Regional Variation in Ovarian Cancer Treatment in Ontario

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ABSTRACT

Background: Ovarian cancer (OC) affects about 1 in 70 Canadian women and is the fifth ranking cause of cancer deaths among women. About 2800 new cases of ovarian cancer are expected in 2016 in Canada, and approximately 45% are in Ontario. There are significant regional differences in prevalence and survival outcomes across Canada among women with OC. This study aims to assess the regional differences in the patient profile, treatment patterns, health care resource utilization and clinical outcomes of patients with OC in Ontario.

Methods: A retrospective cohort of 2199 patients was identified from the Ontario administrative health databases. Study subjects were women (≥18 years) diagnosed with OC and treated under the Ontario provincial health insurance plans between January 1, 2007 and December 31, 2011. Descriptive statistics were presented for all patient demographics and baseline characteristics data overall and by region. Health regions were grouped based on 14 predefined public health units in Ontario. To identify predictors of patient centered health outcomes (overall survival, relapse, time to first surgery and time between first and second surgery) multivariate Cox proportional hazards regression was used. Time to surgery, relapse and survival was assessed with the Kaplan Meier estimate of the survival function.

Results: There is a difference in time to death (months; $p<0.001$) and time to treatment (weeks; time to first surgery ($p<0.001$) and time to follow up surgery (weeks; $p=0.001$)) between LHINs, but no difference in time to disease relapse ($p=0.069$). Region was a predictor in time to death and time to first surgery, but not a predictor with disease relapse or time to second surgery from index date. The overall mean (SD) time to death was 39.32 (0.93) months and 83.21 (1.88) weeks for time to disease relapse. The overall cost of prescription medications was $5,589.4 CAD per patient and South East LHIN had the greatest mean cost in prescription per patient of $19,239.5 CAD compared to Hamilton Niagara having the lowest mean cost of $1,683.7 CAD

Conclusion: There is a difference in clinical outcomes and time to treatment between LHINs in Ontario, study findings merit further investigation in factors that drive such variations. Better detection and patient education, standardizing care and improved access to care may improve patient health outcomes and reduce regional variation in patient care.

RESUME

Objectifs: Le cancer de l'ovaire (OC) affecte environ 1 Canadien sur 70 et est la cinquième cause de mortalité due au cancer chez les femmes. Environ 2800 nouveaux cas de cancer de l'ovaire sont prévus en 2016 au Canada et environ 45% en Ontario. Il existe des différences régionales significatives dans la prévalence et les résultats de survie partout au Canada chez les femmes avec OC. Cette étude vise à évaluer les différences régionales dans le profil des patients, les modes de traitement, l'utilisation des ressources de soins de santé et les résultats cliniques des patients avec OC en Ontario.

Méthodes: Il s'agit d'une étude rétrospective observationnelle de 2199 patients a été identifiée utilisent les bases de données administratives de l'Ontario. Les patientes de l'étude sont des femmes (≥18 ans) atteintes d'un cancer ovaire et traités selon les régimes provinciaux d'assurance-maladie de l'Ontario entre le 1er janvier 2007 et le 31 décembre 2011. Des statistiques descriptives ont été présentées pour toutes les données démographiques et les données de base des patients en général et par région. Les régions géographiques ont été regroupés en fonction de 14 unités de santé publique prédéfinies. Pour identifier les prédicteurs des résultats de santé axés sur le patient (survie globale, temps de récidive de la maladie, temps de la première chirurgie et temps entre la première et la deuxième chirurgie), on a utilisé une régression multivariée des risques proportionnels de Cox. Le temps prix pour recevoir la chirurgie, récidive de la maladie et de décès a été évalué avec l'estimation de Kaplan Meier de la fonction de survie.

Résultats: Les résultats bruts pour le temps moyenne (DS) du mort et de récidive de la maladie était 39.32 (0.93) mois et 82.21 (1.88) semaine, respectivement. Il y a une différence dans le temps de mourir (p <0,001) et le temps de traitement (durée de la première chirurgie (p <0,001) et délai de suivi (p = 0,001) entre les RLISS, mais aucune différence dans le temps pour la récidive de la maladie (P = 0,069). La région était un prédicteur dans le temps jusqu'à la mort et le temps de la première chirurgie, mais pas un prédicteur avec récidive de la maladie ou le temps de la deuxième chirurgie à partir de la date d'index. Le coût global des médicaments d'ordonnance était de $5 589,4 par patient et le RLISS du Sud-Est avait le coût moyen le plus élevé en ordonnance par patient de $19 239.5 comparativement à Hamilton Niagara ayant le coût moyen le plus bas de $1 683.7.

Conclusion: Il y a une différence dans les résultats cliniques et le temps de traitement entre les RLISS en Ontario, résultats de l'étude méritent une enquête plus approfondie sur les facteurs qui entraînent ces variations. Une meilleure détection et l'éducation des patients, la standardisation des soins et l'amélioration de l'accès aux soins peuvent améliorer les résultats en matière de santé des patients et réduire les variations régionales dans les soins aux patients.

PREFACE

This thesis is presented in the traditional style, with a sequence of chapters. The chapters include a general introduction, a statement of the study objectives and scientific rationale, a comprehensive literature review of the current knowledge surrounding this topic, a detailed description of the methodology and the statistical analyses used, and a presentation of the study results, both in tabular and descriptive form. I conclude with a discussion of the findings and how it relates to the current literature, a final study conclusion, and finally recommendations to reduce regional variation in treatment and care of ovarian cancer in Canada.

This study was entitled "Regional variation in Ovarian Cancer Treatment in Ontario" and I am the sole author of the study. I designed the study, reviewed the literature, conducted the statistical analyses, and wrote the manuscript. The data is owned by Dr John Sampalis B.Sc., B.A., M.Sc., Ph.D., F.A.C.E; who is my PhD supervisor, a professor in the Department of Experimental Surgery at McGill University. The data was originally requested by Dr Sampalis as part of a study with Dr Lucy Gilbert MD, MSc, FRCOG; professor at McGill University and Director of Oncology Gynecology at McGill University Health Center (MUHC) as part of the Dove Project for recurrent ovarian cancer patients. Dr Gilbert acted as a medical expert, fielding any medical questions to comply with medical accuracy for this study. James Fraggos, employed by Dr Sampalis, contributed to the acquisition of the data and conducted quality control of the data to eliminate any discrepancies.

STATEMENT OF ORIGINALITY

This doctoral thesis makes notable original contributions to the evidence of regional variation in health outcomes and treatment in the management of ovarian cancer (OC) in Ontario. The contributions have been described in the context of the preceding results, conclusion and discussion section. The key findings suggest that there is a regional variation in overall survival, time to treatment but no difference in time to disease relapse. The research suggests that patients who are equally ill at baseline and have no difference in disease morphology by regional location have found that there is a difference in overall survival and time to treatment based on where a patient has their permanent address.

In 2014, at the time of the commencement of this research project, there was no studies which investigated regional variation in the overall survival, treatment patterns and costs associated with the management of OC in Ontario. There was a similar study investigating regional variation in different types of gynecologic cancers, however, this doctoral work was the first of its kind to go beyond overall survival differences and look at the treatment and cost associated with OC cancer care in Ontario.

STATEMENT OF SUPPORT

There was no funding provided for this research.

ACKNOWLEDGEMENT

During my master's thesis, I would often find myself standing in the kitchen recounting to my mother the findings and objectives of my ongoing research. She said to me "sounds like you are on to great things". Although, I can't hear her voice anymore or stand in the kitchen telling her about my research, that one sentence has changed the course of my life. The purpose of going forward with my education and striving to complete worthwhile and innovative research which will impact the healthcare system has become a personal goal. Unfortunately, my mother was touched by cancer and her illness has shaped the way I perceive the healthcare system, but for every negative that we experienced, I vowed to shed light on the Canadian healthcare to avoid any unnecessary deaths resulting from poor treatment. You were a woman of few words, but I hope my doctoral degree and this research project has made you proud, I like to believe that I am still on the road to great things and that the best is yet to come.

A special thank you to my supervisor Dr John Sampalis. I had very little experience as a researcher, however, you gave me the opportunity to demonstrate diligence and determination and without hesitation you helped me pursue my academic goals. I admire your work ethic and saw first hand the long and strenuous hours you put in. Even during those busy days, you would carve out a few minutes to answer my research questions, and I appreciated those few minutes as they would give me the drive to work feverishly during my spare time. I am grateful to have met you and started working with you, as this has shaped my life for the positive. I have learned a great deal from you and I hope our professional careers will grow as I continue my career in medical research.

My committee members, Dr. Moishe Liberman, Dr Stephane Bergeron, Dr Lucy Gilbert and Dr Maria Petropavlovskaya your willingness and patience with me over the years has been incredible. Dr. Liberman and Dr. Bergeron your understanding of the medical system and methodological suggestions allow me to improve the quality of my research. Dr. Gilbert, your oncology expertise provided me with a clear and concise research direction. Dr Petropavlovskaya, thank you for being so organized and available for any meetings, irrespective of the sometimes-difficult location. I believe we all share a driving force in improving public health research and patient outcomes. I have really appreciated all your help over the years and I hope to rise to your levels in science as I continue.

The last four years, have been filled with a lot of coffee, late nights, early mornings and enduring many personal and medical struggles. To my family and friends who encouraged me to go reach for the highest degree possible. My father always said, it's better to try and get a maybe than not to and get a no. To my love, thank you for being with me during the worst times, when we didn't know if our future would be

complete. Also, your financial support was greatly appreciated during these trying student times☺. Thank you, Helene, for the many hours of babysitting. To my dear colleagues, especially K, we have shared many hours discussing course work, research problems and solutions and your generosity, encouragement and expertise is admirable. I wish you great success in the future.

As this chapter in my life comes to an end, I reflect on the many times where people told me I couldn't succeed and am proud that I was able to persevere. Growing my family and completing this thesis are the two most rewarding achievements thus far! The last few years, I have been able to sharpen my academic acumen, all while learning life lesson, which shaped the course of my life. Many people will always tell you, how you can't and how you shouldn't, but perseverance and trusting your instinct is essential in achieving your goals, whatever they may be. Quitting is never an option and never take no for an answer, as the solution is always there it's just a matter of finding the right path.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of the Variance
ATC	Anatomical Therapeutic Chemical
CCI	Canadian Classification of Health Interventions
CI	Confidence Interval
CT	Computerized Tomography
DAD	Discharge Abstract Database
DS	Déviation standard
EOS	End of Study
FAS	Full Analysis Set
FUP	Follow up
GLM	Generalized linear model
GOS	Gynecological Oncology Service
HCRU	Health Care Resource Utilization
HCR	Health Care Resource
HR	Hazard Ratio
IRB	Institutional Review Board
KM	Kaplan Meier
LHIN	Local Health Integration Network
LOS	Length of Stay
MOHLTC	Ontario Ministry of Health and Long-Term Care
NCCN	National Comprehensive Cancer Network
OC	Ovarian Cancer
ODB	Ontario Drug Benefit
OHIP	Ontario Health Insurance Plan
OS	Overall survival
PCP	Primary care physician
PFS	Progression Free Survival
PHU	Public Health Unit
PLD	Pegylated liposomal doxorubicin
PVD	Peripheral vascular disease
RPDB	Registry Person Data Base
SE	Standard Error
SD	Standard Deviation

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1 Introduction

1.1 Background

Ovarian cancer (OC) represents the leading cause of mortality due to gynecological malignancy and ranks fifth among the causes of cancer death in women worldwide (1). In Canada, the 10-year prevalence of OC is 9,355 cases accounting for 3% of all female cancers or 30% of all genital cancers in women(2). Approximately 2800 new cases of ovarian will be diagnosed in Canada in 2016, and approximately 1750 die each year from OC (3). The high mortality results from most cases being diagnosed at late stage with poor prognosis. Approximately, 67% to 69% correspond to advanced stage OC due to the lack of an effective screening test and the fact that early symptoms are often non-specific (4).

The incidence of ovarian cancer increases significantly after the age of 40 with its highest level observed in women older than 70 years old with 63% occurring after the age of 50 (5). Risk factors for ovarian cancer include age, family history, infertility and null or low parity. There is evidence that for certain ovarian cancers there is a hereditary component with the BRCA1/2 mutations being implicated. As a result, there is regional variation between countries and within Canada with respect to the incidence of ovarian cancer. More specifically, the lowest rates in the world have been observed in Western Africa (3 per 100,000) and the highest in Northern Europe (13 per 100,000). In Canada, the lowest incidence rate has been observed in Prince Edward Island (10 per 100,000) while the highest has been observed in Ontario (13.7 per 100,000)(5).

For all types of ovarian cancer, the five-year survival rate is 45%, however, depending on stage and type of tumor the 5-year survival rate is much better. For instance, stage I epithelial cancer is 90% compared to stage IV epithelial is 17% (5-7). Good prognosis is associated with younger age, cell type, stage at diagnosis, well differentiated tumor, small affected volume, absence of ascites and low degree of post-surgical residual disease (8).

Treatment options is dependent on the stage of disease progression; however, non-differential treatment recommendations include surgery, chemotherapy and/ or radiation. Despite positive initial response for 70 to 80% of the patients undergoing first line chemotherapy after surgery it is estimated that approximately 55% to 80% of the patients, depending on the stage and treatment, undergoing first line treatment for ovarian cancer will relapse within two years and will develop drug-resistant recurrent

cancer(9, 10). Moreover, geographic variation in the delivery of health care services is an important factor in understanding the use of treatment, cost and patient health outcomes. Previous studies have reported a variation in cancer screening and treatment received for selected cancer (11, 12). However, at this point in time there is no clear consensus on the optimal treatment of recurrent ovarian cancer with any regimen demonstrating clear superiority over others. In addition, there is no study in Ontario, which have assessed the geographic variation in the healthcare resource utilization and patient centered outcomes of ovarian cancer management.

OC represents a major burden of illness for Western world in general and Canada. It is the highest cause of death for gynecological cancers. The major challenge presented in the management of OC is related to the fact that the majority of patients are diagnosed at a late stage that increases the risk for relapse and poor outcome including reduced survival rates. Moreover, there is evidence of variation in treatment for OC, specifically older women with late stage of disease receive less than optimal treatment recommendations for surgery and chemotherapy (13, 14). In addition to variation in treatment recommendations, there is evidence for differential outcomes based on treating physician specialty. Appropriate surgical interventions occur more often if patient is treated by a gynecological oncologist and not a general surgeon or gynecologist (15-18).

1.2Scientific Rational

Although there are well established treatment guidelines for advanced OC, at this point in time there is a lack of Canadian population-based data describing the actual treatment rendered for patients with advanced OC. Therefore, there is a knowledge gap with respect to the possible regional variation in the epidemiology and treatment and consequently outcomes of patients with advanced OC.

In order to adequately assess the burden of illness including health care utilization and costs, the treatments used and the related outcomes for patients with OC and more specifically recurrent platinum-resistant disease and partially platinum sensitive disease in Canada, a population-based study is required. The determinants of treatment decision among patient, disease and clinician parameters must also be delineated to identify potential treatment gaps and define interventions that can optimize effectiveness.

The current study addressed these specific needs by utilizing the provincial health insurance claims databases from Ontario to conduct a retrospective cohort study of patients with OC. Ontario contributes the majority of OC cases with approximately 45% of new cases in Canada (3). Although treatment

recommendations within the province and across Canada should be the same, it is important to provide empirical evidence describing the real-life treatment and clinical outcomes of this population. Furthermore, using real life data, this study was able to demonstrate the differences in treatment and clinical outcomes between rural and urban settings, between community and academic centers, and between medical oncologists and gynecologic oncologists.

1.3 Thesis outline

This thesis begins with a literature review of the epidemiology of OC including the natural history the disease, which proceeds gradually through a series of stages and severity of disease and the impact each stage has on survival. The management and treatment of OC is discussed through the use of surgery, chemotherapy and radiation. The results of the literature above are discussed, including a discussion of the limitations of those studies that were included in the review. The methodology, including the statistical analysis, and the results are presented. The discussion and conclusion sections follow. Finally, recommendations that arise from this study are presented along with a discourse about how regional variation and access to care impact patients survival. The recommendations to improve and minimize this variation in the downstream treatment of OC and how it will positively impact upstream patient access to quality care.

This thesis is mostly written in the first person to show ownership of my research work. In some instances, I use the pronouns —we‖ or —us‖ to indicate when the research team was involved in a specific aspect of the study.

2 Objectives

2.1 Primary Objective

The primary objective of the current study was to determine if there was regional variation in the process and outcomes for OC patients in Ontario, specifically if there are clinical outcome differences by region in Ontario. An ecological inference was used to infer if there was a difference in care and patient health outcomes by region in Ontario.

2.2 Secondary Objectives

1. Described the profile of women diagnosed with OC in Ontario and determine if there was regional differences within Ontario.

2. Described the course of treatment(s) used in the management of OC patients in Ontario

    a. Identified determinants of treatment patterns in the management of OC patients in Ontario and explored if regional variation was present.

3. Described the health care cost associated with management of OC in Ontario.

    a. To describe the regional variation in healthcare cost for OC management in Ontario.

    b. What are the drivers in cost for OC in Ontario

2.3 Additional Objectives

In addition to the primary and secondary objectives, this study sought to identify predictors associated with patients centered outcomes and treatment with healthcare jurisdiction regions for patients being treated for OC.

3 Literature Review

The literature review is one of an exhaustive nature whereby the literature presented was based upon extensive database searches inclusive to Academic Search, Biological Abstracts, BioOne, CINAHL: Cumulative Index to Nursing and Allied Health, Global Health, JSTOR, MedlinePlus, Merck Index, and PsycINFO. The cumulative resources are categorized based upon the overall topic of each literary article and provides such scholarly works by experts in the fields of gynecology, oncology, and biological sciences.

Ovarian cancer represents the leading cause of mortality due to gynecological malignancy and ranks fifth among the causes of cancer death in women worldwide (19). In Canada, the 10-year prevalence of ovarian cancer is 9,355 cases accounting for 3% of all female cancers or 30% of all genital cancers in women (2). The Canadian Cancer Society estimates 2,800 new cases of OC in 2017 and of these cases, 75% to 85%) correspond to advanced stage disease due to the lack of effective screening tests and inconspicuous early symptoms (3). Approximately 1,750 women die of ovarian cancer in Canada every year.

The incidence of ovarian cancer increases significantly after the age of 40 with its highest level observed in women older than 70 years old with 63% occurring after the age of 50. There is regional variation between countries and within Canada with respect to the incidence of ovarian cancer. More specifically, the lowest rates in the world have been observed in Western Africa (3 per 100,000) and the highest in Northern Europe (13 per 100,000). In Canada, the lowest incidence rate has been observed in Prince Edward Island (10 per 100,000) while the highest has been observed in Ontario (13.7 per 100,000) (5).

There is no clear understanding what causes OC, however, within the past decades, experts have found a new understanding in the molecular epidemiology of OC. Risk factors include age, ethnicity, family history, hormone replacement use, disease comorbidities such as endometriosis and polycystic ovaries (20, 21). Genetic mutations are linked with an increased risk of OC, most commonly the defective homologous recombination DNA repair in the BRCA1 and BRCA2 gene. This genetic mutation is five times more common among Ashkenazi Jews compared to the general population (22). Additional genetic syndromes include Peutz-Jegher and other rarer disorders (23). Findings of epidemiological studies have shown that the risk of ovarian cancer is reduced by states of anovulation, such as pregnancy or the use of oral contraception (24). Recent class action law suits against talcum powder companies have questioned the association between asbestos free talc and OC, however, the results are inconclusive (25-27).

OC goes undetected until it is often at a late stage in the disease, which is why the prognosis is poor. Common symptoms that are associated with the disease include abdominal bloating, difficulty eating or a feeling of fullness or pressure, pelvic or abdominal pain, and an urgency or high frequency to urinate (28). Late-stage ovarian cancers often have symptoms, but they are usually nonspecific and not recognized as symptoms of cancer. If the symptoms are less than one year or frequent and occur more than 12 days each month, it is recommend to talk with a family care physician (29). Presently, there is no reliable screening method for OC detection. Currently, if a patient is showing sign and symptoms of OC, the following test may be performed to check for the presence of OC: pelvic exam, trans-vaginal ultrasound to detect abnormal growth, Intravenous pyelogram (IVP) to check from cancer spread, CA-125 assay and a series of x-rays (barium enema or CAT scan). There is no current clear guideline to determine the presence of OC and the only definitive way to determine if a patient has OC is through a biopsy. Definitive surgery is performed upon suspicion of OC, where the tissue is examined to confirm the stage, grade and location of tumor. By identifying the stage and grade of the cancer, will help to determine the best treatment plan.

The basis for OC begins with understanding that the ovaries are prone to producing more varieties of tumors that in any other organ and can produce cells that are teratomas inclusive to the granulosa cell tumor which is difficult to recognize. Cancerous ovarian tumors start from three common cell types: Surface Epithelium - cells covering the outer lining of the ovaries, Germ Cells - cells that are destined to form eggs or Stromal Cells - Cells that release hormones and connect the different structures of the ovaries (30). The type of tumor is a good predictor for the type of OC that will present. Ovarian germ cell tumors develop from the cells that produce the ova or eggs. Most germ cell tumors are benign, although some are cancerous and may be life-threatening. Six main kinds of germ cell carcinoma exist, but the three most common types are: teratomas, dysgerminomas and endodermal sinus tumors. These malignancies tend to be found in women in their twenties (31). Stromal tumors are a rare class of tumors that develop from connective tissue cells that hold the ovary together and those that produce the female hormones, estrogen and progesterone (30). These tumors are considered rare, approximately 70 percent presenting as Stage I disease, providing the patient with a good prognosis. Epithelial tumor are malignant cells which form in the tissue covering the ovary and over 90% of OC cases are of this type (31). There are various types of epithelial cancer; serous, endometrioid, clear cell, mucinous and undifferentiated or unclassifiable. The most common is serous and researchers believe that OC starts in cells at the far end of

the fallopian tube, rather than the surface of the ovary, these early cancer cells then spread to the ovary and grow (32).

Serous tumors can be classified as low or high grade. High-grade serous carcinoma is the most malignant form of ovarian cancer and accounts for up to 70% of all ovarian cancer cases. This tumor originates in the fallopian tube and as a result spread through the abdomen very early in the course of disease, and by the time they become symptomatic they are usually high stage tumors, which results in poor outcomes (33). The pathogenesis of high-grade serous carcinoma, often referred to as Type II pathway is characterized by: (1) rapid development from what are now believed to be intra epithelial carcinomas TP53 mutations, (3) a high level of chromosomal instability, (4) in hereditary tumors, BRCA germline mutations, and (5) absence of mutations of KRAS, BRAF, or ERBB2. Whereas low-grade serous carcinoma, referred to type I pathway is associated with slower growth, and resistance to chemotherapy and a younger age at diagnosis with mean ages of 45–57 years (34). Low grade progress in a stepwise fashion; they arise from a serous cystadenoma or adenofibroma which progresses to an atypical proliferative serous tumor, to non-invasive invasive micropapillary serous carcinoma (MPSC) and then to invasive.

In order to devise a treatment plan for patients, the physician must determine the stage of the tumor. The stage often includes the size of the tumor, which parts of the organ have cancer, whether the cancer has spread (metastasized) and where it has spread. The staging system applies to both epithelial and stromal ovarian tumors, including tumors of borderline malignancy. Stage is determined during the primary debulking surgery. The most common staging system for OC is the FIGO system. In general, the stages I, II, III, and IV refer to the location of tumor involvement, while the subdivisions A, B, and C define the extent of tumor involvement (35). A higher stage of disease indicates more extensive tumor involvement.

Early-stage cancer — Stage I and II disease are considered early-stage ovarian cancer:

- In stage IA and IB disease, the cancer is limited to one or both ovaries, and the capsule or membrane covering the ovaries has not been broken by the cancer's growth.
- In stage IC disease, the capsule of either ovary may have ruptured or there may be signs suggesting that cancer cells have begun to spread within the pelvis (i.e., there are cancerous cells in the fluid taken from the peritoneal cavity during surgery).
- In stage II disease, other pelvic organs, such as the uterus or fallopian tubes, are involved with the tumor, and there may be early signs that the cancer has spread beyond the pelvis.

Advanced-stage disease

- In stage III disease, the cancer is confined to the abdomen and the abdominal lymph nodes.
- In stage IV disease, the cancer has spread to distant sites such as the liver or lungs.

An accurate stage is important as it will determine the patient's treatment and prognosis. If the cancer isn't accurately staged, then cancer that has spread outside the ovary might be missed and not treated (36). The Canadian Cancer society assembled a report describing the 5 year survival rate based on a patients stage and type of tumor; overall the higher the stage the worse the prognosis (37). Recommendations for treatment after surgery depend upon the disease stage.

Primary treatment for presumed ovarian cancer consists of appropriate surgical staging and cytoreduction, followed by systemic chemotherapy. The current treatment guidelines for primary first line treatment of epithelial OC(38) (as this is the most common type) by stage is as follows:

Stage I - Surgery is used as the primary treatment to remove one or both ovaries, fallopian tubes and uterus. Women with low grade stage IA or IB undergo surgery and staging surgery with follow up observation. Women with aggressive (grade 2 or 3) stage IA or IB or IC will undergo chemotherapy after surgery using paclitaxel and carboplatin. Each cycle of chemotherapy is given over three weeks for a total of six cycles. Optimal number of cycles is recommended based on patient risk factors and how well the patient is tolerating the chemotherapy.

Stage II - Surgery to remove both ovaries, fallopian tubes and uterus and staging, followed by platinum-based chemotherapy. Some clinicians also use a combination of IP and IV chemotherapy for women with stage II disease, but there is no evidence that IV/IP treatment in women with stage II ovarian cancer is more beneficial than standard administration of IV chemotherapy alone.

Stage III - Surgery is the first treatment given for stage 3 epithelial ovarian cancer. The types of surgery are: total hysterectomy and bilateral salpingo-oophorectomy, removing the fatty tissue that covers the abdominal organs (omentectomy) and surgical debulking. Chemotherapy is given after surgery with carboplatin or cisplatin along with paclitaxel or docetaxel. Carboplatin and paclitaxel given by IV is the chemotherapy that is most often used. Chemotherapy may be given preoperatively if cytoreduction is not effectively able to be performed.

Stage IV - often treated with surgery and chemotherapy. Surgery may be done to remove the tumor and debulk the cancer. Sometimes chemotherapy is given before surgery to shrink the tumor. During surgery, the surgeon also removes abnormal looking tissue samples from different parts of the pelvis, abdomen and lymph nodes. Chemotherapy for stage IV epithelial ovarian cancer is often carboplatin or cisplatin with paclitaxel or docetaxel. Carboplatin and paclitaxel is the chemotherapy combination that is most often used. Surgical procedures to reduce symptoms and relieve pain for stage 4 cancer include paracentesis, thoracentesis, feeding tube or a stent in large or small intestine or ureter to relieve a blockage caused by a tumor (37).

Despite the many different treatment options for OC patients, they are not always effective in treating the disease. Generally 70% of advanced stage OC relapses, and even in stage I or II, the relapse rate is 20%-25% (39). Recurrence treatment include chemotherapy, hormone therapy and targeted drug therapy. The role of surgery for recurrent disease remains unclear. Evidence suggests a secondary surgery is most effective on patients who had no residual disease after primary surgery, small volume disease, absence of ascites and have platinum sensitive relapse (40). Treatment for recurrent cancer are similar to first line treatment; surgery and chemotherapy. The drugs used for second line chemotherapy are dependent on the patient's first line chemotherapy, they will either be classified as platinum sensitive or platinum resistant. Platinum sensitive is defined as recurrence at least 6 months since the last platinum-based treatment. In this case platinum base drugs are effective and may be reused for second line therapy. The median survival of patients with platinum sensitive recurrent OC is 2 years but can range from a few months to a decade (41). Patients who relapse within 6 months from the last first line treatment are classified as platinum resistant. The main goal of treatment in this group of patients is maintaining quality of life by preventing and reducing symptoms (42). Angiogenesis has been validated as target therapy is being used to treat advance epithelial OC by targeting only the cancer cells and preserving normal cells. Clinical trials have demonstrated that single agent bevacizumab delays tumor progression and stabilizing advanced OC (43-45). At this point in time there is no clear consensus on the optimal treatment of recurrent ovarian cancer with any regimen demonstrating clear superiority over others. For patients with platinum-sensitive disease combination therapy with several agents must be considered. Carboplatin with paclitaxel is as the standard of care according to the National Cancer Institute. The use of pegylated liposomal doxorubicin (PLD) should also be considered.

