Cabasag Citadel Jungco (Orcid ID: 0000-0003-0680-0060)
Ferlay Jacques (Orcid ID: 0000-0003-4927-6932)
Morgan Eileen (Orcid ID: 0000-0002-4242-6240)
Gourley Charlie (Orcid ID: 0000-0002-2377-7221)
Bray Freddie (Orcid ID: 0000-0002-3248-7787)
Soerjomataram Isabelle (Orcid ID: 0000-0002-6017-741X)

Shifting incidence and survival of epithelial ovarian cancer (1995-2014): a SurvMark-2 study

Short title: Incidence and survival of epithelial ovarian cancer

Citadel J. Cabasag[1], Melina Arnold[1], Mark Rutherford[1,2], Jacques Ferlay[1], Aude Bardot[1], Eileen Morgan[1,3], John Butler[4], Dianne L O'Connell[5], Gregg Nelson[6], Claus Høgdall[7], Tine Schnack[7,25], Anna Gavin[3], Mark Elwood[8], Louise Hanna[9], Charlie Gourley[10], Prithwish De[11], Nathalie Saint-Jacques[12], Lina Steinrud Mørch[13], Ryan R Woods[14], Alon D. Altman[15,16], Peter Sykes[17], Paul A. Cohen[18,19], Orla McNally[20,21], Bjørn Møller[22], Paul Walsh[23], David S Morrison[24], Freddie Bray[1], Isabelle Soerjomataram[1]

1 International Agency for Research on Cancer, Lyon, France

2 Biostatistics Research Group, Department of Health Sciences, University of Leicester, Leicester, UK

3 Northern Ireland Cancer Registry, Centre for Public Health, Queen's University Belfast, Belfast, Northern Ireland, United Kingdom

4 Royal Marsden Hospital, London, England, United Kingdom

5 The Daffodil Centre, The University of Sydney, a joint venture with Cancer Council NSW, Australia

6 Tom Baker Cancer Centre, University of Calgary, Calgary, Alberta, Canada

7 Department of Gynecology, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark

8 Department of Epidemiology and Biostatistics, School of Population Health, University of Auckland, New Zealand

9 Velindre Cancer Centre, Cardiff, Wales, United Kingdom

10 Institute of Genetics and Cancer, Cancer Research UK Edinburgh Centre, The University of

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Edinburgh, Scotland, United Kingdom

11 Ontario Health, Toronto, Canada

12 Nova Scotia Health Cancer Care Program, Halifax, Nova Scotia, Canada

13 The Danish Cancer Society Research Center, Cancer Surveillance and Pharmacoepidemiology Copenhagen, Denmark

14 Cancer Control Research, BC Cancer, Vancouver, British Columbia, Canada

15 Department of Obstetrics, Gynecology and Reproductive Sciences, University of Manitoba, Manitoba, Canada

16 CancerCare Manitoba Research Institute, Manitoba, Canada

17 University of Otago, Christchurch, New Zealand

18 Department of Gynaecological Oncology, St John of God Subiaco Hospital, Perth, Western Australia, Australia

19 Discipline of Obstetrics and Gynaecology, Medical School, University of Western Australia, Perth, Western Australia, Australia

20 Royal Women's Hospital, Melbourne, Australia

21 University of Melbourne, Melbourne, Australia

22 Cancer Registry of Norway, Norway

23 National Cancer Registry Ireland, Ireland

24 Scottish Cancer Registry, Scotland

25 Odense University Hospital, Odense, Denmark

Corresponding author

Isabelle Soerjomataram
Cancer Surveillance Branch
International Agency for Research on Cancer
Email: soerjomatarami@iarc.who.int

Novelty and Impact:

Our study provides a comprehensive assessment on incidence and survival of epithelial by histological subtype in seven high-income countries between 1995 and 2014. The differences in temporal incidence trends and survival patterns by subtype observed in our study are likely attributable to changes in national cancer management, advancement in diagnostic procedures, and changes in the prevalence of risk factors.

Keywords: net survival, population-based; epithelial ovarian cancer; histological subtype; cancer surveillance

List of Abbreviations:

AAPC – average annual percent change

ASR – age standardized incidence rates

DCO – death certificate only

EOC – epithelial ovarian cancer

ICBP – International Cancer Benchmarking Partnership

ICD-O-3 – International Classification of Disease for Oncology, 3rd revision

NOS – not otherwise specified

NS – net survival

SEER – Surveillance, Epidemiology, and End Results

UK – United Kingdom

WHO – World Health Organization

Article Category: Cancer Epidemiology

Abstract

The aim of the study is to provide a comprehensive assessment of incidence and survival trends of epithelial ovarian cancer (EOC) by histological subtype across seven high income countries (Australia, Canada, Denmark, Ireland, New Zealand, Norway, and the United Kingdom). Data on invasive EOC diagnosed in women aged 15-99 years during 1995-2014 were obtained from 20 cancer registries. Age standardized incidence rates and average annual percentage change were calculated by subtype for all ages and age groups (15-64 and 65-99 years). Net survival (NS) was estimated by subtype, age group, and 5-year period using Pohar-Perme estimator. Our findings showed marked increase in serous carcinoma incidence was observed between 1995-2014 among women aged 65-99 years with average annual increase ranging between 2.2% and 5.8%. We documented a marked decrease in the incidence of adenocarcinoma 'not otherwise specified' with estimates ranging between 4.4% and 7.4% in women aged 15-64 years and between 2.0% and 3.7% among the older age group. Improved survival, combining all EOC subtypes, was observed for all ages combined over the 20-year study period in all countries with 5-year NS absolute percent change ranging between 5.0 in Canada and 12.6 in Denmark. Several factors such as changes in guidelines and advancement in diagnostic tools may potentially influence the observed shift in histological subtypes and temporal trends. Progress in clinical management and treatment over the past decades potentially plays a role in the observed improvements in EOC survival.

Introduction

In 2020, approximately 314,000 women were diagnosed with ovarian cancer and approximately 207,000 died from this disease globally [1]. Despite a decline in the incidence of ovarian cancer, particularly in high income countries [2], it is the 8th leading cause of cancer death among women [1]. Ovarian cancer is a heterogeneous disease with multiple histological subtypes. Approximately 90% of ovarian cancer diagnoses are epithelial ovarian cancer (EOC) [3, 4], which historically has been further divided into serous, mucinous, endometrioid, clear cell carcinomas, and adenocarcinoma 'not otherwise specified' (NOS) [5]. These subtypes have distinct etiologies and risk factors and different molecular, histopathological and clinical characteristics [4, 6, 7].

Prognosis varies by histological subtype, stage, and tumor grade. Both localized and advanced-stage low-grade serous and endometrioid carcinomas have more favorable outcomes with higher overall survival compared to other EOC subtypes, based on an analysis of more than 28,000 incident EOC cases in the Surveillance, Epidemiology, and End Results (SEER) cancer registry in the United States diagnosed 2004-2014 [8]. Advanced stage clear cell carcinoma has a high risk of relapse and poor prognosis compared with other subtypes, whereas early-stage clear cell carcinoma is associated with more favorable prognosis [9, 10].

A recent study from the International Cancer Benchmarking Partnership (ICBP) SurvMark-2 project, a collaboration of clinicians, policymakers, researchers, and cancer data experts, showed overall improvement in 5-year net survival (NS) between 1995 and 2014, reaching up to 36-46% in the most recent period (2010-2014) [11]. However, ovarian cancer is a group of different diseases varying in their etiologies, pathogenesis, treatment responses and prognoses. To address this diversity, in this paper we provide comprehensive estimates of the incidence of EOC and survival of women diagnosed with EOC by histological subtypes and age at diagnosis over time across seven high income countries with universal access to healthcare and comparable health expenditure.

Materials and Methods

Ovarian cancer data were obtained from 20 population-based cancer registries in seven countries, namely, Australia (New South Wales, Victoria, and Western Australia); Canada (Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island, and Saskatchewan); Denmark; Ireland; New Zealand; Norway; and the United Kingdom (UK) (England, Northern Ireland, Scotland, and Wales). Details on the data processing and data quality were previously described by Arnold and colleagues [11]. Each cancer registry data was subjected to several data quality assessments and each case was checked for consistency. Editorial tables which included quality indicators (e.g., % of death certificate only cases, and % of morphologically verified cases) were constructed and communicated to the registries. Any issues identified were also followed-up and discussed between investigators and registry staff. Revised datasets were submitted by the participating cancer registry when necessary.

