EPH280

Years of Life Lost and Productivity Costs Due to Premature Cancer-Related Mortality in Ukraine and in Kyiv City, Lviv and Cherkassy Regions

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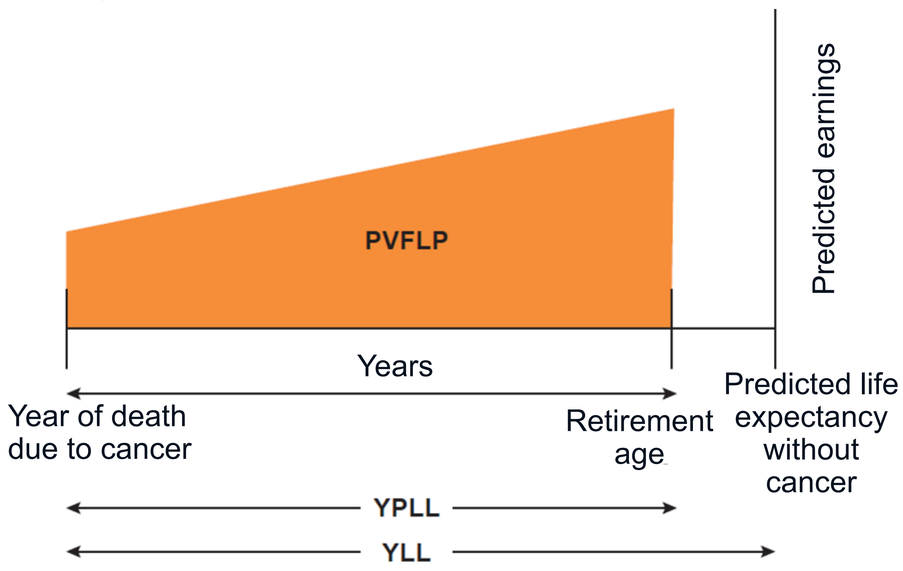
Background

Many cancers have high mortality in Ukraine and afflict individuals at a relatively young age, leading to substantial productivity losses and premature death. This study aimed to provide a perspective on the cancer mortality burden and productive life lost in Ukraine, and specifically in Kyiv city, and in the Lviv and Cherkassy regions, focusing on melanoma, breast, cervical, endometrial and ovary cancer.

Methods

The human capital approach was used to estimate both years of life lost (YLL), due to premature death, and the present value of future loss of productivity (PVFLP). Age- and sex-specific mortality data were sourced from the National Cancer Registry of Ukraine.[1] Retirement age, life expectancy, and labor force participation were sourced from the World Bank.[2-5] Average wage was sourced from ILOSTAT.[6] Years of productive life lost measured the number of working years lost prior to the standard retirement age of 60, thus capturing the impact of premature mortality on economic productivity.

Figure 1. Schematic model illustrating years of life lost (YLL) and present value of future lost productivity (PVFLP) calculations. This was adapted with permission from Bencina et al., 2022[7]



Results

In 2022, 112,244 patients died of cancer in Ukraine, with 2,438, 3,457, 2,274 cancer deaths in Kyiv city, Lviv and Cherkassy, respectively. Melanoma, breast, cervical, endometrial and ovary cancer were the malignancies (Table 1) with the highest mortality with an estimated 2,403, 12,335, 3,004, 5,601 and 2,806 deaths in Ukraine in 2022, respectively. There were an estimated number of deaths in melanoma of 42, 46 and 41; in breast of 271, 262 and 191; in cervical of 55, 75 and 55; in endometrial of 82 ,93 and 49 and in ovary cancer of 64, 87 and 49, in 2022, respectively for Kyiv, Lviv and Cherkassy.

Table 1 : Mortality; estimated number of death in cancer sub-types in 2022

Cancer sub-type	Kyiv	Lviv	Cherkassy	Ukraine
Melanoma	42	46	41	2,403
Breast	271	262	191	12,335
Cervical	55	75	55	3,004
Endometrial	82	93	49	5,601
Ovary Cancer	64	87	49	2,806
All Cancer	2,438	3,457	2,274	112,244

References

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Presented at [ISPOR, Glasgow; 10 November 2025]

All cancer deaths resulted in 1,393,352 YLL overall in Ukraine (20,201 in Kyiv, 29,197 in Lviv and 17,789 in Cherkassy), with breast accounting for 243,998, endometrial for 94,139, cervical for 78,836, ovary cancer for 59,048, and melanoma for 37,769 YLL in Ukraine in 2022 (Table 3).

Table 3 : Years of Life Lost (YLL); estimated number of YLL in cancer sub-types in 2022

Cancer sub-type	Kyiv	Lviv	Cherkassy	Ukraine
Melanoma	406	441	405	37,769
Breast	3,692	4,160	2,610	243,998
Cervical	981	1,867	1,077	78,836
Endometrial	1,020	1,148	617	94,139
Ovary Cancer	966	1,281	794	59,048
All Cancer	**20,201**	**29,197**	**17,789**	**1,393,352**

Annual PVFLP in Ukraine was estimated to be $1,742,642,354 for all cancer types, with breast accounting for $239,937,174, cervical for $98,405,881, endometrial for $60,639,269, ovary cancer for $57,996,124, and melanoma accounting for $58,684,143, in 2022, respectively (Table 4).

Table 4 : Present Value of Future Loss of Productivity (PVFLP); estimated 2022 PVFLP by cancer sub-type and region

A: PVFLP in both sexes ($)

Cancer sub-type	Kyiv	Lviv	Cherkassy	Ukraine
Melanoma	561,911	742,483	680,335	58,684,143
Breast	2,471,722	3,284,878	1,548,891	239,937,174
Cervical	952,252	2,141,034	1,048,525	98,405,881
Endometrial	420,597	289,503	268,377	60,639,269
Ovary Cancer	548,812	715,885	598,622	57,996,124
All Cancer	**18,160,692**	**32,525,944**	**18,007,923**	**1,742,642,354**

B : PVFLP in 2022 by age and sex ($)

	PVFLP; $			PVFLP/death; $ (Average)		
Cancer sub-type	**Male**	**Female**	**Total**	**Male**	**Female**	**All**
Melanoma	30,122,564	28,561,579	58,684,143	27,137	22,089	24,421
Breast	1,837,449	238,099,725	239,937,174	23,863	19,424	19,452
Cervical	0	98,405,881	98,405,881	0	32,758	32,758
Endometrial	0	60,639,269	60,639,269	0	10,827	10,827
Ovary Cancer	0	57,996,124	57,996,124	0	20,669	20,669
Total / Average (All Cancer)	**793,031,773**	**949,610,580**	**1,742,642,354**	**14,376**	**16,636**	**15,525**

Conclusion

YLL and PVFLP due to premature cancer mortality in Ukraine were substantial with melanoma, breast, cervical, endometrial and ovary cancer having a major impact. Continued prioritization of investment in cancer care including awareness, prevention, early detection and treatment is imperative to improve societal burden for Ukraine.

Limitations

This study did not account for direct costs of cancer to the healthcare system, productivity loss due to cancer morbidity, or inability to work while alive. There is a wider impact on the caregivers of patients with cancer, which was not included here.

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