EPH186

Premature Cancer-Related Morbidity and Mortality in Israel: Years Lived with Disability and Years of Life Lost Productivity Costs

Shira Yaari[1], Galit Gilad[2], Keren Dodick[2], Anne Meiwald[3], Aimée Fox[3], Peter Toth[3], Chamath Perera[3], Guy Tavori[4], Sharon Pelles Avraham[5], Bernadette Pöllinger[6]

1 V&I Outcome Research, MSD Israel

2 MSD Israel

3 Adelphi Values PROVE, Bollington, UK

4 All.Can Israel manager

5 Director of Oncology Unit- Barzilai Medical center, Israel

6 V&I Outcome Research, MSD Sharp & Dohme GmbH, Germany

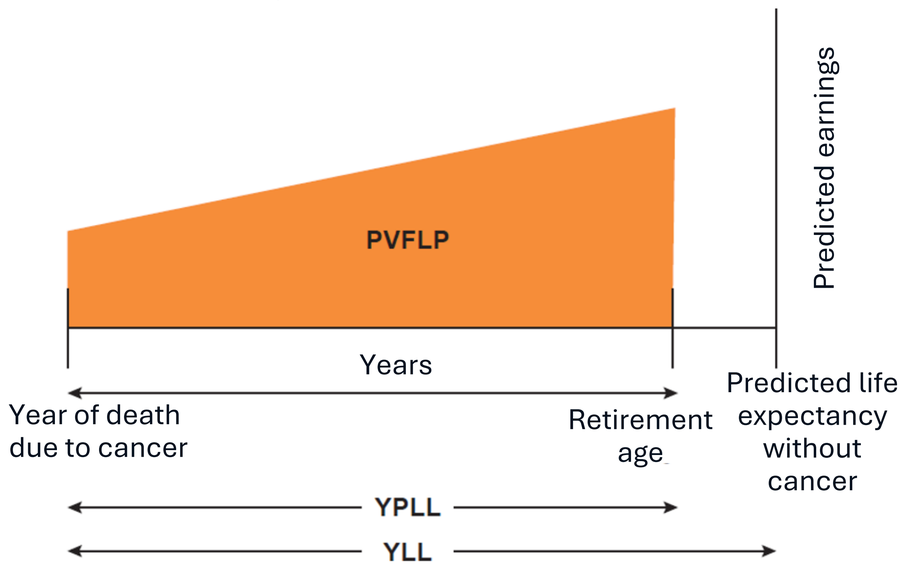
Background

Cancer is the leading cause of deaths in Israel and afflicts individuals at a relatively young age, leading to substantial productivity losses and premature death. [1] This study aimed to provide a perspective on the cancer morbidity and mortality burden and productive life lost in Israel in 2010, 2015, 2019, and 2022.

Methods

Institute for Health Metrics and Evaluation (IHME) data was used to estimate age, sex, cancer-specific deaths, Years lived with disability (YLD) and Years of life lost (YLL).[2] YLD was used to estimate value of years lived with disability (VYLD) for morbidity.[2] YLL was used to estimate years of productive life lost (i.e. years lost before retirement age [67 for males and 63 for females])[2,3] and present value of future lost productivity (PVFLP) for mortality. Labor force participation and unemployment rate were sourced from the World Bank.[4,5] Average wage was sourced from ILOSTAT.[6]

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



Results

In Israel, cancer malignancies resulted in 15,028 YLD overall in 2022, with pancreatic cancer accounting for 244, lung for 670, colorectum for 2,142 and breast for 3,563 YLD, respectively. Annual VYLD was estimated to be $189,712,444 for all cancer types, with breast accounting for $41,124,524, colorectum for $22,860,888, lung for $8,587,373, and pancreatic cancer for $2,476,305, respectively.

14,657 patients died of cancer in Israel in 2022. Lung, colorectum, breast and pancreatic cancer were the malignancies with the highest mortality with an estimated number of 2,601, 1,956, 1,432 and 1,335 deaths, respectively.