In our study, ovarian cancer was defined based on the *International Classification of Disease for Oncology 3rd revision* (ICD-O-3) as malignant cancer of the ovary (C56), malignant cancer of the fallopian tubes (C57.0), and malignant cancer of the peritoneum (C48.1-2 with the following histology: 8010-8035, 8041-8046, 8050- 8148, 8160-8231, 8246, 8250-8530, 8541, 8550-8576, 8590-8670, 8931, 8933, 8934, 8935, 8950, 8959, 8980-8982, 9000, 9014, 9015, 9060-9090, 9100, 9110). Supplementary figure 1 summarizes the overall inclusion and exclusion criteria in the study. Initially, there were 221,476 ovarian cancer cases diagnosed from 1 January 1995 to 31 December 2014; except for Ireland where data were only available until 31 December 2013 at the time of collection. All cases were followed until 31 December 2015, except for two Canadian cancer registries (Ontario and Newfoundland), with follow-up to 31 December 2014. Our study only included first primary ovarian malignant tumors. Non-invasive tumors and tumors with specified 'borderline' histology codes 8442, 8451, 8462, 8472, and 8473

(n=1,192) were excluded. In addition, only morphologically verified ovarian cancer (with the following basis of diagnosis: cytology, histology of the metastatic site, and histology of the primary tumor) (n=31,437) were included. Additionally, age at diagnosis less than 14 years and over 99 were excluded (n=612). All non-epithelial ovarian cancer were excluded (n=13,189). Of all cases eligible for analysis (n=175,046), we excluded death certificate only (DCO) and autopsy only cases, and cases with invalid or missing dates for the survival analysis (n=207).

EOCs were grouped into five histological subtypes based on the histological grouping presented in Cancer in Five Continents Volume XI (https://ci5.iarc.fr/CI5-XI/Pages/Chapter4.aspx): serous carcinoma (8441, 8460–8463 and 9014); mucinous carcinoma (8470–8490 and 9015); endometrioid carcinoma (8380–8383, 8560 and 8570); clear cell carcinoma (8310–8313 and 9110); and adenocarcinoma NOS (8140–8147, 8170–8190, 8211–8231, 8260, 8384, 8440 and 8576). All other remaining epithelial tumors including other specified and unspecified EOC (8010–8035) were grouped as 'other' EOC. As low grade serous ovarian cancer was only recognized as a separate disease entity in 2014 according to the World Health Organization (WHO) guidelines [12], low-grade and high-grade serous cancers were considered together as "serous" carcinoma.

Age standardized incidence rates (ASRs) (per 100,000 person-years) were calculated for two age groups (15-64 years and 65-99 years), as well as by calendar year and histological subtype for each country using the World Standard population by Segi and colleagues [13, 14]. ASRs were also estimated for 5-year study periods: 1995-1999, 2000-2004, 2005-2009, and 2010-2014. The average annual percent change (AAPC) was calculated for 1995-2014 to summarize the change in incidence over time. AAPC is the average annual rate of change in the ASR and is estimated by fitting a simple regression model to the log of the ASR.

The age-standardized NS, which is defined as survival if ovarian cancer was the only possible cause of mortality in the defined population [15], was estimated by histological subtype, study period, and country.

The cohort analysis approach was used for the first three study periods, and the period analysis approach was used for the last study period 2010-2014, with analysis period window of 2012-2014. To account for differences in disease patterns across populations, background mortality rates obtained from life tables provided by each cancer registry containing all-cause death rates by sex, age, and calendar year (for 1995-2015) were used. The age-standardized 1- and 5-year NS were calculated using the Pohar-Perme estimator [16] and the International Cancer Survival Standard [17]. The *stnet* command in Stata was used to calculate all NS estimates and 95% confidence intervals [18]. All incidence and survival estimates are presented by country. Survival by jurisdictions (Canada, UK, and Australia) are presented as supplementary materials. All analyses were performed using Stata/IC version 14.2.

Results

Overall incidence trends and patient characteristics

In general, the median age at diagnosis among women in the study was 64-65 years. Overall, serous carcinoma is the most common EOC subtype in the study. Information on tumor grade were mainly missing for most countries across all study periods. In 2010-2014, majority of the countries had <50% completeness for the tumor grades for serous carcinoma except Ireland (73.7%) and Norway (68.4%) (Supplementary table 1).

Table 1 presents the proportions of EOC by histological subtype and ASRs (per 100,000 women) for each 5-year study period. The overall incidence of EOC for most countries was generally stable comparing 2010-2014 and 1995-1999 study periods. Norway (15.0), Denmark (13.2) and the UK (13.2) had the highest incidence of EOC for the 2010-2014 period. Serous carcinoma is the most common EOC subtype, with proportions ranging between 47.9% in Ireland and 64.9% in Denmark for the most recent study period (2010-2014), followed by adenocarcinoma NOS which ranged between 12.2% in Australia and

20.3% in Ireland. Women diagnosed with adenocarcinoma NOS were older with median age at diagnosis ranging between 70 and 75 years for 2010-2014. The median age at diagnosis for serous carcinoma ranged between 63 and 67 years for all countries, whereas for women diagnosed with mucinous (51-60 years), endometrioid (54-66 years), and clear cell (55-62 years) carcinomas the median age was younger.

Age-standardized incidence rates for epithelial ovarian cancers by histological subtype

In general, serous carcinoma had the highest incidence rate among all EOC subtypes with ASR ranging between 4.9 (per 100,000 person-years) in Canada and 9.7 in Norway for the 2010-2014 study period, followed by adenocarcinoma NOS with ASRs ranging between 1.0 in Australia and Canada and 2.0 in Ireland (Table 1). The overall incidence trends for serous carcinoma for all ages combined have been generally stable in the past two decades, except for UK which showed an average annual increase of 3.3% (95% CI: 0.5, 6.1) (Table 2 & Fig 1). In contrast, adenocarcinoma NOS incidence rates for all ages combined have been decreasing, with the largest decline of 5.6% annually (95% CI:-9.5, -1.6) observed in Denmark. A significant decrease in the overall incidence of mucinous carcinoma were observed in Ireland (AAPC=-5.3%, 95% CI:-10.1, -0.3) and New Zealand (-6.0%, 95% CI:-11.4, -0.4), while in Denmark (AAPC=-5.3, 95% CI:-10.0, -0.4) a significant decline in incidence was observed for endometrioid carcinoma. The overall incidence rates for clear cell and 'other' EOC have generally remained stable in most countries in the study.

Among the 15-64 age group, a significant decrease in incidence of adenocarcinoma NOS was observed for some countries with the largest decline found in New Zealand (AAPC=-7.4%, 95% CI:-13.3, -1.0) (Table 2 & Supplementary figure 2). Furthermore, a statistically significant decrease in mucinous carcinoma (AAPC=-6.1%, 95% CI:-11.6, -0.3) was observed in New Zealand, and a significant decrease in endometrioid carcinoma (AAPC=-5.9, 95% CI:-11.1, -0.3) was observed in Denmark.

Among the older age group (65-99 years) serous carcinoma showed important changes in incidence rates over time, with a statistically significant increase observed in five out of the seven countries with AAPC ranging between 2.2% (95% CI:0.8, 3.6) in Australia and 5.8% (95% CI:4.3, 7.4) in the UK (Table 2 & Supplementary figure 2). In contrast, the incidence of adenocarcinoma NOS showed statistically significant decreases over time for most countries, with annual reductions of 2.0% (95% CI:-3.6, -0.3) to 3.7% (95% CI:-5.5, -1.8) to observed in UK and Denmark, respectively. Large reductions in mucinous (2.7% to 5.8%) and endometrioid (0.8% to 5.7%) carcinomas were also observed among the older age group. Significantly decreasing trends were also observed in New Zealand (AAPC=-4.8, 95% CI:-8.5, -0.9) and Denmark (AAPC=-7.6, 95% CI:-11.3, -3.8) for 'other' EOC.