For patients with platinum-resistant or -refractory disease use of non–platinum agents including PLD, paclitaxel, topotecan are treatment options as monotherapy since to date there is no evidence of benefits

for combination therapy. Other possible agents that can be used for this patient population include docetaxel, gemcitabine and bevacizumab. For this patient population in particular evidence of superiority of any regimen is lacking , more clinical trials are needed (46).

With a growing elderly population and the rising cost of healthcare, particular attention has been given to the economics of healthcare utilization. The advances in medicine and better access to health care people are living longer, in particular, OC patients are living longer with aggressive cytoreductive surgery and the availability of a rapidly expanding menu of chemotherapeutic agents (47). However, most patients with recurrent or advance staged OC embark on a slow decline in functional status with an increase in healthcare resource utilization. Clinical management of OC is expensive, OC is associated with a high burden of disease and poor patient prognosis. The clinical management of OC is expensive and although HCRU may vary between countries, the high burden of disease with poor patient prognosis is shared worldwide. In the Netherlands, Greving et al showed a Markov model estimating mean costs of managing ovarian cancer to be €34,274 to €43,332 per patient for 10 years in 2006 (48). In the United States in the mean cost of hospitalization for patients in non- hospice unit during the last 60 days to death was US $59,319 in 2005 (49). A more recent study in the United States identified regional variation in Medicare spending for advanced cancer and found that the mean 6-month expenditure was $33,727 in the incident cohort and $33,099 in the decedent cohort (50). A Canadian study evaluated the inherent resource utilization in patients undergoing second- or third-line chemotherapy for recurrent or refractory advanced OC and found the mean cost per patient from initiation of second- or third-line chemotherapy until death was estimated to be Can $53,000, with 45% of this total cost attributable to chemotherapy in 1997 (51). Analysis of regional variation in medical spending can be used to assess value in health care delivery. Studies of regional variation in spending have demonstrated large differences in HCRU and treatment recommendations (50, 52), yet no consistent association between spending and survival (50, 53). Having a greater understanding of the treatment cost associated with the OC, will help close the literature gap and enable policy makers to allocate change most effectively. To date, there are no current studies evaluating the cost of treatment for OC in Canada, specifically Ontario.

The understanding of how resource utilization in health may affect prognosis and treatment of women with OC has only recently been introduced. Authors McCorkle, et al. examined the effectiveness of early intervention from both a healthcare provider and a psychiatric consult-nurse liaison when women are undergoing treatment for OC (54). The authors compared the progress between those women who were actually hospitalized during their treatment versus those who chose outpatient therapy services and

treatment. The authors used a two-group study of experimental and longitudinal design to ascertain if the dual treatment method (both physical and cognitive) were more responsive than just the symptom management alone. Using a intervention group of randomly assigned women who have had OC surgery within either a 48 hour, 1 month, 3 month, or 6 month period, the authors included 67 women in the first group (n=67) and a control group. The control group included 70 randomly assigned women with the same characteristics (n=70) (53). The inclusion criteria were based upon a recruitment taking place from December 2003 to June 2006. The primary candidates for the study was based upon the women being discharged with orders for chemotherapy, were over the age of 21 years, lived in Connecticut, had a suspected diagnosis of OC after an abdominal surgery with a prognosis of 6 months plus. All sample population participants had received their primary care at North-east academic medical center.

Using covariates, healthcare utilization data, and power analysis for healthcare provider intervention and the relative effect on the healthcare utilization from past expert information and studies, McCorkle, et al. examined the differences in HCRU between the different providers and their respective intervention methods. The authors found no differences between those patients hospitalize and those patients employed in outpatient oncological care. The authors discerned the main discovery was a noteworthy alteration in the amount of primary care visits between the two groups as those participants in the attention control group were found visiting their primary care physician (PCP) rather than the group for intervention treatment. Along with this, the authors noted that depressive symptoms were more regularly reported in those women visiting their PCP rather that the intervention group. However, “the intervention group visited the emergency room more often because the nurse instructed patients to go when they recognized symptoms that needed urgent care after hours”. Using the covariates for the data collection and analysis, the authors relayed the determinants that the monitoring and management of both in-house and outpatient treatment for OC show to be equally effective.

A second, more current study, on the resource utilization for those patients with ovarian cancer surgery and/or chemotherapy treatments by Wright, et al. examined and compared the conventional intravenous taxane-based intravenous measures in chemotherapy for OC to the use of intraperitoneal chemotherapy and frequent dose-dense intravenous chemotherapeutic method (54). Believing that the latter have been associated with an increased and improved percentage for survival rate, the authors performed a population-based examination of women having OC, who had undergone OC surgery, and who were ordered platinum and taxane-based chemotherapy. From the years 2009-2013, 5,892 women recorded in the common MarketScan database allowed the examination of their respective health records for the

purpose of the study. The number (proportion) received the standardized chemotherapy (70.2% (4,135)), with 14.6% (859) treated with intraperitoneal chemotherapy and 15.2% (898) receiving dose-dense chemotherapy (weekly administration of chemotherapy), dose-dense chemotherapy regimens deliver drugs intravenously but at a more frequent schedule with at least one drug delivered weekly (55). Examination of data was based upon an every 21-day round of chemotherapy. The authors concluded that "the efficacy of intraperitoneal chemotherapy for ovarian cancer, we noted only modest use of the treatment. In contrast, the use of dose-dense chemo- therapy appears to be increasing rapidly". However, the authors also noted that the intraperitoneal chemotherapy also produced a higher percentage of complications and side effects.

As with every facet of healthcare services, cost conditions are of vital interest to all parties involved. This is inclusive to the patient, the healthcare provider, and the hospital in which treatment (or surgery) is scheduled. Such considerations for the economic utilization of healthcare resources have been based upon the total cost factors weighed against the insurance payment ranges and the hospitals own policy factors. Such incidences in payment versus care has caused a plethora of research and examination into all facets of the healthcare economics based upon measurements of resource utilization.

For example, Pennington, et al. examined the potential probability for preventative care with a higher possibility for successful remission in patients with OC due to long-term secondary care costs (56). The authors examined the cost effectiveness between 491 women who were diagnosed with OC at various stages. The strongest predicators of cost for these women were the stage, grade, and BMI of the OC with a majority of cost for stages 1 and 2 being after diagnosis during first six months. Those in stages 3 and 4 incurred considerably higher costs after the first six months due to the higher level and more profound needs in their treatment plans. The authors conclusively found that the accrued costs were three times higher in those patients needing treatment for diagnoses of later stage OC than that of women in stages one or two. The treatment costs are considered when establishing the cost-effectiveness for OC and in essence provide validity that healthcare providers must begin to observe for those early signs of OC in their patients for cost effectivity.

However, authors Lewin, et al. had derived that those end-of-life medical costs associated with OC patients, annually consume 10-12% of the national healthcare expenditures. Of these patients, 27% are on Medicaid in the US and the number is increasing annually. (49). The authors examined the cost comparative between OC patient stays during the final 60 days of their lives versus the early costs of

hospital-based resources used by early stage OC patients. Along with this comparison, the authors examined the differences in cost for those end-of-life patients who were using hospital funded hospice services (during the last 60 days of life) versus those not using hospice services.

The authors used patient records of those patients who were deceased from the years 1999 to 2003 and who had purposefully been examined and declared to have expired due to OC. Medical records, medical billing records, lab and pharmaceutical records, demographic records, histology records, and use of hospice or not records were evaluated for 84 patients and the authors found "demographic, histologic and staging characteristics as well as platinum sensitivity were similar between the two groups before the last 60 days of life. Mean number of chemotherapy cycles before the study period was also similar (20.4 and 21.0, respectively)". The findings suggested that there is a substantial cost variance with no substantial improvement in survival between OC patients treated aggressively versus those treated by hospice. The authors suggested that hospice enrollment can be beneficial the earlier it is implemented.

While certain evidence from experts suggested that treating OC at the end of life is not cost effective, the question is not how we save money with such treatment measures, but when do we stop treatment altogether based upon cost constraints. Von Gruenigen and Daly examined the consideration, fallacies, and fundamental issues based upon cost containment and resource utilization for those OC patients in the end stages of OC (57). Von Gruenigen and Daly examined at what stage of the progressive and terminal OC the healthcare provider should discern was not effective or efficient to continue such treatment measures as chemotherapy and what factors substantiate and support such decisions. The authors recognized that Lewin, et al. justified their decision by focusing upon costs and the excessiveness of paying for treatment measures that would do no good, nor would they extend an OC patient's life. Also recognizing the fact that non-hospice patients incurred higher amounts of hospital bills and charges than those who were under hospice care. However, with no reported difference in survival rates, Von Gruenigen and Daly argued that Lewin, et al.'s (56) study could not be interpreted as justified proof that continuing therapy will fail to extend life. The reason Von Gruenigen and Daly suggested as much was due to the absence of any substantial data from any patient being treated and found still alive post-data collection. Yet Von Gruenigen and Daly also found that laboratory and pharmacy expenses were considerably higher than in-patient hospitalization. The authors suggested that there needs to be a recognition for changes in the matters of treatment of OC patients. Of course, the first variable would be to identify this disease early enough that treatment would be effective, but also the understanding of late

stage OC must be presented so an impact of continued dependence on cure-oriented therapy methods over palliative care will be accepted by healthcare providers.

The cost associated with OC vary by country as mentioned previously, however, an important gap in the literature is if quality of care varies by region leading to a variation in patient health outcomes. Receiving quality care is an important facet of cancer treatment and differences in treatment received can majorly affect a patient's OS. Several studies have suggested that optimal treatment resulting in better outcomes is more often achieved through subspecialist gynecologic oncologist service (15, 58, 59). Although the US guidelines do not specifically nominate such a service, studies demonstrate that women who are optimally debulked to a microscopic residual in a high volume centers (60, 61), have better OS than women who are suboptimal debulked (less than 1 cm tumor remaining) (62-64). Cancer directed surgery and chemotherapy are the standard treatment recommendations and an observed variation in the utilization of these treatments will have a downstream effect on outcomes of OC patients. Fairfield et al. study of regional treatment variation in the American Medicare population observed a difference in receipt of cancer-directed surgery and chemotherapy, they felt that much of the variation was explained by a difference in surgical rates. In Canada, where healthcare is publicly funded, Kwon et al. conducted a study to determine if regional variation exist in endometrial cancer outcomes. The study was conducted in Ontario, where LHIN vary from densely populated cities such as Toronto, to very rural communities in Northern Ontario. They observed that in three LHINs, almost 50% of patients received surgery in a different LHIN from where they reside. In addition, they found significant differences in rates of surgical staging (0.7% to 58.3%) and adjuvant pelvic radiotherapy (11.8% to 27.5%). Surgical staging procedures, consisted of hysterectomy with bilateral salpingo oophorectomy and pelvic lymphadenectomy. However, the OS did not differ after adjusting for patient and hospital level variables. Other studies have attempted to explain the presence of regional variation due to a differential access to quality care (65-68). Tracey et al. examined how the distance of residence from a Gynecological Oncology Service (GOS) was associated with OS in Australia (65). In their study, they found that women who sought treatment close to their residence in a GOS center was associated with improved OS. Geographic variation in the delivery of health services is an important factor in understanding the use of, effectiveness of, and access to care for a variety of healthcare services. More research is needed to understand the reasons for this variation.

4 Material and Methods

4.1 Study Design

4.2 *Study Source Population*

The study sample consisted of women which have been treated for OC under the Ontario provincial health insurance plans between January 1, 2007 and December 31, 2011 18 years and older. Patients treated for OC during the study period were identified from the Discharge Abstract Database (DAD) in Ontario and linked to administrative claims health insurance plans database Ontario Ministry of Health and Long-Term Care (MOHLTC) in Ontario. The ICD 9 Code (183.0) and related ICD 10 (C56.9) codes were used to identify the patients that were included in the study cohort. The MOHLTC database was used to extract data for treatments received in the hospital and at physician offices or clinics.

4.3 Study Source of Data

The data was obtained from the MOHLTC (demographic files, Ontario Drug Benefit Program (ODB), Registry Person Data Base (RPDB), hospitalizations records using DAD and OHIP using medical claims. Unique encrypted identifier numbers were used to link the MOHLTC datasets on a patient-level basis.

The description of the data acquisition process was as followed:

i. The MOHLTC identified and selected all the Ontario residents diagnosed with OC (based on respective ICD-9/ICD-10 codes) between January 01, 2007 and December 31, 2011 (or the most recent date of available data at the time of data extraction) from the DAD.

iii. The MOHLTC extracted the required data for the individuals and created encrypted unique identification numbers.

iv. The MOHLTC sent the following information to the principal investigator

- Encrypted unique identification numbers
- Demographics (demographics and coverage files in Ontario)
- Medical services (OHIP medical services in Ontario)

- Pharmaceutical services (ODB in Ontario)
- Hospitalization data (DAD in Ontario)
- Healthcare utilization cost (OHIP in Ontario)

v. The principal investigator merged the individual datasets from the MOHLTC (RPDB, ODB, OHIP and DAD) using the Ministry's encrypted unique identification numbers.

The governmental data extraction time frame and specifications are presented in Table 1. All the individuals diagnosed with OC between January 01, 2007 and December 31, 2011 (or the most recent date of available data at the time of data extraction) were identified from the DAD based on the respective ICD-9 (183.0) and ICD-10 (C56) codes. The individuals were entered in the cohort at the time of the diagnosis of OC (index date). For each individual selected, all claims for medical and pharmaceutical services and all hospitalization records were extracted for a period of two years preceding the diagnosis of OC (index date). This data was essential to describe the medical and pharmaceutical history of the individuals to identify the prevalent and the incident cases of OC and to adjust for potential confounders, including comorbidities. To ascertain the study outcomes, all the medical and pharmaceutical claims and hospitalization records of the individuals included in the study were extracted from the index date to March 31, 2012 (or to the most recent date of data availability at the time of data extraction) or death, whichever occurred first.

Table 1 Data Extraction Specifications

Patient Selection Window:	From January 01, 2007 to December 31, 2011 inclusively
Time patient enters in the study (Index date):	Time of the OC diagnosis defined as the date of diagnosis (ICD-9: 183.0; ICD-10: C56) recorded
Look-back Window:	2 years preceding the index date (time patient entered in the cohort)
Observation Window:	From time patient entered the cohort (index date) to March 31, 2012 (or to the most recent date of data availabilities at the time of data extraction)

Maximum Follow-up Date:	March 31, 2012 (or to the most recent date of available data at the time of data extraction) or death, whichever occurred first
End of Observation period:	March 31, 2012 (or to the most recent date of available data at the time of data extraction)

4.4 *Data Quality*

The data derived from the MOHLTC health insurance plan administrative databases. Quality control was conducted by the agencies on the data and this provided assurance for the validity of the data.

4.5 Selection of Patients

All the patients fulfilling the inclusion and exclusion criteria during the study period were included in the study cohort.

4.6 *Inclusion Criteria*

Women diagnosed with OC between January 1, 2007 and December 31, 2011 were included in the study. The patients were identified by the ICD9 (183.0) or equivalent ICD10 code (C56.9) for OC in any of the diagnoses codes.

4.7 *Exclusion Criteria*

- Patients with missing data for treatments used after first diagnosis,
- Patients lost to follow up after initial diagnosis as indicated by no data for 2 years or more
- Patients with illogical age (e.g. < 18 and >100) or age outliers
- Records with claims after death (0 days)
- Male gender
- Patients with missing residential postal code a forward sortation area (FSA) information.
- Patient who did not undergo a minimum of one chemotherapy treatment and surgery (Exploratory Surgery Related, Hysterectomy, Omentectomy, Oophorectomy, Salpingo-Oophorectomy or diagnostic surgery) for OC.

4.8 Definitions

The study sample will consist of all women diagnosed and treated for OC in Ontario between January 1, 2007 and December 31, 2011. Therefore, the primary exposure of interest is the diagnosis with OC.

4.9 *Regional Location*

In 2006, the province of Ontario established local health integration networks (LHINs) as governance structures to regulate health care delivery at a local level with Bill 36. There are 14 LHINs, which are mandated with planning, integrating, and distributing provincial funding for all public healthcare services at a regional level (69). The population was analyzed according to region of residence defined by LHINs. For the purpose of this analysis, tables were reported using the LHIN number, appendix 2 describes the LHIN name with the corresponding LHIN number. A description of the LHIN and corresponding census subdivision name is described in appendix 3.

4.10 *Treatment*

4.10.1 Surgical Treatment

The established treatment for OC is surgical, chemotherapy and or radiotherapy. Treatments were defined using procedure codes extracted from the administrative databases CCI (from the DAD) and the OHIP fee code, as described in table 2. This table described the variables used to classify the treatment received and the corresponding Canadian Classification of Health Interventions (CCI) and the Ontario Health Insurance Plan (OHIP) fee codes. Treatment received included: Unilateral - bilateral oophorectomy, unilateral - bilateral salpingo-oophorectomy, hysterectomy, omentectomy, removal of regional lymph nodes, radiation therapy, intra-peritoneal treatment or at least three of the following treatments Uni/bilateral oophorectomy with or without hysterectomy; Omentectomy; Cytoreduction Pelvic/paraortic lymph node excision.

Treatments were grouped into either surgical, first line or second line treatment by the surgical procedures and pharmaceutical treatments described as follows:

Surgical Treatment:

Unilateral or bilateral oophorectomy

Unilateral or bilateral salpingo-oophorectomy

Hysterectomy

Removal of regional lymph nodes

Omentectomy

First line treatment:

- Radiation therapy
- Intra-peritoneal P-32
- Platinum based drugs
    - Cisplatin
    - Carboplatin
- Paclitaxel
- Combination therapy

Second line treatment:

- Platinum based drugs
    - Cisplatin
    - Carboplatin
- Paclitaxel
- PLD
- Combination therapy
- Topotecan
- Docetaxel
- Gemcitabine
- Bevacizumab
- Etoposide
- Vinorelbine

4.10.2 Pharmaceutical treatment

In addition, the database extracted pharmaceutical medication received by the study sample patients paid for by the public provincial health insurance plans, as described in Table 3. The medications covered by private insurance were not ascertained.

Table 2 MOHLTC Extraction Codes

Medical Treatments/Interventions	CCI (for DAD & Med-Echo)	OHIP Fee codes
Unilateral - bilateral oophorectomy	1.RR.87 1.RB.89	n/a
unilateral - bilateral salpingo-oophorectomy	1RB89DA 1RB89LA 1RB89RA 1RD89DA 1RD89LA 1RD89RA	n/a
hysterectomy	1RM89AA 1RM89CA 1RM89DA 1RM89LA 1RM91CA 1RM91LA	n/a
omentectomy	1OT87DA 1OT87LA	n/a

Medical Treatments/Interventions	CCI (for DAD & Med-Echo)	OHIP Fee codes
removal of regional lymph nodes	1MJ87 1MJ89 1MJ91 1MH87 1MH89 1MG87 1MG89	R912 R913 R914 S776
radiation therapy	n/a	X310 X311 X312 X313 A345 A346 A745 C345 C346 C745

Medical Treatments/Interventions	CCI (for DAD & Med-Echo)	OHIP Fee codes
intra-peritoneal treatment	n/a	G339 G345 G359 G381 G372
At least 3 of the following 4: • Uni/bi oophorectomy w/wo hysterectomy; • Omentectomy; • Cytoreduction; • Pelvic/paraortic lymph node excision	n/a	n/a

Table 3 List of codes to identify pharmaceutical treatments in the Ontario governmental administrative datasets

Pharmaceutical Treatments	ATC	DCC	DIN
cisplatin	L01XA01	40966	02126613 02366711
carboplatin	L01XA02	45403	02125439 02126680
paclitaxel	L01CD01	47023 and 47680	02281066 02248844 02244372 02296624 02320010 02016796
topotecan	L01XX17	47246	02231116 02333880 02344009
docetaxel	L01CD02	46286 and 47156	02361957 02177099 02177080
gemcitabine	L01BC05	47230	02305526 02370034

Pharmaceutical Treatments	ATC	DCC	DIN
			02324210
			02324202
			02305534
			02298775
			02318741
			02298783
			02302098
			02302101
			02230309
			02230308
bevacizumab	L01XC07	47573	02270994
			02270994
etoposide	L01CB01	42760	02241182
			02080036
			00616192
vinorelbine	L01CA04	46224 and 47095	02091283
			02265990
			02271214
			02257777

4.11 *Carcinoma Type*

The following definitions were used to classify the tumor grade:

Type I

Patients who did not receive three (3) chemotherapy treatments before receiving surgical treatment. Surgical treatment is restricted to the following procedures: Unilateral or bilateral oophorectomy, Unilateral or bilateral salpingo-oophorectomy, Hysterectomy, Removal of regional lymph nodes or Omentectomy. Any compilation of chemotherapy and the included surgical treatment are eligible in this group. I.e. surgery followed by two chemotherapy treatments then followed by an additional surgery.

Type II

Patients who received three (3) treatment of chemotherapy treatment before receiving a surgical treatment. Surgical treatment is restricted to the following procedures: Unilateral or bilateral oophorectomy, Unilateral or bilateral salpingo-oophorectomy, Hysterectomy, Removal of regional lymph nodes or Omentectomy.

4.12 *Cancer Type*

Based on the response to platinum analogues, patients with recurrent OC were subdivided into the following four groups:

1. Platinum-sensitive disease: patients who relapse 12 months or more after completion of initial platinum-based chemotherapy.

2. Partially platinum-sensitive disease: patients who relapse between 6 and 12 months after completion of initial platinum-based chemotherapy.

3. Platinum-resistant disease: patients relapsing under 6 months from completion of initial platinum-based chemotherapy.

4. Platinum-refractory disease: patients who relapse during or immediately following initial platinum-based chemotherapy.

5. Cannot Determine/Other: If a patient did not conform to the above definitions, it was possibly due to the fact that for certain patients and disease parameters oncologists and surgeons may have applied treatments, these patients were classified in this group and the treatment used were

assessed on a case by case basis in order to determine if the patient was able to be classified into one of the four categories listed above or into new categories.

4.13 *Relapse*

A patient was in remission if they had no subsequent OC related surgery, radiotherapy and/or chemotherapy medication after the last date of second line treatment. At the end of the study, if a patient had a third line treatment, they were not considered to have been in remission.

4.14 *Socioeconomic Status*

Socioeconomic status is the social standing or class of an individual or group. It is often measured as a combination of education, income and occupation. This was calculated using 2011 statistics Canada mean household income by census subdivision name (70).

4.15 *Comorbidity*

A patient was classified as having comorbidities if there was presence of any of the following: Cardiovascular disease, Hypertension, Hyperlipidemia, Diabetes, Other Cancer, CHF Respiratory, CHF Depression, CHF Diagnosed, Stroke, Peripheral vascular disease, Pulmonary Hypertension, Myocardial Infarction, Dyslipidemia, Kidney disease, Arthritis, Osteoporosis, Autoimmune Disease, Neurological, Hepatitis, Infectious Disease.

4.16 *Hospital Type*

A university hospital is defined as an institution which combines the services of a hospital with the education of medical students and with medical research. These hospitals are typically affiliated with a medical school or university. We included only hospitals which treat adults (> 18 years). A hospital was defined as a teaching hospital if it fell into the predetermined university hospitals as per the provincial government outlined in Appendix 1, all other hospital were classified as non-teaching hospital (71).

4.17 *Physician Type*

Physician type was classified based on the physician fee code provided by OHIP data. Each physician has specialty training such as obstetrics/gynecologist and if no specialty, the physician was classified as general physician.

4.18 Outcome Measures

4.19 *Patient Profile*

This study described the patient profile of all included women, which included age, socioeconomic status, residence location, comorbidities and age at diagnosis. The patient profiles were described overall and compared between geographical regions of Ontario.

4.20 *Treatment Received*

For each patient, the specific treatments and combination of treatments described in section 2.4.3 were assed overall and for each geographical region. The distribution of treatment regimens including surgery, radiotherapy and chemotherapy and combinations were described. Treatment endpoints were assessed by:

- Duration of treatment
- Time to first surgery from index date
- Time to second line treatment surgery from last first line surgery

Duration of treatment was estimated from the date of onset of treatment to the last date of treatment as recorded. In addition, for patients with recurrent cancer duration of survival was also estimated from the time of onset of the second line treatments from the last first line cancer treatment.

4.21 *Clinical Outcomes*

The clinical outcomes were assessed overall and by each geographical health region using measuring the following:

- Time to death (mortality) from any cause from index date
- Time to disease relapse from index date

Time to death was estimated from the date of onset of treatment to death date as recorded in the administrative databases. Time to relapse was estimated from the date of termination of first line treatment to the date of initiation of second line treatment. Patients with third line treatment were classified as not in remission at the end of the study.

4.22 *Health Care Utilization Costs*

Direct health care costs were estimated from health care utilization (HCRU) data derived from the prescription, medical service and hospitalization/claims data. HCRU was assessed using MOHLTC extraction codes described in table 2 and was reported overall and by geographical health region for OC related and not related procedures. The cost is from a health care service perspective. HCRU was reported for the number of patients with recorded procedures and the number of events per 1000 patients was reported. Length of hospital stay (days) was reported from date of first hospital admission date to discharge

date. Physician visits was assessed with the number of patients who frequented the physician office and the number of events per 1000 patients. Pharmaceutical prescription was extracted from the ODB as described in Table 3. Pharmaceutical services were reported by ATC medication class for the frequency each medication was filled and for each prescription per 1000 patients. The cost of pharmaceutical services was reported for each medication charged to the publicly insured OHIP and the number of medication filled per 1000 patients. Cost of pharmaceutical services was grouped by ATC medication class and was reported for the mean unit cost per patient overall and by health region. Cost was derived using the cost as indicated in the ODB claims database and the mean cost was derived by using the count of medication prescribed per patient divided by the total prescribed per region multiplied by the total cost. Costs to society was estimated using the unit costs for each service or procedure based on their 2011 market value based on private payer cost schedules in Canadian Dollars.

4.23 Study Size

This is a retrospective observational study aimed at describing the treatment patterns for OC in Ontario. As a descriptive study sample size requirement are based on the precision of the estimates obtained in the sample that is directly related to the validity of the inference that could be made to the target population. Precision was assessed by the width of the 95% Confidence Interval (CI) of the estimates obtained in the study. More precisely, in the current study precision was assessed by the 95% CI of the sample estimate of the proportions of patients undergoing specific treatments for OC.

The following assumptions were employed in the sample size considerations:

- Based on the 2007-2011 Canadian Cancer Statistics issued by the Canadian Cancer Society, the annual incidence rate of OC in Ontario between 2007 and 2011 was approximately 1,700 cases per year (70, 72-75). Therefore, it is expected that approximately 5, 140 new cases of OC were diagnosed during the five-year period covered by the study as described in table 4.

Table 4 Distribution of New Cases of OC by Year

Years	References	Ontario
2007	(72)	990
2008	(73)	1000
2009	(74)	1050
2010	(75)	1050

2011	(70)	1050
Total		5140

It was necessary for the study sample size to be sufficient to produce precise estimates of the proportion of patients receiving specific treatments. Given the sample size of 2199 we can estimate the width of the 95% CI to range between +/- 0.35% for any proportion estimate of 1.0% and ± 1.0% for any proportion estimate of 50.0%. The width of the 99% confidence interval range was between +/- 0.46% for any proportion estimate of 1.0% and ± 1.0% for any proportion estimate of 50.0% this indicates that the study sample provided high levels of precision.

5 Statistical Methods

Statistical analysis was performed using SAS 9.4 and SPSS 23.

5.1 Analysis Populations

The full analysis set (FAS) comprised all the patients who have met the inclusion/exclusion criteria in the cohort. Descriptive statistics were reported for the study cohort as a whole and by geographical health regions.

