Review

Long-Term Survival Trend of Gynecological Cancer: A Systematic Review of Population-Based Cancer Registration Data*

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Abstract: Gynecological cancer significantly affect the health of women. This review aimed to describe the global patterns and trends in the survival of patients with gynecological cancers. We searched PubMed, Embase, Web of Science, SinoMed, and SEER for survival analyses of cancer registration data of cervical, endometrial, and ovarian cancers published between 1980 and 2022. Globally, the highest 5-year observed survival rate for cervical cancer was 76.5% in Anshan, Liaoning, China (2008–2017). The 5-year observed survival rates of endometrial and ovarian cancers were higher in Finland (1995–1999, 82.5%) and Singapore (1988–1992, 62.0%). The 5-year relative survival rate of cervical cancer patients was higher in Haining, Zhejiang, China (2011–2014, 85.8%). Korea ranked first at 89.0% and 64.5% for endometrial and ovarian cancers, respectively. Survival rates have improved for cervical, endometrial, and ovarian cancers. Patients aged ≥ 75 years and those with advanced-stage disease had the worst 5-year survival rates. Survival rates were better for squamous cell carcinoma in cervical cancer, for endometrial carcinoma and mucinous adenocarcinoma in endometrial cancer, and for germ cell and sex-cord stromal tumors in ovarian cancer. Over the past four decades, the survival rates of gynecological cancers have increased globally, with notable increases in cervical and endometrial cancers. Survival rates are higher in developed countries, with a slow-growing trend. Future studies should focus on improving survival, especially in ovarian cancer patients.

Key words: Gynecology cancer; Relative survival rate; Observed survival study; Cancer registry; Time trend

INTRODUCTION

Gynecological cancer is the most prevalent malignancy among women worldwide. It disrupts the functioning of the female reproductive system and seriously affects their quality of life[1]. Cervical, uterine, and ovarian cancers are the three primary types of gynecological cancers. According to the Global Cancer Statistics 2022, cervical cancer ranks fourth in terms of incidence (6.8%) and mortality (8.1%) in women, and is the most frequently diagnosed cancer and the leading cause of cancer death in low and medium Human Development Index (HDI) regions and in India[2]. Uterine corpus cancer (endometrial cancer) is the sixth most common cancer in women, accounting for 420,242 cases worldwide. The incidence rate of endometrial cancer in the high/very high HDI group was 3.4-fold higher than that in the low/medium HDI[2]. Ovarian cancer is the eighth most diagnosed cancer among women in 2022 and has the highest lethality, accounting for nearly half of all gynecological malignancy deaths[2,3].

In addition to incidence and mortality, survival is an important indicator for cancer burden. Population-based cancer survival statistics provide indicators for the effectiveness of screening, early diagnosis, and treatment, as well as reflect the overall effectiveness

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of health services[4]. Accurate survival rates not only have broad population-based implications, but also provide patients with a better understanding of the nature and course of the disease, as well as guide clinicians in counseling and management[5]. However, the availability of cancer survival data may be limited in countries or regions with systematic reports of cancer incidence or mortality because of the time gaps that often exist in survival.

Little attention has been paid to the characteristics and long-term trends of gynecological cancer survival in different countries and regions. This systematic review extracted the survival rates of population-based cancer registrations for common gynecological cancers from published articles. The primary aim was to provide a comprehensive analysis of global trends and temporal variations in the survival outcomes of patients with gynecological cancer across different populations or regions between the 1980s and the 2020s.

METHODS

Literature Search and Data Extraction

This review was conducted in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) statement (Supplementary Table S1, available in www.besjournal.com). A comprehensive search of the PubMed, Web of Science, EMBASE, SinoMed, and Surveillance, Epidemiology, and End Results (SEER) databases was conducted for retrieving related studies published between January 1980 and November 2022. The keywords were as follows: “cervical cancer,” “uterine corpus cancer,” “ovarian cancer,” “survival rate,” “cancer registry”, and “population-based survival analysis” (Appendix S1, available in www.besjournal.com). The cancer site and histological type were coded according to the International Classification of Diseases or the International Classification of Diseases for Oncology (Supplementary Table S2, available in www.besjournal.com).

A total of 5,055 articles were identified using the search strategy and examined independently by two authors (Xiaohui Zhou and Danni Yang). Studies were included as follows: (a) a population-based survival analysis or from cancer registries, (b) survival rate as outcome, and (c) not assessing overlapping periods and incomplete or unavailable articles. After reviewing the titles and abstracts of the publications, 501 full-text articles were identified. After full-text evaluation, 132 articles were included in the final analysis (Figure 1).

Statistical Analysis

Estimates of observed survival rates (OSR), relative survival rates (RSR), and net survival rates were extracted from published studies. OSR estimates the chance of remaining alive for some years after diagnosis and uses death from all causes as the endpoint. RSR is the ratio of the overall survival of cancer patients to the expected survival of a comparable group of cancer-free individuals[5]. Expected survival, which uses life tables from the general population covered by the cancer registry, can be calculated using the Ederer I, Ederer II, Hakulinen, and Pohar-Perme. The net survival rate is an estimate of the net effect of cancer diagnosis after eliminating the influence of competing causes of death as a cancer prognosis indicator[5]. Both RSR and net survival refer to the cumulative survival probabilities in a given period after excluding other causes of death. Therefore, these two indicators were combined in the present study. The observed relative or net survival rates were primarily utilized and compared across various countries or regions, as well as across different age and sex groups. Age-standardized survival rate was used to compare survival rates between different populations or time periods by adjusting for differences in age distribution. We extracted age-standardized RSRs from each article to further eliminate the impact of age structure on international comparisons. The RSR estimates were age-standardized using weights from different standard populations, including the World, SEER, European, and country-specific Standard Populations. In addition, we collected the results of the statistical tests of all survival trends at different time periods and subgroup-specific 5-year survival rates. EndNote X20 was employed for literature management, while Microsoft Excel 2016 was used for data analysis and graph creation.

RESULTS

Global Pattern and Disparities by Regions

Table 1 shows the overall 1-, 3-, 5-, and 10-year OSRs of cervical cancer in 20 countries[6-39]. The 5-year OSR was the highest in Anshan, Liaoning, China (2008–2017)[11] at 76.5%, whereas it was the lowest in Uganda, Kampala (1993–1997)[38] at 15.9%. Among the collected countries and regions[9,11,13,14,18,22,27,30,31,33-36,40,41], the 5-year OSRs for endometrial cancer were highest in Finland

(1995–1999)[34] and lowest in Sihui, Guangdong, China (1987–1996)[9], at 82.5% and 7.4%, respectively (Table 2). For ovarian cancer[7,8,11,13,14,18,20-22,30,31,33-36,40,42-52], the highest 5-year OSR was observed in Singapore (1988–1992)[18] at 64.0%; in Kampala, Uganda (1988–1997)[51] and Ragusa, Sicily, Italy (1992)[31], the 5-year OSRs were poor, only at 14.1% and 18.1%, respectively (Table 3).

Tables 4–6 show the overall relative or net survival rates of the common gynecological cancers worldwide. For cervical cancer[6,8-10,13,14,18-20,22,27,28,30,33,37-39,53-86], the 5-year survival rates were higher in Haining and Jiashan, Zhejiang, China (2011–2014)[54] and in Finland (1995–1999)[66], with 85.8% and 82.3%, respectively; differences remained very wide, with levels as low as 18.2% in Kampala, Uganda (1993–1997)[38]. The highest 10-year survival rate (78.3%) was observed in Korea (1996–2000, 2001–2005)[60]; the lowest rate (28.4%) was observed in Qidong, Jiangsu, China (1987–1991)[6]. For endometrial cancer[9, 13, 14, 18, 22, 27, 28, 30, 36, 53, 54, 57, 59, 64, 65, 67-69, 71, 72, 75-77, 82-84, 86-94], 5-year survival rates were very high in Korea (2015–2019; 89.0%)[59]. Conversely, Tianjin (1981–1985)[14] had the lowest 5-year survival rate (39.3%) (Table 5). For ovarian cancer[8,13,14,18,20,22,30,34,36,38,42, 46,52-54,57,59,62-64,67-69,71,72,75-77,82-84,86,88,91,93,95-105], Korea (2011–2015) ranked first, with a 5-year relative and net survival rate of 64.8%[59]. In Kampala, Uganda (1993–1997)[38], the 5-year rate was low (16.2 %). The range of survival in Asia was wider than that in Europe. In Asia, the 5-year survival rate ranges from 64.5%[59] to 25.4%[20]; in Europe, 5-year survival ranges from 49.0%[100] –32.0%[30].

