Cervical cancer is an important disease in Ukraine. Among all cancers in females, it ranks 5th for incidence and 6th for mortality.\(^1\) The importance of cervical cancer as a cause of pre-mature death in females has decreased slightly over the last 25 years, accounting for 1.6% of years of life lost in 1990 and 1.3% of all years of life lost in 2016.\(^2\)

**KEY MESSAGES**

1. Cascade analysis provides a **framework to assess the continuum of care** from screening to full diagnosis, treatment start, treatment monitoring and adherence, and outcomes. Such analyses of the continuum of care highlight **breakpoints in the patient pathway** and can be used to prioritise efforts for health care improvements.

2. In this present cascade analysis, public sector routine data in two Ukraine Regions (oblasts) shows that only 53% (Lviv) and 62% (Poltava) of eligible women were screened for cervical cancer in 2016 i.e. **screening gaps of 47% and 38%**, respectively.

3. Among women who were screened, 13% of all screens in Lviv were targeted at women <30 years, and 18% of screens in Poltava were in women <30. This is due to Ukraine’s cervical cancer screening eligibility from 18 years to encourage screening at an early age.

4. Percentages of women with positive screens varied by age with the **highest positive yield among women older than 50** (dysplasia reported in 0.7% of women <30 years, 2.1% in women 31-50 years and 4.7% in women above 50 years).

5. **Screening intervals were short in many women**, leading to efficiency concerns: 47% of women had evidence of an interval <1 year and 84% had a <2 year interval.

6. Among the diagnosed cervical cancer cases, negative outcomes (death, loss to care, treatment refusal, and withdrawal from treatment) were not sufficiently documented in either region, calling for **urgent attention to track all care outcomes**. In the 2015 treatment cohorts, 38% (Lviv) and 24% (Poltava) had no record of cervical cancer treatment completion.

7. Systems for **age- and risk-appropriate screening** need to be developed in Ukraine for earlier detection of cases and an overall **more efficient cervical cancer program**.

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\(^1\) [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5742529/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5742529/)

\(^2\) [https://vizhub.healthdata.org/gbd-compare/](https://vizhub.healthdata.org/gbd-compare/)
RATIONALE

Over the 15 year period from 2002 to 2016, progress in earlier detection of cervical cancer (CC) has however been small, and first year mortality showed a modest decrease. In 2016, 77% of CC cases were detected in stages I-II, compared to 75% in 2002; 4.8% of cases were first diagnosed at stage IV in 2016, compared to 5.6% in 2002. First year mortality post diagnosis decreased from 19.3% of all CC cases in 2002 to 15.2% in 2016.3

Overall, 49% of cervical cancers were found during routine preventive women’s examinations. Among those with a positive cancer diagnosis, 79% received anti-cancer treatment in 2016.4

According to Ukrainian national guidelines (as of 2017), every woman aged 18 – 60 years should have a cytological test for CC every year and should not wait more than the maximum of three years between examinations.5 Health care providers have been conducting cytology-based cervical screening programs as part of routine care in Ukraine, which include a cytological smear during the preventive women’s examination by gynaecologists. Suspect smear test results should be followed up with a cytology recall. Pelvic ultrasound exams are also conducted as a follow-up examination.

The World Bank, with support from the Swiss Development Cooperation, implements the technical assistance program “Support to Reforms and Governance in the Health Sector in Ukraine.” In 2017, an analysis was conducted on the continuum of care for CC in two Ukrainian Regions, Lviv and Poltava, to assess the breakpoints in the care cascade and identify opportunities for strengthening CC control.

The analysis also provided a 2016 baseline prior to the introduction of a CC prevention, screening and health sector strengthening program in Lviv Region, and referred to recommendation from the Ministry of Health of Ukraine on CC screening issued in February 2018.6

FINDINGS

The official 2016 CC surveillance data show stark differences across Ukraine in the early detection of CC at stage I-II, ranging from a low of 45% in Chernihiv Oblast to more than 90% in Sumy Oblast. At over 80%, Lviv and Poltava are above the national average for early detection of CC (Figure 1). In both regions, there was also a gradual decline of first year CC mortality over the last 15 years (Lviv: 37 % reduction from 2001 to 2016, Poltava: 34%, Figure 2). This may be a combined effect of earlier detection and better CC care.

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3 https://vizhub.healthdata.org/gbd-compare/
CERVICAL CANCER IN UKRAINE: THE CONTINUUM OF CARE AND IMPLICATIONS FOR ACTION

JUNE 2018

Figure 1  Stage distribution of new cervical cancer cases (2016)


Figure 2  First year cervical cancer mortality (2001, 2011–16)

SCREENING CASCADE: DEFINING STAGES

The screening cascade in both regions was determined by the coverage of the annual preventive examination among eligible females (aged 18 and above), which is the entry point to the clinical cervical screening (Figure 3).