Age-standardized NS for epithelial ovarian cancers by histological subtypes and age over time

Overall, there was a 10.5 points percent difference for 1-year NS and 8.4 points percent difference for 5-year NS between 1995-1999 and 2010-2014 among all EOC for all countries combined (Supplementary table 2). Marked differences in 1- and 5-years survival were observed between countries in the study in the most recent study period (2010-2014). The highest 5-year overall NS (combining all ages and subtypes) was observed in Norway (NS=47.8%, 95% CI:44.4, 51.0) followed by Denmark (NS=44.3%, 95% CI:41.2, 47.2) and Australia (NS=43.5%, 95% CI:41.1, 45.8) (Table 3). The 1-year overall NS ranged between 72.7% (95% CI:68.8, 76.1) in Ireland and 81.4% (95% CI:79.8, 82.8) in Australia.

For women diagnosed with serous carcinoma, the 5-year NS for all ages combined generally improved between the first and last study periods (Figure 2) with the 5-year NS ranged between 32.2% (95% CI:27.3, 37.1) in New Zealand and 47.5% (95% CI:43.2, 51.6) in Norway in the most recent study period. Similar trends were observed for age groups 15-64 and 65-99 years (Supplementary table 3). Further, comparable survival trends were observed in 1- and 5-year NS across study periods by Australian, Canadian, and UK jurisdictions (Supplementary figure 3). A sensitivity analysis was performed to assess

survival for high-grade serous carcinoma (grades III and IV) in the most recent study period (2010-2014) for countries with >50% completeness (Ireland and Norway). Supplementary table 4 presents NS for high-grade serous carcinomas. Our findings showed a slightly increase in 1-year NS for both countries (Ireland: 81.7% vs 77.0% and Norway: 86.4% vs 84.8%), while a slight decrease in 5-year NS was observed (Ireland: 30.7% vs 33.0% and Norway: 46.5% vs 47.5%). Adenocarcinoma NOS had the lowest NS compared to other EOC subtypes. In 2010-2014, the 5-year all ages combined NS ranged between 15.7% (95% CI:12.1, 19.8) in Canada and 22.6% NS (95% CI:16.4, 29.5) in Norway (Table 3). In comparison with the initial study period, we observed lower 1- and 5-year NS for the study period 2010-2014 in some countries particularly in the younger age group (Supplementary table 3). In contrast, women diagnosed with endometrioid carcinoma had higher survival compared to those with other EOC subtypes. In 2010-2014, the 5-year NS for all ages combined was above 63% across all countries ranging between 63.5% (95% CI: 44.6%, 77.54%) in Ireland and 90.1% (95% CI: 66.1%, 97.4%) in New Zealand (Table 3). A large improvement in 5-year NS over time (1995-1999 versus 2010-2014) was also observed for this subtype in most countries across age groups.

In general, mucinous, and clear cell carcinomas showed similar trends. The 5-year all ages combined NS for mucinous carcinoma ranged between 55.0% (95% CI:38.1, 69.0) in Ireland and 71.9% NS (95% CI:67.4, 75.9) in the UK, while the 5-year NS for clear cell carcinoma ranged between 46.5% (95% CI:25.7, 65.0) in Ireland and 68.2% (95% CI:55.6, 77.9) in Australia (Table 3). The 1-year NS for these two cancers were above 70% across countries and age groups. Overall, the 1 and 5-year survival for both mucinous and clear cell carcinomas improved (1995-1999 versus 2010-2014) in almost all countries and age groups (Supplementary table 3).

Age-standardized NS for epithelial ovarian cancers by histological subtypes and stage at diagnosis

We assessed the survival by stage and histological subtype for all countries combined in the latest study period, 2010-2014 (Supplementary table 5). Our result showed highest 5-year survival observed among

women with localized stage with NS of 92.4% (95% CI: 88.6, 95.0) for all EOC combined and lowest among distant stage with NS of 25.0% (95% CI: 24.0, 25.9). Among distant stage tumors, endometrioid carcinoma had the highest survival of 43.9% (95% CI: 36.1, 51.4), and adenocarcinoma NOS had the lowest survival of 12.5% (95% CI: 10.8, 14.3).

Discussion

This population-based study provides the most up-to-date estimated incidence and survival of EOC by histological subtype and age at diagnosis in seven high-income countries between 1995 and 2014. Our assessment of the incidence trends by histological subtype revealed substantial increases in the incidence of serous carcinoma particularly among women aged 65-99 years over the past two decades. This increase was accompanied by marked decrease in adenocarcinoma NOS incidence, while the incidence trends for endometrioid, clear cell, and mucinous carcinomas were generally stable. Our findings also illustrate improving 1- and 5-year NS in all countries and age groups for serous, endometrioid, clear cell and mucinous carcinomas over the last two decades. Endometrioid carcinoma had the highest NS, with 5-year net survival above 65% across all seven countries for all ages combined. In contrast, survival from adenocarcinoma NOS has substantially declined with 5-year NS ranging between 12.5% and 31.0% for in 2010-2014.

The incidence trends by histological subtype observed in our study aligned with previous reports. In general, serous carcinoma is the most common EOC subtype [19], followed by adenocarcinoma NOS. Patients with adenocarcinoma NOS are more likely to have been diagnosed with advanced disease from a cytological sample of ascites or pleural effusion and not have had a surgical resection or tissue biopsy. Within this group there may be patients who are misclassified as having ovarian cancer but have other primary cancers at sites such as the gastrointestinal tract [20]. For this reason, the gold standard for ovarian cancer diagnosis is a tissue biopsy with full immunohistochemistry to ensure correct diagnosis and adequate management of patients [21].

The temporal trends in incidence and differences in the distribution of subtypes may be partly attributed to reclassification and improvement in the classification of ovarian cancer subtypes. In the past decades, several histopathologic advancements have refined the classification of ovarian cancer. For example, new insights from morphological, immunohistochemistry, and molecular genetics studies have led to several modifications of WHO classification criteria over the past 40 years [12, 22], with the most recent modifications published in 2020 [5]. The two most recent editions of the WHO classification (published on 2014 and later) no longer used adenocarcinoma NOS, although for the current study it has been included since the data used precede the 2014 WHO guidelines.

The decline in adenocarcinoma NOS and increase in the incidence of serous carcinoma likely represents improvements in diagnostic pathology. Advancement in diagnostic procedures has more accurately classified many ovarian cancer subtypes, such as high grade endometrioid to high grade serous and many adenocarcinoma NOS to high grade serous carcinomas [23]. Additionally, centralization of ovarian cancer care, including expert histopathological review, may also have led to reduced misclassification of ovarian cancer histological subtypes in recent years [24]. Changes in prevalence of various reproductive risk factors, such as the increase in use of oral contraceptive pills and decrease in menopausal hormone therapy use [2], may also partially contribute to the overall incidence trends observed in the study.

Our findings showed marked differences in EOC survival between countries by age, which is consistent with our previous study [25]. Further, a recent study also showed improved ovarian cancer survival in these seven countries from 1995-2014 [11]. Our study exhibited increased in 1- and 5-year survival by EOC subtypes within the 20-year study period, except for adenocarcinoma NOS where survival decreased. Adenocarcinoma NOS was historically assigned to epithelial ovarian tumors where a specific histological subtype could not be allocated [3]. With improvement in diagnostic pathology, the low survival observed among women diagnosed with adenocarcinoma NOS may be indicative that those classified as adenocarcinoma in more recent years in the study had more advanced cancers with poor prognosis and did not receive surgery or tissue biopsy.

Increased survival for almost all EOC subtypes over the years may also be attributable to the improvement in clinical management and treatment of ovarian cancer, such as the increased use of chemotherapy among older patients, increased used of new agents (e.g., bevacizumab), and increased radicality of surgery, which is an important predictor of better survival in advanced stage patients [26, 27]. Additionally, consistent with previous findings, our study showed low survival among women diagnosed with distant stage with lowest survival observed among those with adenocarcinoma NOS. Improved ovarian cancer staging procedures – both surgically and radiologically such as with PET scans – may potentially lead to stage shift and ultimately impact survival by stage [28]. In the most recent decade, genetic and molecular testing in combination with histology and tumor grade information also aid treatment decisions as different ovarian cancer subtypes are increasingly managed and treated differently. Centralization of ovarian cancer care and management by a multidisciplinary team may potentially contribute to improvement in ovarian cancer survival, for instance, the improved survival observed in Norway and Denmark in the recent decade [29, 30].