Figures 2–4 demonstrate the age-standardized 5-year relative or net survival rates for cervical, endometrial, and ovarian cancer from to 1980–2015.

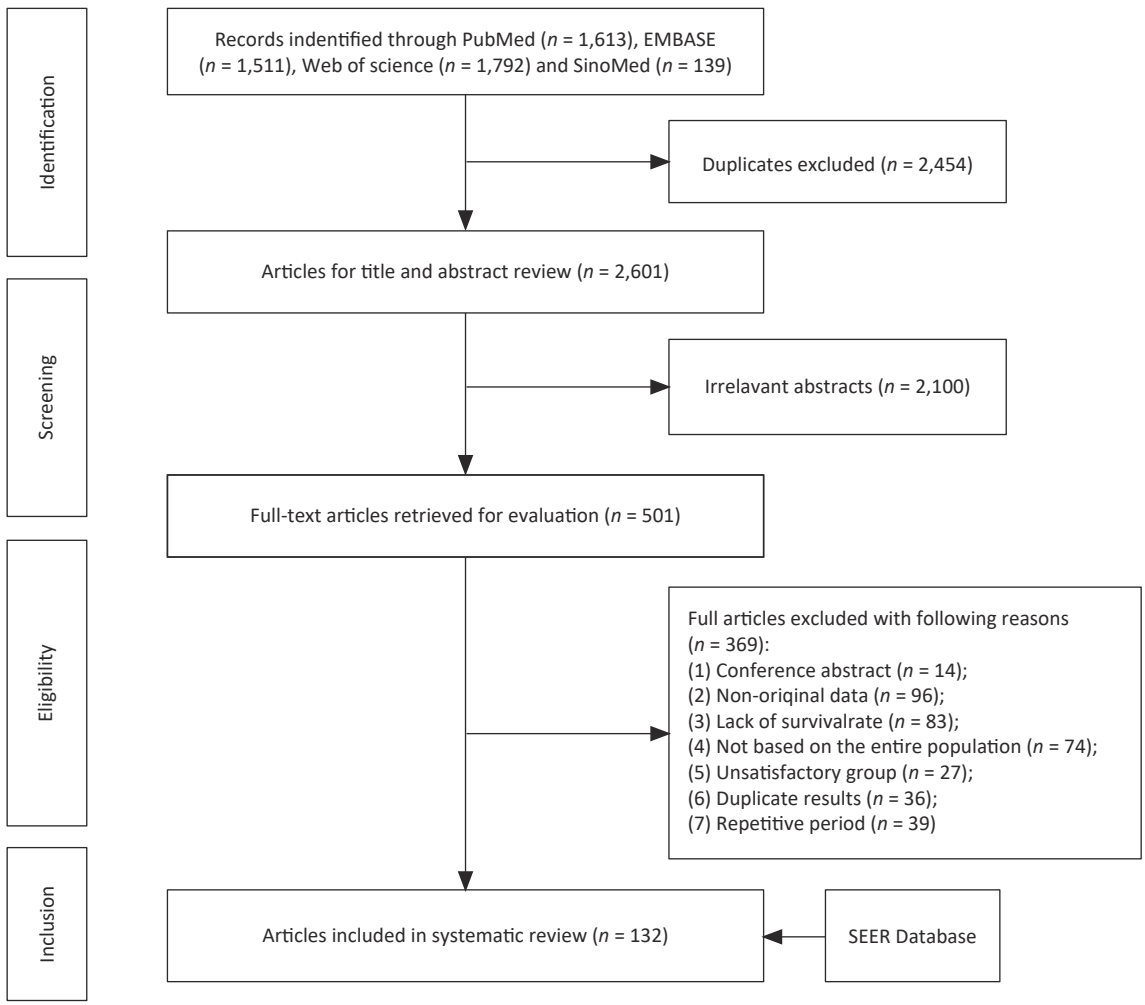

Figure 1. Study selection process.

Table 1. Overall observed survival rates (%) of cervical cancer in selected countries and regions during 1980–2017

Continent	Country	Region	Period	1-year	3-year	5-year	10-year
Asia	China	Qidong, Jiangsu[6]*	1982–1986	57.4	37.4	33.0	27.0
			1987–1991	57.9	39.0	26.3	20.0
			1992–1996	42.4	35.3	29.4	27.1
			1997–2001	55.8	41.9	33.7	25.6
			2002–2006	65.3	51.5	49.1	45.2
			2007–2011	79.3	66.2	62.8	58.2
			2012–2016	90.9	77.9	73.6	–
		Jiulongpo, Chongqing[7]	2008–2013	69.8	42.6	35.3	–
		Zhejiang[8]	2005–2010	86.9	75.4	70.8	–
		Sihui, Guangdong[9]*	1987–1996	–	–	18.8	–
			1997–2006	–	–	47.1	–
			2007–2009	–	–	49.8	–
		Guizhou[a][10]	2013–2015	81.6	66.4	–	–
		Anshan, Liaoning[b][11]	2008–2017	91.5	81.0	76.5	–
		Yangpu, Shanghai[12]	2002–2012	91.2	79.1	75.5	–
		Shanghai[13]	1988–1991	73.3	53.6	45.4	–
		Tianjin[14]	1981–1985	55.0	42.0	38.0	–
	Korea	Kangwha[15]	1983–1987	–	–	67.1	–
	Malaysia[16]		2000–2005	94.1	79.3	71.1	–
	Thailand	Khon Kaen[17]	1985–1990	–	–	56.8	–
	Singapore[18]		1983–1987	–	–	56.0	–
			1988–1992	–	–	63.0	–
	India	Bangalore[19]	1982–1989	–	–	34.4	–
		Mumbai[20]	1990–1994	77.0	55.9	44.0	–
		Dindigul Ambilikkai[21]	2003–2006	–	–	35.0	–
America	Costa Rica[22]		2011–2015	–	–	68.0	–
	Colombia	Manizales[23]	2003–2007	80.7	62.1	51.4	–
	Canada	Ontario[24] [25]*	1995–1998	–	71.1	–	–
			1999–2001	–	75.9	–	–
			2003–2007	–	–	71.0	–
	Canada	British Columbia[26]	1980–1989	89.0	–	73.0	–
			1990–1999	91.0	–	73.0	–
			2000–2002	90.0	–	–	–
	Cuba[27]		1982	–	–	44.0	–
			1988–1998	74.0	57.0	52.0	–
Europe	total[28]		1995–1999	84.9	68.0	62.0	–
	France	Martinique[29]	2002–2011	84.1	62.6	55.1	43.3
	Switzerland	Vaud[30]	1984–1988	–	–	55.0	–
			1989–1993	–	–	62.0	–

Continued

Continent	Country	Region	Period	1-year	3-year	5-year	10-year
	Italy	Sicily, Ragusa[31]	1992	–	–	55.8	–
	Lithuanian[32]		2001–2009	–	–	64.1	–
	Sweden[33]		2011–2015	–	–	74.0	–
	Finland[34]		1995–1999	–	–	63.4	–
	Bulgaria[35]*		1993–1997	–	–	49.7	–
			2005–2009	–	–	54.7	–
	Germany[36]		2002–2006	–	–	65.0	–
	Australia[c] [37]		2003–2007	–	–	70.3	–
			2008–2012	–	–	72.1	–
Africa	Uganda	Kampala[38,39]	1995–1997	79.7	52.4	–	–
			1993–1997	–	–	15.9	–

Note. –, No report or unavailable in the original article. *Long–term change in survival rates was statistically significant. [a]Only three counties in the Guizhou Province are included. [b]Only four districts in Anshan, Liaoning Province are included. [c]Six Australian states/territories (New South Wales, Victoria, Queensland, South Australia, Western Australia, and the Northern Territory) were included in the original article.