5.2 Analysis of the Study Objectives

5.3 *Primary Objective*

The primary objective of this study was to asses if there were clinical health differences by region in Ontario. Regional differences in patient survival and disease relapse was assessed for statistical significance with One Way Analysis of Variance (ANOVA) and the Student's t-test for continuous variables if normally distributed or Wilcoxon rank sum test if not normally distributed, and the Chi-Square statistic or the Fisher's exact test for categorical variables. Time to death from any cause and disease relapse was assessed with Kaplan Meier survival analysis, while predictors of time were identified among patient, disease and treatment patterns using Cox's proportional hazards models. The indicator contrast method was used and the last alphabetical or numeric variable coding as the referent category was applied for covariates.

5.4 *Secondary Objectives*

Demographic and Baseline Characteristics

Descriptive statistics including the mean, median, standard deviation, and 95% confidence intervals (CI) of the mean for continuous parameters and frequency distributions (number and proportion) for categorical parameters were produced for all patient demographics and baseline characteristics. Age was calculated as follows: Age = Largest Integer ≤ [(Visit Date – Date of Birth + 1)/365.25.

Demographics and baseline characteristics, including age (continuously), age categories, region of residence, follow up duration, year of diagnosis, Charlston comorbidity index, presence of comorbidities, prior and current comorbidities were presented for the total population and by health region. In addition, the patient parameters were presented for the following patient subgroups:

Parameters for which clinically important, defined as statistically noteworthy (P<0.15) difference between groups were considered as potential confounders and were entered as covariates in multivariate models.

Differences for continuous parameters were compared using analysis of variance (ANOVA) or the t-test, if normally distributed, and the Kruskal-Wallis test or the Wilcoxon-Mann-Whitney test, if not normally distributed, as appropriate. The Chi-Square statistic or Fisher's exact test was used for categorical variables.

Disease Characteristics and Comorbidities

Frequency distributions were presented for patients overall and by health region. Descriptive statistics were produced included mean, median, SD and 95% confidence interval of the mean for continuous scale variables and number and proportion for categorical scale variables and was produced for:

- Cancer type
- Comorbidities at Follow-up (EOS or Death)
- Presence of comorbidities during Follow-up (EOS or Death)
- Charlson Index Score at Follow-up (EOS or Death)
- Charlson Index Score Severity Group
    - Patients were categorized in three groups according to their Charlson Index comorbidity score: score 0 (no recorded comorbidity), score 1–2 (moderate comorbidity), and score 3 or more (severe comorbidity).

Regional differences in disease characteristics and comorbidities were assessed for statistical significance with One Way Analysis of Variance (ANOVA) and the Student's t-test for continuous variables if normally distributed or Wilcoxon rank sum test if not normally distributed, and the Chi-Square statistic or the Fisher's exact test for categorical variables.

Treatment Received

Descriptive statistics included mean, median, SD and 95% confidence interval of the mean for continuous scale variables and frequency distributions for categorical scale variables were produced for:

- Type of Surgery
- Time to first surgery (weeks)
- Time to secondary surgery from first line treatment end date (weeks)

- Number of surgical procedures related to OC

Time to surgery was assessed with the Kaplan Meier estimate of the survival function, 95% confidence intervals around the estimate of these proportions were reported. Survival was calculated from the date of diagnosis (index date). Cox regression was used to assess the effect of regional differences on time to surgery. The indicator contrast method was used and the last alphabetical or numeric variable coding as the referent category.

Regional differences in treatment received were assessed for statistical significance with One Way Analysis of Variance (ANOVA) and the Student's t-test for continuous variables if normally distributed or Wilcoxon rank sum test if not normally distributed, and the Chi-Square statistic or the Fisher's exact test for categorical variables.

Healthcare Utilization and Costs

Descriptive characteristics included the mean, median, standard deviation, and 95% CI of the mean for continuous parameters were produced for total utilization and costs of treatment related and unrelated to OC treatment, including the hospitalization, medical services provided, emergency department visits, physician visits, specialist visits and prescribed medications.

5.5 *Additional Analysis*

Process outcome associations

To identify predictors of patient centered health outcomes (overall survival, time to disease relapse, time to first surgery and time between first and second surgery) multivariate Cox proportional hazards regression models with clinically important covariates entered into the multivariate model. The following potential independent predictors was used:

- Patient parameters (age, Charlson Comorbidity Index at baseline and FUP and type of center, socioeconomic status (was calculated using census service name for average household income. Income was further divided by 10, 000, to reflect a $10, 000 unit increase and not $1.00.), presence of any comorbidity at baseline or FUP).
- Type of center (teaching vs non-teaching)
- Area type (urban vs rural)

- Cancer Type (platinum sensitive, partially platinum sensitive, platinum resistant, platinum refractory, cannot determine or missing)
- LHIN

These models were based on the observed data without any imputation for missing data.

6 Study Limitations

6.1 Internal Validity of Study Design

6.2 *Selection Bias*

There was potential for selection bias due to the fact that only patients that were treated under the provincial health insurance plans were included in the analysis. However, given that treatment for cancer is predominantly conducted in hospitals and oncology clinics, all relevant treatments were captured by the study databases. Therefore, selection bias will not affect the primary objective. However, a potential selection bias may have been introduced since the health care utilization and cost analysis were limited to the public health insurance plan for medication, therefore would not have captured pharmaceutical costs associated with private insurance.

6.3 *Information Bias*

The use of administrative claims databases carries a possibility of information bias related to the validity of the data reported by the service providers and the likelihood of human error during transcription. The MOHLTC have implemented quality control measures to reduce such errors. Nevertheless, the results of the study must be interpreted in consideration of the known limitations of administrative databases.

6.4 External Validity of Study Design

6.5 *Generalizability of the study results*

There was a potential issue for generalizability of the results to the Canadian population given that the study sample comprised only patients treated in Ontario, however, in 2010, there were 2,465 new cases of OC in Canada, and 1157 were in Ontario (76, 77). The differences present in treatment patterns within the province, between rural and urban settings, between academic and non-academic centres and between medical and gynaecologic oncologists would have minimal impact on the results as the differences are non-differential.

Given that the study sample was comprised of women that had received both surgery and chemotherapy, the study results can be generalized only to this population. Specifically, the women with OC that have a claim for surgery and chemotherapy in the MOHLTC databases. The rationale for these inclusion criteria is based on good research practices for using administrative databases. Accordingly, confirmation of a diagnostic claim with an appropriate treatment is required to minimize false positive inclusions in the analysis. In the current study we determined that patients that have undergone both surgery and chemotherapy have a definitive diagnosis of advanced OC; hence the likelihood of including patients that

do not have advanced OC is extremely low if not nil. While the results of the study can be extrapolated to other regions and the general population of advanced OC patients, this should be with caution and in consideration of the sample of the study.

7 Missing Information

The current data was sourced from administrative databases; therefore, it was not possible to identify missing data for treatments received and it is not possible to retrieve any missing data. The likelihood of having missing data was low, as the treatments are administered in a hospital or clinical setting. There were no imputations for any missing data.

8 Ethical and Regulatory Obligations

The study was conducted according to ethical principles stated in the Declaration of Helsinki (2013), ethics approval was obtained before initiating study.

8.1 Institutional Review Board

The study was submitted to the Institutional Review Board (IRB) at the McGill University Health Center and received expedited ethics approval under certificate number A11-E74-16A. The IRB determined that the study involves no more than minimal risk. In accordance with articles 2.9 and 6.12 of the 2nd Edition of the Canadian Tri-council Policy Statement of Ethical Conduct for Research involving Humans (TCPS 2) and U.S. Title 45 CFR 46, Section 110 (b), paragraph (1).

8.2 Protection of Human Subjects

This study complied with all applicable laws, regulations, and guidance regarding patient protection including patient privacy. As a retrospective observational study using administrative data, the study presented no risk to the patients. All patients and treating physicians were identified via unique encrypted subject and physician identifiers were never linked to any identifying patient or physician data.

9 Results

9.1 Primary Outcome

The primary objective was to determine if there where was a clinical difference between LHIN regions in Ontario. Table 32-33 report the clinical health outcomes by LHIN and overall for time to death overall and by cancer type and table 33 describes the time to disease relapse. Table 32 reports a statistical difference between the geographic regions ($p<0.001$) for time to death (months). The overall mean (SD) time to death was 39.32 (0.93) and Central Toronto having the greatest time to death with 41.26 (2.84) and the North West with 22.66 (3.18) months.

Table 33 reports a statistical difference between cancer type and time to death ($p=0.38$). Platinum refractory patients had the shortest mean (SE) time to death 30.44 (3.630) and Platinum Sensitive 41.24 (1.378) the longest, respectively.

Table 34 reports the time to disease relapse by LHIN and overall. Based on this table, a borderline statistical significant difference was observed ($p=0.069$). The greatest mean (SD) time to relapse was observed in Central Ontario with 92.18 (7.74) weeks and the least in the Champlain region with 70.99 (5.04) weeks. Figure 3 demonstrates the time to relapse from index date and this figure demonstrates an inverse relationship between cumulative survival and time. Moreover, it has a steeper slope than time to death (figure 1).

9.2 Patient Disposition

Table 5 describes the patient disposition for this study. The complete population consisted of 6620 patients diagnosed with ovarian cancer in Ontario during the study period, 4359 patients did not meet the inclusion criteria; 215 received chemotherapy, but not or missing surgery information, 1984 received surgery, but not chemotherapy and 2160 did not receive any treatment. 2. Of the remaining patients 49 were excluded for missing year of diagnosis, N=9 missing for being <18 years old and 4 for missing FSA information. Patients who did not meet the inclusion/exclusion criteria were excluded, leading to FAS of 2199 patients and of those patients 914 (41.6%) were dead at the end of the study period. Table 7, describes the patient disposition by LHIN. This table demonstrates that there was an equal proportion of patients excluded from each LHIN, except for Champlain and North West. Table 7 describes the number and proportion of patients in each LHIN and overall throughout Ontario. The greatest number and

proportion of patients was in the Central East LHIN with 322 (14.6%) patients and the least was in the North West with 34 (1.5%).

9.3 Patient Profile

Table 8-21 describe the patient profile by LHIN and overall and the statistical difference between regions. The overall mean (SD) age was 63.14 (12.73) years. The North West region had the greatest mean (SD) age of 67.77 (11.80) and the youngest was observed in the South East with 60.78 (12.01), a significant difference in age between groups was observed ($p<0.001$). The greatest proportion of patients are 65-74 years old with N=742(33.7%), followed by 55-64 years (23.5%), 45-54 years (17.0%) then 75-84 years (15.0%), similar proportions were present in each region. Central East Ontario was the only region to have 2 (1.0%) patients < 20 years old. The majority of patients (15.4%-18.8%) were diagnosed between 2007-2011 overall. The mean (SD) follow up duration overall was 1.78 (1.39) with similar distribution for each region.

Table 12 reports the number and proportion of patient's type of cancer. Overall, 873 (39.7%) of patients were platinum sensitive, 423 (19.2%) partially platinum sensitive, 383 (17.4%) platinum resistant, 47 (2.1%) platinum refractory and 473 (21.5%) are not determined. Similar proportions were presented for each region, with exception of Waterloo Wellington and Erie St Clair having outlying number and proportion of patients compared to other regions; partially platinum sensitive (3,8.8%) patients in Waterloo Wellington and 6(6.5%) in Erie St Clair of Platinum Refractory. At the end of the study, mortality was reported in 914 (41.6%) of patients overall. The greatest number and proportion was observed in Central West Ontario (55 (54.5%)) and the lowest in Erie St Clair with (28 (30.1%)). Table 14 reports platinum sensitive patients have the greatest proportion of patients overall (16.6%) who are dead at the EOS. There is statistical significant difference between LHIN and mortality ($p<0.001$). In Table 15, the mean (SD) Charlson comorbidity index score at baseline was 2.31 (1.66) overall and increased to 5.65 (2.47) at FUP. Erie St. Clair had the highest mean (SD) score with 2.72 (2.31) and South East had the lowest mean (SD) of 1.69 (1.07). At FUP, the score increased by 500% for each region and overall. Champlain Ontario had the highest score of 6.12(2.59) and South East had the lowest of 4.91 (2.56). There was no statistical difference between regions at baseline ($p=0.304$), but present ($p<0.001$) at FUP.

Table 16 converted the Charlson comorbidity index scores into categories of severity. At baseline. 717 (32.6%) had moderate comorbidity scores, 156 (7.1%) were considered severe and 1326 (60.3%) had no records. Proportions were approximately similar, with exception of Central Ontario had the greatest

number, proportion of patients (16(12.8) with severe scores and the North West had the least with 1 (1.5%) of patients. There was no statistical difference between LHIN regions. At FUP, 1798 (81.8%), the majority of patients had severe Charlson comorbidity index scores and 401 (18.2%) were moderate. At baseline there was no difference between the regions, but a difference in categorical Charlson comorbidity index scores at FUP. Table 17, reports the comorbidity status by LHIN and overall at baseline and FUP. 1848 (84.0%) patients reported having at least one comorbidity at baseline and increased to 2009 (941.4%) at FUP. All regions report >75.0% of patients having at least one comorbidity at baseline and FUP. It was observed at baseline and FUP, that Erie St Clair had the greatest number (proportion) of patients having at least one comorbidity; 84(90.3%) and 90(96.8%), respectively. The lowest number (proportion) of patients with comorbidities at baseline and FUP was observed in central west at baseline 77(76.2%) patients and in North West with 58(89.2%) at FUP.

Table 8-17, 20 and 21 demonstrated there was a significant difference ($p<0.05$) between the LHIN regions, with regards to age, age categories, FUP duration, cancer type, Charlson comorbidity index scores at FUP (continuous and categorical), hospital type and residential area type.

Moreover, there was statistical difference found between group in certain baseline and follow-up comorbidities (table 18-19): baseline hypertension, baseline diabetes, baseline CHF respiratory, stroke and myocardial infarction. At FUP the statistical significant difference between LHIN regions was observed in hypertension, hyperlipidemia, CHF respiratory, PVD and myocardial infarction. At FUP many of the comorbidities were not calculable as 100% of the patients reported not having specific comorbidities (dyslipidemia, kidney disease, arthritis, osteoporosis, auto immune disease, neurological, hepatitis and infectious disease). As per table 20, 1138 (51.8%) patients sought treatment at a teaching hospital and there was significant difference ($p<0.001$) between LHIN regions in the type of hospital patients sought treatment. Within each LHIN and overall the majority of patients resided in an urban area (82.5%) and a statistical difference between regions ($p<0.001$) was observed.

9.4HCRU

Table 22-31 describes the health resource utilization of the patient population overall and within each LHIN region. Table 22 reports the number, the number of events per 1000 patients for procedures used in health care resource utilization related to ovarian cancer treatment. The greatest procedures used were CT scan (1543, 701.68), hysterectomy (1549, 704.41), Omentectomy (181, 826.74), secondary surgery (1703, 774.44) and salpingo oophorectomy (2080, 945.88). The same procedures were the most

frequently used within each region. Table 23 reports HCRU related to OC by Cancer Type, LHIN and Overall. Platinum sensitive patients utilized the greatest resources, events per 1000 (4090, 1859.9) total resources followed by “cannot determine” cancer group (2324, 1056.8).

Table 24 reports the number, number of events per 1000 patients of resources used not related to ovarian cancer. The most used procedure not related to ovarian cancer was excision not related (888,403.82) CT-scan (532, 241.93) and other drug therapy i.e. pharmaceutical not related to cancer treatment (451, 205.09). It was observed that the Champlain region utilized health resources not related to OC treatment the most (725 patients and 2877.0 events per 1000 patients) and Waterloo Wellington the least (79 patients and 782.2 events per 1000 patients.

Table 25 reported a mean (SD) number of OC related procedures per patient is 2.65 (1.05) overall and Mississauga Halton reporting a mean (SD) of 2.76(0.97) number of OC related Surgical procedures and the least being Waterloo Wellington with 2.21 (0.93) per patient. There was no significant difference between regions (p=0.197) for OC related number of treatments.

Table 26 describes the length of stay (LOS) in the hospitably relation to OC by LHIN region and overall. The greatest LOS not related to OC was observed in Central East with a mean (SD) of 9.39 (13.01) days and the least in South East with 5.37 (9.37) days and an overall of 8.01(10.92) days. The overall mean (SD) was shorter when related to OC, with 7.38(8.99) days and the greatest mean (SD) in North West with 11.63(15.65) and the shortest in South East with 5.50 (5.78) days. There was a statistical difference in both related and unrelated to OC LOS between regions ($p<0.001$). Table 27-28 summarizes LOS in the hospital by relationship status of OC by cancer type and LHIN, respectively. In both OC related status, the platinum refractory patients had the longest LOS with a mean (SD) of 9.67 (20.06) days not related to OC and 8.92 (10.93) related to OC, respectively. In both related and unrelated OC, an observed statistical difference between LHIN for Platinum sensitive, partially platinum sensitive and Platinum resistant ($p<0.001$). Patients in “cannot determine/other” group of the not related to OC status had an observed statistical difference between LHIN ($p<0.005$).

Table 29, describes the number and events per 1000 patients of service/physician visits related to ovarian cancer treatment. Patients utilized services of a wide array of medical services such as microbiology, physiotherapy to general surgery and the proportions were approximately similar for each region. North Simcoe Muskoka had highest utilization of physician visits related to OC and Waterloo Wellington with the least number of events per 1000 patients, 119288.5 and 12772.3 respectively. Physician visits such as:

family practice (10,288.8 per 1000 patients), internal medicine (7,131.9 per 1000 patients), medical oncology (2,996.8 per 1000 patients) and obstetrics and gynaecology (13,196.0 per 1000 patients) experienced the greatest utilization when related to OC and within the regions similar utilization was observed.

Table 30 reported the physician utilization within each LHIN and overall for unrelated OC treatment. It was observed that the South East utilized the greatest number of physician visits compared to other LHIN's (312,184.62 per 1000 patients) and Waterloo Wellington the least (28,356.44 per 1000 patients). The greatest service used overall for treatment not related to OC is general family physician (28,136.4 per 1000 patients), internal medicine (12,025.0 per 1000 patients) and diagnostic radiology (17,061.4 Per 1000 patients) overall and similar proportions in each LHIN.

Table 31 describes the prescription medication use by region and overall. The greatest number and prescription per 1000 patients is Central Nervous System Drugs (59763, 27177.35), Gastrointestinal Drugs (40640, 18481.13), Cardiovascular Drugs (29120, 13242.38), Hormones (22123, 10060.48) and various miscellaneous medications (14219, 6466.12). There was a large variation between LHINs of the mean cost of prescription medication as seen in table 32. The lowest cost of medication per patient was observed in Waterloo Wellington region ($1,688.6) and the greatest in the South-East region ($19,239.5), with an overall mean cost of $5,589.4 per patient. Cost per drug varied greatly by region, for instance, Anti-infective agents in Central East was $43.7 per patient and $287.3 in South East. The most expensive medication costs were Blood Formation and Coagulation ($1,334.27 overall) and various miscellaneous medication ($1,354.65) for the overall population. Smooth Muscle Relaxants were only calculated for Central and South East, as all other patients reported not taking these medications.

9.5Treatment Received

Table 36-37 described the time to treatment (surgery) for patients by LHIN region and overall. Table 36 reports the time to first treatment surgery from the index date by region and overall. The overall mean (SE) time to first surgery is 8.298(0.342) weeks and North Simcoe Muskoka had the greatest mean (SE) wait time of 12.66 (2.49) weeks and the least was South west with mean (SE) of 5.39 (0.91) weeks. There was a significant difference between regions ($p<0.001$) for time to first surgery from index date. Figure 3 demonstrates that as time proceeds, fewer people are having their first surgery. Table 37 reported the time (weeks) to second treatment from the first treatment received. It was observed that Toronto had the greatest mean (SE) wait time with 104.22 (34.55) and the shortest wait time was in Central West

(15(3.24)) and North West (15, (5.08)). Both Central West and North West had the same mean of 15 days, however, Central West had a smaller SE. There was significant difference between the LHIN regions with time to second treatment from first (p=0.001). Figure 4, reports the cumulative survival decreases as time increases between first and second surgery.

9.6Additional Analysis

Table 38-41 summarizes the results assessing the effect of several variables upon the OS, disease relapse, and initial and follow up surgery.

Table 38 reports the cox regression model for time to death. The model describes age (HR 1.013, 95% CI, 1.007-1.018) area type (HR 1.249, 95% CI, 1.016-1.536) Charlson comorbidity index scores at FUP (HR 1.162, 95% CI, 1.127-1.198), are significantly ($p<0.05$) associated with an increased hazard of time to death. In contrast, cancer type (platinum sensitive) (HR .602, 95% CI .385- .942) and LHIN 4 (Champlain) (HR .638, 95% CI .447-.909) are significantly ($p<0.05$) associated with a decrease hazard of time to death. LHIN 2 (Central East) was borderline statistically significant (p=0.052) (HR 0.714, 95% CI. .509- 1.003).

Table 39 reports the cox regression model for time to disease relapse or relapse. Presence of baseline comorbidities (HR .706, 95% CI .531-.937) and average household income (HR .760, 95% CI .620- .930) were significantly associated ($p<0.05$) with a decrease hazard of time to disease relapse. The presence of comorbidities at follow up was borderline (p=0.074. (HR 1.360, 95% CI .970-1.905).

Table 40 reports the cox regression model for time to first surgery from date of diagnosis or index date. Presence of comorbidities at baseline and FUP (HR, 1.227, 95% CI, 1.046-1.439) and hospital type (HR 1.130, 95% CI, 1.017-1.256) are significantly ($p<0.05$) associated with an increased hazard of time to death. In contrast, age at diagnosis (HR .994, 95% CI .990-.998), baseline presence of comorbidities (HR .745, 95% CI .654-.849) and LHIN (North Simcoe Muskoka) (HR .641, 95% CI .474-.868) are significantly ($p<0.05$) associated with a decrease hazard of time to first surgery.

Table 41 reports the cox regression model for time to second surgery from first initial surgery. This table reports that there were no significant predictors of time to second surgery from the first.

10 Discussion

In this retrospective cohort study, the aim was to investigate if there was a difference in clinical outcomes, quality of treatment and healthcare costs associated with geographic location of the treatment of ovarian cancer in Ontario. This study found that there is a difference in OS ($p<0.001$), treatment, specifically time to first surgery ($p<0.001$) and time to follow up surgery ($p=0.001$) between LHINs in Ontario and no difference in time to disease relapse ($p=0.069$).

To the best of our knowledge, this is the only study to report variation in clinical outcomes, treatment and cost of care for OC in Ontario; as such there is very little literature to directly compare our results. Our current findings demonstrate a difference in survival between LHINs in OC patients. Although no study directly researched the differences in OS for OC in Ontario, Dehaeck et al. conducted a similar study among the 5 health regions in British Columbia (BC) (78). They confirmed there is a difference in survival rates for OC patients across BC, and that these differences may be attributed to disease characteristics (stage and grade) and differential treatment variables (optimal debulking and combination chemotherapy). Both Dehaeck et al. and our study differed in provincial location (BC vs. Ontario) and patient population characteristics. Although, we did not exclude any patients based on stage (as we did not have this information) we made an assumption that our population had advanced stage cancer (stage III or IV) as they all underwent chemotherapy and surgery. Whereas Dehaeck et al. included all patients diagnosed with OC, irrespective of their cancer stage and that a significant proportion (14.4% of the cohort) did not have surgery. Previous reports state that patients have superior survival rates, if the surgery was performed by a specialized gynecologist oncologist (15, 60, 79, 80). There are geographic barriers, historic referral patterns or patients lack of awareness of specialized surgeons that potentially limit access to care by a gynecologist oncologist, which could result in differential OS (80). Although we did not have this information available, it does not mean that such physicians, allowing for a difference in survival rates, did not perform the difference in treatment. Kwon et al. study was the most similar to ours, in that both studies investigated regional variation in Ontario for gynecological cancer. However, Kwon et al. study differed in that they used a different exposure i.e. endometrial cancer and did not investigate any costing information. Unlike Dehaeck et al. and our study, Kwon did not find a difference in the 5 year OS among the LHINs (81). They did fit a multilevel cox regression model to describe the association between covariates and OS and found that after adjusting for both patient and hospital level variables, 1 anonymous LHIN had significant lower HR than the reference but no overall difference in survival across

LHINs. The discord in studies may be attributed to unrecognized factors or different cohort characteristics. Despite this disagreement our study confirmed a difference in OS across LHINs.

The second important finding is that there was an observed difference in treatment patterns across the province, specifically time to first surgery ($p<0.001$) and time to follow up surgery ($p=0.001$). A difference in treatment patterns can directly impact differential OS throughout the province; therefore, it's logical that both treatment and OS have significant differences across LHINs.

Most patients with OC will relapse several times and receive treatment with multiple lines of therapy, it can be lethal and a chronic disease. In spite of recent progress in treatment, it is still the leading cause of death among case of gynecologic cancers. Although, we have seen an improved progression free survival (PFS) after first-line therapy has not increased OS (42). The time to disease relapse from index date found in this study ranged from 70-97 months by LHIN and an overall of 83 months, which is comparable to the current relapse rates found in other cohort studies (82-91). Nevertheless, the period of first relapse varies widely from a few months to more than 5 years (39). According to Ushijima and al. half of the relapses occur at more than 12 months from the end of the first-line therapy, and one quarter of all relapses occur at less than 6 month (39). The five year PFS for patients with OC is 50.0% (92). The differences in PFS may not be at the aggregate level, rather an individual patient level. Previous studies established these factors as predictors of overall or PFS. The significant characteristics included: age (93) family history (94), stage, grade and histology (86, 95-98), primary site (99), residual disease and debulking status after cytoreductive surgery (95, 97, 100, 101), the total number of chemotherapy cycles received (42, 96, 102) and the number of cycles before normalization of CA-125 (103-105). Moreover, a long disease-free interval after primary treatment is a good indicator of optimal OS (106-109).

There was no difference in disease relapse between LHINs, although this was not significant, approached the borderline of significance. A P-value just above 0.05 does not mean no effect. The size of a P value depends on two factors: the magnitude of the treatment effect (relative risk, hazard ratio, mean difference, etc.) and the size of the standard error (which is influenced by the study size, and either the number of events or standard deviation, depending on the type of outcome measure used) (110). It is important to include the confidence intervals to determine the effect size, as it will provide information about the population estimate and the direction of the effect (111). In our study, the p value ($p=0.069$), although borderline there was a possible observed treatment effect. The overall mean of 83.214 months, and the 95% CI of 79.538 to 86.890 tell us that that the true effect lie somewhere in the confidence interval

range, however, the SE of 1.876, being relatively large, gives us an indication that our mean is relatively far from the true mean of our overall population. Borderline p-values may occur when there is a clinically meaningful treatment effect but a large or moderate Standard error—often because of an insufficient number of participants or events ie being underpowered (110). Borderline results could be avoided by designing trials with small or moderate effect sizes. However, this was not feasible in our study as it was a retrospective cohort study, with a predetermine exposure. Hackshaw et al. suggest a possible solution of using validated and established a surrogate marker as the primary (or co-primary) end point—for example, PFS instead of OS (110). This would allow for more events and may increase the chance of the result being statistically significant. In our study, a patient had disease relapse if they underwent any subsequent OC related surgery, radiotherapy and/or chemotherapy medication after the last date of second line treatment. Perhaps, modifying this definition to include a broader scope of remission variables would allow us to capture more patients, thus making the results statistically significant.