In this study endometrioid and clear cell carcinomas both had higher survival compared to other EOC subtypes. Both of these cancers are associated with endometriosis which appears to provide more favorable outcomes [31, 32]. Endometrioid carcinoma and clear cell carcinoma are more frequently diagnosed at early stage [32] and in younger women which may contribute to its higher survival compared with other EOC. Our previous study showed higher 1- and 3-year survival among younger women diagnosed with ovarian cancer compared to older age groups, which may be attributed to differences in histology and cancer treatment between the two groups, as well as lower comorbidity among younger patients [25].

This study included high quality data from 20 long-standing cancer registries, including a high proportion of microscopically verified cases ranging between 87% and 95% in the most recent 5-year study period. In addition, all data included in the study have been rigorously checked for quality and completeness as described by Arnold and colleagues [11]. Also, all variables were harmonized across the seven countries to obtain consistency. Although tumor grade has been increasingly recognized as an important factor for

ovarian cancer survival, most participating cancer registries had incomplete or missing information on tumor grade particularly in the earlier study periods. As a result, we could not distinctly separate low- versus high-grade serous carcinomas. Previous reports estimated that approximately <5% of EOC are low-grade carcinomas [32]. Low grade serous carcinomas are more often diagnosed in early stages and have better overall survival, which is more comparable to endometroid carcinoma when diagnosed in early stages [8].

The data in this study did not include a central expert pathology review. Primary ovarian mucinous carcinomas are difficult to distinguish from metastatic gastrointestinal (GI) neoplasms by histology alone, thus misclassification of metastatic GI tract carcinomas as primary ovarian cancer may have occurred [33]. Some histological subtypes in this study had relatively small numbers, namely endometrioid, clear cell, and mucinous carcinomas, which resulted in wide confidence intervals around the estimates, and should therefore be interpreted with caution. In addition, Brenner tumors were grouped with NOS, however the cases were very small, which did not influence the overall conclusions of the study. The study only presented survival by histological subtype and stage at diagnosis for all countries combined and for each country in the study, thus these estimates should be interpreted with caution.

Cancer data for two countries in the study were aggregated from multiple jurisdictions (i.e. Australia, UK and Canada), thus the nation-wide estimates reported for these countries may only be applicable for the jurisdictions included in the study. Cancer deaths in Newfoundland prior to 2005 may not capture all death occurrences since death clearance was not routinely carried out prior to 2005. Nevertheless, a sensitivity analysis was performed removing cancer data for Newfoundland prior to 2005 and no marked difference in survival estimates were observed (Supplementary table 6). Consistent findings among the jurisdictions supports the overall trend observed across the study. Lastly, differences in cancer registry practices [34, 35], clinical and pathological practices, and changes in ovarian cancer classifications also need to be considered when interpreting the results presented in this study.

The incidence trends by histological group observed in this study may be attributed to several factors such as changes in national and international cancer care, advances in diagnostic procedures, and changes in the prevalence of risk factors. Our study also demonstrated variation in ovarian cancer survival by histological subtype between countries. Progress in ovarian cancer clinical management and treatment (e.g., centralization of care and care by multidisciplinary team) over the past two decades have likely played an important role in the increased ovarian cancer survival over time. Further advances in ovarian cancer care are anticipated in the era of personalized medicine and treatment based on histological and molecular characteristics. Accurate classification is paramount in both developing individualized treatment plans and further understanding how different subtypes of ovarian cancer behave.

Disclaimer

Where authors are identified as personnel of the International Agency for Research on Cancer/World Health Organization, the authors alone are responsible for the views expressed in this article and they do not necessarily represent the decisions, policy or views of the International Agency for Research on Cancer/World Health Organization.

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Author Contributions

The work reported in the paper has been performed by the authors, unless clearly specified in the text. Citadel J. Cabasag – conceptualization, formal analysis, investigation, visualization, writing – original draft; Isabelle Soerjomataram – funding acquisition, resources, supervision, writing – review & editing; Melina Arnold – project management, writing – review & editing; Mark Rutherford – methodology; Aude Bardot – data curation; All other authors – writing – review & editing.

Conflict of Interest

Authors have no potential conflicts of interest to disclose.

Ethics Statement

The study was approved by the IARC Ethics Committee, and where needed approval was also given by local (or national) ethical committees. This study was conducted according to the guidelines of the Declaration of Helsinki and used secondary cancer data from the cancer registries, thus not requiring individual re-consenting for the purpose.

Data Availability Statement

Aggregate data based on the results of the study is publicly accessible through https://gco.iarc.fr/survival/survmark/. Additional data may be requested in each cancer registry. The criteria to access additional data from cancer registries may differ between registries. Further information is available from the corresponding author upon request.

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Figure legend

Figure 1. Age-standardized incidence rate (per 100,000 person-years, World) for all ages combined (15-99 years) years by histological subtype among women diagnosed with epithelial ovarian cancer (EOC) between 1995 and 2014.

[1] Australia includes New South Wales, Victoria, and Western Australia; Canada includes Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island, and Saskatchewan; and the United Kingdom includes England, Northern Ireland, Scotland, and Wales. [2] Other carcinoma includes 'other' specified carcinoma and unspecified carcinoma.

Figure 2. Age-standardized 5-year net survival (%) by histological subtype among women diagnosed with epithelial ovarian cancer for all ages combined (15-99 years) by study period.

[1] Australia includes New South Wales, Victoria, and Western Australia; Canada includes Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island, and Saskatchewan; and the United Kingdom includes England, Northern Ireland, Scotland, and Wales. [2] Other carcinoma includes 'other' specified carcinoma and unspecified carcinoma.

Table 1. Age-standardized incidence rate (ASR, per 100,000 person-years, World) and age at diagnosis among women diagnosed with epithelial ovarian cancer (EOC) in 1995-2014 by period, histological subtype and country