Table 2. Overall observed survival rates (%) of uterine corpus cancer in selected countries and regions during 1981–2017

Continent	County	Region	Period	1-year	3-year	5-year
Asia	China	Sihui, Guangdong[9]*	1987–1996	–	–	7.4
			1997–2006	–	–	40.0
			2007–2009	–	–	78.1
		Anshan, Liaoning[b][11]	2008–2017	94.1	86.9	82.2
		Shanghai[13]	1988–1991	89.3	77.6	72.6
		Tianjin[14]	1981–1985	65.0	55.0	54.0
		Jiulongpo, Chongqing[7]	2008–2013	69.4	48.4	37.6
	Singapore[18]		1983–1987	–	–	71.0
			1988–1992	–	–	72.0
Europe[28]			1995–1999	88.3	76.1	69.4
	Denmark[91]		2005–2009	–	–	73.5
	Germany[36]		2002–2006	–	–	70.0
	Bulgaria[35]*		1993–1997	–	–	66.6
			2005–2009	–	–	69.0
	Finland[34]		1995–1999	–	–	82.5
	Switzerland	Vaud[30]	1984–1988	–	–	69.0
			1989–1993	–	–	74.0
	Italy	Sicily, Ragusa[31]	1992	–	–	68.5
America	Costa Rica[22]		2011–2015	–	–	74.0
	Cuba[27]		1982	–	–	56.0
			1988–1998	77.0	59.0	52.0

Note. *The long-term change trend of survival rate was statistically significant. [b]Only four districts in Anshan, Liaoning Province are included. –, No report or unavailable in the original article.

Table 3. Overall observed survival rates (%) of ovarian cancer in selected countries and regions during 1981–2017

Continent	County	Region	Period	1–year	3–year	5–year
Asia	China	Qidong, Jiangsu[42]	1982–1986	–	–	46.8
			1987–1991	–	–	30.3
			1992–1996	–	–	32.7
			1997–2000	–	–	43.1
		Tianjin[14]	1981–1985	47.0	35.0	33.0
		Shanghai[13]	1988–1991	65.0	47.2	41.6
		Sihui, Guangdong[43]	2003–2005	64.7	58.8	58.8
		Zhejiang[8]	2005–2010	76.7	61.0	52.6
		Anshan, Liaoning[b][11]	2008–2017	80.7	60.7	50.2
		Jiulongpo, Chongqing[7]	2008–2013	65.8	44.7	37.5
	Singapore[18]		1983–1987	–	–	56.0
			1988–1992	–	–	64.0
	India	Mumbai[20]	1990–1994	51.0	27.5	23.3
		Dindigul Ambilikkai[21]	2003–2006	–	–	30.0
	Iran[44, 105]		2000–2004	–	–	61.0
			2009-2014	84.0	66.0	55.0
Africa	Egypt	Alexandria[49]	1988–1997	–	–	46.0
	Uganda	Kampala[38]	1993–1997	–	–	14.1
America	Costa Rica[22]		2011–2015	–	–	52.0
Europe[28,47]			1995–1999	69.1	46.5	37.1
			1999–2001	–	–	34.8
			2002–2004	–	–	34.3
			2005–2007	–	–	35.5
	Central Europe[47]		1999–2001	–	–	38.7
			2002–2004	–	–	37.9
			2005–2007	–	–	37.7
	Southern Europe[47]		1999–2001	–	–	35.7
			2002–2004	–	–	33.7
			2005–2007	–	–	36.7
	Eastern Europe[47]		1999–2001	–	–	28.9
			2002–2004	–	–	30.1
			2005–2007	–	–	32.2
	Northern Europe[47]		1999–2001	–	–	36.8
			2002–2004	–	–	37.6
			2005–2007	–	–	38.8
	UK and Ireland[47]		1999–2001	–	–	27.8
			2002–2004	–	–	28.5
			2005–2007	–	–	29.7
	Denmark[48,91]		2000–2002	73.0	–	37.0
			2003–2005	69.0	–	36.0

Continued

Continent	County	Region	Period	1–year	3–year	5–year
			2005–2009	–	–	37.7
			2009–2011	69.0	–	–
	Italy	Sicily, Ragusa[31]	1992	–	–	18.1
	Bulgaria[35]*		1993–1997	–	–	35.4
			2005–2009	–	–	40.3
	France[52]		1989–2010	74.0	–	40.0
	Finland[34]		1995–1999	–	–	44.6
	Germany[36]		2002–2006	–	–	37.0
		Saarland[45]	1981–1985	–	–	29.9
			1986–1990	–	–	32.4
			1991–1995	–	–	37.2
	Switzerland	Vaud[30]	1984–1988	–	–	28.0
			1989–1993	–	–	32.0

Note. *The long-term change trend of survival rate was statistically significant. [b]Only four districts in Anshan, Liaoning Province are included. –, No report or unavailable in the original article.

Table 4. Overall relative/net survival rates (%) of cervical cancer in selected countries and regions during 1980–2019

Continent	Country	Region	Period	1–year	3–year	5–year	10–year
Asia	China	Qidong, Jiangsu[6]*	1982–1986	59.3	41.4	39.2	38.0
			1987–1991	59.8	43.0	31.1	28.4
			1992–1996	43.6	38.5	34.2	37.9
			1997–2001	57.3	45.4	38.6	33.6
			2002–2006	66.2	53.8	53.0	52.6
			2007–2011	80.2	68.5	66.4	65.0
			2012–2016	91.6	79.8	76.8	–
		Zhejiang[8]	2005–2010	87.5	77.2	73.9	–
		Guizhou[a][10]	2013–2015	84.7	74.3	–	–
		Sihui, Guangdong[9]	2007–2009	–	–	50.5	–
		Shanghai[13]	1988–1991	75.2	57.9	52.1	–
		Tianjin[14]	1981–1985	56.8	46.6	45.8	–
		Fujian[53]	2012–2014	–	–	68.6	–
		Haining and Jiashan, Zhejiang[54]	2003–2006	–	–	65.6	–
			2007–2010	–	–	81.7	–
			2011–2014	–	–	85.8	–
		Hong Kong[55]	1997–2006	90.6	76.6	71.3	–
		Taiwan[56]	2004–2008	–	–	75.1	–
	Japan[d][57]		1993–1996	–	–	73.4	–
			1997–1999	–	–	71.5	–
		Osaka[58]*	1987–1994	–	–	58.6	54.0