In our study we found age, area type, Charlson score at FUP, cancer type and LHIN all to be significant predictors of mortality. In a variety of cancer related studies, age plays a significant role in determining a patient's survival (112-115). In several countries, the relative 1-year and 5-year survival of women diagnosed with ovarian cancer has previously been reported to decrease with old age (112-117). In our study, we found age had an increase risk with mortality and after running a backward selection multivariate regression using age as a categorical variable, we found similar results that age impacts mortality negatively. We have no research to determine why older women have poorer prognosis, is it related to physiological or do they receive different quality of care? Trillsch et al. (118) and Sabatier et al. (119) and Thigpen et al (120) suggested that older women with OC may demonstrate worse survival due to potentially inferior treatment or perhaps patient reluctance to be treated. Older individuals, may feel they have accomplished all that was necessary or don't want to increase burden of disease on family members, so they decide to forgo treatment, resulting in poorer survival times than younger patients. Although, this is possible, more research needs to be done to assess the validity of this claim. This was beyond the scope of our research question. Our findings of significant predictors in mortality are comparable to other studies. Area type was a significant predictor and often rural residence's tend to have higher mortality rates (121, 122). The presence of severe comorbidity is generally associated with an advanced stage of ovarian cancer moreover; mortality is higher among patients with comorbidities (123-125). Advanced stage and carcinoma type play a significant role in determining a patient's survival or PFS, not only with OC but all cancers (39, 92, 98). In contrast, cancer type (platinum sensitive) (HR .602, 95%

CI .385- .942) and LHIN 4 (Champlain) (HR .637, 95% CI .447-.907) are significantly ($p<0.05$) associated with a decrease hazard of time to death. LHIN 2 (Central East) was borderline statistically significant ($p=0.052$) (HR 0.714, 95% CI. .508- 1.003).

Platinum sensitive type of cancer is well established that women tend to increased OS or PFS as they respond better to chemotherapy treatment medications (39, 80, 126). In our study, a very interesting and noteworthy finding was the Champlain LHIN having decreased hazard mortality. For every one unit increase in the mortality the risk of the death decreases by 0.637. Seeing as our study was the first of its kind to demonstrate regional variation in Ontario for OC time to death there is no direct comparison. However, Dehaeck study found differences in survival rates for OC patients across BC. They attributed to variations in disease characteristics and treatment, particularly rates of optimal debulking and combination of effective chemotherapy (78). However, Kwon, et al. conducted a similar study for epithelial cancer patients and found no difference across the LHINs (81). This may be attributed to Kwon, having a more complete patient demographic. They were able to extract tumor histopathology, grade and stage from pathology files at the Ontario Cancer Registry, something we did not do. The lack of complete cancer information is identified as a limitation in our study.

Of all the covariates entered into the model, presence of baseline comorbidities (HR.706, 95% CI .531-.937) and average household income (HR .322, 95% CI .141- .735) was found to decrease the hazard of time to disease relapse. Although studies have found the presence of baseline comorbidities to impact cancer relapse (127, 128), there are other studies whom have demonstrated that there are more predictors present for OC relapse. Kurta et al. conducted a case control study to estimate conditional PFS among OC patients and evaluate the impact of patient characteristics (104). The significant characteristics included family history, stage, primary site, grade, histology, pre-treatment CA-25, pre-treatment pleural effusion, cytology of ascites/pelvic washings, pre-treatment ascites, lymph node involvement, residual disease and debulking status after cytoreduction surgery, number of chemo monotherapy cycles before normalization of CA-125 and total number of platinum, taxane and other chemotherapy cycles received. It is important to note that approximately 80.0% of patients had disease relapse from index date to EOS or death date. The high proportion of patients helped provide a large sample size to give an accurate survival estimate.

Providing appropriate surgical treatment for women with OC is one of the most effective ways to improve their outcomes. Long wait times have been linked to poor access to healthcare services, inefficiency and

poor quality of care (129, 130), moreover, wait time for definitive surgery is anxiety provoking for the patient, decreases patient satisfaction and may result in a poorer quality of life (131). Previous literature found that longer wait times are associated with shorter OS breast (130), rectal (132), endometrial (133), however, the relationship is less clear for other cancers such as esophagus (134), pancreas (130) and cervix (135, 136). Elit, L conducted a systematic literature review showing divergent answers as to whether there is a relationship between wait times for cancer surgery and survival (137). Cancer Care Ontario (CCO) established benchmarks for cancer surgery wait times, gynecological cancer surgeries are targeted to receive surgery from 1-24 days depending on priority level (138). Wait time was defined as how long a patient waited from deciding on surgery with the surgeon, to having the surgery. Priority levels are defined more in depth on the CCO government documents (139). The surgical wait times in our study was from index date defined as the time of the OC diagnosis defined as the date of diagnosis (ICD-9: 183.0; ICD-10: C56) to the defined first surgery outlined in section 1.10.2.1. Patient, disease and hospital characteristics have previously been studied to verify the association with quality of care and health outcomes received and the results are in line with our study (140-143).

In our study, we found significant predictors for time to first surgery included; the presence of comorbidities at FUP, hospital type, age at diagnosis as increased risk of hazard ratio and the presence of baseline comorbidities and LHIN (North Simcoe Muskoka) (HR .641, 95% CI .474-.868) as decreased HR. Goff et al. who conducted an investigation to evaluate the surgical treatment received by patients with OC to identify factors associated with receipt of comprehensive surgical treatment (140). In their study, factors associated with comprehensive care included: age, race, payer status (insurance vs Medicaid) cancer stage (advance vs. early), surgeon volume and specialty, comorbidities and residence location (urban). Although our study did not include all the same covariates, our results are in line with their findings. Both Studies, found hospital type, age and comorbidities, specifically in congestive heart failure and hypothyroidism in Goff study, were associated with treatment received. However, Goff et al. did not find hospital type to an independent predictor of quality of care, rather it had an interaction with hospital volume. This was not tested in our analysis. Across different health care providers and patient locations, teaching hospitals are significantly associated with superior surgical treatment (144-146). Our findings of significant predictors of time to surgery are comparable to other cancer surgery studies in Ontario (147).

A notable finding for our study was the presence of baseline comorbidities and receiving surgery in Central Ontario was found to decrease the HR for time to first surgery. Typically the faster a patient receives surgical treatment for cancer related diseases, the better chance of a positive prognosis (133). With

shorter time to surgery in Central Ontario, patients are being positioned for superior health outcomes. Like our study, Kwon et al. study of wait times in Ontario found a significant difference between LHIN and median wait times ($p<0.001$), ranging from 24-35 days for endometrial cancer patients (133). In both our study and Kwon, a median wait time of 3 weeks was found for central Ontario. Our findings suggest regional variation in surgical wait times in Ontario is present and impacts patients' survival. The factors that may influence such differences are elaborated in Birkmeyer et al. literature review; influences may include broader environmental factors, including technology diffusion, specialist supply and local training paradigm, financial incentives and regulatory factors (148).

Typically, comorbidities contribute to a delay in the time from decision-to-treat to the surgical procedure (149-151), but in our study we found that the presence of baseline comorbidities was associated with a decrease HR for time to first surgery. These differences may be attributed to the type and aggressiveness of the cancer or comorbidities present, our study demonstrates that certain patient and system characteristics influence wait time.

OC is associated with high treatment costs, effective interventions are limited (152). As a result, regional variation is likely to be attributed to healthcare systems and not patient or disease factors. The overall cost of prescription medications was $5,589.4 per patient and South East LHIN had the greatest mean cost in prescription per patient of $19,239.5 compared to Hamilton Niagara having the lowest mean cost of $1,683.7. Studies of regional variation have demonstrated large area-level differences in general medical spending (50, 153, 154); however, the literature is divergent if higher spending equates to improved patient outcomes (52, 155). Although, we assessed the regional variation in spending and HCRU, we did not go further with the analysis and examine the associations with spending, regional variation and patient outcomes. Further research is needed to meet this paucity in the literature.

In the current study we included only patients that had chemotherapy and surgery. As is customary for administrative data base research confirmation of diagnosis requires IC9 and IC10 diagnostic codes for target disease and a claim for treatment related to that disease. In the case of advanced OC which was the target disease of this study, chemotherapy and surgery is the recommended treatment. Therefore, in order to conclude that our population was homogenous with respect to the diagnosis of advanced OC, the inclusion criteria specified a patient must have received both chemotherapy and surgery. Therefore, generalization of the results should be limited to only the population of patients with advanced OC that received both surgery and chemotherapy as treatment and not all administrative claims indicating an OC

diagnosis. Never the less, the results in this analysis show that there were no major differences with the proportion of patients included in the study from each region, captured in table 6, with exception of Champlain and North West. Champlain had the highest and North West had the lowest proportion of included patients. While the cause of patients receiving both chemotherapy and surgery was found to be the highest proportion in Champlain and the lowest proportion in North West is unknown. Hence some of the differences observed in this study for North West and Champlain may be attributed by this.

10.1 Study Limitations

There are several notable limitations to this study. First, utilizing administrative databases, we were restricted to using the available information collected by the governing bodies. This study lacked known important covariates such as, physician volume, Tumor histopathology, grade, and staging information, referring physician specialty and primary treating physician (gynecologist, gynecologic oncologist or general surgeon). There is a plethora of literature describing the effect of hospital surgical volume on survival and cancers. Although the observed reduction in risk of death in the high-volume centers is known (156-160), we did not use this covariate as the case volume information was not available in the current dataset and would need to be extrapolated from other non-readily available datasets. To circumvent confounding effect of stage of disease, we restricted population to women who underwent chemotherapy and surgical treatment, representing advanced stage cancer, assuming patient disease characteristics to be highly heterogeneous. Cancer staging is only collected on patient hospital records, we would have had to contact each case and perform a chart review. This was not in our budget or time frame; to compensate, we attempted to use carcinoma type as a proxy for disease severity. Type I carcinomas are low grade, genetically stable, and relatively less aggressive than Type II, which are high-grade serious carcinomas, which account for approximately 70% of all cases. A patient was classified as type II if they had three or more chemotherapy treatments prior to surgery and type I if they had surgery prior to any chemotherapy treatments. The inclusion criteria of the study were to have at least one surgery and one chemotherapy, which all patients did, however, not all patients had multiple treatment of one or the other, preventing us from classifying based on carcinoma. Ultimately, we chose to only include patients who had both surgery and chemotherapy treatments, this would allow us to assume they had similar level of disease severity. In this analysis, recurrent cancer type was the best fitting proxy for disease severity. Patients were classified as platinum resistant, platinum sensitive, platinum refractory, missing or cannot determine/other as define in section 4.4.4 Cancer Type. It is assumed that patients who were classified as

either missing or cannot be determined/other were not relapsed, rather in the first line treatment of the disease.

While we did have the physician billing information, we were unable to confirm the referring physician specialty. With OC, the index or diagnosis date is often the same as a patient is diagnosed during an exploratory surgery. Therefore, the patient start date was the date of their first surgery, and in our study, would not have included prior physician visits. Although, primary treating physician is well regarded as an important covariate in determining a patient's health outcomes, it was not in the scope of the time frame of this study. Although, we did do some analyses and verifications, the logic for some patients did not make sense. For instance, a patient who surgical date (using restricted OBGYN related surgeries only) was inputted as being treated by physician code 56 (optometry). For instance, patient 1013112813 had physician code 56 on 4 September 2009.Although this is possible, the likelihood is low and we decided to forgo a covariate that may have major imputation errors thus leading to incorrect results.

Second, the use of administrative claims databases carries a possibility of information bias related to the validity of the data reported by the service providers and the likelihood of human error during transcription. The MOHLTC have implemented quality control measures to reduce errors. As described above, we aired on the side of caution to avoid using variables with obvious transcription errors; nevertheless, the results of the study must be interpreted in consideration of the known limitations of administrative databases.

Third, the study population consisted only those treated under the provincial health insurance plans, potentially discounting patients who had private insurance. However, given that treatment for cancer is predominantly conducted in hospitals and oncology clinics, all relevant treatments were likely captured by the study databases. Therefore, selection bias likely did not affect the primary objective. The health care utilization and cost analysis was limited to the prescription medications used for patients covered by the public insurance. Our study demonstrated a major difference in mean prescription cost per patients as seen in Table 32. For instance, South East had the highest cost per patient and Hamilton Niagara Haldimand Brant had the lowest; $19,239.5 and $1,683.7 respectively. There is a disproportionate difference between these two LHIN's, however, no further testing was done to determine what those driving cost differences were. More research is needed to determine what those differences are and how they affect the cost of care in each region. As a result, information bias may be present and there was nothing done to correct this. Fourth, because we relied on claims data, we may have missed relevant

clinical and treatment data. Some women may have opted to decline or delay surgery for personal reasons in favor of alternate treatment or supportive care only. The reasons are unknown, but there be a combination of factors such as advanced age, patient preference, and poor patient response to treatment or health care providers' bias (161, 162). We were forced to conduct our analysis based on available data and all conclusions should note such potential caveats.

10.2 Strength and generalizability

Despite the limitations discussed above, this study had several strengths. First, this was a population-based study; hence the results have greater validity than a hospital or clinic- based study. We utilized real world data; therefore, the results can be generalized to other province in Canada, as each province provides similar access and quality of care. Particularly, Ontario comprises almost one third of the Canadian population. The other provinces and territories are serviced by a similar health care system; therefore, the Ontario health system is generalizable to the rest of Canada. Second, retrospective studies are inexpensive and an efficient method for analyzing associations. Upon reception of the data, there were minimal time delays for commencing our analysis, as quality control measures and data checks are performed from the organization where the data was sourced. Moreover, as the patient information was sourced from government run administrative data records, there is a low likelihood of data entry error. We are confident the patient information, specifically data essential for the primary research questions i.e. death and treatment dates and residential LHIN are accurate, thus providing accurate research outcomes. Further, quality assessment was based on a priori defined explicit medical criteria, which renders the study results more reliable and reproducible.

The cox regression applied in the analyses was the indicator contrast using the last alphabetical or numeric variable coding as the referent category. A polynomial regression was applied to verify if there was a difference in significant covariates using a different contrast method from the indicator contrast which was used to perform the analysis. This was done to verify if categories which were assumed to be equally spaced, would differ from a contrast which categories the variables by the presence or absence of category membership. We found that no significant difference was observed. In addition, as the reference category for the regression analyses was the last alphabetic category i.e. Waterloo Wellington, it seemed arbitrary, therefore different references regions were tested to see if this made a difference in terms of outcomes. The analysis suggested that no difference in the outcomes was observed using different regions as the reference.

10.3 Recommendations and Future Research

The identification of regional differences in OS and time to surgery in our study suggest a need for improved treatment patterns for OC patients. Our findings suggest a need for improved access to care in Ontario, which are goals that are consistent with patient centered care. Furthermore, some studies show geographic variations in the patterns of cancer care, which may be due to socioeconomic or other factors (11, 163, 164). Additional research is needed to determine the effect of such other variables on patient centered outcomes. Finally, more research is needed on how to deliver patients' needs into acceptable performance measures to help promote the delivery of the standard of care. Standardizing care is an ideal goal, but cancer care is an individualized approach and standardizing cancer care may not be possible. The majority of Canadians live in urban settings and have great access to universal health care; however, some patients are in rural setting with limited access to specialty care such as gynecologic oncologist. Utilizing developing technologies such as telecommunication can improve patient access at low cost. Regional differences in Canada may be present in a non-standardized health dissemination, however, finding solutions to reduce this variability with a cost effective approach is essential in providing equal quality healthcare in Canada.

Although, this thesis did not discuss the type of chemotherapy treatment and differences in treatment received in terms of therapeutics and adjuvant therapy. The COO guidelines suggested that more research is needed to evaluate the implementation of surgical staging as a means of avoiding the use of chemotherapy in women who may not require toxic therapy (in stage 1) (165). The guidelines suggest that the role of adjuvant therapy in women with poor prognostic factors who are optimally staged needs to be assessed. The optimal chemotherapy regimen in terms of agents, dose, and duration has yet to be defined. Reducing the number of women having unnecessary treatment, may decrease the surgical wait times and reduce the strain on the HCRU by OC patients. In addition, determining the optimal treatment approach may increase the quality of life for patients in addition to reducing the potential cost of care. The goal of future research should be to find a healthcare model which optimizes patients centered care, in terms of quality of life and health outcomes, all while reducing the burden of disease, in terms of decreased utilization and expenditures.

The study being conducted using Ontario data allows for a good representation of the real life Canadian population, however, it would be interesting to reproduce the study in each province. This would provide a better indication if regional variation is in fact present and what or how potential predictors play a role

in patient outcome and a better understanding of OC treatment will potentially reduce mortality. In additional, more research on the dissemination of treatment and costs will provide empirical evidence that a system will reduce time to definitive care (surgery), time to readmission, length of stay in hospital and provide an understanding of the services being utilized and their associated cost for this type of care. A better understanding of health care resource utilization can reduce costs and overall mortality for these patients. Providing policy makers with recommendations based on actual data driven priorities and not perceived importance, will provide patients with the best possible outcomes and standard of quality cancer care.

11 Conclusion

In summary, the present study identified the existence of regional differences in clinical outcomes, quality of treatment and the existence of a variability in the prescription of costs between LHINs in Ontario. The differences observed may be attributed study specific factors such as patient or hospital level characteristics not examined in this study. As such, further investigation is warranted not only to further characterize the treatment and outcomes of OC in real-world, clinical settings, but also to evaluate the effect on the individual and the society with respect to understanding the burden of illness related to costs and health outcomes. With an aging population and limited resources, understanding the comprehensive treatment modalities and utilization will help provide a better understanding of how this effects patient outcomes. Adequate measures of disease incidence and economic costs are fundamental in measuring the disease burden in Canada. A better understanding of the extent at which there is a variation in the treatment regimen, will help promulgate a need for standardizing disease management. An increase in understanding of the distribution of cancer care and bringing forth any weaknesses in the quality of care will improve the overall treatment and survival. Standardizing treatment across the Canada will reduce the possibility of geographic variation and allow policy makers to increase public health access in order to circumvent any regional barriers preventing patients from receiving optimal care.

The study aimed to help close the literature gap on the management of ovarian cancer in Canada, shedding light on the need for reduced variability and better standardization of treatment. More research is needed to identify potential predictors associated with OC which will help reduce mortality, morbidity and the overall disease burden on both a personal and a public health level. Moreover, better detection and understanding disease predictors may allow for a less invasive treatment plan, thus allowing for an increase in disease management cost effectiveness. Identifying regional differences in care will help develop the tools needed to change the scope for ovarian cancer treatment.

Appendix 1: Ontario Academic Health Science Centers

1. Hamilton| Hamilton Health sciences Corporation
    a. Chedoke Hospital Site
    b. General Hospital Site
    c. Juravinski Hospital and Cancer Centre Site
    d. McMaster University Medical Centre Site
    e. St. Peter's Hospital Site
    f. McMaster Children's Hospital
    g. The Main Street West Urgent Care Centre
    h. Ron Joyce Children's Health Centre
2. Hamilton| St. Joseph's Health Care System –Hamilton
    a. Charlton Campus
    b. King Campus
    c. West 5th Campus
3. Kingston
    a. Kingston General Hospital
    b. Hotel Dieu Hospital
    c. St Mary's of the Lake Hospital
4. London| London Health Sciences Centre
    a. University Site
    b. Victoria Site
    c. Children's Hospital of Western Ontario
5. London| St joseph's Health Care, London
    a. Parkwood Institute
    b. St. Joseph's Hospital
    c. Southwest Centre for Forensic Mental Health Care
6. Ottawa| Children's Hospital of Eastern Ontario
7. Ottawa| The Ottawa Hospital | L'Hopital D'Ottawa
    a. Civic Site
    b. General Site
    c. Riverside Site (converted to urgent care clinic)
    d. The Rehabilitation Centre Site
8. Ottawa| Bruyere Continuuing Care Inc.
    a. Saint-Vincent Hospital
    b. Elisabeth Bruyere Hospital
9. Ottawa| Royal Ottawa Health Care Group
    a. The Royal Ottawa Mental Health Centre
    b. The Brockville Mental Health Centre
10. Ottawa| University of Ottawa Heart Institute
11. Sudbury| Health Sciences North
    a. Sudbury Outpatient Centre
    b. Sudbury Mental Health & Addictions Centre
    c. Ramsay Lake Health Centre

12. Thunder Bay| Thunder Bay Regional Health Sciences Centre
13. Toronto| Sinai Health System
    a. Mount Sinai Hospital
    b. Bridgepoint Active Healthcare
14. Toronto| University Health Network
    a. Toronto General Hospital Site
    b. Toronto Western Hospital Site
    c. Princess Margaret Hospital /The Ontario Cancer Institute Site
    d. Toronto Rehabilitation Institute
15. Toronto| Sunnybrook Health Sciences Centre
    a. Sunnybrook Health Sciences Site
    b. Holland Orthopaedic and Arthritic Site
    c. St. John's Rehab
16. Toronto| Hospital for Sick Children (The)
17. Toronto| Women's College Hospital
18. Toronto| St Michael's Hospital
19. Toronto| Baycrest Centre for Geriatric Care
20. Toronto| Centre for Addiction and Mental Health
21. Toronto| Holland Bloorview kids Rehabilitation Hospital

Appendix 2: Number of Patients in LHIN Name Group by Corresponding LHIN Number

LHIN Name	LHIN Number														
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	Total
Central	0	0	0	0	0	0	0	269	0	0	0	0	0	0	269
Central East	0	0	0	0	0	0	0	0	322	0	0	0	0	0	322
Central West	0	0	0	0	93	0	0	0	0	0	0	0	0	0	93
Champlain	0	0	0	0	0	0	0	0	0	0	252	0	0	0	252
Erie St. Clair	125	0	0	0	0	0	0	0	0	0	0	0	0	0	125
Hamilton Niagara Haldimand Brant	0	0	0	293	0	0	0	0	0	0	0	0	0	0	293
Mississauga Halton	0	0	0	0	0	92	0	0	0	0	0	0	0	0	92
North East	0	0	0	0	0	0	0	0	0	0	0	0	140	0	140
North Simcoe Muskoka	0	0	0	0	0	0	0	0	0	0	0	104	0	0	104
North West	0	0	0	0	0	0	0	0	0	0	0	0	0	34	34
South East	0	0	0	0	0	0	0	0	0	65	0	0	0	0	65
South West	0	198	0	0	0	0	0	0	0	0	0	0	0	0	198
Toronto Central	0	0	0	0	0	0	111	0	0	0	0	0	0	0	111
Waterloo Wellington	0	0	101	0	0	0	0	0	0	0	0	0	0	0	101
Total	125	198	101	293	93	92	111	269	322	65	252	104	140	34	2199

Appendix 3: Number of Patients in LHIN Groups by Census Subdivision Name

Census Subdivision Name	LHIN														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Addington Highlands	0	0	0	0	0	0	0	0	0	0	10	0	0	0	10
Adelaide Metcalfe	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
Adjala-Tosorontio	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Ajax	0	14	0	0	0	0	0	0	0	0	0	0	0	0	14
Algoma, Unorganized, North Part	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5
Alnwick/Haldimand	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Amherstburg	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
Ashfield-Colborne-Wawanosh	0	0	0	0	0	0	0	0	0	0	0	11	0	0	11
Athens	0	0	0	0	0	0	0	0	0	0	9	0	0	0	9
Aurora	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Barrie	0	0	0	0	0	0	0	0	23	0	0	0	0	0	23
Bayham	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6
Beckwith	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Billings	0	0	0	0	0	0	0	16	0	0	0	0	0	0	16

Census Subdivision Name	LHIN														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Blandford-Blenheim	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6
Bracebridge	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6
Bradford West Gwillimbury	12	0	0	0	0	0	0	0	0	0	0	0	0	0	12
Brampton	0	0	74	0	0	0	0	0	0	0	0	0	0	0	74
Brant	0	0	0	0	0	7	0	0	0	0	0	0	0	0	7
Brantford	0	0	0	0	0	22	0	0	0	0	0	0	0	0	22
Burlington	0	0	0	0	0	44	0	0	0	0	0	0	0	0	44
Caledon	0	0	14	0	0	0	0	0	0	0	0	0	0	0	14
Cambridge	0	0	0	0	0	0	0	0	0	0	0	0	0	16	16
Central Elgin	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Centre Wellington	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Champlain	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
Chatham-Kent	0	0	0	0	16	0	0	0	0	0	0	0	0	0	16
Clarence-Rockland	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Clarington	0	20	0	0	0	0	0	0	0	0	0	0	0	0	20
Clearview	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4

Census Subdivision Name	LHIN														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Cochrane, Unorganized, North Part	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Collingwood	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5
Cornwall	0	0	0	18	0	0	0	0	0	0	0	0	0	0	18
Dawn-Euphemia	0	0	0	0	10	0	0	0	0	0	0	0	0	0	10
Dysart and Others	0	14	0	0	0	0	0	0	0	0	0	0	0	0	14
East Gwillimbury	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9
East Zorra-Tavistock	0	0	0	0	0	0	0	0	0	0	0	15	0	0	15
Elliot Lake	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Erin	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Essa	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6
Essex	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Fort Erie	0	0	0	0	0	7	0	0	0	0	0	0	0	0	7
Front of Yonge	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
Frontenac Islands	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Galway-Cavendish and Harvey	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8
Georgian Bay	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4

Census Subdivision Name	LHIN														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Georgian Bluffs	0	0	0	0	0	0	0	0	0	0	0	21	0	0	21
Georgina	12	0	0	0	0	0	0	0	0	0	0	0	0	0	12
Gravenhurst	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
Greater Madawaska	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Greater Napanee	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Greater Sudbury / Grand Sudbury	0	0	0	0	0	0	0	21	0	0	0	0	0	0	21
Grimsby	0	0	0	0	0	29	0	0	0	0	0	0	0	0	29
Guelph	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Guelph/Eramosa	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5
Haldimand County	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
Halton Hills	0	0	0	0	0	0	19	0	0	0	0	0	0	0	19
Hamilton	0	0	0	0	0	90	0	0	0	0	0	0	0	0	90
Hanover	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5
Huntsville	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Huron East	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
Innisfil	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5
Kapuskasing	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1

Census Subdivision Name	LHIN														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Kawartha Lakes	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
Kee-Way-Win	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Kenora, Unorganized	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Kettle Point 44	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6
Killarney	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Kincardine	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
King	8	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Kingston	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6
Kingsville	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
Kitchener	0	0	0	0	0	0	0	0	0	0	0	0	0	39	39
Lakeshore	0	0	0	0	18	0	0	0	0	0	0	0	0	0	18
Lanark Highlands	0	0	0	17	0	0	0	0	0	0	0	0	0	0	17
Lincoln	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
London	0	0	0	0	0	0	0	0	0	0	0	83	0	0	83
Loyalist	0	0	0	0	0	0	0	0	0	0	13	0	0	0	13
Markham	11	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Markstay-Warren	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5

Census Subdivision Name	LHIN														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
McNab/Braeside	0	0	0	9	0	0	0	0	0	0	0	0	0	0	9
Midland	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7
Milton	0	0	0	0	0	0	14	0	0	0	0	0	0	0	14
Mississauga	0	0	0	0	0	0	57	0	0	0	0	0	0	0	57
Muskoka Lakes	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Neskantaga	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Niagara Falls	0	0	0	0	0	16	0	0	0	0	0	0	0	0	16
Niagara-on-the-Lake	0	0	0	0	0	8	0	0	0	0	0	0	0	0	8
Nipissing, Unorganized, South Part	0	0	0	0	0	0	0	24	0	0	0	0	0	0	24
Norfolk County	0	0	0	0	0	8	0	0	0	0	0	0	0	0	8
North Bay	0	0	0	0	0	0	0	9	0	0	0	0	0	0	9
North Shore	0	0	0	0	0	0	0	11	0	0	0	0	0	0	11
Oakville	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
Oliver Paipoonge	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Orangeville	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Orillia	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7

Census Subdivision Name	LHIN														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Oshawa	0	40	0	0	0	0	0	0	0	0	0	0	0	0	40
Ottawa	0	0	0	169	0	0	0	0	0	0	0	0	0	0	169
Owen Sound	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7
Parry Sound	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5
Peawanuck	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Penetanguishene	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6
Perth	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5
Perth East	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5
Petawawa	0	0	0	6	0	0	0	0	0	0	0	0	0	0	6
Peterborough	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Pic Mobert North	0	0	0	0	0	0	0	0	0	10	0	0	0	0	10
Pickering	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
Point Edward	0	0	0	0	10	0	0	0	0	0	0	0	0	0	10
Port Colborne	0	0	0	0	0	6	0	0	0	0	0	0	0	0	6
Prince Edward	0	0	0	0	0	0	0	0	0	0	7	0	0	0	7
Quinte West	0	0	0	0	0	0	0	0	0	0	8	0	0	0	8
Rankin Location 15D	0	0	0	0	0	0	0	8	0	0	0	0	0	0	8

Census Subdivision Name	LHIN														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Renfrew	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Richmond Hill	45	0	0	0	0	0	0	0	0	0	0	0	0	0	45
Russell	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Sarnia	0	0	0	0	10	0	0	0	0	0	0	0	0	0	10
Sault Ste. Marie	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Scugog	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Six Nations (Part) 40	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5
Smith-Ennismore-Lakefield	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
South Algonquin	0	0	0	0	0	0	0	9	0	0	0	0	0	0	9
South River	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5
Southgate	0	0	0	0	0	0	0	0	0	0	0	0	0	15	15
Southwold	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7
St. Catharines	0	0	0	0	0	28	0	0	0	0	0	0	0	0	28
St. Thomas	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
Sudbury	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Tecumseh	0	0	0	0	11	0	0	0	0	0	0	0	0	0	11

Census Subdivision Name	LHIN														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
The Nation / La Nation	0	0	0	21	0	0	0	0	0	0	0	0	0	0	21
Thorold	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5
Thunder Bay	0	0	0	0	0	0	0	0	0	6	0	0	0	0	6
Thunder Bay, Unorganized	0	0	0	0	0	0	0	0	0	12	0	0	0	0	12
Tillsonburg	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6
Timiskaming,	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
Timmins	0	0	0	0	0	0	0	9	0	0	0	0	0	0	9
Tiny	0	0	0	0	0	0	0	0	14	0	0	0	0	0	14
Toronto	141	165	2	0	0	0	0	0	0	0	0	0	111	0	419
Trent Hills	0	25	0	0	0	0	0	0	0	0	0	0	0	0	25
Uxbridge	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
Vaughan	8	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Walpole Island	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
Wasaga Beach	0	0	0	0	0	0	0	0	10	0	0	0	0	0	10
Waterloo	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12
Welland	0	0	0	0	0	12	0	0	0	0	0	0	0	0	12
Whitby	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6

Census Subdivision Name	LHIN														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Whitchurch-Stouffville	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Windsor	0	0	0	0	31	0	0	0	0	0	0	0	0	0	31
Woodstock	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8
Woolwich	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7
Zorra	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
Total	269	322	93	252	125	293	92	140	104	34	65	198	111	101	2199

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Table 5 Patient Disposition

	Total	
	N	%
POPULATIONS		
MERGED POPULATION ITT [1]	6620	100.0%
Had chemotherapy and no or missing surgery	215	3.2%
Had surgery and no chemotherapy	1984	30.0%
No Treatment	2160	34.2
Complete Cohort	2261	34.2%
Missing Year of Diagnosis	49	0.74%
Age <18 years	9	0.1%
Missing FSA [2]	4	0.06%
FULL ANALYSIS SET (FAS) POPULATION [3]	2199	33.2%
Death Status for FAS		
Dead	914	41.6%
Alive	1285	58.4%

[1]Merged population includes all patient with ovarian cancer diagnosis between January 01, 2007 and December 31, 2011 extracted from the Ministry of Health and Long-Term Care (MOHLTC) (demographic files, Registry Person Data Base (RPDB), Ontario Drug Benefit Program (ODB), Hospitalization Discharge Abstract Database (DAD) and Ontario Health Insurance Plan (OHIP) medical claims).