Histology group by study period	Australia[1]			Canada[1]			Denmark			Ireland			New Zealand			Norway			United Kingdom[1]		
	Total (%)	Median age (P25-P75)	ASR	Total (%)	Median age (P25-P75)	ASR	Total (%)	Median age (P25-P75)	ASR	Total (%)	Median age (P25-P75)	ASR	Total (%)	Median age (P25-P75)	ASR	Total (%)	Median age (P25-P75)	ASR	Total (%)	Median age (P25-P75)	ASR
(1995-1999)																					
Epithelial	3419	64 (53-74)	10.9	7080	64 (52-73)	9.4	2629	63 (53-73)	17.7	1238	61 (51-71)	15.4	1071	61 (51-72)	13.5	2076	64 (53-74)	17.5	22351	64 (54-73)	13.7
Serous	1746 (51.1)	64 (54-73)	5.7	3473 (49.1)	64 (54-72)	4.7	1162 (44.2)	63 (53-72)	7.9	447 (36.1)	60 (52-70)	5.7	423 (39.5)	61 (52-72)	5.4	1034 (49.8)	63 (52-73)	9.0	6948 (31.1)	63 (54-72)	4.4
Mucinous	342 (10.0)	56 (45-70)	1.2	637 (9.0)	59 (46-70)	0.9	290 (11.0)	60 (50-70)	2.1	170 (13.7)	56 (43-67)	2.2	160 (14.9)	54 (43-65)	2.2	154 (7.4)	62 (50-74)	1.4	2583 (11.6)	61 (49-72)	1.7
Endometrioid	308 (9.0)	58 (49-68)	1.1	874 (12.3)	58 (48-69)	1.2	320 (12.2)	61 (52-70)	2.3	103 (8.3)	55 (47-65)	1.4	121 (11.3)	58 (50-71)	1.5	245 (11.8)	59 (50-72)	2.2	2538 (11.4)	60 (51-69)	1.7
Clear cell	200 (5.8)	57 (48-66)	0.7	376 (5.3)	55 (47-66)	0.6	120 (4.6)	62 (51-74)	0.8	41 (3.3)	59 (45-67)	0.5	46 (4.3)	60 (52-66)	0.7	116 (5.6)	59 (51-71)	1.0	1031 (4.6)	60 (52-69)	0.7
Adenocarcinoma NOS	648 (19.0)	71 (61-78)	1.7	1315 (18.6)	70 (61-78)	1.5	563 (21.4)	66 (57-75)	3.6	357 (28.8)	66 (55-75)	4.1	237 (22.1)	68 (58-76)	2.7	395 (19.0)	71 (59-79)	2.8	6778 (30.3)	67 (58-75)	3.8
Other EOC	175 (5.1)	69 (55-77)	0.5	405 (5.7)	68 (55-77)	0.5	174 (6.6)	66 (55-76)	1.1	120 (9.7)	66 (56-75)	1.4	84 (7.8)	63 (52-72)	1.0	132 (6.4)	68 (56-75)	1.0	2473 (11.1)	66 (56-75)	1.4
(2000-2004)																					
Epithelial	3703	64 (54-74)	10.7	7690	63 (52-73)	9.2	2582	64 (54-73)	16.4	1381	60 (52-71)	15.6	1082	62 (53-72)	12.1	2223	64 (53-75)	17.7	24575	65 (56-74)	14.1
Serous	1970 (53.2)	64 (54-73)	5.8	3836 (49.9)	63 (54-72)	4.7	1249 (48.4)	64 (55-72)	8.0	490 (35.5)	61 (53-70)	5.7	540 (49.9)	63 (54-72)	6.2	1154 (51.9)	63 (53-73)	9.5	8810 (35.8)	64 (55-72)	5.2
Mucinous	263 (7.1)	57 (45-71)	0.8	514 (6.7)	56 (46-70)	0.7	274 (10.6)	58 (49-71)	1.9	163 (11.8)	54 (45-65)	1.9	93 (8.6)	55 (44-71)	1.1	183 (8.2)	58 (47-74)	1.5	2230 (9.1)	61 (50-72)	1.4
Endometrioid	326 (8.8)	56 (49-67)	1.0	765 (9.9)	55 (47-68)	1.0	289 (11.2)	60 (52-70)	1.9	129 (9.3)	57 (49-66)	1.6	131 (12.1)	58 (50-69)	1.5	236 (10.6)	59 (51-71)	2.0	2528 (10.3)	60 (52-70)	1.6
Clear cell	222 (6.0)	56 (48-67)	0.7	455 (5.9)	55 (48-64)	0.6	133 (5.2)	60 (52-66)	0.9	77 (5.6)	54 (47-62)	0.9	59 (5.5)	53 (48-62)	0.7	102 (4.6)	61 (53-72)	0.8	1305 (5.3)	60 (52-68)	0.8

Adenocarcinoma NOS	644 (17.4)	72 (62-79)	1.6	1635 (21.3)	70 (60-79)	1.7	516 (20.0)	69 (59-78)	2.9	381 (27.6)	66 (57-75)	4.0	186 (17.2)	70 (58-79)	1.8	428 (19.3)	71 (59-79)	2.9	7048 (28.7)	69 (60-77)	3.6
Other EOC[2]	278 (7.5)	69 (55-79)	0.7	485 (6.3)	63 (52-76)	0.6	121 (4.7)	68 (56-76)	0.7	141 (10.2)	62 (55-73)	1.5	73 (6.7)	66 (53-75)	0.8	120 (5.4)	67 (58-78)	0.9	2654 (10.8)	68 (57-77)	1.4
(2005-200[illegible])																					
Epithelial	4162	64 (54-74)	10.8	7953	63 (53-73)	8.5	2624	65 (56-74)	15.4	1459	62 (53-71)	14.6	1225	63 (54-74)	12.0	2156	64 (56-75)	15.8	25012	65 (57-74)	13.4
Serous	2371 (57.0)	65 (55-73)	6.2	3896 (49.0)	63 (54-72)	4.2	1567 (59.7)	65 (57-73)	9.2	627 (43.0)	62 (54-70)	6.5	682 (55.7)	64 (55-73)	6.7	1259 (58.4)	63 (56-74)	9.4	10855 (43.4)	65 (57-73)	6.0
Mucinous	293 (7.0)	57 (49-72)	0.8	481 (6.0)	55 (45-67)	0.6	236 (9.0)	61 (52-70)	1.5	134 (9.2)	52 (40-65)	1.4	86 (7.0)	53 (39-63)	1.0	119 (5.5)	62 (49-75)	0.9	2089 (8.4)	59 (46-70)	1.3
Endometrioid	368 (8.8)	55 (47-66)	1.1	702 (8.8)	54 (47-65)	0.8	248 (9.5)	61 (51-71)	1.6	152 (10.4)	59 (50-67)	1.6	93 (7.6)	55 (48-65)	1.0	166 (7.7)	60 (50-69)	1.4	2079 (8.3)	59 (50-70)	1.3
Clear cell	253 (6.1)	56 (50-66)	0.7	506 (6.4)	55 (48-63)	0.6	108 (4.1)	60 (52-67)	0.7	85 (5.8)	56 (47-63)	0.9	75 (6.1)	55 (46-62)	0.8	85 (3.9)	61 (53-71)	0.7	1433 (5.7)	59 (51-68)	0.9
Adenocarcinoma NOS	605 (14.5)	73 (62-81)	1.3	1441 (18.1)	72 (61-80)	1.3	379 (14.4)	71 (62-79)	1.9	329 (22.5)	69 (60-77)	2.9	209 (17.1)	73 (61-80)	1.6	375 (17.4)	70 (60-80)	2.4	6360 (25.4)	70 (61-78)	3.0
Other [illegible]	272 (6.5)	68 (54-77)	0.7	927 (11.7)	64 (54-74)	1.0	86 (3.3)	67 (55-75)	0.5	132 (9.0)	67 (57-75)	1.2	80 (6.5)	61 (50-69)	0.8	152 (7.1)	67 (57-78)	1.1	2196 (8.8)	69 (59-78)	1.1
(20[illegible])																					
Epithelial	4443	65 (55-74)	10.2	9173	63 (53-73)	8.9	2457	67 (57-75)	13.2	1268	63 (54-73)	11.1	1256	64 (54-74)	11.2	2212	65 (56-74)	15.0	26546	66 (57-75)	13.2
Serous	2758 (62.1)	65 (57-74)	6.3	5074 (55.3)	64 (55-72)	4.9	1594 (64.9)	67 (59-74)	8.5	608 (47.9)	63 (54-71)	5.4	725 (57.7)	65 (55-73)	6.3	1423 (64.3)	65 (57-73)	9.7	14543 (54.8)	67 (59-74)	7.1
Mucinous	298 (6.7)	54 (42-66)	0.8	565 (6.2)	54 (43-67)	0.7	190 (7.7)	59 (45-69)	1.3	98 (7.7)	58 (45-70)	0.9	78 (6.2)	51 (37-63)	0.9	140 (6.3)	60 (48-69)	1.1	1975 (7.4)	59 (46-70)	1.2
Endometrioid	331 (7.4)	56 (47-66)	0.9	862 (9.4)	54 (47-61)	1.0	175 (7.1)	66 (55-74)	1.0	119 (9.4)	57 (50-66)	1.1	132 (10.5)	56 (46-65)	1.3	179 (8.1)	57 (49-66)	1.4	2139 (8.1)	58 (49-69)	1.2
Clear cell	250 (5.6)	58 (49-67)	0.6	589 (6.4)	55 (49-62)	0.6	93 (3.8)	62 (53-71)	0.6	79 (6.2)	58 (53-65)	0.7	79 (6.3)	56 (48-65)	0.8	94 (4.2)	60 (51-71)	0.7	1518 (5.7)	60 (52-69)	0.9

Adenocarcinoma NOS	544 (12.2)	75 (64-83)	1.0	1266 (13.8)	73 (63-81)	1.0	344 (14.0)	72 (63-80)	1.6	258 (20.3)	70 (61-78)	2.0	166 (13.2)	74 (64-83)	1.1	275 (12.4)	73 (63-82)	1.5	4632 (17.4)	71 (63-79)	1.9
Other EOC[2]	262 (5.9)	65 (56-78)	0.6	817 (8.9)	63 (52-74)	0.8	61 (2.5)	67 (60-78)	0.3	106 (8.4)	63 (55-76)	0.9	76 (6.1)	62 (52-78)	0.7	101 (4.6)	65 (57-74)	0.7	1739 (6.6)	69 (58-78)	0.8

Abbreviations: EOC = epithelial ovarian cancer, P25-P75 = 25th and 75th percentile, NOS = not otherwise specified

[1] Australia includes New South Wales, Victoria, and Western Australia; Canada includes Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island, Saskatchewan; and the United Kingdom includes England, Northern Ireland, Scotland, and Wales.