Continued

Continent	Country	Region	Period	1–year	3–year	5–year	10–year
			1995–2002	–	–	56.8	52.7
			2003–2010	–	–	64.3	59.6
	Korea[59,60]		1993–1995	–	–	78.3	–
			1996–2000	–	–	80.3	77.2
			2001–2005	–	–	81.5	78.3
			2006–2010	–	–	80.7	77.1
			2011–2015	–	–	80.3	–
			2015–2019	–	–	80.5	–
	Singapore[18]		1983–1987	–	–	57.0	–
			1988–1992	–	–	65.0	–
	Thailand[e][61]		1997–2001	78.8	–	55.4	–
			2002–2006	80.9		55.5	
			2008–2012	81.5	–	59.5	–
		Bangkok[61]	1997–2001	52.5		33.9	
			2002–2006	75.5		49.0	
			2008–2012	79.9		56.5	
		Chiang Mai[61]	1997–2001	83.7		60.8	
			2002–2006	86.9		61.9	
			2008–2012	85.3		67.0	
		Khon Kaen[61]	1997–2001	83.1		57.4	
			2002–2006	81.0		57.2	
			2008–2012	79.2		56.1	
		Lampang[61]	1997–2001	81.7		46.1	
			2002–2006	83.5		55.0	
			2008–2012	83.8		64.5	
		Songkhla[61]	1997–2001	88.8		59.0	
			2002–2006	79.6		55.3	
			2008–2012	80.6		55.6	
	Philippines	Metro Manila and Rizal province[62]	1998–2002	–	–	45.4	–
	India	Bangalore[19]	1982–1989	–	–	38.8	–
		Mumbai[20]	1990–1994	78.2	58.7	47.7	–
	Kuwait[63]		2000–2004	84.4	–	57.8	–
			2005–2009	88.7	–	73.8	–
			2010–2013	86.3	–	71.8	–
	Turkey[64]		2009			62.0	–
Europe[28,65,66]			1981–1983	–	–	60.0	–
			1983–1985	–	–	61.0	
			1986–1988	–	–	62.0	–
			1989–1991	–	–	64.0	–
			1992–1994	–	–	63.0	–

Continued

Continent	Country	Region	Period	1–year	3–year	5–year	10–year
			1995–1999	86.0	71.0	66.7	–
	Denmark[66,67]		1983–1985	–	–	62.0	–
			1986–1988	–	–	66.0	–
			1989–1991	–	–	67.0	–
			1992–1994	–	–	66.0	–
			1994–2003	89.0	–	71.0	–
	Finland[66,68]		1980–1982	–	–	57.5	–
			1983–1985	–	–	65.0	–
			1986–1988	–	–	60.0	–
			1989–1991	–	–	62.0	–
			1992–1994	–	–	69.0	–
			1995–1999	–	–	82.3	–
	Iceland[66]		1983–1985	–	–	69.0	–
			1986–1988	–	–	75.0	–
			1989–1991	–	–	67.0	–
			1992–1994	–	–	75.0	–
	Norway[66]		1983–1985	–	–	67.0	–
			1986–1988	–	–	65.0	–
			1989–1991	–	–	66.0	–
			1992–1994	–	–	71.0	–
	Sweden[33,66,69]		1983–1985	–	–	68.0	–
			1986–1988	–	–	67.0	–
			1989–1991	–	–	71.0	–
			1992–1994	–	–	68.0	–
			2000–2002	–	–	70.9	–
			2011–2015	–	–	76.0	–
	England[66,70]		1983–1985	–	–	59.0	–
			1986–1988	–	–	61.0	–
			1989–1991	–	–	65.0	–
			1992–1994	–	–	62.0	–
			2006–2008	80.4	–	62.2	–
			2007–2009	80.8	–	–	–
			2008–2010	80.9	–	–	–
	Scotland[66]		1983–1985	–	–	54.0	–
			1986–1988	–	–	58.0	–
			1989–1991	–	–	61.0	–
			1992–1994	–	–	60.0	–
	Wales[66]		1983–1985	–	–	62.0	–
			1986–1988	–	–	59.0	–
			1989–1991	–	–	59.0	–

Continued

Continent	Country	Region	Period	1–year	3–year	5–year	10–year
			1992–1994	–	–	58.0	–
	France[66]		1983–1985	–	–	70.0	–
			1986–1988	–	–	64.0	–
			1989–1991	–	–	71.0	–
			1992–1994	–	–	67.0	–
	Germany[66]		1983–1985	–	–	63.0	–
			1986–1988	–	–	63.0	–
			1989–1991	–	–	61.0	–
			1992–1994	–	–	66.0	–
		Augsburg, Swabia[71]	2005–2011	–	71.4	67.2	–
			2005–2007	–	72.1	–	–
			2008–2010	–	72.2	–	–
			2011–2013	–	72.3	–	–
		Saarland[72]	1990–1992	–	–	61.0	56.6
			2000–2002	–	–	60.4	55.2
	Switzerland[66]		1983–1985	–	–	66.0	–
			1986–1988	–	–	62.0	–
			1989–1991	–	–	70.0	–
			1992–1994	–	–	61.0	–
		Vaud[30,73]	1980–1982	–	–	59.0	–
			1983–1985	–	–	59.0	–
			1984–1988	–	–	61.0	–
			1989–1993	–	–	70.0	–
	Netherlands[66,74]*		1983–1985	–	–	66.0	–
			1986–1988	–	–	69.0	–
			1989–1991	–	–	72.0	–
			1992–1994	–	–	66.0	–
			2009–2013	–	–	73.0	–
			2014–2018	–	–	74.0	–
			1989–2018*	–	–	71.0	–
		Eindhoven[75]	1980–2002	–	–	70.4	65.1
	Italy[66]		1983–1985	–	–	60.0	–
			1986–1988	–	–	62.0	–
			1989–1991	–	–	63.0	–
			1992–1994	–	–	67.0	–
		Umbria[76]	1994–1998	85.0	69.0	64.0	–
	Slovenia[66]		1983–1985	–	–	56.0	–
			1986–1988	–	–	61.0	–
			1989–1991	–	–	60.0	–
			1992–1994	–	–	59.0	–

Continued

Continent	Country	Region	Period	1–year	3–year	5–year	10–year
	Spain[66]		1983–1985	–	–	59.0	–
			1986–1988	–	–	59.0	–
			1989–1991	–	–	70.0	–
			1992–1994	–	–	70.0	–
	The Czech Republic[77]*		2000–2004	–	–	62.1	–
			2005–2008	–	–	64.2	–
	Estonia[66,78]*		1983–1985	–	–	51.0	–
			1986–1988	–	–	58.0	–
			1989–1991	–	–	59.0	–
			1992–1994	–	–	49.0	–
			1995–1999	80.0	–	59.0	–
			2000–2004	84.0	–	64.0	–
			2005–2009	86.0	–	69.0	–
			2010–2014	84.0	–	67.0	–
	Lithuania[79]*		1990–1994	–	–	46.9	–
			1995–1999	–	–	51.5	–
			2000–2004	–	–	55.3	–
	Poland[66]		1983–1985	–	–	49.0	–
			1986–1988	–	–	52.0	–
			1989–1991	–	–	48.0	–
			1992–1994	–	–	49.0	–
	Slovakia[66]		1983–1985	–	–	56.0	–
			1986–1988	–	–	60.0	–
			1989–1991	–	–	57.0	–
			1992–1994	–	–	58.0	–
America	Columbia	Cali[80]	1995–1999	77.0	58.0	50.0	47.0
			2000–2004	82.0	63.0	60.0	–
	Cuba[27]		1982	–	–	47.0	–
			1988–1998	76.0	59.0	56.0	–
	Costa Rica[22]		2011–2015	–	–	69.0	–
	Canada	Manitoba[81]	1985–1989	–	–	68.0	–
			1990–1994	–	–	65.0	–
			1995–1999	–	–	72.0	–
	United States[82–84]		1985–1989	–	–	66.0	–
			2006–2012	–	–	68.8	–
			2013–2019	–	–	67.2	–
Oceania	Australia	New South Wales[85,86]	1982–1986	–	–	68.0	–
			1987–1991	–	–	72.0	–
			1993–1996	–	–	73.1	–
	Australia[c][37]		2003–2007	–	–	75.6	–

Continued

Continent	Country	Region	Period	1–year	3–year	5–year	10–year
			2008–2012	–	–	76.3	–
Africa	Uganda	Kampala[38,39]	1993–1997	–	–	18.2	–
			1995–1997	84.1	59.9	–	–

Note. *The survival rate trend was statistically significant in the original article. [a]Only three counties in the Guizhou Province were included in the original article. [c]Six Australian states/territories (New South Wales, Victoria, Queensland, South Australia,Western Australia, and the Northern Territory) were included in the original article. [d]Six registries (Miyagi, Yamagata, Niigata, Fukui, Osaka, and Nagasaki) were included in the original article. [e]Five Thai provinces (Bangkok, Chiang Mai, Khon Kaen, Lampang, and Songkhla) were included in the original article. –, No report or unavailable in the original article.