To achieve this, the following stages were defined:

1. The percentage of eligible women covered by the annual gynaecologist examination (based on screening eligibility and using 2016 demographic and Health Index survey data)
2. The proportion of women screened for cervical cancer as per norm (based on ambulatory patient card data)
3. The proportion of women with a suspect cervical cancer screen receiving a follow-up investigation within 6 months (ambulatory patient cards)

CERVICAL CANCER SCREENING: ISSUES OF COVERAGE, RECORD KEEPING AND EFFICIENCY

Of all eligible females, 47% in Lviv Region and 38% in Poltava Region did not have a gynaecological examination according to the Health Index Survey 2016 (the national value is 45%). According to ambulatory patient card data, almost all women have been undergoing the clinical cervical cancer screen during the gynaecological exam in Lviv Region (98%) and Poltava Region (99%). We triangulated two data points on the estimated number of PAP smears, one using the above-mentioned Health Index Survey and patient card data (coverage-based cascade estimate, Figure 3), and one using cytology laboratory data on smears tested. The total number of smears reported by the cytology lab was higher than the cascade estimation in both regions. This may be due to many women having more than one routine smear test per year – 32% of Lviv patient cards and 55% of Poltava cards showed a PAP screening interval of <1 year. It was encouraging to see in the routine data that at least some of these short screening intervals were due to suspect smears: Among women with a result of “atypia” (class II staging), 57% were re-screened within 12 months and among those with “dysplasia” (class III/IV staging), 78% were re-screened within 12 months. Nevertheless, 44% of women with a normal smear result were re-screened within 12 months, which is not an efficient use of resources.

DIAGNOSIS: IMPORTANT LOSSES TO FOLLOW-UP

With a high number of annual cytological examinations, there is low yield at 0.85% in Lviv Region and 4.6% in Poltava (it remained unclear why positive yields differed by a factor of five between the two regions). The last two cascade columns on suspect screens and follow-up diagnostic tests were challenging to estimate due to low numbers in the patient card survey in Lviv. In Poltava Region, 28% of women who screened positive did not receive a follow-up appointment within 6 months, such as a pelvic, ultrasound or cytology examination. However, almost all women with “dysplasia” (96%) were re-tested within two years, and most with “atypia” (80%) were also re-tested within two years.

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CERVICAL CANCER CASES: IN BOTH REGIONS, FEW YOUNG CASES, OVER HALF AGED 40–59 YEARS (54%), AND A THIRD AGED 60 AND ABOVE (32%).

CC incidence per 100 females was 19.8 in Lviv and 24.1 in Poltava region. A more in-depth analysis of age patterns and staging results of registered first time episodes of CC showed that less than 5% of all CC cases were diagnosed in women under 35 years, and very few cases were aged below 30 years (2% in Lviv, youngest case aged 21 years, and 1% in Poltava, youngest case 27 years). In the older age groups, the proportion with stages II–IV was higher, in line with what is expected of a slowly developing pathology. This relates back to the age-targeting of CC screening, which is in many country contexts prioritising women aged 30-65 years due to best yield and efficiency. Invasive, stage IV cancer was diagnosed at 6% (Lviv) and 4% (Poltava) among all registered CC cases, respectively. Stage I cancers were the most frequently diagnosed in both regions (Figure 4).

9 Based on 2015-mid 2017 data of cancer registry.
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Figure 4  Cervical cancer cases registered in 2015 to mid-2017 in Lviv and Poltava Regions by age group and cancer stage

Figure 5  Treatment types in Lviv and Poltava Regions by cancer stage, 2015 to mid-2017 data

Sources: Cancer registries 2015 to mid-2017 Lviv and Poltava Regions.

TREATMENT STRATEGIES: BOTH REGIONS HAVE USED A COMBINATION OF TREATMENTS IN MOST CASES (FIGURE 5)

There are differences in treatment strategy and protocol between the two regions, often due to resource availability and capacity. For instance, Lviv used radiation treatment in 34% of cases in all stages, while Poltava used radiation treatment in just 2% of cases and in stage II only. Poltava oncology teams reported that there is a lack of adequate equipment for radiological treatment and patients were referred to Kharkiv region for radiation treatment if necessary.