[2] In the merged population, 11 patients were missing FSA information to determine their LHIN, however, of those 7 (n=4) were excluded from the complete cohort, who received both chemotherapy and surgery.

[3] The FAS includes patients from patients meeting all exclusion and inclusion criteria.

Table 6 Disposition by LHIN

LHIN	Statistic	Disposition				Total
		Chemotherapy and no or missing Surgery	Included	No Treatment	Surgery and No Chemotherapy	
Missing[1]	n	0	4	1	6	11
	% within LHIN	0.0%	36.4%	9.1%	54.5%	100.0%
Central	n	13	136	134	176	459
	% within LHIN	2.8%	29.6%	29.2%	38.3%	100.0%
Central East	n	10	156	140	151	457
	% within LHIN	2.2%	34.1%	30.6%	33.0%	100.0%
Central West	n	1	85	91	107	284
	% within LHIN	0.4%	29.9%	32.0%	37.7%	100.0%
Champlain	n	22	241	169	134	566
	% within LHIN	3.9%	42.6%	29.9%	23.7%	100.0%
Erie St. Clair	n	12	130	119	78	339
	% within LHIN	3.5%	38.3%	35.1%	23.0%	100.0%
Hamilton Niagara Haldimand Brant	n	31	269	252	243	795
	% within LHIN	3.9%	33.8%	31.7%	30.6%	100.0%

LHIN	Statistic	Disposition				Total
		Chemotherapy and no or missing Surgery	Included	No Treatment	Surgery and No Chemotherapy	
Mississauga Halton	n	7	141	129	174	451
	% within LHIN	1.6%	31.3%	28.6%	38.6%	100.0%
North East	n	13	130	156	114	413
	% within LHIN	3.1%	31.5%	37.8%	27.6%	100.0%
North Simcoe Muskoka	n	6	102	102	60	270
	% within LHIN	2.2%	37.8%	37.8%	22.2%	100.0%
North West	n	5	34	78	38	155
	% within LHIN	3.2%	21.9%	50.3%	24.5%	100.0%
South East	n	35	143	117	78	373
	% within LHIN	9.4%	38.3%	31.4%	20.9%	100.0%
South West	n	9	181	141	131	462
	% within LHIN	1.9%	39.2%	30.5%	28.4%	100.0%
Toronto Central	n	35	354	398	365	1152
	% within LHIN	3.0%	30.7%	34.5%	31.7%	100.0%
Waterloo Wellington	n	16	155	133	129	433

LHIN	Statistic	Disposition				Total
		Chemotherapy and no or missing Surgery	Included	No Treatment	Surgery and No Chemotherapy	
	% within LHIN	3.7%	35.8%	30.7%	29.8%	100.0%
Total	n	215	2261	2160	1984	6620
	% within LHIN	3.2%	34.2%	32.6%	30.0%	100.0%

[1] In the merged population, 11 patients were missing FSA information to determine their LHIN, however, of those 7 were excluded from the complete cohort, who received both chemotherapy and surgery.

Table 7 Patients by LHIN and Overall

LHIN Number	LHIN Name	N	%
1	Central	269	12.2
2	Central East	322	14.6
3	Central West	93	4.2
4	Champlain	252	11.5
5	Erie St. Clair	125	5.7
6	Hamilton Niagara Haldimand Brant	293	13.3
7	Mississauga Halton	92	4.2
8	North East	140	6.4
9	North Simcoe Muskoka	104	4.7
10	North West	34	1.5
11	South East	65	3.0
12	South West	198	9.0
13	Toronto Central	111	5.0
14	Waterloo Wellington	101	4.6
Total		2199	100.0

Table 8 Age at Diagnosis by LHIN and Overall

		LHIN													P-value[1]	Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
N		125	198	101	293	93	92	111	269	322	65	252	104	140	34	<0.001*	2199
Mean		63.31	64.48	63.17	65.31	61.52	59.89	63.05	62.98	62.93	67.77	60.78	63.42	61.40	67.44		63.14
Std. Deviation		14.25	12.90	12.31	11.07	12.09	13.75	14.18	13.38	12.69	11.80	12.01	12.75	12.36	12.43		12.73
Std. Error		1.27	.92	1.22	.65	1.25	1.43	1.35	.82	.71	1.46	.76	1.25	1.04	2.13		.27
95% CI for Mean	Lower Bound	60.79	62.68	60.74	64.03	59.03	57.04	60.38	61.37	61.53	64.85	59.29	60.94	59.33	63.10		62.60
	Upper Bound	65.83	66.29	65.60	66.58	64.01	62.74	65.71	64.58	64.32	70.69	62.27	65.90	63.47	71.78		63.67
Minimum		21.00	18.00	27.00	23.00	21.00	21.00	27.00	23.00	22.00	45.00	22.00	21.00	21.00	38.00		18.00
Maximum		94.00	89.00	92.00	90.00	83.00	86.00	85.00	92.00	90.00	91.00	89.00	88.00	87.00	90.00		94.00

[1]Between group P-value was assessed with non-parametric Kruskal Wallis test for continuous variables. A Test for normality was performed.

Statistically significant results are marked with a "*".

[2] 9 patients were removed for not being <18 years and 44 patients did not have birth year information available.

Table 9 Age Distribution at Diagnosis by LHIN and Overall

Age	Statistics	LHIN														P-value[1]	Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14		
<= 20.00	n	0	2	0	0	0	0	0	0	0	0	0	0	0	0	<0.001*	2
	%	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		.1
21.00 - 34.00	n	5	2	1	4	1	4	4	5	8	0	3	3	4	0		44
	%	4.0	1.0	1.0	1.4	1.1	4.3	3.6	1.9	2.5	0.0	1.2	2.9	2.9	0.0		2.0
35.00 - 44.00	n	9	8	6	5	10	9	8	20	17	0	19	6	9	1		127
	%	7.2	4.0	5.9	1.7	10.8	9.8	7.2	7.4	5.3	0.0	7.5	5.8	6.4	2.9		5.8
45.00 - 54.00	n	16	32	19	39	9	16	25	50	57	12	56	11	27	5		374
	%	12.8	16.2	18.8	13.3	9.7	17.4	22.5	18.6	17.7	18.5	22.2	10.6	19.3	14.7		17.0
55.00 - 64.00	n	33	45	29	67	30	26	15	51	77	12	69	28	31	4		517
	%	26.4	22.7	28.7	22.9	32.3	28.3	13.5	19.0	23.9	18.5	27.4	26.9	22.1	11.8		23.5
65.00 - 74.00	n	36	65	27	123	33	24	32	91	109	22	72	42	51	15		742
	%	28.8	32.8	26.7	42.0	35.5	26.1	28.8	33.8	33.9	33.8	28.6	40.4	36.4	44.1		33.7
75.00 - 84.00	n	20	37	16	48	10	11	25	45	44	13	29	13	16	7		334
	%	16.0	18.7	15.8	16.4	10.8	12.0	22.5	16.7	13.7	20.0	11.5	12.5	11.4	20.6		15.2
85.00+	n	6	7	3	7	0	2	2	7	10	6	4	1	2	2		59

Age	Statistics	LHIN														P-value[1]	Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14		
	%	4.8	3.5	3.0	2.4	0.0	2.2	1.8	2.6	3.1	9.2	1.6	1.0	1.4	5.9		2.7
Total	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0

[1]Between group P-value was assessed with Pearson Chi-Square for categorical variables; missing categories were not included in the p-value assessment.

Statistically significant results are marked with a "*".

[2] 9 patients were removed for not being <18 years and 49 patients did not have birth year information available.

[3] Proportions are based on patients with available data.

Table 10 Year of Diagnosis by LHIN and Overall

Year	Statistic	LHIN														P-value[1]	Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14		
2005	n	4	7	1	6	0	3	2	9	9	0	2	2	3	1	0.190	49
	%	3.2	3.5	1.0	2.0	0.0	3.3	1.8	3.3	2.8	0.0	.8	1.9	2.1	2.9		2.2
2006	n	2	17	13	21	6	6	8	15	19	4	16	10	10	0		147
	%	1.6	8.6	12.9	7.2	6.5	6.5	7.2	5.6	5.9	6.2	6.3	9.6	7.1	0.0		6.7
2007	n	34	33	23	52	10	21	23	50	61	11	46	17	27	5		413
	%	27.2	16.7	22.8	17.7	10.8	22.8	20.7	18.6	18.9	16.9	18.3	16.3	19.3	14.7		18.8
2008	n	18	32	9	50	19	21	29	66	71	12	52	19	25	3		426
	%	14.4	16.2	8.9	17.1	20.4	22.8	26.1	24.5	22.0	18.5	20.6	18.3	17.9	8.8		19.4
2009	n	20	33	23	62	15	13	20	40	52	14	50	14	30	7		393
	%	16.0	16.7	22.8	21.2	16.1	14.1	18.0	14.9	16.1	21.5	19.8	13.5	21.4	20.6		17.9
2010	n	29	40	18	49	27	12	15	58	57	15	46	26	26	10		428
	%	23.2	20.2	17.8	16.7	29.0	13.0	13.5	21.6	17.7	23.1	18.3	25.0	18.6	29.4		19.5
2011	n	17	35	14	52	16	15	14	31	53	9	40	16	19	8		339
	%	13.6	17.7	13.9	17.7	17.2	16.3	12.6	11.5	16.5	13.8	15.9	15.4	13.6	23.5		15.4
2012	n	1	1	0	1	0	1	0	0	0	0	0	0	0	0		4
	%	.8	.5	0.0	.3	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		.2
Total	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0

[1]Between group P-value was assessed with Pearson Chi-Square for categorical variables; missing categories were not included in the p-value assessment.

Statistically significant results are marked with a “*”.

[3] Proportions are based on patients with available data.

Table 11 Follow-Up Duration (Years) by LHIN and Overall

		LHIN														P-value[1]	Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
N		125	198	101	293	93	92	111	269	322	65	252	104	140	34	<0.001*	2199
Mean		1.88	1.49	1.72	1.39	1.54	1.91	2.00	1.86	1.87	1.83	2.05	1.94	1.93	1.31		1.78
Std. Deviation		1.47	1.33	1.28	1.33	1.32	1.47	1.53	1.36	1.47	1.23	1.34	1.38	1.36	1.00		1.39
Std. Error		.13	.09	.13	.08	.14	.15	.15	.08	.08	.15	.08	.14	.12	.17		.03
95% CI for Mean	Lower Bound	1.62	1.30	1.47	1.24	1.26	1.61	1.71	1.69	1.71	1.52	1.88	1.67	1.70	.96		1.72
	Upper Bound	2.14	1.68	1.98	1.54	1.81	2.21	2.29	2.02	2.03	2.13	2.22	2.21	2.16	1.66		1.83
Minimum		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02		.00
Maximum		6.87	4.98	5.74	6.37	5.75	5.09	5.73	5.88	6.37	5.86	5.48	6.15	5.11	4.08		6.87

[1]Between group P-value was assessed with non-parametric Kruskal Wallis test for continuous variables; missing categories were not included in the p-value assessment.

Statistically significant results are marked with a "*".

Table 12 Recurrent Cancer Type by LHIN and Overall

Cancer Type	Statistic	LHIN														P-value[1]	Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Cannot Determine	n	26	35	21	69	22	21	19	68	80	13	44	23	26	6	<0.001*	473
	%	20.8	17.7	20.8	23.5	23.7	22.8	17.1	25.3	24.8	20.0	17.5	22.1	18.6	17.6		21.5
Platinum Sensitive	n	47	86	35	124	31	39	56	104	135	24	81	45	50	16		873
	%	37.6	43.4	34.7	42.3	33.3	42.4	50.5	38.7	41.9	36.9	32.1	43.3	35.7	47.1		39.7
Partially Platinum Sensitive	n	26	43	28	63	19	14	19	57	61	14	41	14	21	3		423
	%	20.8	21.7	27.7	21.5	20.4	15.2	17.1	21.2	18.9	21.5	16.3	13.5	15.0	8.8		19.2
Platinum Resistant	n	22	30	16	31	15	18	14	39	41	13	76	21	38	9		383
	%	17.6	15.2	15.8	10.6	16.1	19.6	12.6	14.5	12.7	20.0	30.2	20.2	27.1	26.5		17.4
Platinum Refractory	n	4	4	1	6	6	0	3	1	5	1	10	1	5	0		47
	%	3.2	2.0	1.0	2.0	6.5	0.0	2.7	.4	1.6	1.5	4.0	1.0	3.6	0.0		2.1
Total	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0

[1]Between group P-value was assessed with Pearson Chi-Square for categorical variables; missing categories were not included in the p-value assessment.

Statistically significant results are marked with a "*".

Table 13 Mortality Status at End of Study by LHIN and Overall

Status	Statistic	LHIN														P-value[1]	Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Alive	n	68	109	46	165	65	52	67	151	199	40	163	60	79	21	0.066	1285
	%	54.4	55.1	45.5	56.3	69.9	56.5	60.4	56.1	61.8	61.5	64.7	57.7	56.4	61.8		58.4
Dead	n	57	89	55	128	28	40	44	118	123	25	89	44	61	13		914
	%	45.6	44.9	54.5	43.7	30.1	43.5	39.6	43.9	38.2	38.5	35.3	42.3	43.6	38.2		41.6
Total	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0

[1]Between group P-value was assessed with Pearson Chi-Square for categorical variables and statistically significant results are marked with a "*".

[3] Proportions are based on patients with available data.

Table 14 Mortality by Cancer Type and LHIN

Cancer Type	Status	Statistic	LHIN															
			1	2	03	04	05	06	07	08	09	10	11	12	13	14	P-value	Total
Cannot Determine	Dead	n	15	18	7	43	16	10	10	42	45	9	25	14	18	4	<0.001*	276
		%	12.0	9.1	6.9	14.7	17.2	10.9	9.0	15.6	14.0	13.8	9.9	13.5	12.9	11.8		12.6
	Alive	n	11	17	14	26	6	11	9	26	35	4	19	9	8	2		197
		%	8.8	8.6	13.9	8.9	6.5	12.0	8.1	9.7	10.9	6.2	7.5	8.7	5.7	5.9		9.0
	Total	n	26	35	21	69	22	21	19	68	80	13	44	23	26	6		473
		%	20.8	17.7	20.8	23.5	23.7	22.8	17.1	25.3	24.8	20.0	17.5	22.1	18.6	17.6		21.5
Platinum Sensitive	Dead	n	24	53	16	65	23	25	35	54	89	17	46	29	22	9		507
		%	19.2	26.8	15.8	22.2	24.7	27.2	31.5	20.1	27.6	26.2	18.3	27.9	15.7	26.5		23.1
	Alive	n	23	33	19	59	8	14	21	50	46	7	35	16	28	7		366
		%	18.4	16.7	18.8	20.1	8.6	15.2	18.9	18.6	14.3	10.8	13.9	15.4	20.0	20.6		16.6
	Total	n	47	86	35	124	31	39	56	104	135	24	81	45	50	16		873
		%	37.6	43.4	34.7	42.3	33.3	42.4	50.5	38.7	41.9	36.9	32.1	43.3	35.7	47.1		39.7
Partially Platinum Sensitive	Dead	n	15	22	14	33	13	8	9	31	38	6	31	7	14	3		244
		%	12.0	11.1	13.9	11.3	14.0	8.7	8.1	11.5	11.8	9.2	12.3	6.7	10.0	8.8		11.1
	Alive	n	11	21	14	30	6	6	10	26	23	8	10	7	7	0		179
		%	8.8	10.6	13.9	10.2	6.5	6.5	9.0	9.7	7.1	12.3	4.0	6.7	5.0	0.0		8.1
	Total	n	26	43	28	63	19	14	19	57	61	14	41	14	21	3		423
		%	20.8	21.7	27.7	21.5	20.4	15.2	17.1	21.2	18.9	21.5	16.3	13.5	15.0	8.8		19.2

Cancer Type	Status	Statistic		LHIN														
			1	2	03	04	05	06	07	08	09	10	11	12	13	14	P-value	Total
Platinum Resistant	Dead	n	10	14	8	19	10	9	11	23	26	8	54	10	23	5		230
		%	8.0	7.1	7.9	6.5	10.8	9.8	9.9	8.6	8.1	12.3	21.4	9.6	16.4	14.7		10.5
	Alive	n	12	16	8	12	5	9	3	16	15	5	22	11	15	4		153
		%	9.6	8.1	7.9	4.1	5.4	9.8	2.7	5.9	4.7	7.7	8.7	10.6	10.7	11.8		7.0
	Total	n	22	30	16	31	15	18	14	39	41	13	76	21	38	9		383
		%	17.6	15.2	15.8	10.6	16.1	19.6	12.6	14.5	12.7	20.0	30.2	20.2	27.1	26.5		17.4
Platinum Refractory	Dead	n	4	2	1	5	3		2	1	1	0	7	0	2			28
		%	3.2	1.0	1.0	1.7	3.2		1.8	.4	.3	0.0	2.8	0.0	1.4			1.3
	Alive	n	0	2	0	1	3		1	0	4	1	3	1	3			19
		%	0.0	1.0	0.0	.3	3.2		.9	0.0	1.2	1.5	1.2	1.0	2.1			.9
	Total	n	4	4	1	6	6		3	1	5	1	10	1	5			47
		%	3.2	2.0	1.0	2.0	6.5		2.7	.4	1.6	1.5	4.0	1.0	3.6			2.1
Total	Dead	n	68	109	46	165	65	52	67	151	199	40	163	60	79	21		1285
		%	54.4	55.1	45.5	56.3	69.9	56.5	60.4	56.1	61.8	61.5	64.7	57.7	56.4	61.8		58.4
	Alive	n	57	89	55	128	28	40	44	118	123	25	89	44	61	13		914
		%	45.6	44.9	54.5	43.7	30.1	43.5	39.6	43.9	38.2	38.5	35.3	42.3	43.6	38.2		41.6
	Total	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0

[1]Between group (cancer type vs mortality) P-value was assessed with Chi-Square for categorical variables. Statistically significant results are marked with a "*".

Table 15 Charlson Comorbidity Index Score (Continuous) at Baseline and Follow Up by LHIN and Overall

			LHIN														P-value[1]	Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		
Baseline Charlson Score	N		58	82	39	128	38	34	41	111	128	24	90	35	52	13	0.304	873
	Mean		2.72	2.21	2.09	2.22	2.36	2.18	2.33	2.32	2.32	1.69	2.69	1.89	2.32	2.19		2.31
	Std. Deviation		2.31	1.63	1.53	1.44	1.66	1.33	1.47	1.67	1.71	1.07	1.77	.89	2.00	1.11		1.66
	Std. Error		.30	.18	.24	.13	.27	.23	.23	.16	.15	.22	.19	.15	.28	.31		0.06
	95% CI for Mean	Lower Bound	2.12	1.85	1.59	1.97	1.81	1.71	1.86	2.00	2.03	1.24	2.32	1.58	1.76	1.52		2.20
		Upper Bound	3.33	2.56	2.59	2.47	2.90	2.64	2.79	2.63	2.62	2.14	3.06	2.19	2.87	2.86		2.42
	Minimum		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
	Maximum		9.00	8.00	8.00	8.00	6.00	6.00	7.00	8.00	8.00	6.00	8.00	6.00	9.00	5.00		9.00
Charlson Score at FUP	N		125	198	101	293	93	92	111	269	322	65	252	104	140	34	<0.001*	2199
	Mean		5.96	5.41	5.81	6.12	5.47	5.85	5.33	6.00	5.49	6.08	4.91	5.43	5.54	6.51		5.65
	Std. Deviation		2.48	2.36	2.23	2.59	2.74	2.45	2.17	2.47	2.42	2.37	2.56	2.13	2.37	2.79		2.47
	Std. Error		.22	.17	.22	.15	.28	.26	.21	.15	.14	.29	.16	.21	.20	.48		.05
	95% CI for Mean	Lower Bound	5.52	5.08	5.37	5.82	4.91	5.34	4.93	5.70	5.23	5.49	4.59	5.01	5.14	5.54		5.54
		Upper Bound	6.40	5.74	6.25	6.42	6.04	6.35	5.74	6.29	5.76	6.66	5.23	5.84	5.94	7.49		5.75
	Minimum		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00		2.00

		LHIN													P-value[1]	Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	Maximum	12.00	11.00	10.50	13.00	14.50	11.00	11.00	14.00	14.00	9.50	12.00	10.00	14.00	13.00		14.50

[1]Between group P-value was assessed with non-parametric Kruskal Wallis test for continuous variables. Statistically significant results are marked with a "*".

[2]The score was calculated from baseline to last follow up (FUP) and excluded cases with missing baseline scores.

Table 16 Charlson Comorbidity Index Score Category at Baseline and Follow Up by LHIN and Overall

			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Baseline Charlson comorbidity index Categories	No Record	n	67	116	62	165	55	58	70	158	194	41	162	69	88	21	0.518	1326
		%	53.6	58.6	61.4	56.3	59.1	63.0	63.1	58.7	60.2	63.1	64.3	66.3	62.9	61.8		60.3
	Moderate	n	42	68	34	107	31	30	35	90	106	23	66	32	43	10		717
		%	33.6	34.3	33.7	36.5	33.3	32.6	31.5	33.5	32.9	35.4	26.2	30.8	30.7	29.4		32.6
	Severe	n	16	14	5	21	7	4	6	21	22	1	24	3	9	3		156
		%	12.8	7.1	5.0	7.2	7.5	4.3	5.4	7.8	6.8	1.5	9.5	2.9	6.4	8.8		7.1
	Total	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Charlson Comorbidity Index at FUP Categories	Moderate	n	18	35	12	42	22	15	19	43	59	8	83	17	23	5	<0.001*	401
		%	14.4	17.7	11.9	14.3	23.7	16.3	17.1	16.0	18.3	12.3	32.9	16.3	16.4	14.7		18.2
	Severe	n	107	163	89	251	71	77	92	226	263	57	169	87	117	29		1798
		%	85.6	82.3	88.1	85.7	76.3	83.7	82.9	84.0	81.7	87.7	67.1	83.7	83.6	85.3		81.8
	Total	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0

[1]Between group P-value was assessed with non-parametric Kruskal Wallis test for continuous variables. Statistically significant results are marked with a "*".

[2]The score was calculated from baseline to last follow up (FUP).

Table 17 Comorbidity Status by LHIN and Overall

			LHIN														Total	P-value
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Baseline Comorbidity	No	n	19	35	24	33	9	13	23	45	44	14	48	16	24	4	351	0.094
		%	15.2	17.7	23.8	11.3	9.7	14.1	20.7	16.7	13.7	21.5	19.0	15.4	17.1	11.8	16.0	
	Yes	n	106	163	77	260	84	79	88	224	278	51	204	88	116	30	1848	
		%	84.8	82.3	76.2	88.7	90.3	85.9	79.3	83.3	86.3	78.5	81.0	84.6	82.9	88.2	84.0	
	Total	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34	2199	
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Comorbidity at FUP	No	n	15	20	9	19	3	7	9	20	33	7	27	8	11	2	190	0.567
		%	12.0	10.1	8.9	6.5	3.2	7.6	8.1	7.4	10.2	10.8	10.7	7.7	7.9	5.9	8.6	
	Yes	n	110	178	92	274	90	85	102	249	289	58	225	96	129	32	2009	
		%	88.0	89.9	91.1	93.5	96.8	92.4	91.9	92.6	89.8	89.2	89.3	92.3	92.1	94.1	91.4	
	Total	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34	2199	
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

[1]Between group P-value was assessed with Pearson Chi-Square for categorical variables. Statistically significant results are marked with a "*".