Table 5. Overall relative/net survival rates (%) of uterine corpus cancer in selected countries and regions during 1980–2019

Continent	County	Regions	Period	1–year	3–year	5–year	10–year
Asia	China	Fujian[53]	2012–2014	–	–	68.3	–
		Haining, Jiashan, Zhejiang[54]	2003–2006	–	–	75.4	–
			2007–2010	–	–	85.2	–
			2011–2014	–	–	87.2	–
		Shanghai[13]	1988–1991	90.2	80.2	77.0	–
		Tianjin[14]	1981–1985	66.3	60.5	58.6	–
		Sihui,Guangdong [9]	2007–2009	–	–	79.6	–
	Japan [b] [57,87]*		1993–1996	–	–	79.5	–
			1997–1999	–	–	76.8	–
			1993–2000	90.4	–	77.7	–
			2001–2006	91.8	–	80.2	–
		Osaka[88,89]	1982–1989	–	–	70.7	–
			1990–1997	–	–	68.5	–
			1989–2000	–	–	–	71.2
	Korea[59,90]		1999–2017	–	–	88.1	–
			1993–1995	–	–	82.9	–
			1996–2000	–	–	82.0	–
			2001–2005	–	–	84.7	–
			2006–2010	–	–	86.5	–
			2011–2015	–	–	87.7	–
			2015–2019	–	–	89.0	–
	Singapore[18]		1983–1987	–	–	68.0	–
			1988–1992	–	–	64.0	–
	Turkey[64]		2009	–	–	85.0	–
America	United States[82–84]		1985–1989	–	–	83.0	–
			2006–2012	–	–	83.4	–

Continued

Continent	County	Regions	Period	1–year	3–year	5–year	10–year
			2013–2019			81.0	
	Costa Rica[22]		2011–2015	–	–	78.0	–
	Cuba[27]		1982	–	–	69.0	–
			1988–1998	81.0	66.0	62.0	–
Oceania	Australia	New South Wales[86]	1993–1996	–	–	79.2	–
Europe[28]			1995–1999	90.3	81.7	78.6	–
	Czech[77]		2000–2004	–	–	76.6	–
			2005–2008	–	–	78.9	–
	Denmark[67,91]		1994–2003	94.0	–	80.0	–
			2005–2009	–	–	83.0	–
	Estonia[92]		1996–2002	–	–	75.0	–
			2003–2009	–	–	73.0	–
			2010–2016	–	–	79.0	–
	Finland[68,93]		1985–1994	92.0	–	82.0	82.0
			1980–1982	–	–	75.9	–
			1985–1987	–	–	75.1	–
			1990–1992	–	–	80.3	–
	Germany[36]		2002–2006	–	–	79.0	–
		Augsburg, Swabia[71]	2005–2011	–	85.4	82.5	–
			2005–2007	–	82.7	–	–
			2008–2010	–	87.3	–	–
			2011–2013	–	88.0	–	–
		Saarland[72]	1990–1992	–	–	81.8	80.8
			2000–2002	–	–	82.8	81.9
	Italy	Umbria[76]	1994–1998	92.0	81.0	79.0	–
	Netherlands[83,94]		1985–1989	–	–	75.2	–
			1989–1993	–	–	77.0	–
			1994–1998	–	–	78.0	–
			1999–2003	–	–	79.0	–
			2004–2008	–	–	80.0	–
		Eindhoven[75]	1980–2002	–	–	81.2	79.1
	Sweden[65,69]		1981–1983	–	–	75.0	–
			1984–1986	–	–	75.0	–
			1987–1989	–	–	73.0	–
			2000–2002	–	–	85.3	–
	Switzerland	Vaud[30]	1984–1988	–	–	78.0	–
			1989–1993	–	–	84.0	–

Note. *The survival rate trend was statistically significant in the original article. –, No report or unavailable in the original article.

Table 6. Overall relative/net survival rates(%) of ovarian cancer in selected countries and regions during 1980–2019

Continent	County	Regions	Period	1–year	3–year	5–year
Asia	China	Fujian[53]	2012–2014	–	–	51.5
		Haining, Jiashan, Zhejiang[54]	2003–2006	–	–	51.1
			2007–2010	–	–	47.2
			2011–2014	–	–	53.1
		Zhejiang[8]	2005–2010	77.3	62.6	55.2
		Qidong, Jiangsu[42,95]	1982–1986	–	–	48.7
			1987–1991	–	–	31.7
			1992–1996	–	–	34.3
			1997–2000	–	–	44.6
			2002-2006	68.0	47.3	45.2
			2007-2011	75.7	50.9	41.9
			2012-2016	78.8	57.9	49.5
		Shanghai[13]	1988–1991	65.7	48.9	44.3
		Tianjin[14]	1981–1985	47.8	37.0	36.3
	Japan[d] [57]		1993–1996	–	–	49.4
			1997–1999	–	–	52.0
		Osaka[88,96]	1985–1994	–	–	40.9
			1982–1989	–	–	27.7
			1990–1997	–	–	33.2
	Korea[59]		1993–1995	–	–	60.1
			1996–2000	–	–	59.4
			2001–2005	–	–	61.7
			2006–2010	–	–	61.3
			2011–2015	–	–	64.8
			2015–2019	–	–	64.5
	Kuwait[63]		2000–2004	73.4	–	38.9
			2005–2009	79.0	–	42.6
			2010–2013	78.3	–	40.3
	Turkey[64]		2009	–	–	50.0
	Philippines	Metro Manila and Rizal[62]	1998–2002	–	–	49.5
	India	Mumbai[20]	1990–1994	51.9	29.0	25.4
	Singapore[18]		1983–1987	–	–	51.0
			1988–1992	–	–	62.0
Africa	Uganda	Kampala[38]	1993–1997	–	–	16.2
America	United States[82,84,97]		1981–1987	69.6	–	36.9
			2006–2012	–	–	46.4
			2013–2019	–	–	50.8
	Canada[98]		2010–2014	71.7	50.1	–
	Canada	Manitoba[99]	1992–1995	64.9	37.2	–

Continued

Continent	County	Regions	Period	1–year	3–year	5–year
			1996–1999	71.0	44.4	–
			2000–2003	72.1	49.1	–
			2004–2007	66.6	43.3	–
			2008–2011	69.6	46.7	–
			1992–2011	68.8	44.4	–
	Costa Rica[22]		2011–2015	–	–	54.0
Oceania	Australia[98]		2010–2014	78.2	56.4	–
		New South Wales[86]	1993–1996	–	–	37.3
	New Zealand[98]		2010–2014	71.4	45.5	–
Europe[28,65,100]			1981–1983	–	–	33.0
			1984–1986	–	–	35.0
			1987–1989	–	–	33.0
			1990–1994			36.7
			1995–1999	70.7	49.9	41.8
	Austria[83]		1985–1989	–	–	44.0
	Czech[77]* [100]		1995–1999	–	–	45.0
			2000–2004	–	–	37.0
			2005–2008	–	–	38.4
	Denmark[67,91,98]		1994–2003	77.0	–	37.0
			2005–2009	–	–	41.5
			2010–2014	77.6	53.6	–
	Finland[34,68,93,100]		1980–1982	–	–	44.8
			1985–1994	68.0	37.0	35.0
			1985–1987	–	–	42.9
			1990–1992	–	–	45.7
			1995–1999	–	–	40.4
			2003–2005	–	–	49.0
	France [101]*		1982–2005	81.0	55.0	44.0
			1982–1989	82.0	49.0	41.0
			1990–1997	74.0	50.0	39.0
			1998–2005	87.0	64.0	49.0
	France[52]		1989–2010	76.0	–	42.0
	Germany[36]		2002–2006	–	–	40.0
		Saarland[45, 72, 102]	1981–1985	–	–	32.0
			1986–1990	–	–	34.4
			1991–1995	–	–	39.4
			1999-2003	–	–	45.2
			2000–2002	–	–	45.7
		Augsburg, Swabia [71]	2005–2011	–	48.0	40.2
			2005–2007	–	41.7	–