Table 1 : Years Lived with Disability (YLD) and Value of Years Lived with Disability (VYLD) in 2022; estimated number of YLD , and annual VYLD in cancer sub-types in $

Cancer sub-type	Pancreatic	Lung	Colorectum	Breast	All Cancers
YLD; no.	244	670	2,142	3,563	15,028
VYLD; $	2,476,305	8,587,373	22,860,888	41,124,524	189,712,444

Table 2 : Mortality ; estimated number of deaths by cancer sub-types

Cancer sub-type	Mortality 2010	Mortality 2015	Mortality 2019	Mortality 2022
Lung	2,069	2,289	2,377	2,601
Colorectum	1,625	1,700	1,770	1,956
Breast	1,139	1,216	1,319	1,432
Pancreatic	932	1,128	1,209	1,335
All Cancer	11,523	12,604	13,355	14,657

The total deaths resulted in 296,240 YLL overall (Table 3), with lung accounting for 54,392, colorectum for 34,807, breast for 31,213 and pancreatic cancer for 26,216 YLL in 2022. Annual PVFLP (Table 4A and B) was estimated to be $926,021,209 for all cancer types, with lung accounting for $165,058,222, colorectum for $89,083,376, breast for $90,294,429 and pancreatic cancer for $68,856,437 respectively.

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

Cancer sub-type	YLL 2010	YLL 2015	YLL 2019	YLL 2022
Lung	46,318	50,148	50,370	54,392
Colorectum	30,759	31,276	31,868	34,807
Breast	27,110	27,691	29,256	31,213
Pancreatic	18,902	22,716	24,048	26,216
All Cancer	**248,550**	**264,740**	**274,246**	**296,420**

Table 4 : Present Value of Future Loss of Productivity (PVFLP); estimated annual PVFLP in cancer sub-types

A: PVFLP in both sexes ($)

Cancer sub-type	PVFLP 2010	PVFLP 2015	PVFLP 2019	PVFLP 2022
Lung	173,613,094	171,389,578	157,911,181	165,058,222
Colorectum	87,811,117	86,644,545	84,787,488	89,083,376
Breast	86,245,395	86,795,686	87,030,705	90,294,429
Pancreatic	57,509,852	64,931,472	65,353,768	68,856,437
All Cancer	**898,056,755**	**903,659,597**	**888,004,118**	**926,021,209**

B : PVFLP in each sex in 2022 ($)

	PVFLP; $			PVFLP/death; $ (Average)		
Cancer sub-type	Male	Female	Total	Male	Female	All
Lung	136,309,374.69	28,748,847.78	165,058,222	80,748	31,490	63,458
Colorectum	64,850,811.46	24,232,564.97	89,083,376	64,935	25,313	45,543
Breast	1,767,056.49	88,527,372.13	90,294,429	77,209	62,832	63,062
Pancreatic	55,544,056	13,312,381	68,856,437	79,086	21,054	51,593
Total / Average (All Cancer)	**637,275,207**	**288,746,003**	**926,021,209**	**83,357**	**41,179**	**63,179**

Conclusion

The societal burden in Israel of lung, colorectum, breast and pancreatic cancers was significant due to premature cancer morbidity and mortality. Targeted investment in medical infrastructure, physician incentives in underserved areas, and early diagnosis efforts, particularly in Arab communities, are essential. Survivors also need support to regain daily function and productivity.

Limitations

This study did not account for direct costs of cancer to the healthcare system. There is a wider impact on the caregivers of patients with cancer, which was not included here.

References

1. Health Systems in Action (HSiA) Insights: Israel. 2024 edition. Available via: https://eurohealthobservatory.who.int/publications/i/health-systems-in-action-israel-2024
2. Institute for Health Metrics and Evaluation (IHME). Global Burden of Disease. Available via: https://www.healthdata.org/research-analysis/gbd. Data used under license; restrictions apply. Permission required from IHME for access.
3. The World Bank. Indicator: Pension, Age at which men and women can retire with full pension benefits 2023. Available via: https://wbl.worldbank.org/en/data/exploretopics/wbl_gpen. Accessed: 12th May 2025.
4. The World Bank. Indicator: Labor force participation rate, total (% of total population ages 15+) (modeled ILO estimate) 2022. Available via: https://databank.worldbank.org/source/world-development-indicators#. Accessed: 15th May 2025.
5. The World Bank. Indicator: Unemployment, total (% of total labor force) (modeled ILO estimate). Available via: https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS. Accessed: 15th May 2025.
6. ILOSTAT. Average monthly earnings of employees by sex and economic activity (local currency) - Total values. Available via: https://ilostat.ilo.org/topics/wages/.
7. Bencina G, Chami N, Hughes R, Weston G, Baxter C, Salomonsson S, Demedtsl. Indirect Costs Due to Lung Cancer-Related Premature Mortality in Four European Countries. AdvTher. 2023 Jul;40(7):3056-3069. doi: 10.1007/s12325-023-02509-x. Epub2023 May 17. PMID: 37195488; PMCID: PMC10189212. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10189212/pdf/12325_2023_Article_2509.pdf

Contact information

Bernadette.Poellinger; bernadette.poellinger@msd.de

Presented at [ISPOR, Glasgow; 10 November 2025]