Table 18 Baseline Comorbidity Disease by LHIN and Overall

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Cardiovascular	No	n	121	190	101	287	92	92	111	262	310	62	248	101	140	33	0.090	2150
		%	96.8	96.0	100.0	98.0	98.9	100.0	100.0	97.4	96.3	95.4	98.4	97.1	100.0	97.1		97.8
	Yes	n	4	8	0	6	1	0	0	7	12	3	4	3	0	1		49
		%	3.2	4.0	0.0	2.0	1.1	0.0	0.0	2.6	3.7	4.6	1.6	2.9	0.0	2.9		2.2
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Hypertension	No	n	76	124	65	163	45	55	72	162	186	41	182	67	90	19	0.010*	1347
		%	60.8	62.6	64.4	55.6	48.4	59.8	64.9	60.2	57.8	63.1	72.2	64.4	64.3	55.9		61.3
	Yes	n	49	74	36	130	48	37	39	107	136	24	70	37	50	15		852
		%	39.2	37.4	35.6	44.4	51.6	40.2	35.1	39.8	42.2	36.9	27.8	35.6	35.7	44.1		38.7
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Hyperlipidemia	No	n	125	197	101	292	92	92	111	268	322	65	251	104	140	34	0.910	2194
		%	100.0	99.5	100.0	99.7	98.9	100.0	100.0	99.6	100.0	100.0	99.6	100.0	100.0	100.0		99.8
	Yes	n	0	1	0	1	1	0	0	1	0	0	1	0	0	0		5
		%	0.0	.5	0.0	.3	1.1	0.0	0.0	.4	0.0	0.0	.4	0.0	0.0	0.0		.2
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Diabetes	No	n	106	183	89	247	71	84	95	227	271	50	233	92	125	29	0.001*	1902

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
		%	84.8	92.4	88.1	84.3	76.3	91.3	85.6	84.4	84.2	76.9	92.5	88.5	89.3	85.3		86.5
	Yes	n	19	15	12	46	22	8	16	42	51	15	19	12	15	5		297
		%	15.2	7.6	11.9	15.7	23.7	8.7	14.4	15.6	15.8	23.1	7.5	11.5	10.7	14.7		13.5
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Other Cancers	No	n	101	157	80	228	73	72	84	209	263	57	200	84	118	26	0.829	1752
		%	80.8	79.3	79.2	77.8	78.5	78.3	75.7	77.7	81.7	87.7	79.4	80.8	84.3	76.5		79.7
	Yes	n	24	41	21	65	20	20	27	60	59	8	52	20	22	8		447
		%	19.2	20.7	20.8	22.2	21.5	21.7	24.3	22.3	18.3	12.3	20.6	19.2	15.7	23.5		20.3
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
CHF Respiratory	No	n	113	183	97	272	92	89	102	255	314	61	245	97	137	33	0.009*	2090
		%	90.4	92.4	96.0	92.8	98.9	96.7	91.9	94.8	97.5	93.8	97.2	93.3	97.9	97.1		95.0
	Yes	n	12	15	4	21	1	3	9	14	8	4	7	7	3	1		109
		%	9.6	7.6	4.0	7.2	1.1	3.3	8.1	5.2	2.5	6.2	2.8	6.7	2.1	2.9		5.0
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
CHF Depression	No	n	74	123	76	189	62	62	69	168	201	48	162	67	94	22	0.535	1417
		%	59.2	62.1	75.2	64.5	66.7	67.4	62.2	62.5	62.4	73.8	64.3	64.4	67.1	64.7		64.4
	Yes	n	51	75	25	104	31	30	42	101	121	17	90	37	46	12		782
		%	40.8	37.9	24.8	35.5	33.3	32.6	37.8	37.5	37.6	26.2	35.7	35.6	32.9	35.3		35.6

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
CHF Diagnosed	No	n	121	189	97	274	85	87	105	254	307	61	240	104	135	33	0.509	2092
		%	96.8	95.5	96.0	93.5	91.4	94.6	94.6	94.4	95.3	93.8	95.2	100.0	96.4	97.1		95.1
	Yes	n	4	9	4	19	8	5	6	15	15	4	12	0	5	1		107
		%	3.2	4.5	4.0	6.5	8.6	5.4	5.4	5.6	4.7	6.2	4.8	0.0	3.6	2.9		4.9
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Stroke	No	n	125	198	101	291	92	92	111	269	322	65	252	104	140	33	0.019*	2195
		%	100.0	100.0	100.0	99.3	98.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.1		99.8
	Yes	n	0	0	0	2	1	0	0	0	0	0	0	0	0	1		4
		%	0.0	0.0	0.0	.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9		.2
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Peripheral Vascular Disease (PVD)	No	n	118	191	98	283	92	91	110	262	312	64	250	102	134	32	0.301	2139
		%	94.4	96.5	97.0	96.6	98.9	98.9	99.1	97.4	96.9	98.5	99.2	98.1	95.7	94.1		97.3
	Yes	n	7	7	3	10	1	1	1	7	10	1	2	2	6	2		60
		%	5.6	3.5	3.0	3.4	1.1	1.1	.9	2.6	3.1	1.5	.8	1.9	4.3	5.9		2.7
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
	No	n	125	197	101	293	93	92	110	268	322	65	252	104	140	34	0.690	2196

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Pulmonary Hypertension		%	100.0	99.5	100.0	100.0	100.0	100.0	99.1	99.6	100.0	100.0	100.0	100.0	100.0	100.0		99.9
	Yes	n	0	1	0	0	0	0	1	1	0	0	0	0	0	0		3
		%	0.0	.5	0.0	0.0	0.0	0.0	.9	.4	0.0	0.0	0.0	0.0	0.0	0.0		.1
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Myocardial Infarction	No	n	117	190	92	273	82	89	104	253	292	57	245	98	132	31	0.042*	2055
		%	93.6	96.0	91.1	93.2	88.2	96.7	93.7	94.1	90.7	87.7	97.2	94.2	94.3	91.2		93.5
	Yes	n	8	8	9	20	11	3	7	16	30	8	7	6	8	3		144
		%	6.4	4.0	8.9	6.8	11.8	3.3	6.3	5.9	9.3	12.3	2.8	5.8	5.7	8.8		6.5
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Dyslipidemia	No	n	100	169	91	227	71	69	95	214	256	59	213	91	110	25	0.012*	1790
		%	80.0	85.4	90.1	77.5	76.3	75.0	85.6	79.6	79.5	90.8	84.5	87.5	78.6	73.5		81.4
	Yes	n	25	29	10	66	22	23	16	55	66	6	39	13	30	9		409
		%	20.0	14.6	9.9	22.5	23.7	25.0	14.4	20.4	20.5	9.2	15.5	12.5	21.4	26.5		18.6
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Kidney Disease	No	n	123	196	99	285	92	89	109	262	313	64	247	102	139	31	0.492	2151
		%	98.4	99.0	98.0	97.3	98.9	96.7	98.2	97.4	97.2	98.5	98.0	98.1	99.3	91.2		97.8
	Yes	n	2	2	2	8	1	3	2	7	9	1	5	2	1	3		48
		%	1.6	1.0	2.0	2.7	1.1	3.3	1.8	2.6	2.8	1.5	2.0	1.9	.7	8.8		2.2

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Arthritis	No	n	99	150	88	229	71	73	88	210	255	52	209	76	118	23	0.271	1741
		%	79.2	75.8	87.1	78.2	76.3	79.3	79.3	78.1	79.2	80.0	82.9	73.1	84.3	67.6		79.2
	Yes	n	26	48	13	64	22	19	23	59	67	13	43	28	22	11		458
		%	20.8	24.2	12.9	21.8	23.7	20.7	20.7	21.9	20.8	20.0	17.1	26.9	15.7	32.4		20.8
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Osteoporosis	No	n	100	164	93	239	75	71	89	217	271	54	205	91	118	23	0.151	1810
		%	80.0	82.8	92.1	81.6	80.6	77.2	80.2	80.7	84.2	83.1	81.3	87.5	84.3	67.6		82.3
	Yes	n	25	34	8	54	18	21	22	52	51	11	47	13	22	11		389
		%	20.0	17.2	7.9	18.4	19.4	22.8	19.8	19.3	15.8	16.9	18.7	12.5	15.7	32.4		17.7
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Autoimmune Disease	No	n	117	193	99	277	88	89	107	252	314	63	241	102	132	33	0.388	2107
		%	93.6	97.5	98.0	94.5	94.6	96.7	96.4	93.7	97.5	96.9	95.6	98.1	94.3	97.1		95.8
	Yes	n	8	5	2	16	5	3	4	17	8	2	11	2	8	1		92
		%	6.4	2.5	2.0	5.5	5.4	3.3	3.6	6.3	2.5	3.1	4.4	1.9	5.7	2.9		4.2
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Neurological	No	n	116	187	99	265	87	89	100	248	294	58	233	98	135	31	0.226	2040

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
		%	92.8	94.4	98.0	90.4	93.5	96.7	90.1	92.2	91.3	89.2	92.5	94.2	96.4	91.2		92.8
	Yes	n	9	11	2	28	6	3	11	21	28	7	19	6	5	3		159
		%	7.2	5.6	2.0	9.6	6.5	3.3	9.9	7.8	8.7	10.8	7.5	5.8	3.6	8.8		7.2
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Hepatitis	No	n	122	184	98	265	86	84	102	247	296	63	235	97	136	33	0.169	2048
		%	97.6	92.9	97.0	90.4	92.5	91.3	91.9	91.8	91.9	96.9	93.3	93.3	97.1	97.1		93.1
	Yes	n	3	14	3	28	7	8	9	22	26	2	17	7	4	1		151
		%	2.4	7.1	3.0	9.6	7.5	8.7	8.1	8.2	8.1	3.1	6.7	6.7	2.9	2.9		6.9
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Infectious Disease	No	n	107	165	87	264	79	82	100	231	264	55	211	90	118	29	0.456	1882
		%	85.6	83.3	86.1	90.1	84.9	89.1	90.1	85.9	82.0	84.6	83.7	86.5	84.3	85.3		85.6
	Yes	n	18	33	14	29	14	10	11	38	58	10	41	14	22	5		317
		%	14.4	16.7	13.9	9.9	15.1	10.9	9.9	14.1	18.0	15.4	16.3	13.5	15.7	14.7		14.4
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0

[1] Between group P-value was assessed with the Pearson Chi-Square for categorical variables. Statistically significant results are marked with a "*".

[2] Numbers and proportions of patients with the comorbidity at the time of diagnosis with ovarian cancer.

Table 19 Comorbidity during Follow-Up by LHIN and Overall

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Cardiovascular	No	n	119	188	95	275	88	91	105	254	300	57	239	100	130	32	0.570	2073
		%	95.2	94.9	94.1	93.9	94.6	98.9	94.6	94.4	93.2	87.7	94.8	96.2	92.9	94.1		94.3
	Yes	n	6	10	6	18	5	1	6	15	22	8	13	4	10	2		126
		%	4.8	5.1	5.9	6.1	5.4	1.1	5.4	5.6	6.8	12.3	5.2	3.8	7.1	5.9		5.7
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Hypertension	No	n	63	119	58	135	35	53	55	133	162	42	169	56	79	15	<0.001*	1174
		%	50.4	60.1	57.4	46.1	37.6	57.6	49.5	49.4	50.3	64.6	67.1	53.8	56.4	44.1		53.4
	Yes	n	62	79	43	158	58	39	56	136	160	23	83	48	61	19		1025
		%	49.6	39.9	42.6	53.9	62.4	42.4	50.5	50.6	49.7	35.4	32.9	46.2	43.6	55.9		46.6
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Hyperlipidemia	No	n	123	195	100	285	89	87	102	252	306	65	248	96	138	32	0.001*	2118
		%	98.4	98.5	99.0	97.3	95.7	94.6	91.9	93.7	95.0	100.0	98.4	92.3	98.6	94.1		96.3
	Yes	n	2	3	1	8	4	5	9	17	16	0	4	8	2	2		81
		%	1.6	1.5	1.0	2.7	4.3	5.4	8.1	6.3	5.0	0.0	1.6	7.7	1.4	5.9		3.7
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Diabetes	No	n	101	180	85	240	71	80	92	219	263	53	220	89	117	26	0.111	1836
		%	80.8	90.9	84.2	81.9	76.3	87.0	82.9	81.4	81.7	81.5	87.3	85.6	83.6	76.5		83.5

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
	Yes	n	24	18	16	53	22	12	19	50	59	12	32	15	23	8		363
		%	19.2	9.1	15.8	18.1	23.7	13.0	17.1	18.6	18.3	18.5	12.7	14.4	16.4	23.5		16.5
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Other Cancers	No	n	57	69	30	104	31	36	47	93	119	25	93	41	44	9	0.437	798
		%	45.6	34.8	29.7	35.5	33.3	39.1	42.3	34.6	37.0	38.5	36.9	39.4	31.4	26.5		36.3
	Yes	n	68	129	71	189	62	56	64	176	203	40	159	63	96	25		1401
		%	54.4	65.2	70.3	64.5	66.7	60.9	57.7	65.4	63.0	61.5	63.1	60.6	68.6	73.5		63.7
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
CHF Respiratory	No	n	114	175	96	263	92	86	98	249	307	58	241	97	126	32	0.010*	2034
		%	91.2	88.4	95.0	89.8	98.9	93.5	88.3	92.6	95.3	89.2	95.6	93.3	90.0	94.1		92.5
	Yes	n	11	23	5	30	1	6	13	20	15	7	11	7	14	2		165
		%	8.8	11.6	5.0	10.2	1.1	6.5	11.7	7.4	4.7	10.8	4.4	6.7	10.0	5.9		7.5
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
CHF Depression	No	n	62	101	52	150	53	45	53	128	168	43	126	56	85	22	0.206	1144
		%	49.6	51.0	51.5	51.2	57.0	48.9	47.7	47.6	52.2	66.2	50.0	53.8	60.7	64.7		52.0
	Yes	n	63	97	49	143	40	47	58	141	154	22	126	48	55	12		1055
		%	50.4	49.0	48.5	48.8	43.0	51.1	52.3	52.4	47.8	33.8	50.0	46.2	39.3	35.3		48.0
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
CHF Diagnosed	No	n	117	180	91	259	82	86	100	239	290	54	235	94	122	30	0.477	1979
		%	93.6	90.9	90.1	88.4	88.2	93.5	90.1	88.8	90.1	83.1	93.3	90.4	87.1	88.2		90.0
	Yes	n	8	18	10	34	11	6	11	30	32	11	17	10	18	4		220
		%	6.4	9.1	9.9	11.6	11.8	6.5	9.9	11.2	9.9	16.9	6.7	9.6	12.9	11.8		10.0
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Stroke	No	n	123	195	99	290	92	91	111	264	318	65	250	100	139	34	0.650	2171
		%	98.4	98.5	98.0	99.0	98.9	98.9	100.0	98.1	98.8	100.0	99.2	96.2	99.3	100.0		98.7
	Yes	n	2	3	2	3	1	1	0	5	4	0	2	4	1	0		28
		%	1.6	1.5	2.0	1.0	1.1	1.1	0.0	1.9	1.2	0.0	.8	3.8	.7	0.0		1.3
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Peripheral Vascular Disease (PVD)	No	n	109	188	93	267	91	84	105	244	308	61	245	100	122	30	<0.001*	2047
		%	87.2	94.9	92.1	91.1	97.8	91.3	94.6	90.7	95.7	93.8	97.2	96.2	87.1	88.2		93.1
	Yes	n	16	10	8	26	2	8	6	25	14	4	7	4	18	4		152
		%	12.8	5.1	7.9	8.9	2.2	8.7	5.4	9.3	4.3	6.2	2.8	3.8	12.9	11.8		6.9
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Pulmonary Hypertension	No	n	125	196	101	292	93	92	110	269	320	65	252	103	140	33	0.297	2191
		%	100.0	99.0	100.0	99.7	100.0	100.0	99.1	100.0	99.4	100.0	100.0	99.0	100.0	97.1		99.6

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
	Yes	n	0	2	0	1	0	0	1	0	2	0	0	1	0	1		8
		%	0.0	1.0	0.0	.3	0.0	0.0	.9	0.0	.6	0.0	0.0	1.0	0.0	2.9		.4
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Myocardial Infarction	No	n	117	182	91	254	83	86	97	236	281	54	240	95	126	30	0.041	1972
		%	93.6	91.9	90.1	86.7	89.2	93.5	87.4	87.7	87.3	83.1	95.2	91.3	90.0	88.2		89.7
	Yes	n	8	16	10	39	10	6	14	33	41	11	12	9	14	4		227
		%	6.4	8.1	9.9	13.3	10.8	6.5	12.6	12.3	12.7	16.9	4.8	8.7	10.0	11.8		10.3
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Dyslipidemia	No	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34	NC	2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
	Yes	n	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Kidney Disease	No	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34	NC	2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
	Yes	n	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Arthritis	No	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34	NC	2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
	Yes	n	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Osteoporosis	No	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34	NC	2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
	Yes	n	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Autoimmune Disease	No	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34	NC	2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
	Yes	n	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Neurological	No	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34	NC	2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0

Comorbidity			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
	Yes	n	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Hepatitis	No	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34	NC	2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
	Yes	n	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
Infectious Disease	No	n	125	198	101	293	93	92	111	269	322	65	252	104	140	34	NC	2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0
	Yes	n	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0

[1]Between group P-value was assessed with the Pearson Chi-Square for categorical variables; statistically significant results are marked with a "*".

[2]Only Patients who had a comorbidity at follow up were included in this table.

NC= Not Calculable

Table 20 Type of Hospital by LHIN and Overall

			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Hospital Type	Non-Teaching	n	87	158	83	145	41	22	7	73	91	9	203	28	84	30	<0.001*	1061
		%	69.6	79.8	82.2	49.5	44.1	23.9	6.3	27.1	28.3	13.8	80.6	26.9	60.0	88.2		48.2
	Teaching	n	38	40	18	148	52	70	104	196	231	56	49	76	56	4		1138
		%	30.4	20.2	17.8	50.5	55.9	76.1	93.7	72.9	71.7	86.2	19.4	73.1	40.0	11.8		51.8
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0

[1]Between group P-value was assessed with non-parametric Kruskal Wallis test for continuous variables and Pearson Chi-Square for categorical variables. Statistically significant results are marked with a "*".

Table 21 Area Type by LHIN and Overall

			LHIN														P-value[1]	Total
			01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Area Type	Rural	n	25	59	15	39	0	2	0	19	48	19	33	33	79	13	<0.001*	384
		%	20.0	29.8	14.9	13.3	.0	2.2	.0	7.1	14.9	29.2	13.1	31.7	56.4	38.2		17.5
	Urban	n	100	139	86	254	93	90	111	250	274	46	219	71	61	21		1815
		%	80.0	70.2	85.1	86.7	100.0	97.8	100.0	92.9	85.1	70.8	86.9	68.3	43.6	61.8		82.5
Total		n	125	198	101	293	93	92	111	269	322	65	252	104	140	34		2199
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0

Between groups, P-value was assessed with the Pearson Chi-Square for categorical variables.

Statistically significant results are marked with a "*".

Table 22 HCRU (Related to Ovarian Cancer) by LHIN and Overall

Resource	Statistic [2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Chemotherapy -Cancer	n	45	63	52	106	11	29	9	45	69	28	211	10	75	8	761
	EVTS	167.3	195.7	559.1	420.6	88.0	99.0	97.8	321.4	663.5	823.5	3246.2	50.5	675.7	79.2	346.1
CT-Scan Related	n	98	117	71	186	76	63	92	219	221	40	149	80	112	19	1543
	EVTS	364.3	363.4	763.4	738.1	608.0	215.0	1000.0	1564.3	2125.0	1176.5	2292.3	404.0	1009.0	188.1	701.7
Diagnostic Surgery	n	31	48	32	103	22	23	25	52	104	36	68	24	49	10	627
	EVTS	115.2	149.1	344.1	408.7	176.0	78.5	271.7	371.4	1000.0	1058.8	1046.2	121.2	441.4	99.0	285.1
Endoscopy Related	n	2	0	0	2	0	0	0	1	0	0	0	1	0	0	6
	EVTS	7.4	0.0	0.0	7.9	0.0	0.0	0.0	7.1	0.0	0.0	0.0	5.1	0.0	0.0	2.7
Examinations Related	n	0	2	0	9	0	2	0	0	1	0	3	3	1	0	21
	EVTS	0.0	6.2	0.0	35.7	0.0	6.8	0.0	0.0	9.6	0.0	46.2	15.2	9.0	0.0	9.5
Exploratory Surgery Related	n	10	6	5	10	1	6	8	9	12	3	4	4	3	1	82
	EVTS	37.2	18.6	53.8	39.7	8.0	20.5	87.0	64.3	115.4	88.2	61.5	20.2	27.0	9.9	37.3
Hysterectomy	n	86	127	82	194	65	57	94	208	237	47	175	67	97	13	1549
	EVTS	319.7	394.4	881.7	769.8	520.0	194.5	1021.7	1485.7	2278.8	1382.4	2692.3	338.4	873.9	128.7	704.4
MRI Related	n	0	2	2	3	5	2	3	8	3	0	5	1	0	1	35
	EVTS	0.0	6.2	21.5	11.9	40.0	6.8	32.6	57.1	28.8	0.0	76.9	5.1	0.0	9.9	15.9

Resource	Statistic [2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Omentectomy	n	99	158	83	242	71	81	96	229	256	51	221	85	118	28	1818
	EVTS	368.0	490.7	892.5	960.3	568.0	276.5	1043.5	1635.7	2461.5	1500.0	3400.0	429.3	1063.1	277.2	826.7
Radiograph Related	n	1	2	5	5	0	0	2	4	5	0	3	2	6	2	37
	EVTS	3.7	6.2	53.8	19.8	0.0	0.0	21.7	28.6	48.1	0.0	46.2	10.1	54.1	19.8	16.8
Radiotherapy	n	1	5	2	3	2	3	5	5	5	0	8	1	5	1	46
	EVTS	3.7	15.5	21.5	11.9	16.0	10.2	54.3	35.7	48.1	0.0	123.1	5.1	45.0	9.9	20.9
Related Excision	n	0.0	0	0	0	0	0	1	0	0	0	2	0	0	0	3
	EVTS	0.0	0.0	0.0	0.0	0.0	0.0	10.9	0.0	0.0	0.0	30.8	0.0	0.0	0.0	1.4
Related Hemorrhage Control	n	0.0	4	1	9	1	0	3	2	3	1	1	0	0	0	25
	EVTS	0.0	12.4	10.8	35.7	8.0	0.0	32.6	14.3	21.4	7.1	15.4	0.0	0.0	0.0	11.4
Removal of Regional Lymph Node	n	28	45	10	53	21	20	17	53	70	7	47	12	17	3	403
	EVTS	104.1	139.8	107.5	210.3	168.0	68.3	184.8	378.6	500.0	50.0	723.1	60.6	153.2	29.7	183.3
Secondary Surgery Related	n	118	143	86	214	65	82	81	221	220	52	201	85	112	23	1703
	EVTS	438.7	444.1	924.7	849.2	520.0	279.9	880.4	1578.6	1571.4	371.4	3092.3	429.3	1009.0	227.7	774.4
Unilateral - Bilateral Oophorectomy	n	3	2	1	4	3	2	3	9	8	0	9	0	4	1	49
	EVTS	11.2	6.2	10.8	15.9	24.0	6.8	32.6	64.3	57.1	0.0	138.5	0.0	36.0	9.9	22.3
Unilateral - Bilateral Salpingo - Oophorectomy	n	122	189	96	275	83	79	107	250	309	65	248	96	133	28	2080
	EVTS	453.5	587.0	1032.3	1091.3	664.0	269.6	1163.0	1785.7	2207.1	464.3	3815.4	484.8	1198.2	277.2	945.9

Resource	Statistic [2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
US Related	n	4	8	3	27	4	3	2	13	8	7	15	1	5	0	100
	EVTS	14.9	24.8	32.3	107.1	32.0	10.2	21.7	92.9	57.1	50.0	230.8	5.1	45.0	0.0	45.5
Total	n	648	921	531	1445	430	452	548	1328	1531	337	1370	472	737	138	10888
	EVTS	2408.9	2860.2	5709.7	5734.1	3440.0	1542.7	5956.5	9485.7	10935.7	2407.1	21076.9	2383.8	6639.6	1366.3	4951.3

[1] A patient may have experienced more than one medical procedure.

[2] EVTS= Events per 1000 patients

Table 23 HCRU (Related to Ovarian Cancer) by Cancer Type, LHIN and Overall

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Cannot Determine																
Chemotherapy-Cancer	n	0	0	7	32	3	6	0	11	31	7	14	0	5	3	119
	EVTS	0.0	0.0	75.3	127.0	24.0	20.5	0.0	78.6	298.1	205.9	215.4	0.0	45.0	29.7	54.1
CT-Scan Related	n	27	12	14	43	23	16	12	63	68	10	20	22	18	3	351
	EVTS	100.4	37.3	150.5	170.6	184.0	54.6	130.4	450.0	653.8	294.1	307.7	111.1	162.2	29.7	159.6
Diagnostic Surgery	n	5	8	5	15	1	6	6	14	26	8	13	4	6	0	117
	EVTS	18.6	24.8	53.8	59.5	8.0	20.5	65.2	100.0	250.0	235.3	200.0	20.2	54.1	0.0	53.2
Endoscopy Related	n	0	0	0	2	0	0	0	1	0	0	0	0	0	0	3
	EVTS	0.0	0.0	0.0	7.9	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	1.4
Examinations Related	n	0	0	0	2	0	0	0	0	0	0	0	1	1	0	4
	EVTS	0.0	0.0	0.0	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	9.0	0.0	1.8
Exploratory Surgery Related	n	4	1	0	1	0	1	2	2	2	0	0	2	1	0	16
	EVTS	14.9	3.1	0.0	4.0	0.0	3.4	21.7	14.3	19.2	0.0	0.0	10.1	9.0	0.0	7.3
Hysterectomy	n	16	27	17	42	16	12	17	53	58	11	31	13	18	3	334
	EVTS	59.5	83.9	182.8	166.7	128.0	41.0	184.8	378.6	557.7	323.5	476.9	65.7	162.2	29.7	151.9

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
MRI Related	n	0	1	0	1	1	0	0	2	0	0	0	0	0	1	6
	EVTS	0.0	3.1	0.0	4.0	8.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	9.9	2.7
Omentectomy	n	19	28	14	59	18	17	16	55	63	8	39	21	19	4	380
	EVTS	70.6	87.0	150.5	234.1	144.0	58.0	173.9	392.9	605.8	235.3	600.0	106.1	171.2	39.6	172.8
Radiograph Related	n	0	0	2	0	0	0	1	2	1	0	0	0	2	0	8
	EVTS	0.0	0.0	21.5	0.0	0.0	0.0	10.9	14.3	9.6	0.0	0.0	0.0	18.0	0.0	3.6
Radiotherapy	n	0	4	0	0	0	1	1	1	0	0	4	0	1	0	12
	EVTS	0.0	12.4	0.0	0.0	0.0	3.4	10.9	7.1	0.0	0.0	61.5	0.0	9.0	0.0	5.5
Related Hemorrhage Control	n	0	0	0	4	1	0	1	0	1	0	1	0	0	0	8
	EVTS	0.0	0.0	0.0	15.9	8.0	0.0	10.9	0.0	9.6	0.0	15.4	0.0	0.0	0.0	3.6
Removal of Regional Lymph Node	n	4	9	4	13	6	8	2	14	19	0	13	3	4	0	99
	EVTS	14.9	28.0	43.0	51.6	48.0	27.3	21.7	100.0	182.7	0.0	200.0	15.2	36.0	0.0	45.0
Secondary Surgery Related	n	16	19	18	57	21	18	11	60	69	12	34	22	19	4	380
	EVTS	59.5	59.0	193.5	226.2	168.0	61.4	119.6	428.6	663.5	352.9	523.1	111.1	171.2	39.6	172.8
Unilateral - Bilateral Oophorectomy	n	1	0	0	1	1	1	0	5	4	0	0	0	0	0	13

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
	EVTS	3.7	0.0	0.0	4.0	8.0	3.4	0.0	35.7	38.5	0.0	0.0	0.0	0.0	0.0	5.9
Unilateral - Bilateral Salpingo - Oophorectomy	n	24	33	21	62	20	17	19	68	80	13	45	19	25	5	451
	EVTS	89.2	102.5	225.8	246.0	160.0	58.0	206.5	485.7	769.2	382.4	692.3	96.0	225.2	49.5	205.1
US Related	n	0	1	1	5	0	0	0	5	4	4	3	0	0	0	23
	EVTS	0.0	3.1	10.8	19.8	0.0	0.0	0.0	35.7	38.5	117.6	46.2	0.0	0.0	0.0	10.5
Total	n	116	143	103	339	111	103	88	356	426	73	217	107	119	23	2324
	EVTS	431.2	444.1	1107.5	1345.2	888.0	351.5	956.5	2542.9	4096.2	2147.1	3338.5	540.4	1072.1	227.7	1056.8
Platinum Sensitive																
Chemotherapy-Cancer	n	16	15	11	38	3	13	7	17	17	3	11	3	9	0	163
	EVTS	59.5	46.6	118.3	150.8	24.0	44.4	76.1	121.4	163.5	88.2	169.2	15.2	81.1	0.0	74.1
CT-Scan Related	n	27	43	30	78	19	26	54	72	75	14	46	23	34	11	552
	EVTS	100.4	133.5	322.6	309.5	152.0	88.7	587.0	514.3	721.2	411.8	707.7	116.2	306.3	108.9	251.0
Diagnostic Surgery	n	15	20	11	46	6	10	18	17	41	15	23	10	21	5	258
	EVTS	55.8	62.1	118.3	182.5	48.0	34.1	195.7	121.4	394.2	441.2	353.8	50.5	189.2	49.5	117.3
Endoscopy Related	n	0	0	0	4	0	1	0	0	0	0	1	1	0	0	7
	EVTS	0.0	0.0	0.0	15.9	0.0	3.4	0.0	0.0	0.0	0.0	15.4	5.1	0.0	0.0	3.2