Continued

Continent	County	Regions	Period	1–year	3–year	5–year
			2008–2010	–	52.4	–
			2011–2013	–	66.3	–
	Ireland[98]		2010–2014	69.2	44.8	–
	Italy[100]		1995–1999	–	–	41.0
		Umbria[76]	1994–1998	73.0	48.0	42.0
		Modena[100]*	1990–1997	–	–	41.0
			1998–2005	–	–	36.0
	Norway[98] [100]*		1991–1995	–	–	39.9
			1996–2000	–	–	44.1
			2010–2014	77.7	57.2	–
	Slovenia[100]*		1993–1997	–	–	37.0
			1998–2002	–	–	46.0
	Spain[83]		1985–1989	–	–	41.0
	Sweden[46,69,83]		1985–1989	–	–	45.0
			2000–2002	–	–	47.5
			2009–2013	–	–	37.0
	Switzerland[83]		1985–1989	–	–	40.0
		Vaud[30]	1984–1988	–	–	32.0
			1989–1993	–	–	37.0
		Geneva[100]*	1990–1994	–	–	39.0
			1994–1998	–	–	48.0
	UK[98]		2010–2014	70.4	–	47.3
	UK–Northern Ireland[100]*		1993–1996	–	–	41.6
			2001–2004	–	–	43.6
	UK–Scotland[100]*		1992–1996	–	–	32.8
			1997–2001	–	–	40.6
	The Netherlands[103]		1989–1991	–	–	36.0
			2007–2009	–	–	41.0
		Eindhoven[75,104]	1980–2002	–	–	40.3
			1981–1985	–	48.0	42.0
		Amsterdam[100]*	1993–1996	–	–	37.0
			2001–2005	–	–	40.0

Note. *The survival rate trend was statistically significant in the original article. [d]Six registries (Miyagi, Yamagata, Niigata, Fukui, Osaka, and Nagasaki) were included in the original article. –, No report or unavailable in the original article.

The age-standardized 5-year relative or net survival rates for cervical cancer varied widely around the world[21,106-111]. The highest was 93.6% in Nigeria and Ibadan (2000–2004), while the lowest was 19.4% in Guadeloupe (2010–2014). Survival was in the range of 50%–70% in most countries and regions (Figure 2). For endometrial cancer, the rates ranged from 60% to 80% in most countries[65,92,112-119], with the highest 5-year rate in the United States (1985–1989) at 83.2%, and the poorest in Poland (1981–1983) at 52.8% (Figure 3). The prognosis of ovarian cancer is typically worse than that of cervical and endometrial cancers, with a rate of less than 50%, regardless of the economic status of the

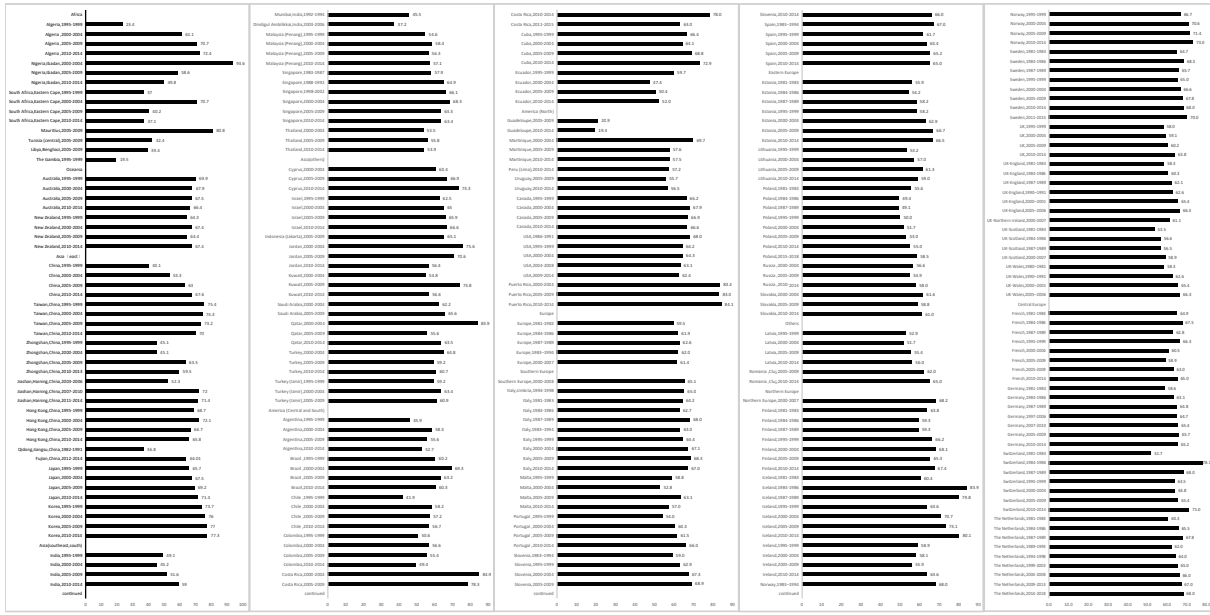

Figure 2. Age-standardized 5-year relative/net survival rates (%) of cervical cancer in selected countries and regions, 1980–2015.

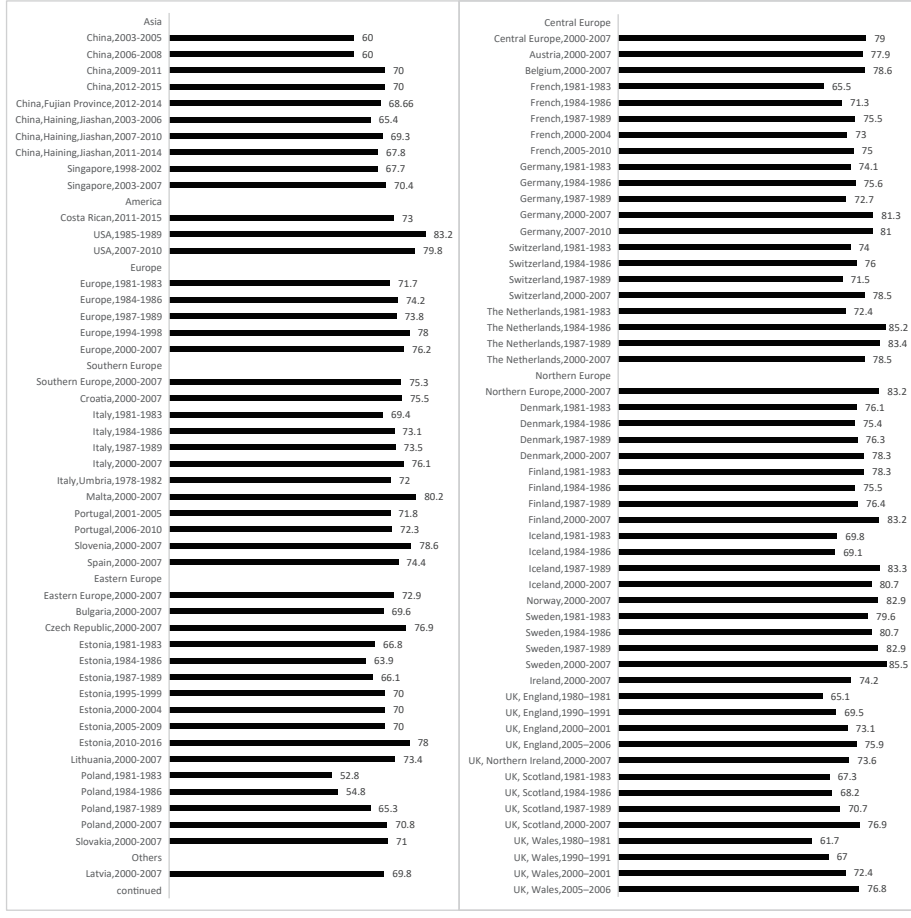

Figure 3. Age-standardized 5-year relative/net survival rates (%) of uterine corpus cancer in selected countries and regions, 1980–2015.

country[47,65,76,108,109,112,120-124] (Figure 4).