The average interval between diagnosis and treatment, i.e., “time-to-treatment,” was analysed. During the period of 2015 to mid-2017, the average interval between diagnosis and the start of treatment was 23 days in Lviv Region and 20 days in Poltava Region. Lviv Region started treatment at 22 days after diagnosis for all stages, whereas Poltava started treatment more quickly for more advanced pathology (e.g., 16 days after diagnosis for stage III vs. 22 days for stage I). The oncology team explained that stage I was often only diagnosed after surgery and concurred that time-to-treatment could potentially be reduced from the current 22 day period for stage I cancers with the adoption of simpler treatment approaches.

TREATMENT CASCADE: THE CANCER REGISTRY DATA FOR 2015–16 WAS EXTRACTED AND ANALYSED TO DEVELOP THE CC TREATMENT CASCADES FOR ANNUAL COHORTS

The treatment cascade defined the following three stages:

1. The percentage of diagnosed cervical cancer cases initiated on treatment
2. The percentage of cases with confirmed treatment completion (first episode only)
3. The percentage of cases which had evidence of post-treatment monitoring
Data was analysed for two annual cohorts, 2015 and 2016, to prevent truncated data due to insufficient follow-up time (data extracted from registries in October 2017) (Figure 6).

**Figure 6** Cervical cancer treatment cascades in Lviv and Poltava Regions (2015, 2016 cohorts)

In both regions and annual cohorts, a proportion of cases had no record of treatment initiation in the cancer registry (Figure 6—3% and 4% in Lviv, 12% and 9% in Poltava). A closer investigation showed that most of these cases had no information on linkage to care recorded, whereas a minority had evidence of treatment refusal, out-transfer (changing place of living and health care) or very partial treatment. The oncologists indicated that the main reasons for refusals were old age and advanced cancer stages. In several cases, it was difficult to identify the reason for loss to care due to insufficient documentation in the cancer registry in both regions. It was often unclear at what stage of the continuum of CC care a death had occurred.

Treatment completion data was not thoroughly recorded in the cancer registry annual cohort for 2015 and 2016 (Figure 6). In the two years analysed, 62% and 54% in Lviv lacked data on the status or date of treatment completion and a small number, 4 out of 677, had documented treatment withdrawal. In Poltava, 76% and 73% have no treatment outcome recorded into the 2015/2016 registry, and no data could be found on withdrawal while on treatment.

Post-treatment monitoring of cases was in both regions not well tracked and documented in the registry. This was explained by the lack of information from family doctors to flow back to the registry, including patient death. According to the Cancer Bulletin of 2016, however, the five-year survival rate is 70,4%. The lack of follow-through with patients implies potential concern that women with a cervical cancer history may not be systematically recalled for higher-frequency re-testing.

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**Sources:** Cancer registries, cervical cancer cases newly registered in 2015 and 2016 Lviv and Poltava Regions.

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IMPLICATIONS FOR ACTION

► The study, conducted in collaboration with the regional Oncology Teams, demonstrated the value of analysis of cancer registry data on strategic key information, such as time-to-treatment, treatment coverage, loss to care and treatment patterns (each by cancer stage) to guide quality improvements.

► In order to initiate cancer treatments without delay, the oncology teams need to have clear standard procedures, improved pharmaceutical supplies and access to reliable diagnostic equipment.

► Implementation-oriented guidance on efficient treatment initiation, patient support and counselling (to minimise refusals, withdrawals and losses) should be part of the standard protocol for care.

► Coordination between levels of cervical cancer care and in particular follow-up monitoring and recording needs strengthening to ensure long-term patient support and understand final patient outcomes. Better data flow to the Cancer Registry Units would improve data on the timing and prevalence of death and eventually provide better estimates of 5-year survival rates. It would also strengthen data on treatment completion and post-treatment monitoring which the local oncology teams deem important.

► The recently published National Guidance on Cancer Screening needs to be translated into systems of targeted invitations for screening and patient recall, bearing in mind individuals’ age and risk (Box 1).

► A move towards lower cervical cancer screening frequency and better age targeting, based on the latest MoH guidance and in line with international evidence, is recommended.

Box 1  Global lessons on cervical cancer screening
Success of a screening program in decreasing cervical cancer incidence and mortality is largely a function of:

► Coverage of screening of women at risk

1–3 screens for all in a lifetime for larger number of women more important than frequent screening with low effective coverage for same small women cohort

► Target age of women screened
  ▪ E.g., 30–65 years, as low yield <30 years due to slow cancer growth

► Follow-up of positively screened women
  ▪ Approaches requiring fewer patient contacts (1–2) better than approaches requiring multiple patient visits
  ▪ Screen-and-treat models promising in middle-income countries

► Reliability of cytology services
  ▪ Moderate sensitivity (44–78%), high specificity (91–96%)
  ▪ Stringent training and quality control required
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