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Examinations Related	n	4	2	4	7	1	3	4	1	5	2	3	1	0	0	37
	EVTS	14.9	6.2	43.0	27.8	8.0	10.2	43.5	7.1	48.1	58.8	46.2	5.1	0.0	0.0	16.8
Exploratory Surgery Related	n	32	50	28	79	23	24	48	83	107	18	50	34	34	5	615
	EVTS	119.0	155.3	301.1	313.5	184.0	81.9	521.7	592.9	1028.8	529.4	769.2	171.7	306.3	49.5	279.7
Hysterectomy	n	0	1	0	0	2	2	3	3	0	0	3	0	0	0	14
	EVTS	0.0	3.1	0.0	0.0	16.0	6.8	32.6	21.4	0.0	0.0	46.2	0.0	0.0	0.0	6.4
MRI Related	n	40	67	31	98	24	36	49	94	107	20	70	37	40	14	727
	EVTS	148.7	208.1	333.3	388.9	192.0	122.9	532.6	671.4	1028.8	588.2	1076.9	186.9	360.4	138.6	330.6
Omentectomy	n	1	0	1	2	0	0	1	1	2	0	0	1	3	2	14
	EVTS	3.7	0.0	10.8	7.9	0.0	0.0	10.9	7.1	19.2	0.0	0.0	5.1	27.0	19.8	6.4
Radiograph Related	n	0	1	0	3	2	1	4	2	0	0	2	0	2	1	18
	EVTS	0.0	3.1	0.0	11.9	16.0	3.4	43.5	14.3	0.0	0.0	30.8	0.0	18.0	9.9	8.2
Radiotherapy	n	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
	EVTS	0.0	0.0	0.0	0.0	0.0	0.0	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Related Hemorrhage Control	n	0	2	0	4	0	0	1	1	1	0	0	0	0	0	9
	EVTS	0.0	6.2	0.0	15.9	0.0	0.0	10.9	7.1	9.6	0.0	0.0	0.0	0.0	0.0	4.1

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Removal of Regional Lymph Node	n	9	21	4	27	6	6	9	20	24	2	10	8	7	1	154
	EVTS	33.5	65.2	43.0	107.1	48.0	20.5	97.8	142.9	230.8	58.8	153.8	40.4	63.1	9.9	70.0
Secondary Surgery Related	n	52	63	34	78	16	36	43	70	83	19	62	36	33	10	635
	EVTS	193.3	195.7	365.6	309.5	128.0	122.9	467.4	500.0	798.1	558.8	953.8	181.8	297.3	99.0	288.8
Unilateral - Bilateral Oophorectomy	n	1	2	0	2	0	1	3	3	3	0	4	0	1	1	21
	EVTS	3.7	6.2	0.0	7.9	0.0	3.4	32.6	21.4	28.8	0.0	61.5	0.0	9.0	9.9	9.5
Unilateral - Bilateral Salpingo - Oophorectomy	n	46	81	33	115	30	34	53	97	131	24	78	43	48	14	827
	EVTS	171.0	251.6	354.8	456.3	240.0	116.0	576.1	692.9	1259.6	705.9	1200.0	217.2	432.4	138.6	376.1
US Related	n	1	2	1	13	1	0	2	7	2	0	5	0	4	0	38
	EVTS	3.7	6.2	10.8	51.6	8.0	0.0	21.7	50.0	19.2	0.0	76.9	0.0	36.0	0.0	17.3
Total	n	244	370	188	594	133	193	300	488	598	117	368	197	236	64	4090
	EVTS	907.1	1149.1	2021.5	2357.1	1064.0	658.7	3260.9	3485.7	5750.0	3441.2	5661.5	994.9	2126.1	633.7	1859.9
Partially Platinum Sensitive																
Chemotherapy-Cancer	n	2	11	11	14	1	2	1	13	11	5	7	2	4	1	85
	EVTS	7.4	34.2	118.3	55.6	8.0	6.8	10.9	92.9	105.8	147.1	107.7	10.1	36.0	9.9	38.7

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
CT-Scan Related	n	16	27	13	41	17	12	17	57	44	7	26	11	9	2	299
	EVTS	59.5	83.9	139.8	162.7	136.0	41.0	184.8	407.1	423.1	205.9	400.0	55.6	81.1	19.8	136.0
Diagnostic Surgery	n	6	10	10	28	5	3	1	13	16	6	7	1	7	0	113
	EVTS	22.3	31.1	107.5	111.1	40.0	10.2	10.9	92.9	153.8	176.5	107.7	5.1	63.1	0.0	51.4
Endoscopy Related	n	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2
	EVTS	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.9
Examinations Related	n	0	2	0	2	0	1	0	0	1	0	0	0	0	0	6
	EVTS	0.0	6.2	0.0	7.9	0.0	3.4	0.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0	2.7
Exploratory Surgery Related	n	2	1	1	1	0	1	2	4	1	0	0	0	0	0	13
	EVTS	7.4	3.1	10.8	4.0	0.0	3.4	21.7	28.6	9.6	0.0	0.0	0.0	0.0	0.0	5.9
Hysterectomy	n	21	28	25	47	14	11	15	42	42	8	27	8	15	1	304
	EVTS	78.1	87.0	268.8	186.5	112.0	37.5	163.0	300.0	403.8	235.3	415.4	40.4	135.1	9.9	138.2
MRI Related	n	0	0	0	1	0	0	0	2	2	0	1	0	0	0	6
	EVTS	0.0	0.0	0.0	4.0	0.0	0.0	0.0	14.3	19.2	0.0	15.4	0.0	0.0	0.0	2.7
Omentectomy	n	20	35	26	56	15	12	17	50	49	12	33	12	21	3	361
	EVTS	74.3	108.7	279.6	222.2	120.0	41.0	184.8	357.1	471.2	352.9	507.7	60.6	189.2	29.7	164.2

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Radiograph Related	n	0	2	1	1	0	0	0	0	1	0	1	0	0	0	6
	EVTS	0.0	6.2	10.8	4.0	0.0	0.0	0.0	0.0	9.6	0.0	15.4	0.0	0.0	0.0	2.7
Radiotherapy	n	0	0	1	0	0	1	0	1	1	0	0	1	0	0	5
	EVTS	0.0	0.0	10.8	0.0	0.0	3.4	0.0	7.1	9.6	0.0	0.0	5.1	0.0	0.0	2.3
Related Excision	n	0	2	0	1	0	0	0	1	1	0	0	0	0	0	5
	EVTS	0.0	6.2	0.0	4.0	0.0	0.0	0.0	7.1	9.6	0.0	0.0	0.0	0.0	0.0	2.3
Related Hemorrhage Control	n	8	9	0	10	5	3	4	13	13	3	3	0	2	2	75
	EVTS	29.7	28.0	0.0	39.7	40.0	10.2	43.5	92.9	125.0	88.2	46.2	0.0	18.0	19.8	34.1
Removal of Regional Lymph Node	n	15	34	19	48	15	15	17	59	36	8	31	12	14	2	325
	EVTS	55.8	105.6	204.3	190.5	120.0	51.2	184.8	421.4	346.2	235.3	476.9	60.6	126.1	19.8	147.8
Secondary Surgery Related	n	1	0	1	0	0	0	0	0	0	0	4	0	0	0	6
	EVTS	3.7	0.0	10.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.5	0.0	0.0	0.0	2.7
Unilateral - Bilateral Oophorectomy	n	26	42	26	62	14	12	19	51	56	14	39	14	21	3	399
	EVTS	96.7	130.4	279.6	246.0	112.0	41.0	206.5	364.3	538.5	411.8	600.0	70.7	189.2	29.7	181.4

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Unilateral - Bilateral Salpingo - Oophorectomy	n	1	4	1	5	0	1	0	1	2	2	1	0	1	0	19
	EVTS	3.7	12.4	10.8	19.8	0.0	3.4	0.0	7.1	19.2	58.8	15.4	0.0	9.0	0.0	8.6
US Related	n	119	207	135	317	86	74	93	307	276	65	180	62	94	14	2029
	EVTS	442.4	642.9	1451.6	1257.9	688.0	252.6	1010.9	2192.9	2653.8	1911.8	2769.2	313.1	846.8	138.6	922.7
Total	n	24	35	23	19	1	8	1	4	8	12	171	5	51	4	366
	EVTS	89.2	108.7	247.3	75.4	8.0	27.3	10.9	28.6	76.9	352.9	2630.8	25.3	459.5	39.6	166.4
Platinum Resistant																
Chemotherapy-Cancer	n	26	28	14	20	10	9	8	27	30	6	51	21	40	3	293
	EVTS	96.7	87.0	150.5	79.4	80.0	30.7	87.0	192.9	288.5	176.5	784.6	106.1	360.4	29.7	133.2
CT-Scan Related	n	5	10	6	11	6	4	0	8	20	7	23	9	13	5	127
	EVTS	18.6	31.1	64.5	43.7	48.0	13.7	0.0	57.1	192.3	205.9	353.8	45.5	117.1	49.5	57.8
Diagnostic Surgery	n	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	EVTS	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Exploratory Surgery Related	n	0	0	0	1	0	0	0	0	0	0	2	1	0	0	4
	EVTS	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	30.8	5.1	0.0	0.0	1.8
Hysterectomy	n	0	2	0	1	0	1	0	2	4	1	1	1	1	1	15

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
	EVTS	0.0	6.2	0.0	4.0	0.0	3.4	0.0	14.3	38.5	29.4	15.4	5.1	9.0	9.9	6.8
MRI Related	n	16	18	11	21	9	10	11	29	27	9	61	11	28	4	265
	EVTS	59.5	55.9	118.3	83.3	72.0	34.1	119.6	207.1	259.6	264.7	938.5	55.6	252.3	39.6	120.5
Omentectomy	n	0	0	2	1	2	0	0	1	1	0	0	1	0	0	8
	EVTS	0.0	0.0	21.5	4.0	16.0	0.0	0.0	7.1	9.6	0.0	0.0	5.1	0.0	0.0	3.6
Removal of Regional Lymph Node	n	18	26	12	23	10	16	12	29	34	10	69	14	34	7	314
	EVTS	66.9	80.7	129.0	91.3	80.0	54.6	130.4	207.1	326.9	294.1	1061.5	70.7	306.3	69.3	142.8
Secondary Surgery Related	n	0	0	1	2	0	0	0	1	1	0	2	1	1	0	9
	EVTS	0.0	0.0	10.8	7.9	0.0	0.0	0.0	7.1	9.6	0.0	30.8	5.1	9.0	0.0	4.1
Unilateral - Bilateral Oophorectomy	n	1	0	1	0	0	0	0	1	4	0	2	0	2	0	11
	EVTS	3.7	0.0	10.8	0.0	0.0	0.0	0.0	7.1	38.5	0.0	30.8	0.0	18.0	0.0	5.0
Unilateral - Bilateral Salpingo - Oophorectomy	n	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
	EVTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.8	0.0	0.0	0.0	0.9
US Related	n	0	0	1	0	0	0	1	0	0	1	0	0	0	0	3
	EVTS	0.0	0.0	10.8	0.0	0.0	0.0	10.9	0.0	0.0	29.4	0.0	0.0	0.0	0.0	1.4

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Total	n	7	6	2	3	3	3	1	6	12	2	21	1	2	0	69
	EVTS	26.0	18.6	21.5	11.9	24.0	10.2	10.9	42.9	115.4	58.8	323.1	5.1	18.0	0.0	31.4
Platinum Refractory																
Chemotherapy-Cancer	n	32	21	15	23	8	13	10	32	27	13	65	13	38	7	317
	EVTS	119.0	65.2	161.3	91.3	64.0	44.4	108.7	228.6	259.6	382.4	1000.0	65.7	342.3	69.3	144.2
CT-Scan Related	n	0	0	0	1	2	0	0	1	0	0	1	0	3	0	8
	EVTS	0.0	0.0	0.0	4.0	16.0	0.0	0.0	7.1	0.0	0.0	15.4	0.0	27.0	0.0	3.6
Diagnostic Surgery	n	22	29	15	31	14	16	13	33	38	13	76	19	35	6	360
	EVTS	81.8	90.1	161.3	123.0	112.0	54.6	141.3	235.7	365.4	382.4	1169.2	96.0	315.3	59.4	163.7
Endoscopy Related	n	2	1	0	4	1	2	0	0	0	1	5	1	0	0	17
	EVTS	7.4	3.1	0.0	15.9	8.0	6.8	0.0	0.0	0.0	29.4	76.9	5.1	0.0	0.0	7.7
Examinations Related	n	154	176	103	161	66	82	57	174	206	75	552	98	248	37	2189
	EVTS	572.5	546.6	1107.5	638.9	528.0	279.9	619.6	1242.9	1980.8	2205.9	8492.3	494.9	2234.2	366.3	995.5
Exploratory Surgery Related	n	3	2	0	3	3		0	0	2	1	8	0	6	0	28
	EVTS	11.2	6.2	0.0	11.9	24.0	0.0	0.0	0.0	19.2	29.4	123.1	0.0	54.1	0.0	12.7
Hysterectomy	n	2	7	0	4	7		1	0	4	3	6	3	11	0	48

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
	EVTS	7.4	21.7	0.0	15.9	56.0	0.0	10.9	0.0	38.5	88.2	92.3	15.2	99.1	0.0	21.8
MRI Related	n	0	0	0	3	4		0	0	1	0	2	0	2	0	12
	EVTS	0.0	0.0	0.0	11.9	32.0	0.0	0.0	0.0	9.6	0.0	30.8	0.0	18.0	0.0	5.5
Omentectomy	n	0	0	0	0	0		0	0	0	0	0	0	1	0	1
	EVTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.5
Radiograph Related	n	1	4	1	5	3		3	1	3	1	6	1	2	0	31
	EVTS	3.7	12.4	10.8	19.8	24.0	0.0	32.6	7.1	28.8	29.4	92.3	5.1	18.0	0.0	14.1
Radiotherapy	n	0	0	0	0	0		0	0	0	0	1	0	0	0	1
	EVTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.4	0.0	0.0	0.0	0.5
Related Hemorrhage Control	n	2	2	0	6	4		2	1	3	1	10	1	4	0	36
	EVTS	7.4	6.2	0.0	23.8	32.0	0.0	21.7	7.1	28.8	29.4	153.8	5.1	36.0	0.0	16.4
Removal of Regional Lymph Node	n	0	0	0	0	1		1	0	2	0	0	0	2	0	6
	EVTS	0.0	0.0	0.0	0.0	8.0	0.0	10.9	0.0	19.2	0.0	0.0	0.0	18.0	0.0	2.7
Secondary Surgery Related	n	3	6	0	8	5		0	0	5	0	9	2	8	0	46
	EVTS	11.2	18.6	0.0	31.7	40.0	0.0	0.0	0.0	48.1	0.0	138.5	10.1	72.1	0.0	20.9

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Unilateral - Bilateral Oophorectomy	n	0	0	0	0	0		0	0	1	0	0	0	0	0	1
	EVTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0	0.5
Unilateral - Bilateral Salpingo - Oophorectomy	n	4	4	1	5	5		3	1	4	1	10	1	4	0	43
	EVTS	14.9	12.4	10.8	19.8	40.0	0.0	32.6	7.1	38.5	29.4	153.8	5.1	36.0	0.0	19.6
US Related	n	0	0	0	0	2		0	0	0	0	1	0	0	0	3
	EVTS	0.0	0.0	0.0	0.0	16.0	0.0	0.0	0.0	0.0	0.0	15.4	0.0	0.0	0.0	1.4
Total	n	15	25	2	34	34		10	3	25	7	53	8	40	0	256
	EVTS	55.8	77.6	21.5	134.9	272.0	0.0	108.7	21.4	240.4	205.9	815.4	40.4	360.4	0.0	116.4

[1] A patient may have experienced more than one medical procedure.

[2] EVTS= Events per 1000 patients

Table 24 HCRU (Not Related to Ovarian Cancer) by LHIN and Overall

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Biopsy Other Area	n	13	21	2	26	6	8	11	20	27	9	15	12	22	3	195
	EVTS	48.3	65.2	21.5	103.2	48.0	27.3	119.6	142.9	259.6	264.7	230.8	60.6	198.2	29.7	88.7
CT-Scan Other	n	34	46	37	93	29	23	33	59	61	7	40	37	25	8	532
	EVTS	126.4	142.9	397.8	369.0	232.0	78.5	358.7	421.4	586.5	205.9	615.4	186.9	225.2	79.2	241.9
Cytology	n	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	EVTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Drug Therapy Other	n	42	77	43	56	11	10	19	39	54	6	26	14	47	7	451
	EVTS	156.1	239.1	462.4	222.2	88.0	34.1	206.5	278.6	519.2	176.5	400.0	70.7	423.4	69.3	205.1
Endoscopy Other	n	3	6	5	13	8	5	4	10	24	0	7	5	2	2	94
	EVTS	11.2	18.6	53.8	51.6	64.0	17.1	43.5	71.4	230.8	0.0	107.7	25.3	18.0	19.8	42.7
Excision Not Related	n	54	98	54	88	55	47	55	129	115	26	50	41	60	16	888
	EVTS	200.7	304.3	580.6	349.2	440.0	160.4	597.8	921.4	1105.8	764.7	769.2	207.1	540.5	158.4	403.8
Excision Other	n	1	2	2	6	0	1	2	7	2	0	3	2	0	0	28
	EVTS	3.7	6.2	21.5	23.8	0.0	3.4	21.7	50.0	19.2	0.0	46.2	10.1	0.0	0.0	12.7
Exploratory Surgery Other	n	11	6	3	10	3	6	2	7	12	3	3	5	10	1	82
	EVTS	40.9	18.6	32.3	39.7	24.0	20.5	21.7	50.0	115.4	88.2	46.2	25.3	90.1	9.9	37.3
MRI - Not related	n	9	4	3	19	6	10	2	19	9	0	11	7	4	2	105
	EVTS	33.5	12.4	32.3	75.4	48.0	34.1	21.7	135.7	86.5	0.0	169.2	35.4	36.0	19.8	47.7

Resource	Statistic[2]	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Non-Related Hemorrhage Control	n	1	0	1	2	0	2	0	2	4	1	0	0	4	0	17
	EVTS	3.7	0.0	10.8	7.9	0.0	6.8	0.0	14.3	38.5	29.4	0.0	0.0	36.0	0.0	7.7
Procedures Not related	n	163	198	151	381	123	103	117	292	345	76	200	104	171	37	2461
	EVTS	605.9	614.9	1623.7	1511.9	984.0	351.5	1271.7	2085.7	3317.3	2235.3	3076.9	525.3	1540.5	366.3	1119.1
Ultra Sound Not Related	n	3	11	4	17	2	1	1	6	12	3	5	0	5	0	70
	EVTS	11.2	34.2	43.0	67.5	16.0	3.4	10.9	42.9	115.4	88.2	76.9	0.0	45.0	0.0	31.8
X-Ray Not related	n	6	9	3	14	9	3	2	5	13	3	4	1	7	3	82
	EVTS	22.3	28.0	32.3	55.6	72.0	10.2	21.7	35.7	125.0	88.2	61.5	5.1	63.1	29.7	37.3
Total	n	340	478	308	725	252	219	248	596	678	134	364	228	357	79	5006
	EVTS	1263.9	1484.5	3311.8	2877.0	2016.0	747.4	2695.7	4257.1	6519.2	3941.2	5600.0	1151.5	3216.2	782.2	2276.5

[1] A patient may have experienced more than one medical procedure.

[2] EVTS= Events per 1000 patients

Table 25 Number of OC Related[2] Surgical Procedures by LHIN and Overall

Statistic		LHIN														P-value[1]	Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
N		145	212	118	323	102	102	127	306	364	83	296	114	165	38	0.197	2495
Mean		2.61	2.71	2.62	2.73	2.61	2.63	2.76	2.65	2.74	2.52	2.61	2.53	2.55	2.21		2.65
Std. Deviation		1.11	1.10	1.08	1.08	1.08	1.08	.97	1.00	1.08	1.06	1.05	.93	.98	.93		1.05
Std. Error		.09	.08	.10	.06	.11	.11	.09	.06	.06	.12	.06	.09	.08	.15		.02
95% CI for Mean	Lower Bound	2.43	2.56	2.42	2.61	2.40	2.42	2.59	2.53	2.63	2.29	2.49	2.35	2.40	1.90		2.61
	Upper Bound	2.80	2.86	2.82	2.85	2.82	2.84	2.93	2.76	2.85	2.75	2.73	2.70	2.70	2.52		2.69
Minimum		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
Maximum		5.00	7.00	6.00	5.00	6.00	6.00	5.00	5.00	6.00	5.00	6.00	5.00	5.00	4.00		7.00

[1]Between group Between Group P-value was assessed with non-parametric Kruskal Wallis test for continuous variables. Statistically significant results are marked with a "*"

[2]OC related procedures include Diagnostic Surgery, Omentectomy, Exploratory surgery, Hysterectomy, removal of lymph nodes, Unilateral - Bilateral Oophorectomy, Unilateral - Bilateral Salpingo – Oophorectomy.

Based on available information.

Table 26 Length of Hospital Stay (Days) by OC Relation Status, LHIN and Overall

		LHIN														P-value[1]	Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
Not Related To OC																	
N		266	385	232	577	154	208	222	462	523	95	481	222	325	62	<0.001*	4214
Mean		7.70	9.39	8.75	7.94	9.55	9.27	7.81	9.00	8.11	7.33	5.37	7.62	7.63	8.05		8.01
Std. Deviation		7.98	13.01	10.62	11.09	16.09	16.03	9.24	10.55	9.95	7.10	9.37	9.09	10.16	8.55		10.92
Std. Error		.49	.66	.70	.46	1.30	1.11	.62	.49	.44	.73	.43	.61	.56	1.09		.17
95% CI for Mean	Lower Bound	6.73	8.09	7.38	7.04	6.99	7.08	6.58	8.04	7.25	5.88	4.53	6.42	6.52	5.88		7.68
	Upper Bound	8.66	10.70	10.12	8.85	12.11	11.46	9.03	9.96	8.96	8.77	6.21	8.82	8.74	10.22		8.34
Minimum		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
Maximum		48.00	113.00	75.00	120.00	157.00	160.00	56.00	70.00	91.00	39.00	97.00	49.00	75.00	55.00		160.00
Related to OC																	
N		145	210	117	323	96	92	114	309	375	79	323	110	177	41	<0.001*	2511
Mean		7.88	7.45	8.40	6.97	8.28	7.00	6.89	7.70	6.94	11.63	5.50	7.86	8.13	9.24		7.38
Std. Deviation		6.92	7.85	7.05	8.80	9.75	6.57	6.25	11.27	8.13	15.65	5.78	10.07	11.89	6.98		8.99
Std. Error		.57	.54	.65	.49	.99	.69	.59	.64	.42	1.76	.32	.96	.89	1.09		.18
95% CI for Mean	Lower Bound	6.75	6.38	7.11	6.01	6.31	5.64	5.73	6.44	6.11	8.13	4.87	5.96	6.37	7.04		7.03

		LHIN														P-value[1]	Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	Upper Bound	9.02	8.52	9.69	7.93	10.26	8.36	8.05	8.96	7.76	15.14	6.13	9.77	9.89	11.45		7.73
Minimum		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
Maximum		57.00	69.00	40.00	128.00	64.00	41.00	42.00	123.00	73.00	109.00	67.00	72.00	113.00	30.00		128.00

[1]Between group P-value was assessed with non-parametric Kruskal Wallis test for continuous variables. Statistically significant results are marked with a "*".

[2]A patient may have had more than one hospital admission and have been admitted for both related and not related to ovarian cancer. Length of stay was based on admission date to discharge date.