Time Trend Analysis

The 5-year OSR trends of cervical cancer have increased by 20%–40% in Qidong, Jiangsu, China[6] and in Sihui, Guangdong Province, China [9,43], and by 5%–10% in Singapore[18], Vaud, Switzerland [30,125], Bulgaria[35] and Cuba[27] (Table 1). For women diagnosed with endometrial cancer between 2007-2009, the 5-year OSR was 78.1% in Sihui, Guangdong, China, a significant increase from 7.4% for women diagnosed 20 years ago[9] (Table 2). The 5-year OSR improvements of more than 5.0% in ovarian cancer were found in Singapore (from 56.0% in 1983–1987 to 64.0% in 1988–1992)[18] and Saarland, Germany (from 29.9% in 1981–1985 to 37.2% in 1991–1995)[45] (Table 3).

The 5-year relative or net survival rate trends of cervical cancer from the 1980s to the 2010s increased by 20%–40% in Qidong, Jiangsu, China[6], in Haining, Zhejiang, China[54], in Bangkok, Thailand[61], and in Finland[66,68]. Survival increased by 5%–20% in Osaka, Japan[58], Singapore[18], Chiang Mai, Thailand[61], Lampang, Thailand[61], Kuwait[63], Cuba[27], Cali, Columbia[80], and nine European countries (Denmark[66,67], Iceland[66], Sweden[33,66,69], Scotland[66], Netherlands[66,74], Italy[66], Spain[66], Estonia[66,78] and Lithuania[79]) (Table 4). For endometrial cancer, the 5-year survival trends were rather flat in the United States[83,84] and Sweden[28, 41,65], but increased in Haining, Jiashan, Zhejiang, China [54], Korea[59,126], and the Netherlands[83,94] (Table 5). From the 1980s to the 2010s, the 5-year survival trends of ovarian cancer increased by 5%–10% in Osaka, Japan[88,96], Singapore[18], the United States[82,84,97], Saarland, Germany[45, 72,102], Slovenia[100], Geneva[100], and Switzerland[83] (Table 6).

For the time changes, the age-standardized 5-year relative or net survival rates for cervical cancer increased over time in many countries and regions, including those in a few countries such as Australia, Nigeria, Ibadan, Costa Rica, and the United States (Figure 2). The 5-year survival rates of endometrial cancer continued to increase until 2015 in Asian and European countries, with an increase of more than 10% in China, Estonia, Poland, England, and Wales (Figure 3). In most countries and regions, the 5-year survival rate for ovarian cancer has increased or fluctuated from 1980 to 2015. These rates increased by more than 10% in Japan, Ecuador, Algeria, Cuba, Latvia, Estonia, Ireland, England, and Costa Rica (Figure 4). In addition, in Argentina, Colombia, South Africa (Eastern Cape), Thailand, France, and Italy, this rate fell by more than 10%.

Survival by Age Group

Supplementary Tables S3–S5 (available in www.besjournal.com) compare the age-specific relative or net survival rates for gynecological cancer. Generally, survival rates gradually decrease with increasing age, wherein patients aged ≥ 75 years have the worst prognoses. However, there are exceptions in some regions. For cervical cancer, the lowest rate was in the 65–74-year age group in Qidong, Jiangsu, China (2001–2007)[127]. The worst prognosis for ovarian cancer was in the 65–74-year age group in Mumbai and Europe (1981–1983). As compared with other countries and regions, Taizhou, Zhejiang, China (2014–2018)[128] had a better prognosis for cervical cancer in each age group.

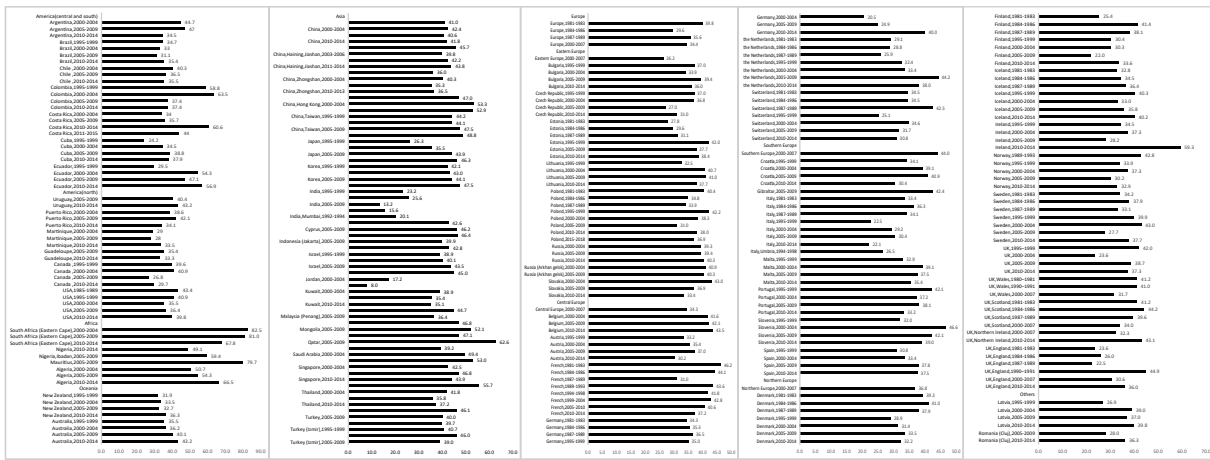

Figure 4. Age-standardized 5-year relative/net survival rates (%) of ovarian cancer in selected countries and regions, 1980–2015.

Besides, the survival rates of endometrial cancer demonstrated a consistent improvement over time, particularly among patients aged ≥ 75 years in Europe[28, 41,65,114].

Survival by Clinical Stage

Supplementary Tables S6–S8 (available in www.besjournal.com) illustrates the 5-year relative or net survival rates for gynecological cancers by country and stage, respectively. Cases registered as localized or stage I-II exhibited better 5-year survival rates than those in other stages. The 5-year survival rates of patients in the early stages are usually between 80% and 90%; as the disease progresses to advanced stages, the rates drop significantly to below 20%. Furthermore, the rates of cervical cancer for each clinical stage showed significant improvements in Osaka, Japan (from to 1987–1994 to 2003–2010)[58] and Lithuania (from to 1990–1994 to 2000–2004)[79]. The 5-year survival rates remained flat in Korea (from to 1996–2015 to 2015–2019)[59,60].

Survival by Histological Type

Supplementary Tables S9–S11 (available in www.besjournal.com) show the pathology-specific 5-year relative/net survival rates of gynecological cancers. The prognosis of patients with squamous cell carcinoma (SCC) was similar to that of patients with adenocarcinoma (ADC) and adenosquamous carcinoma (ASC) in most countries and regions (Supplementary Table S8). SCC shows slightly better survival than non-SCC histology[55,60,64,73,74,78]. For endometrial cancer, the 5-year rates were higher in patients with endometrial carcinoma and mucinous adenocarcinoma than in those with other histological subtypes (Supplementary Table S9). For ovarian cancer, the 5-year rates of germ cell and sex cord-stromal tumors were higher than those of epithelial ovarian cancers (Supplementary Table S10). Among the different histological types of epithelial ovarian cancer, endometrioid, mucinous, and clear cell ovarian cancers have a higher 5-year relative/net survival than serous, not otherwise specified (NOS), and other epithelial cancers.