[2]Other carcinoma includes 'other' specified carcinoma and unspecified carcinoma

Table 2. Average annual percent change (AAPC) with 95% confidence interval (95% CI) in the incidence of epithelial ovarian cancer (EOC) by histological subtype and age group, 1995-2014

Country	Age groups		
	15-99	15-64	65-99
	AAPC (95%CI)	AAPC (95%CI)	AAPC (95%CI)
All EOC combined			
Australia[1]	-0.3 (-5.0 – 4.6)	-0.7 (-6.3 – 5.1)	0.3 (-2.2 – 2.9)
Canada[1]	-0.5 (-5.6 – 4.8)	-0.4 (-6.4 – 5.9)	-0.8 (-3.5 – 2.0)
Denmark	-1.9 (-5.7 – 2.1)	-2.7 (-7.2 – 2.1)	-0.6 (-2.6 – 1.5)
Ireland	-2.1 (-6.1 – 2.1)	-2.8 (-7.4 – 2.1)	-0.8 (-3.1 – 1.5)
New Zealand	-1.2 (-5.5 – 3.4)	-1.8 (-6.8 – 3.4)	0.2 (-2.2 – 2.7)
Norway	-1.1 (-4.9 – 2.8)	-1.7 (-6.1 – 2.8)	0.2 (-1.9 – 2.3)
United Kingdom[1]	-0.3 (-4.4 – 4.1)	-1.1 (-5.9 – 4.0)	1.2 (-1.1 – 3.5)
Serous carcinoma			
Australia[1]	0.9 (-1.7 – 3.5)	0.0 (-3.1 – 3.2)	**2.2 (0.8 – 3.6)**
Canada[1]	-0.0 (-3.0 – 3.0)	-0.3 (-3.8 – 3.3)	0.4 (-1.1 – 2.0)
Denmark	0.7 (-1.5 – 2.9)	-0.3 (-2.9 – 2.4)	**2.2 (1.1 – 3.4)**
Ireland	-0.2 (-2.8 – 2.5)	-0.9 (-3.9 – 2.2)	1.2 (-0.3 – 2.7)
New Zealand	1.1 (-1.5 – 3.8)	-0.1 (-3.1 – 3.1)	**3.2 (1.8 – 4.6)**
Norway	0.5 (-1.6 – 2.6)	-0.5 (-2.9 – 1.9)	**2.6 (1.4 – 3.8)**
United Kingdom[1]	**3.3 (0.5 – 6.1)**	1.8 (-1.4 – 5.2)	**5.8 (4.3 – 7.4)**
Mucinous carcinoma			
Australia[1]	-2.2 (-8.6 – 4.7)	-1.8 (-8.7 – 5.7)	-3.7 (-8.0 – 0.9)
Canada[1]	-2.2 (-9.5 – 5.6)	-1.3 (-9.2 – 7.3)	**-5.2 (-10.0 – -0.2)**
Denmark	-3.3 (-8.0 – 1.6)	-3.4 (-8.5 – 2.0)	-3.1 (-6.1 – 0.0)
Ireland	**-5.3 (-10.1 – -0.3)**	-5.3 (-10.4 – 0.0)	**-5.1 (-8.5 – -1.6)**
New Zealand	**-6.0 (-11.4 – -0.4)**	**-6.1 (-11.6 – -0.3)**	**-5.8 (-10.1 – -1.4)**
Norway	-2.4 (-7.9 – 3.5)	-2.3 (-8.3 – 4.2)	-2.7 (-6.2 – 0.9)
United Kingdom[1]	-2.2 (-7.4 – 3.3)	-1.7 (-7.3 – 4.3)	**-3.7 (-7.1 – -0.1)**
Endometrioid carcinoma			
Australia[1]	-1.1 (-7.2 – 5.4)	-0.9 (-7.5 – 6.0)	-1.6 (-5.8 – 2.7)
Canada[1]	-1.9 (-8.0 – 4.6)	-0.9 (-7.5 – 6.0)	**-5.7 (-10.0 – -1.3)**
Denmark	**-5.3 (-10.0 – -0.4)**	**-5.9 (-11.1 – -0.3)**	**-4.1 (-6.8 – -1.2)**
Ireland	-1.3 (-6.5 – 4.1)	-1.5 (-7.1 – 4.5)	-0.8 (-4.1 – 2.7)
New Zealand	-1.3 (-6.6 – 4.3)	-1.1 (-6.7 – 4.9)	-2.2 (-5.8 – 1.6)
Norway	-3.5 (-8.1 – 1.4)	-3.2 (-8.1 – 2.1)	**-4.4 (-7.5 – -1.3)**
United Kingdom[1]	-2.1 (-7.2 – 3.3)	-1.9 (-7.5 – 4.0)	-2.6 (-5.9 – 0.8)
Clear cell carcinoma			
Australia[1]	-0.7 (-8.0 – 7.2)	-0.9 (-8.7 – 7.5)	0.1 (-5.0 – 5.5)
Canada[1]	1.0 (-7.0 – 9.7)	1.3 (-7.0 – 10.5)	-0.7 (-6.9 – 6.0)
Denmark	-2.6 (-9.6 – 5.0)	-2.4 (-10.1 – 5.9)	-3.0 (-7.4 – 1.6)
Ireland	1.2 (-5.8 – 8.8)	1.1 (-6.3 – 9.0)	2.0 (-3.2 – 7.5)
New Zealand	1.4 (-5.9 – 9.1)	1.6 (-6.1 – 10.0)	0.4 (-4.7 – 5.7)
Norway	-3.0 (-9.7 – 4.2)	-3.3 (-10.8 – 4.8)	-2.5 (-6.5 – 1.8)
United Kingdom[1]	1.4 (-5.5 – 8.9)	1.5 (-6.0 – 9.6)	1.2 (-3.4 – 5.9)
Adenocarcinoma NOS			
Australia[1]	-3.8 (-8.9 – 1.7)	-4.5 (-11.6 – 3.3)	**-3.2 (-5.5 – -0.9)**
Canada[1]	-3.2 (-8.4 – 2.2)	-4.4 (-11.5 – 3.3)	-2.2 (-4.5 – 0.1)
Denmark	**-5.6 (-9.5 – -1.6)**	**-7.3 (-12.3 – -2.0)**	**-3.7 (-5.5 – -1.8)**
Ireland	**-4.9 (-8.3 – -1.4)**	**-7.2 (-11.5 – -2.6)**	**-2.2 (-3.8 – -0.5)**
New Zealand	**-5.5 (-10.0 – -0.8)**	**-7.4 (-13.3 – -1.0)**	**-3.6 (-5.7 – -1.4)**

Norway	-4.0 (-7.9 – 0.1)	-5.1 (-10.1 – 0.2)	**-2.7 (-4.6 – -0.7)**
United Kingdom[1]	-4.0 (-7.4 – -0.3)	-5.7 (-10.2 – -1.0)	**-2.0 (-3.6 – -0.3)**
Other carcinoma[2]			
Australia[1]	0.1 (-7.7 – 8.6)	0.3 (-9.3 – 10.8)	-0.2 (-4.2 – 3.9)
Canada[1]	3.8 (-3.9 – 12.2)	5.0 (-4.3 – 15.2)	1.9 (-2.1 – 6.1)
Denmark	-7.4 (-14.8 – 0.7)	-7.2 (-16.4 – 3.0)	**-7.6 (-11.3 – -3.8)**
Ireland	-2.7 (-8.1 – 3.1)	-2.8 (-9.3 – 4.2)	-2.6 (-5.4 – 0.4)
New Zealand	-2.8 (-9.4 – 4.3)	-1.8 (-9.4 – 6.5)	**-4.8 (-8.5 – -0.9)**
Norway	-2.0 (-8.4 – 4.9)	-1.6 (-9.4 – 6.8)	-2.5 (-5.8 – 0.9)
United Kingdom[1]	-3.8 (-9.4 – 2.2)	-4.7 (-11.5 – 2.6)	-2.4 (-5.3 – 0.5)

Abbreviations: CI = confidence interval, NOS = not otherwise specified

[1] Australia includes New South Wales, Victoria, and Western Australia; Canada includes Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island, and Saskatchewan; and the United Kingdom includes England, Northern Ireland, Scotland, and Wales.

