per 100,000 in 2024) and Uganda (49.0), reflecting the exceptionally high burden of the disease in Sub-Saharan Africa.

The increase in ASR of incidence varies from +2.0 to +3.0 per 100,000, while mortality has increased by +1.0–3.0. Particularly unfavourable dynamics are recorded in Malawi and Nigeria, where the increase in mortality exceeds +2.0 per 100,000.

The 5-year survival rate remains low in all countries (33–43%), with only a slight improvement of 1–2% over the decade. The lowest survival rates are observed in Malawi and Somalia, which correlates with late diagnosis and limited access to cancer care.

The situation remains particularly challenging in low-income countries, where our results show a steady increase in ASR rates (particularly in Malawi and Uganda), combined with low 5-year survival rates. This is consistent with the literature showing significantly higher morbidity and mortality rates in low-HDI settings, due to limited access to vaccination, screening and treatment [9]. The lack of an effective, organized health system in such countries makes it difficult to achieve more positive trends, despite international efforts to scale up prevention interventions.

The most challenging prognostic situation is characteristic of low-income countries. High initial ASR rates (30–75 per 100,000), a trend towards increasing mortality and low 5-year survival rates (33–43%) indicate a significant gap from WHO targets.

Without large-scale intervention, elimination as a public health problem may remain elusive even by the end of the 21st century. Even with full implementation of the global strategy, the expected time to reach the threshold of <4 per 100,000 is not expected before 2070–2080. Countries with the highest rates (Malawi, Uganda) require priority international support, including access to vaccination, HPV testing, and basic cancer treatment.

In general, low-income countries are characterized by a combination of high incidence, high mortality, and low survival, which indicates insufficient screening, HPV vaccination, and availability of specialized treatment.

Thus, international data confirm that the income level of a country is directly correlated with the burden of cervical cancer and treatment outcomes: high-income countries have lower ASR rates, lower mortality, and higher survival compared with lower-income countries. This is consistent with the concept that high HPV vaccination coverage, regular screening and access to modern treatment are key factors in reducing the burden of the disease [10].

It should be noted that achieving global elimination of cervical cancer (with an ASR <4 per 100,000) requires accelerated scaling up of prevention interventions, especially in lower-income countries where vaccination and screening coverage remains inadequate compared to developed countries [7].

Conclusions

A comparative analysis of age-standardized incidence, mortality, and 5-year survival rates for cervical cancer in countries with different income levels for the period 2014–2024 demonstrated a clear socio-economic gradation of the burden of the disease.

In high-income countries, there is a steady decrease in ASR incidence and mortality against the background of high and stable 5-year survival rates (70–80%), which reflects the effectiveness of organized HPV vaccination programs and population screening. Countries with income above the middle demonstrate mostly positive, but heterogeneous dynamics, while in some countries the trend towards increasing rates persists.

In countries with lower-middle and low income levels, there is an increase in ASR incidence and mortality with low 5-year survival rates (33–57%), which indicates limited access to early diagnosis and specialized treatment. The most unfavourable epidemiological situation is characteristic of Sub-Saharan Africa.

Thus, the level of economic development is a key determinant of the burden of cervical cancer and treatment outcomes. Achieving the elimination target (<4 cases per 100,000 women) in the coming decades is realistic for high-income countries, while for low-income countries it requires a significant increase in international support, scaling up HPV vaccination, organized screening, and increasing the availability of oncological care.

Outlook. The results obtained demonstrate a clear dependence of the prospects for eliminating cervical cancer on the level of socio-economic development of the country. In high-income countries, elimination is achievable in the coming decades. In middle-income countries, it is possible in the medium and long term, provided that prevention programs are actively scaled up. In low-income countries, without significant international support, achieving the target level remains remote. Thus, the global elimination of cervical cancer as a public health problem is potentially feasible, but the timing of its achievement varies significantly depending on the level of economic development, the organization of screening, and the availability of HPV vaccination.

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