DISCUSSION

In this study, we systematically collected and summarized the global survival features and long-term trends among common gynecological cancers. We also compared the survival rates by region, diagnostic period, stage, histological type, and age group. The overall survival rate in developed countries was generally higher than that in developing countries. The 5-year survival rates for cervical and endometrial cancers have increased in several Asian and European countries and regions. The magnitude of this increase was greater in developing than in developed countries. However, the trend for ovarian cancer fluctuated in most countries but increased in a few countries.

Survival rates of cervical and endometrial cancers were lower in low-HDI countries. For instance, the survival rate in Africa was poorer than that in other continents; Eastern Europe was poorer than that in other parts of Europe. A global study showed that cancer outcomes were significantly correlated with economic indicators[129]. Countries with high HDI usually have more sophisticated health systems, wider medical security, and higher levels of medical services. There was more than a 10-fold difference in median physician densities between the lowest and highest HDI quintiles[130]. Compared with the number of patients with cancer in Latin American countries, there are fewer oncologists, radiotherapists, cancer surgeons, and palliative care professionals in the Caribbean region[131,132]. Areas with low HDI often experience limited access to medical resources, inadequate healthcare facilities, and unequal distribution of medical services, thus resulting in lower rates of early cancer screening and diagnosis as well as inaccurate detection of cancer. Denny discussed the challenges in cancer survival data from Africa and pointed out that limitations in detection and diagnostic technologies significantly affect the accuracy of the data collected from these areas[133].

The 5-year survival rates for cervical cancer have improved in Asia and Europe, but remain stagnant in other countries across North America and Oceania. This discrepancy can be attributed to the implementation of more comprehensive screening programs in these regions, aimed at the early detection of precancerous cells and localized tumors that can be effectively treated using a range of simple techniques, thereby reducing the overall incidence of cancer. However, screening may have limited efficacy in detecting aggressive tumor types[108]. Human papillomavirus (HPV) infections are also associated with cervical cancer. Cervical cytology (i.e., liquid-based cytology) and HPV DNA testing are important for its prevention and early diagnosis[134,135]. The early detection and treatment of precancerous cervical lesions can significantly improve survival rates.

In the past 40 years, the survival rate of patients with endometrial cancer has increased, probably due

to improvements in treatment methods and precision. With the continuous increase in medical research, the treatment methods for endometrial cancer have improved, thereby leading to an increase in patient survival rates. With the development of genetic testing and molecular targeted therapy, doctors can more accurately formulate treatment plans according to an individual's condition, thus improving treatment effectiveness and survival rate[136]. Molecularly targeted therapies, such as hormonal drugs[137], immune checkpoint inhibitors[138], drugs targeting ERBB2/HER2[139], poly-ADP-ribose polymerase (PARP) inhibitors[140] and others molecularly targeted therapies[141,142], have become a promising therapeutic modality to improve the prognosis of endometrial cancer.

Ovarian cancer is associated with a low survival rate, partly because of difficulties in early diagnosis and the development of metastases. In addition, low survival is related to the evasion of immune system function[143]. Surgery and chemotherapy are the mainstay treatments for ovarian cancer; however, patients often relapse within a few years after initial treatment because of chemotherapy resistance[144]. Immunotherapy has evolved rapidly over the last two decades, revolutionizing the treatment of a wide range of cancers. New treatment technologies, such as therapeutic targets, neoadjuvant immunotherapy, and nanomedicine, have the potential to prolong patient survival[145].

Our findings suggest that the survival rates for gynecological cancers have increased in China over the past four decades; however, there are still large differences in 5-year survival rates between cities over the same period. For example, in the late 1980s, the 5-year relative/net survival rates for cervical cancer were 52.1% in Shanghai and 31.1% in Qidong. Some of the main reasons for this disparity are as follows. There are significant differences in medical resources between cities, including the distribution of hospital facilities, medical technology levels, and medical talent. Some large cities usually have more advanced medical equipment, more aggressive early screening activities, and higher levels of healthcare teams, thus allowing for better and more advanced treatment services for gynecological cancers[146]. Song et al. suggested that HPV vaccination rates in the Chinese female population of an appropriate age group were affected by the varying economic, health, and educational levels of each region[147].

Survival rates for cervical, endometrial, and ovarian cancers vary significantly across different stages. The cervical cancer results were similar to those of a previous retrospective cohort study[148]. Advanced cancer often entails a heavy tumor burden accompanied by distant metastasis or organ invasion, thus increasing treatment complexity and risk for recurrence[149-152]. Advanced cancers require more invasive treatments, such as radiation therapy, chemotherapy, or surgery. Consequently, these interventions can result in adverse effects and complications[153].

There are differences in survival rates among the various histological types of gynecological cancers. Different histological types of cancer have different biological characteristics, including growth patterns, cell morphology, and degree of differentiation, which may affect the tumor growth rate, degree of invasion, and sensitivity to treatment[154,155]. Cancers of different histological types tend to occur in different patient populations, depending on age, sex, genetic background, and living environment, which may affect a patient's response to treatment and survival[156,157]. Therefore, it is necessary to implement individualized treatments for gynecological tumors of different histological types to improve the therapeutic effect and survival rate.

Age characteristics of the survival of patients with gynecological cancers are also summarized in our review. Survival rates decline with age in most countries and regions, with the lowest survival rates observed in individuals aged ≥ 75 years. Poor prognosis in the elderly may be attributed to several factors, including physiological changes[158], psychological factors[159], health status, treatment tolerance and compliance[160,161], and nutritional status. Older individuals often develop multiple chronic diseases. Conditions such as cardiovascular disease, diabetes, and renal dysfunction can affect the efficacy of cancer treatments and overall tolerability[159]. Even after adjusting for frailty, comorbidities, and socioeconomic status, elderly patients remain under-treated[162]. A population-based study shows that patients aged ≥ 70 years were significantly less likely to be seen by a gynecologic oncologist in their course of treatment[163]. Finally, some older adults may experience malnutrition or physical depletion due to dietary changes or reduced absorption capacity[164,165], thus hurting their treatment tolerance and recovery efficacy.

Several factors must be considered when comparing the survival rates across countries and over time. First, we collected only OSRs and

relative/net survival rates. However, other indicators, such as disease-specific survival rates, were not assessed. Second, the survival rates were considered either too high or low in some countries. The reliability of survival estimates is compromised due to the significant loss of follow-up within 5 years after diagnosis, limited registration based solely on death certificates or autopsy reports, and cases with unknown vital status or incomplete registration dates in some countries and regions, such as Africa (Algeria, Nigeria, South Africa), America (Colombia, Costa Rica, Guadeloupe), and Asia (Cyprus, Malaysia, Qatar, Thailand). Third, some studies excluded patients aged ≤ 18 years in this review.

In conclusion, we summarized the 1-, 3-, 5-, and 10-year survival rates for common gynecological cancers over the past four decades globally, which showed significant differences among countries and regions. To improve the survival rate of gynecological cancers, especially ovarian cancer, there is a need to strengthen international cooperation, share the latest research results and treatment experiences, and promote treatment improvement globally. Developing countries should invest more resources in the development and promotion of screening campaigns for early stage cancers, and raise awareness of early symptoms among medical personnel and the public, so that more patients can be diagnosed and treated at an early stage.

AUTHOR'S CONTRIBUTIONS

Yongbing Xiang designed the research and obtained funding; Xiaohui Zhou, Danni Yang, Qun Xu, and Yongbing Xiang conducted the study; Xiaohui Zhou and Danni Yang collected publications and abstract data; Xiaohui Zhou, Qun Xu, and Yongbing Xiang prepared and wrote the first draft; Xiaohui Zhou, Danni Yang, Yixin Zou, Dandan Tang, Jun Chen, Zhuoying Li, Qiuming Shen, Qun Xu, and Yongbing Xiang reviewed and approved the final version of the manuscript; Yongbing Xiang had primary responsibility for the final content.

CONFILCTS OF INTEREST

All authors declare no conflicts of interest.

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Not applicable.

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