[2] Other carcinoma includes 'other' specified carcinoma and unspecified carcinoma

Table 3. Age-standardized 1-year and 5-year net survival (NS, %) with 95% confidence interval (95% CI) among women diagnosed with epithelial ovarian cancer (EOC) for all ages combined (15-99 years) from 1995-2014 by histological subtype, study period, and country

Epithelial histology groups	Australia[1]	Canada[1]	Denmark	Ireland	New Zealand	Norway	United Kingdom[1]
	NS (95% CI)	NS (95% CI)	NS (95% CI)	NS (95% CI)	NS (95% CI)	NS (95% CI)	NS (95% CI)
1-year net survival							
(1995-1999)							
All epithelial	73.5 (71.7–75.1)	72.8 (71.6–73.9)	65.5 (63.4–67.6)	61.1 (57.9–64.2)	63.4 (60.0–66.6)	73.0 (70.8–75.1)	62.6 (61.9–63.3)
Serous	80.1 (77.8–82.1)	79.9 (78.3–81.4)	71.6 (68.4–74.6)	70.3 (64.7–75.2)	69.3 (63.9–74.1)	79.1 (76.1–81.8)	72.1 (70.9–73.3)
Mucinous	73.3 (66.8–78.8)	69.3 (64.6–73.6)	63.9 (56.7–70.1)	69.1 (58.1–77.7)	68.1 (56.6–77.2)	61.2 (52.0–69.3)	66.2 (64.0–68.3)
Endometrioid	92.4 (86.7–95.8)	87.5 (84.1–90.2)	80.5 (73.5–85.7)	81.0 (65.2–90.2)	82.9 (71.7–90.0)	85.9 (78.9–90.7)	80.2 (78.1–82.1)
Clear cell	79.4 (70.2–86.0)	80.3 (73.5–85.5)	73.1 (62.6–81.0)	86.7 (67.6–94.9)	68.2 (46.0–82.8)	87.9 (77.8–93.7)	71.8 (68.2–75.1)
Adenocarcinoma NOS	57.4 (53.4–61.3)	53.5 (50.7–56.3)	51.4 (46.9–55.6)	47.9 (42.4–53.2)	47.5 (40.9–53.8)	57.1 (52.0–61.9)	50.5 (49.3–51.8)
Other carcinoma[2]	53.1 (44.8–60.8)	65.3 (60.1–69.9)	48.9 (40.8–56.4)	56.7 (46.5–65.7)	54.2 (41.7–65.1)	60.1 (50.8–68.2)	51.5 (49.4–53.6)
(2000-2004)							
All epithelial	76.1 (74.6–77.7)	75.8 (74.7–76.9)	70.0 (67.9–71.9)	64.9 (61.8–67.8)	68.7 (65.4–71.7)	77.0 (75.0–78.8)	66.1 (65.5–66.8)
Serous	83.9 (81.9–85.7)	83.4 (81.9–84.8)	76.4 (73.5–79.1)	72.5 (66.8–77.5)	75.3 (70.6–79.4)	83.2 (80.5–85.5)	76.5 (75.4–77.5)
Mucinous	70.4 (62.9–76.7)	75.0 (69.8–79.5)	67.7 (60.4–74.0)	63.0 (51.6–72.4)	80.6 (67.7–88.8)	73.1 (64.9–79.7)	70.9 (68.6–73.0)
Endometrioid	91.0 (84.8–94.8)	92.3 (88.9–94.7)	80.5 (73.7–85.7)	79.4 (65.5–88.2)	85.5 (75.5–91.6)	89.6 (82.6–93.9)	87.5 (85.6–89.1)
Clear cell	79.3 (70.7–85.7)	82.2 (76.1–86.9)	74.7 (63.3–83.0)	82.2 (67.3–90.8)	88.2 (64.3–96.5)	84.8 (74.9–91.1)	81.1 (78.2–83.6)
Adenocarcinoma NOS	57.5 (53.4–61.3)	57.7 (55.2–60.1)	56.2 (51.6–60.5)	54.9 (49.5–60.0)	39.3 (32.1–46.4)	60.9 (55.9–65.4)	51.6 (50.4–52.8)
Other carcinoma[2]	62.6 (55.9–68.5)	65.1 (60.3–69.6)	50.1 (40.2–59.2)	55.9 (46.6–64.2)	55.5 (42.7–66.6)	63.2 (53.6–71.4)	51.0 (49.1–52.9)
(2005-2009)							
All epithelial	78.3 (76.9–79.7)	77.1 (76.0–78.1)	75.4 (73.5–77.1)	68.7 (65.8–71.4)	68.9 (65.9–71.7)	78.8 (76.9–80.7)	69.7 (69.1–70.3)
Serous	85.6 (83.9–87.1)	84.5 (83.1–85.8)	79.2 (76.7–81.3)	74.3 (69.4–78.5)	76.2 (72.4–79.6)	83.9 (81.4–86.1)	79.9 (79.0–80.7)
Mucinous	74.0 (67.2–79.6)	74.1 (68.4–78.9)	78.4 (71.1–84.1)	78.9 (65.4–87.6)	69.9 (52.6–81.9)	76.2 (65.3–84.1)	76.3 (73.9–78.5)
Endometrioid	92.5 (87.0–95.8)	92.2 (88.3–94.8)	88.5 (82.3–92.6)	91.9 (82.0–96.4)	98.2 (85.4–99.8)	89.5 (80.8–94.4)	90.6 (88.8–92.2)
Clear cell	86.2 (78.8–91.2)	88.7 (83.4–92.3)	82.5 (68.9–90.6)	83.8 (68.6–92.1)	75.3 (55.7–87.1)	84.5 (71.6–91.9)	80.2 (77.3–82.8)
Adenocarcinoma NOS	53.4 (49.0–57.5)	54.3 (51.7–56.9)	55.7 (50.1–60.9)	53.8 (48.2–59.1)	40.2 (33.1–47.1)	67.5 (62.5–72.1)	51.9 (50.7–53.2)
Other carcinoma[2]	67.6 (61.3–73.1)	74.3 (71.1–77.2)	58.8 (46.9–68.9)	54.5 (45.3–62.8)	70.2 (56.9–80.1)	61.7 (53.2–69.0)	51.4 (49.3–53.5)
(2010-2014)							
All epithelial	81.4 (79.8–82.8)	76.8 (75.5–78.0)	80.0 (77.9–82.0)	72.7 (68.8–76.1)	77.5 (74.1–80.4)	80.4 (78.0–82.6)	75.1 (74.4–75.7)

Serous	87.9 (86.2–89.5)	83.4 (81.8–84.8)	84.3 (81.7–86.5)	77.0 (71.4–81.7)	81.7 (77.7–85.1)	84.8 (82.0–87.3)	79.8 (78.9–80.6)
Mucinous	82.5 (73.6–88.6)	76.9 (69.8–82.6)	79.6 (68.7–87.1)	80.6 (63.6–90.2)	85.7 (61.0–95.3)	79.8 (67.5–87.9)	86.2 (83.6–88.4)
Endometrioid	97.7 (88.8–99.6)	93.7 (87.3–97.0)	98.4 (86.1–99.8)	82.1 (62.4–92.1)	99.0 (81.0–99.9)	94.8 (80.9–98.7)	94.6 (92.6–96.0)
Clear cell	89.2 (80.6–94.1)	87.3 (80.4–91.9)	91.8 (78.0–97.1)	72.2 (45.4–87.4)	95.3 (82.3–98.8)	89.3 (75.0–95.6)	84.2 (81.0–86.9)
Adenocarcinoma NOS	47.2 (41.5–52.8)	50.2 (46.1–54.1)	51.5 (42.9–59.5)	53.7 (45.0–61.6)	51.9 (41.7–61.1)	54.8 (46.6–62.3)	54.8 (53.0–56.6)
Other carcinoma[2]	65.9 (57.8–72.8)	61.1 (56.0–65.7)	68.2 (48.4–81.7)	79.7 (65.5–88.5)	56.5 (39.1–70.7)	76.2 (62.2–85.6)	58.7 (55.6–61.6)
5-year net survival							
(1995-1999)							
All epithelial	36.2 (34.4–38.1)	34.8 (33.5–36.1)	31.7 (29.7–33.8)	29.1 (26.2–32.1)	31.5 (28.2–34.8)	36.2 (33.9–38.6)	30.3 (29.6–31.0)
Serous	33.7 (31.2–36.3)	31.2 (29.4–33.0)	27.9 (24.9–30.9)	25 .9 (21.0–31.1)	28.3 (23.3–33.4)	31.9 (28.7–35.2)	30.6 (29.3–31.9)
Mucinous	50.1 (42.6–57.2)	52.1 (46.8–57.2)	46.1 (38.1–53.7)	56.2 (43.1–67.4)	57.5 (44.4–68.5)	47.0 (36.6–56.7)	47.2 (44.6–49.7)
Endometrioid	71.3 (62.9–78.1)	65.3 (60.5–69.6)	59.0 (50.6–66.5)	59.5 (39.6–74.7)	49.0 (35.8–61.0)	61.5 (52.8–69.1)	51.1 (48.4–53.7)
Clear cell	59.4 (48.4–68.8)	58.4 (50.3–65.6)	52.0 (40.5–62.3)	51.8 (26.2–72.4)	50.9 (32.3–66.8)	62.1 (48.4–73.1)	46.1 (41.9–50.2)
Adenocarcinoma NOS	19.0 (15.7–22.5)	18.6 (16.3–20.9)	16.3 (13.1–19.8)	15.7 (12.0–19.9)	17.5 (12.8–22.9)	23.1 (18.7–27.8)	18.6 (17.6–19.6)
Other carcinoma[2]	26.2 (19.1–33.8)	28.5 (23.7–33.5)	28.4 (21.1–36.2)	28.2 (19.9–37.1)	19.7 (11.0–30.3)	31.9 (23.7–40.5)	21.1 (19.4–22.9)
(2000-2004)							
All epithelial	36.4 (34.7–38.2)	35.9 (34.7–37.1)	33.4 (31.4–35.5)	31.1 (28.3–33.9)	35.0 (31.8–38.2)	40.6 (38.3–42.9)	31.3 (30.7–31.9)
Serous	33.5 (31.1–35.8)	34.5 (32.8–36.2)	31.7 (28.8–34.7)	28.5 (23.8–33.3)	29.3 (25.0–33.7)	35.3 (32.2–38.4)	31.0 (29.9–32.1)
Mucinous	45.2 (36.9–53.1)	57.8 (51.7–63.4)	47.9 (40.0–55.4)	49.1 (37.3–59.8)	64.6 (48.8–76.6)	60.8 (51.0–69.3)	50.8 (48.1–53.5)
Endometrioid	71.4 (62.2–78.7)	72.8 (67.2–77.6)	51.1 (43.3–58.4)	62.2 (47.1–74.2)	71.0 (58.7–80.2)	69.4 (59.8–77.1)	59.6 (56.9–62.3)
Clear cell	60.6 (50.6–69.2)	62.7 (55.4–69.2)	41.5 (30.2–52.4)	50.2 (30.5–67.0)	76.3 (50.1–90.0)	70.6 (56.5–80.8)	53.0 (49.0–56.8)
Adenocarcinoma NOS	23.2 (19.7–26.9)	15.6 (13.8–17.6)	23.0 (19.0–27.1)	21.0 (16.8–25.4)	11.0 (6.7–16.4)	29.3 (24.8–34.0)	17.9 (17.0–18.9)
Other carcinoma[2]	31.2 (24.8–37.7)	31.6 (26.9–36.3)	19.7 (12.7–27.9)	23.6 (16.4–31.4)	31.3 (20.0–43.2)	37.4 (27.9–46.8)	20.8 (19.2–22.5)
(2005-2009)							
All epithelial	40.9 (39.2–42.6)	39.1 (37.9–40.4)	39.0 (36.9–41.1)	33.1 (30.3–35.9)	33.8 (30.9–36.8)	42.1 (39.8–44.4)	34.0 (33.4–34.7)
Serous	38.7 (36.5–40.8)	37.3 (35.5–39.0)	35.1 (32.4–37.7)	29.1 (24.7–33.7)	31.8 (28.0–35.6)	39.7 (36.6–42.8)	33.1 (32.1–34.1)
Mucinous	56.0 (47.0–64.0)	57.5 (50.8–63.7)	63.0 (52.4–71.8)	62.1 (44.0–75.9)	51.7 (31.4–68.7)	64.0 (51.6–74.0)	61.3 (58.4–64.1)
Endometrioid	77.4 (68.8–83.9)	77.2 (71.1–82.2)	69.4 (60.9–76.4)	61.7 (48.0–72.8)	80.2 (49.7–93.3)	61.8 (49.9–71.6)	69.5 (66.6–72.3)
Clear cell	67.6 (58.1–75.4)	67.5 (60.1–73.9)	55.4 (40.7–67.9)	66.2 (47.5–79.5)	43.4 (22.8–62.4)	69.3 (53.3–80.8)	57.3 (53.6–60.8)
Adenocarcinoma NOS	20.3 (16.8–24.1)	19.1 (17.0–21.4)	21.6 (17.0–26.6)	20.9 (16.4–25.7)	11.0 (6.7–16.5)	37.2 (31.8–42.5)	17.3 (16.3–18.3)
Other carcinoma[2]	36.5 (30.1–42.9)	36.8 (33.3–40.3)	35.4 (23.2–47.8)	22.6 (15.5–30.5)	44.1 (30.1–57.2)	27.9 (20.4–35.8)	22.3 (20.4–24.2)
(2010-2014)							

All epithelial	43.5 (41.1–45.8)	40.0 (38.0–42.0)	44.3 (41.2–47.2)	36.6 (32.7–40.4)	39.0 (35.0–42.9)	47.8 (44.4–51.0)	38.9 (38.0–39.9)
Serous	40.8 (37.7–43.9)	37.2 (34.4–39.9)	41.6 (37.7–45.4)	33.0 (27.9–38.1)	32.2 (27.3–37.1)	47.5 (43.2–51.6)	34.6 (33.3–35.8)
Mucinous	66.9 (56.5–75.3)	60.1 (51.0–68.0)	68.5 (49.7–81.4)	55.0 (38.1–69.0)	65.1 (42.1–80.8)	68.1 (47.8–81.9)	71.9 (67.4–75.9)
Endometrioid	78.5 (61.1–88.8)	88.9 (75.0–95.3)	89.9 (74.4–96.3)	63.5 (44.6–77.5)	90.1 (66.1–97.4)	74.5 (54.8–86.6)	84.5 (80.1–87.9)
Clear cell	68.2 (55.6–77.9)	64.1 (53.1–73.2)	67.4 (44.4–82.5)	46.5 (25.7–65.0)	60.4 (37.8–77.0)	65.3 (46.5–78.9)	58.1 (51.9–63.7)
Adenocarcinoma NOS	19.3 (14.6–24.4)	15.7 (12.1–19.8)	19.9 (13.3–27.5)	19.8 (13.3–27.3)	16.0 (5.6–31.2)	22.6 (16.4–29.5)	20.5 (18.8–22.3)
Other carcinoma[2]	40.5 (32.3–48.6)	34.6 (28.5–40.7)	32.7 (17.9–48.3)	37.4 (23.9–50.9)	39.2 (24.0–54.0)	49.0 (32.5–63.5)	28.2 (25.1–31.5)

Abbreviations: CI = confidence interval, NOS = not otherwise specified

[1] Australia includes New South Wales, Victoria, and Western Australia; Canada includes Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island, and Saskatchewan; and the United Kingdom includes England, Northern Ireland, Scotland, and Wales.

[2] Other carcinoma includes 'other' specified carcinoma and unspecified carcinoma