Table 27 Length of Hospital Stay (Days) Not Related to OC by Cancer Type, LHIN and Overall

Cancer Type	Statistic		LHIN														P-value	Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		
Missing	N		0	4	11	21	0	10	3	4	29	3	15	0	12	1	0.573	113
	Mean		0.00	10.50	9.45	8.19	0.00	6.80	9.33	9.75	12.00	13.00	6.40	0.00	14.08	17.00		9.93
	Std. Deviation		0.00	13.82	8.99	14.42	0.00	7.86	6.66	12.28	13.22	14.00	7.94	0.00	17.30	.		12.27
	95% CI for Mean	Lower Bound	0.00	-11.49	3.41	0.00	0.00	1.18	-7.21	-9.80	6.97	-21.78	0.00	0.00	3.09	.		7.64
		Upper Bound	0.00	32.49	15.50	0.00	0.00	12.42	25.87	29.30	17.03	47.78	0.00	0.00	25.08	.		12.22
	Minimum		0.00	1.00	1.00	1.00	0.00	1.00	2.00	2.00	1.00	3.00	1.00	0.00	1.00	17.00		1.00
	Maximum		0.00	31.00	29.00	64.00	0.00	22.00	15.00	28.00	54.00	29.00	29.00	0.00	51.00	17.00		64.00
Cannot Determine	N		68	52	37	103	27	43	29	91	121	12	35	39	34	17	0.276	708
	Mean		7.51	8.77	9.84	9.30	10.48	12.77	8.93	8.21	7.73	6.25	8.91	10.36	4.91	8.76		8.71
	Std. Deviation		9.08	9.10	10.08	13.56	13.94	17.09	10.44	11.32	8.02	5.46	16.39	12.85	5.24	7.71		11.36
	95% CI for Mean	Lower Bound	5.32	6.23	6.48	6.65	4.97	7.51	4.96	5.85	6.28	2.78	3.28	6.19	3.08	4.80		7.88
		Upper Bound	9.71	11.30	13.20	11.95	16.00	18.03	12.90	10.57	9.17	9.72	14.55	14.53	6.74	12.73		9.55
	Minimum		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
	Maximum		48.00	45.00	44.00	120.00	47.00	83.00	45.00	64.00	35.00	17.00	97.00	45.00	25.00	33.00		120.00
Platinum Sensitive	N		88	155	79	255	53	91	127	178	194	41	120	87	115	22	0.037*	1605

Cancer Type	Statistic		LHIN														P-value	Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	Mean		7.26	9.30	8.97	7.60	8.60	7.10	7.36	8.23	8.13	7.63	6.70	5.99	6.90	8.05		7.74
	Std. Deviation		7.00	13.19	10.02	11.60	10.33	17.74	9.74	9.02	10.14	7.58	9.71	7.19	8.31	11.58		10.68
	95% CI for Mean	Lower Bound	5.78	7.20	6.73	6.17	5.76	3.40	5.65	6.90	6.70	5.24	4.94	4.46	5.37	2.91		7.21
		Upper Bound	8.75	11.39	11.22	9.03	11.45	10.79	9.07	9.56	9.57	10.03	8.46	7.52	8.44	13.18		8.26
	Minimum		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
	Maximum		35.00	86.00	52.00	107.00	49.00	160.00	56.00	52.00	84.00	39.00	82.00	41.00	54.00	55.00		160.00
Partially Platinum Sensitive	N		45	75	46	119	28	30	41	124	91	17	53	37	32	0	0.036*	738
	Mean		8.36	9.27	10.04	8.26	10.29	13.10	9.07	10.73	8.87	10.18	5.94	5.81	7.75	0.00		9.02
	Std. Deviation		8.40	10.32	13.85	9.07	12.29	16.81	8.70	12.48	12.51	8.06	6.86	5.22	6.63	0.00		10.78
	95% CI for Mean	Lower Bound	5.83	6.89	5.93	6.61	5.52	6.82	6.33	8.51	6.26	6.03	4.05	4.07	0.00			8.24
		Upper Bound	10.88	11.64	14.16	9.91	15.05	19.38	11.82	12.94	11.47	14.32	7.83	7.55	0.00			9.80
	Minimum		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00	0.00		1.00
	Maximum		32.00	59.00	75.00	47.00	53.00	83.00	35.00	70.00	91.00	34.00	29.00	27.00	33.00	0.00		91.00
Platinum Resistant	N		60	92	59	67	21	34	20	65	84	21	242	53	121	22	<0.001*	961
	Mean		8.13	8.21	6.63	6.78	8.14	8.00	5.95	8.88	6.61	3.90	4.05	9.51	8.46	7.09		6.79
	Std. Deviation		8.07	11.88	9.05	6.90	10.49	8.36	5.32	9.05	7.29	2.70	8.44	10.27	12.46	5.28		9.39

Cancer Type	Statistic		LHIN														P-value	Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	95% CI for Mean	Lower Bound	6.05	5.75	4.27	5.09	3.37	5.08	3.46	6.63	5.03	2.68	2.98	6.68	6.22	4.75		6.20
		Upper Bound	10.22	10.67	8.98	8.46	12.92	10.92	8.44	11.12	8.19	5.13	5.12	12.34	10.71	9.43		7.39
	Minimum		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
	Maximum		45.00	52.00	42.00	32.00	47.00	32.00	21.00	45.00	42.00	11.00	78.00	49.00	75.00	24.00		78.00
Platinum Refractory	N		5	7	0	12	25	0	2	0	4	1	16	6	11	0.00	0.226	89
	Mean		6.60	32.57	0.00	6.42	10.92	0.00	10.00	0.00	4.25	14.00	4.69	7.83	7.00	0.00		9.67
	Std. Deviation		4.56	38.19	0.00	6.82	30.67	0.00	4.24	0.00	1.71	.	3.11	6.71	7.14	0.00		20.60
	95% CI for Mean	Lower Bound	.94	0.00	0.00	2.09	0.00	0.00	0.00	0.00	1.53	.	3.03	.80	0.00	0.00		5.33
		Upper Bound	12.26	0.00	0.00	10.75	0.00	0.00	0.00	0.00	6.97	.	6.35	14.87	0.00	0.00		14.01
	Minimum		1.00	3.00	0.00	1.00	1.00	0	7.00	0	2.00	14.00	1.00	2.00	1.00	0.00		1.00
	Maximum		13.00	113.00	0.00	22.00	157.00	0.00	13.00	0.00	6.00	14.00	13.00	16.00	26.00	0.00		157.00

Table 28 Length of Hospital Stay (Days) Related to OC by Cancer Type, LHIN and Overall

Cancer Type	Statistic		LHIN													P-value	Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		
Missing	N		0	1	3	11	0	3	1	4	11	9	9	0	5	1	0.179	58
	Mean		0.00	3.00	3.67	7.73	0.00	7.33	5.00	4.00	9.36	16.44	5.33	0.00	5.60	8.00		8.22
	Std. Deviation		0.00	.	3.06	6.36	0.00	4.16	.	1.41	8.25	12.99	4.82	0.00	5.46	.		8.07
	95% CI for Mean	Lower Bound	0.00	.	-3.92	0.00		-3.01	.	1.75	3.82	6.46	0.00	0.00	-1.18	.		6.10
		Upper Bound	0.00	.	11.26	0.00		17.68	.	6.25	14.91	26.43	0.00	0.00	12.38	.		10.34
	Minimum		0.00	3.00	1.00	1.00	0.00	4.00	5.00	3.00	2.00	3.00	1.00	0.00	1.00	8.00		1.00
	Maximum		0.00	3.00	7.00	22.00	0.00	12.00	5.00	6.00	31.00	39.00	17.00	0.00	15.00	8.00		39.00
Cannot Determine	N		33	36	17	67	24	15	19	80	87	11	50	22	22	6	0.037*	489
	Mean		6.42	6.22	9.12	6.64	11.21	9.33	6.11	7.70	7.93	9.55	6.86	12.36	7.27	9.33		7.78
	Std. Deviation		4.46	4.30	5.84	6.34	13.28	7.19	5.45	9.54	9.23	7.26	10.11	17.33	8.88	7.15		8.97
	95% CI for Mean	Lower Bound	4.84	4.77	6.11	5.10	5.60	5.35	3.48	5.58	5.96	4.67	3.99	4.68	3.34	1.83		6.98
		Upper Bound	8.01	7.68	12.12	8.19	16.82	13.31	8.73	9.82	9.90	14.42	9.73	20.05	11.21	16.83		8.57
	Minimum		2.00	1.00	3.00	1.00	3.00	3.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	4.00		1.00

Cancer Type	Statistic		LHIN													P-value	Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	Maximum		22.00	21.00	24.00	45.00	56.00	26.00	21.00	77.00	52.00	21.00	67.00	72.00	37.00	19.00		77.00
Platinum Sensitive	N		52	89	45	133	30	42	59	115	149	29	104	51	63	20	0.003*	981
	Mean		7.87	7.69	7.93	7.20	6.10	5.21	7.05	7.54	5.59	9.10	5.87	6.39	6.95	8.95		6.87
	Std. Deviation		5.91	9.30	6.99	11.69	4.19	3.43	6.46	12.55	4.43	12.60	5.60	7.04	7.01	7.27		8.39
	95% CI for Mean	Lower Bound	6.22	5.73	5.83	5.19	4.54	4.15	5.37	5.22	4.87	4.31	4.78	4.41	5.19	5.55		6.35
		Upper Bound	9.51	9.64	10.03	9.20	7.66	6.28	8.73	9.86	6.31	13.90	6.96	8.37	8.72	12.35		7.40
	Minimum		3.00	2.00	2.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
	Maximum		32.00	69.00	35.00	128.00	19.00	17.00	42.00	123.00	32.00	61.00	36.00	40.00	50.00	30.00		128.00
Partially Platinum Sensitive	N		28	47	31	67	18	16	19	63	74	15	50	17	32	4	0.029*	481
	Mean		5.79	7.64	8.55	6.42	7.22	10.06	6.16	6.41	8.15	13.67	5.24	5.88	8.09	11.50		7.28
	Std. Deviation		3.88	8.18	7.59	5.44	4.93	10.50	4.40	5.15	12.13	26.54	4.13	4.46	19.56	12.26		9.86
	95% CI for Mean	Lower Bound	4.28	5.24	5.76	5.09	4.77	4.47	4.04	5.12	5.34	-1.03	4.07	3.59	1.04	-8.01		6.40
		Upper Bound	7.29	10.04	11.33	7.75	9.67	15.66	8.28	7.71	10.96	28.37	6.41	8.17	15.15	31.01		8.17
	Minimum		1.00	1.00	3.00	2.00	1.00	3.00	1.00	1.00	1.00	3.00	1.00	1.00	1.00	3.00		1.00

Cancer Type	Statistic		LHIN													P-value	Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	Maximum		19.00	52.00	40.00	31.00	18.00	41.00	15.00	28.00	73.00	109.00	17.00	21.00	113.00	29.00		113.00
Platinum Resistant	N		28	34	20	37	17	16	13	46	45	12	93	19	46	10	<0.001*	436
	Mean		11.39	8.24	9.55	7.11	6.35	6.38	9.31	10.30	7.22	9.42	4.40	8.00	10.13	9.00		7.83
	Std. Deviation		11.37	6.56	7.92	4.48	4.64	6.65	9.03	16.23	7.41	7.50	3.15	8.41	12.78	4.88		9.06
	95% CI for Mean	Lower Bound	6.99	5.94	5.84	5.62	3.97	2.83	3.85	5.48	5.00	4.65	3.75	3.95	6.34	5.51		6.98
		Upper Bound	15.80	10.53	13.26	8.60	8.74	9.92	14.77	15.12	9.45	14.18	5.05	12.05	13.92	12.49		8.68
	Minimum		3.00	2.00	3.00	1.00	3.00	1.00	3.00	1.00	1.00	4.00	1.00	2.00	1.00	2.00		1.00
	Maximum		57.00	34.00	38.00	20.00	18.00	30.00	30.00	88.00	47.00	23.00	20.00	33.00	82.00	18.00		88.00
Platinum Refractory	N		4	3	1	8	7	0.00	3	1	9	3	17	1	9	0.00	0.282	66
	Mean		10.25	5.00	4.00	8.88	15.00	0.00	3.67	3.00	5.33	28.00	6.12	15.00	9.78	0.00		8.92
	Std. Deviation		3.10	1.73	.	12.26	22.19	0.00	.58	.	2.87	21.66	4.65	.	8.12	0.00		10.93
	95% CI for Mean	Lower Bound	5.32	.70	.	-1.38	0.00	0.00	2.23	.	3.13	-25.80	3.73	.	0.00	0.00		6.24
		Upper Bound	15.18	9.30	.	19.13	0.00	0.00	5.10	.	7.54	81.80	8.51	.	0.00	0.00		11.61
	Minimum		6.00	4.00	4.00	3.00	4.00	0.00	3.00	3.00	2.00	3.00	2.00	15.00	2.00	0.00		2.00

Cancer Type	Statistic	LHIN														P-value	Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	Maximum	13.00	7.00	4.00	39.00	64.00	0.00	4.00	3.00	11.00	41.00	16.00	15.00	26.00	0.00		64.00

[1]Between group P-value was assessed with non-parametric Kruskal Wallis test for continuous variables. Statistically significant results are marked with a "*".

[2]A patient may have had more than one hospital admission and have been admitted for both related and not related to ovarian cancer. Length of stay was based on admission date to discharge date.

Table 29 Physician Visits Related to OC by LHIN and Overall

Physician/Service Type		LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Alternate health professionals	n	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
	EVTS/1000	.0	0.0	.0	.0	0.0	0.0	0.0	0.0	.0	0.0	15.4	.0	0.0	0.0	.5
Anesthesia	n	8	32	27	214	15	20	15	72	133	7	103	18	66	11	741
	EVTS/1000	29.7	99.4	290.3	849.2	120.0	68.3	163.0	514.3	1278.8	205.9	1584.6	90.9	594.6	108.9	337.0
Cardiology	n	0	2	0	0	0	0	0	1	0	0	1	0	1	0	5
	EVTS/1000	.0	6.2	.0	.0	0.0	0.0	0.0	7.1	.0	0.0	15.4	.0	9.0	0.0	2.3
Community medicine	n	0	0	0	0	0	0	0	0	0	0	134	0	1	0	135
	EVTS/1000	.0	0.0	.0	.0	0.0	0.0	0.0	0.0	.0	0.0	2061.5	.0	9.0	0.0	61.4
Dental surgery	n	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3
	EVTS/1000	.0	0.0	.0	.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	.0	18.0	9.9	1.4
Dermatology	n	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	EVTS/1000	.0	0.0	.0	.0	0.0	0.0	0.0	7.1	.0	0.0	0.0	.0	0.0	0.0	.5
Diagnostic radiology	n	0	28	20	20	1	0	2	5	3	1	19	0	3	0	102
	EVTS/1000	.0	87.0	215.1	79.4	8.0	0.0	21.7	35.7	28.8	29.4	292.3	.0	27.0	0.0	46.4
Emergency medicine	n	2	0	0	2	2	0	5	6	13	2	1	3	5	0	41
	EVTS/1000	7.4	0.0	.0	7.9	16.0	0.0	54.3	42.9	125.0	58.8	15.4	15.2	45.0	0.0	18.6
Family practice and General	n	1069	2306	2652	2120	537	1141	1229	2678	3155	452	1983	1188	1684	431	22625

Physician/Service Type		LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
	EVTS/1000	3974.0	7161.5	28516.1	8412.7	4296.0	3894.2	13358.7	19128.6	30336.5	13294.1	30507.7	6000.0	15171.2	4267.3	10288.8
Gastroenterology	n	0	0	0	2	9	37	61	95	29	0	0	42	37	1	313
	EVTS/1000	.0	0.0	.0	7.9	72.0	126.3	663.0	678.6	278.8	0.0	0.0	212.1	333.3	9.9	142.3
General surgery	n	18	51	30	93	52	40	13	69	48	13	75	40	126	7	675
	EVTS/1000	66.9	158.4	322.6	369.0	416.0	136.5	141.3	492.9	461.5	382.4	1153.8	202.0	1135.1	69.3	307.0
general thoracic surgery	n	0	0	3	0	0	0	0	8	6	0	0	0	0	1	18
	EVTS/1000	.0	0.0	32.3	.0	0.0	0.0	0.0	57.1	57.7	0.0	0.0	.0	0.0	9.9	8.2
genetics	n	0	0	0	0	0	0	0	0	0	5	18	0	1	0	24
	EVTS/1000	.0	0.0	.0	.0	0.0	0.0	0.0	0.0	.0	147.1	276.9	.0	9.0	0.0	10.9
geriatrics	n	0	0	0	5	1	0	1	7	28	0	0	0	0	0	42
	EVTS/1000	.0	0.0	.0	19.8	8.0	0.0	10.9	50.0	269.2	0.0	0.0	.0	0.0	0.0	19.1
Haematology	n	7	60	40	2	3	22	9	317	84	0	6	0	58	31	639
	EVTS/1000	26.0	186.3	430.1	7.9	24.0	75.1	97.8	2264.3	807.7	0.0	92.3	.0	522.5	306.9	290.6
Internal medicine	n	1304	837	941	1273	879	1258	1175	2100	2833	144	339	1202	1183	215	15683
	EVTS/1000	4847.6	2599.4	10118.3	5051.6	7032.0	4293.5	12771.7	15000.0	27240.4	4235.3	5215.4	6070.7	10657.7	2128.7	7131.9
Medical oncology	n	338	667	617	54	932	447	75	506	1388	31	85	327	764	359	6590
	EVTS/1000	1256.5	2071.4	6634.4	214.3	7456.0	1525.6	815.2	3614.3	13346.2	911.8	1307.7	1651.5	6882.9	3554.5	2996.8

Physician/Service Type		LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Neurology	n	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	EVTS/1000	.0	0.0	10.8	.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	.0	0.0	0.0	.5
Neurosurgery	n	0	0	0	3	0	0	0	0	0	0	0	2	0	0	5
	EVTS/1000	.0	0.0	.0	11.9	0.0	0.0	0.0	0.0	.0	0.0	0.0	10.1	0.0	0.0	2.3
Nuclear medicine	n	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
	EVTS/1000	.0	3.1	10.8	.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	.0	0.0	0.0	.9
Nurse practitioners	n	2	0	0	0	0	0	0	0	2	0	0	0	0	0	4
	EVTS/1000	7.4	0.0	.0	.0	0.0	0.0	0.0	0.0	19.2	0.0	0.0	.0	0.0	0.0	1.8
Obstetrics and gynaecology	n	696	1406	577	2442	720	806	1789	4278	4469	1456	7429	821	1988	141	29018
	EVTS/1000	2587.4	4366.5	6204.3	9690.5	5760.0	2750.9	1944 5.7	3055 7.1	42971 .2	4282 3.5	11429 2.3	4146.5	1790 9.9	1396.0	1319 6.0
Ophthalmology	n	0	0	0	0	0	0	4	4	2	0	0	0	0	0	10
	EVTS/1000	.0	0.0	.0	.0	0.0	0.0	43.5	28.6	19.2	0.0	0.0	.0	0.0	0.0	4.5
Pediatrics[2]	n	5	3	0	1	0	0	0	0	0	0	0	0	2	0	11
	EVTS/1000	18.6	9.3	.0	4.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	.0	18.0	0.0	5.0
Pathology, microbiology, clinical biochemistry	n	1	3	1	8	0	4	1	2	5	0	1	3	4	3	36
	EVTS/1000	3.7	9.3	10.8	31.7	0.0	13.7	10.9	14.3	48.1	0.0	15.4	15.2	36.0	29.7	16.4
Physical medicine	n	0	1	0	47	0	0	0	0	66	0	0	0	0	33	147
	EVTS/1000	.0	3.1	.0	186.5	0.0	0.0	0.0	0.0	634.6	0.0	0.0	.0	0.0	326.7	66.8
Plastic surgery	n	0	0	14	12	0	0	0	0	0	0	0	1	0	0	27

Physician/Service Type		LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
	EVTS/1000	.0	0.0	150.5	47.6	0.0	0.0	0.0	0.0	.0	0.0	0.0	5.1	0.0	0.0	12.3
Respiratory disease	n	0	1	2	14	3	7	1	4	12	0	0	1	0	0	45
	EVTS/1000	.0	3.1	21.5	55.6	24.0	23.9	10.9	28.6	115.4	0.0	0.0	5.1	0.0	0.0	20.5
Therapeutic radiology	n	66	104	53	76	24	52	87	206	129	21	134	50	136	56	1194
	EVTS/1000	245.4	323.0	569.9	301.6	192.0	177.5	945.7	1471.4	1240.4	617.6	2061.5	252.5	1225.2	554.5	543.0
Urology	n	3	4	2	3	0	0	0	4	1	0	3	0	2	0	22
	EVTS/1000	11.2	12.4	21.5	11.9	0.0	0.0	0.0	28.6	9.6	0.0	46.2	.0	18.0	0.0	10.0
Total	n	3519	5506	4981	6391	3178	3834	4467	10363	12406	2132	10332	3698	6063	1290	78160
	EVTS/1000	13081.8	17099.4	53559.1	25361.1	25424.0	13085.3	48554.3	74021.4	119288.5	62705.9	158953.8	18676.8	54621.6	12772.3	35543.4

[1]Patients may have experienced more than one type of physician/service type.

Evts= Events per 1000 patients.

[1]Patients may have experienced more than one type of physician/service type.

Table 30 Physician Visits Not Related to OC by LHIN and Overall

Physician/Service Type		LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Alternate health	n	1	0	3	9	0	0	0	0	2	0	0	1	0	0	16
	Evts/ 1000	3.7	0.0	32.3	35.7	0.0	0.0	0.0	0.0	19.2	0.0	0.0	5.1	0.0	0.0	7.3
Anesthesia	n	743	1034	674	1416	720	615	847	1987	1983	342	1146	702	819	159	13187
	Evts/ 1000	2762.1	3211.2	7247.3	5619.0	5760.0	2099.0	9206.5	14192.9	19067.3	10058.8	17630.8	3545.5	7378.4	1574.3	5996.8
Cardiology	n	135	296	188	624	250	200	331	831	838	226	434	199	313	38	4903
	Evts/ 1000	501.9	919.3	2021.5	2476.2	2000.0	682.6	3597.8	5935.7	8057.7	6647.1	6676.9	1005.1	2819.8	376.2	2229.6
Cardiovascular & thoracic surgery	n	18	2	0	5	1	11	0	75	17	5	31	24	9	0	198
	Evts/ 1000	66.9	6.2	.0	19.8	8.0	37.5	0.0	535.7	163.5	147.1	476.9	121.2	81.1	0.0	90.0
chiropodists (podiatry)	n	5	6	12	10	0	0	16	53	16	0	1	11	2	0	132
	Evts/ 1000	18.6	18.6	129.0	39.7	0.0	0.0	173.9	378.6	153.8	0.0	15.4	55.6	18.0	0.0	60.0
Clinical biochemistry	n	1	36	0	0	0	0	0	0	3	0	0	0	2	0	42
	Evts/ 1000	3.7	111.8	.0	.0	0.0	0.0	0.0	0.0	28.8	0.0	0.0	.0	18.0	0.0	19.1
	n	0	0	0	0	0	1	0	0	0	0	0	0	2	0	3

Physician/Service Type		LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Clinical immunology & allergy	Evts/ 1000	.0	0.0	.0	.0	0.0	3.4	0.0	0.0	.0	0.0	0.0	.0	18.0	0.0	1.4
Community medicine	n	0	0	0	0	0	0	0	1	0	0	4	0	0	0	5
	Evts/ 1000	.0	0.0	.0	.0	0.0	0.0	0.0	7.1	.0	0.0	61.5	.0	0.0	0.0	2.3
Dental surgery	n	0	5	0	0	2	0	3	3	5	0	0	0	7	8	33
	Evts/ 1000	.0	15.5	.0	.0	16.0	0.0	32.6	21.4	48.1	0.0	0.0	.0	63.1	79.2	15.0
Dermatology	n	31	58	14	130	19	29	75	120	110	3	54	18	13	12	686
	Evts/ 1000	115.2	180.1	150.5	515.9	152.0	99.0	815.2	857.1	1057.7	88.2	830.8	90.9	117.1	118.8	312.0
Diagnostic radiology	n	2347	2924	1928	5293	1532	1752	2093	4860	5140	886	3552	2111	2598	502	37518
	Evts/ 1000	8724.9	9080.7	20731.2	21004.0	12256.0	5979.5	22750.0	34714.3	49423.1	26058.8	54646.2	10661.6	23405.4	4970.3	17061.4
Emergency medicine	n	37	184	33	214	50	16	112	181	168	57	189	83	50	13	1387
	Evts/ 1000	137.5	571.4	354.8	849.2	400.0	54.6	1217.4	1292.9	1615.4	1676.5	2907.7	419.2	450.5	128.7	630.7
Family practice and practice in general	n	4276	5445	2413	8212	2662	3204	3318	7586	9877	1424	4821	3574	4242	818	61872
	Evts/	15895.9	16909.9	25946.2	32587.3	21296.0	10935.2	36065.2	54185.7	94971.2	41882.4	74169.2	18050.5	38216.2	8099.0	28136.4

Physician/Service Type		LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
	1000															
Gastroenterology	n	36	71	51	178	120	117	115	267	312	7	83	74	93	4	1528
	Evts/ 1000	133.8	220.5	548.4	706.3	960.0	399.3	1250.0	1907.1	3000.0	205.9	1276.9	373.7	837.8	39.6	694.9
General surgery	n	679	650	477	1057	430	477	429	1200	984	174	409	478	755	202	8401
	Evts/ 1000	2524.2	2018.6	5129.0	4194.4	3440.0	1628.0	4663.0	8571.4	9461.5	5117.6	6292.3	2414.1	6801.8	2000.0	3820.4
General thoracic surgery	n	19	56	50	55	19	11	37	30	60	1	30	8	37	26	439
	Evts/ 1000	70.6	173.9	537.6	218.3	152.0	37.5	402.2	214.3	576.9	29.4	461.5	40.4	333.3	257.4	199.6
Genetics	n	0	0	0	4	3	9	1	0	3	2	6	0	1	0	29
	Evts/ 1000	.0	0.0	.0	15.9	24.0	30.7	10.9	0.0	28.8	58.8	92.3	.0	9.0	0.0	13.2
Geriatrics	n	0	8	11	27	4	1	21	22	22	15	5	5	2	7	150
	Evts/ 1000	.0	24.8	118.3	107.1	32.0	3.4	228.3	157.1	211.5	441.2	76.9	25.3	18.0	69.3	68.2
Haematology (blood disease)	n	18	162	55	466	24	76	204	232	206	14	251	57	186	39	1990
	Evts/ 1000	66.9	503.1	591.4	1849.2	192.0	259.4	2217.4	1657.1	1980.8	411.8	3861.5	287.9	1675.7	386.1	905.0
Internal medicine	n	1973	2113	997	4742	1320	1939	1417	3390	3541	599	1260	959	1840	353	26443

Physician/Service Type		LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
	Evts/ 1000	7334.6	6562.1	10720.4	18817.5	10560.0	6617.7	15402.2	24214.3	34048.1	17617.6	19384.6	4843.4	16576.6	3495.0	12025.0
Medical oncology	n	128	352	468	167	396	493	37	253	351	0	69	171	656	185	3726
	Evts/ 1000	475.8	1093.2	5032.3	662.7	3168.0	1682.6	402.2	1807.1	3375.0	0.0	1061.5	863.6	5909.9	1831.7	1694.4
Microbiology	n	102	273	283	794	317	267	250	602	683	51	229	45	154	17	4067
	Evts/ 1000	379.2	847.8	3043.0	3150.8	2536.0	911.3	2717.4	4300.0	6567.3	1500.0	3523.1	227.3	1387.4	168.3	1849.5
Neurology	n	46	87	4	92	20	22	56	142	85	1	87	53	33	1	729
	Evts/ 1000	171.0	270.2	43.0	365.1	160.0	75.1	608.7	1014.3	817.3	29.4	1338.5	267.7	297.3	9.9	331.5
Neurosurgery	n	22	14	7	16	2	14	13	11	36	6	5	0	9	0	155
	Evts/ 1000	81.8	43.5	75.3	63.5	16.0	47.8	141.3	78.6	346.2	176.5	76.9	.0	81.1	0.0	70.5
Non-medical professionals for IHF	n	1	1	0	1	0	2	0	0	4	0	0	0	1	0	10
	Evts/ 1000	3.7	3.1	.0	4.0	0.0	6.8	0.0	0.0	38.5	0.0	0.0	.0	9.0	0.0	4.5
Non physician lab director	n	160	344	7	49	25	10	48	113	257	4	67	13	31	0	1128
	Evts/ 1000	594.8	1068.3	75.3	194.4	200.0	34.1	521.7	807.1	2471.2	117.6	1030.8	65.7	279.3	0.0	513.0
	n	71	83	68	67	12	4	19	49	114	40	90	2	60	25	704

Physician/Service Type		LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Nuclear medicine	Evts/ 1000	263.9	257.8	731.2	265.9	96.0	13.7	206.5	350.0	1096.2	1176.5	1384.6	10.1	540.5	247.5	320.1
Nurse practitioners	n	27	0	0	0	0	0	0	0	4	1	6	0	0	0	38
	Evts/ 1000	100.4	0.0	.0	.0	0.0	0.0	0.0	0.0	38.5	29.4	92.3	.0	0.0	0.0	17.3
Obstetrics and gynaecology	n	715	1665	692	4029	546	576	861	2404	2602	340	1656	456	575	108	17225
	Evts/ 1000	2658.0	5170.8	7440.9	15988.1	4368.0	1965.9	9358.7	17171.4	25019.2	10000.0	25476.9	2303.0	5180.2	1069.3	7833.1
Ophthalmology	n	85	171	84	401	135	105	241	382	413	78	315	110	142	62	2724
	Evts/ 1000	316.0	531.1	903.2	1591.3	1080.0	358.4	2619.6	2728.6	3971.2	2294.1	4846.2	555.6	1279.3	613.9	1238.7
optometrists	n	141	193	87	320	72	39	56	206	273	64	177	93	122	29	1872
	Evts/ 1000	524.2	599.4	935.5	1269.8	576.0	133.1	608.7	1471.4	2625.0	1882.4	2723.1	469.7	1099.1	287.1	851.3
Oral pathology	n	0	0	0	1	0	4	7	2	3	0	0	0	0	0	17
	Evts/ 1000	.0	0.0	.0	4.0	0.0	13.7	76.1	14.3	28.8	0.0	0.0	.0	0.0	0.0	7.7
Oral radiology	n	0	0	0	0	0	3	7	8	8	0	0	0	3	0	29
	Evts/ 1000	.0	0.0	.0	.0	0.0	10.2	76.1	57.1	76.9	0.0	0.0	.0	27.0	0.0	13.2
Oral surgery	n	0	2	0	2	0	3	3	4	1	1	0	0	0	1	17

Physician/Service Type		LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
	Evts/ 1000	.0	6.2	.0	7.9	0.0	10.2	32.6	28.6	9.6	29.4	0.0	.0	0.0	9.9	7.7
Orthopaedic surgery	n	29	73	38	175	40	26	86	88	109	46	103	76	24	20	933
	Evts/ 1000	107.8	226.7	408.6	694.4	320.0	88.7	934.8	628.6	1048.1	1352.9	1584.6	383.8	216.2	198.0	424.3
Otolaryngology	n	17	38	25	97	5	30	53	88	111	8	89	42	36	2	641
	Evts/ 1000	63.2	118.0	268.8	384.9	40.0	102.4	576.1	628.6	1067.3	235.3	1369.2	212.1	324.3	19.8	291.5
Paediatrics	n	2	34	3	14	5	3	0	20	11	0	6	6	4	0	108
	Evts/ 1000	7.4	105.6	32.3	55.6	40.0	10.2	0.0	142.9	105.8	0.0	92.3	30.3	36.0	0.0	49.1
Pathology, microbiolog, clinical biochemistry	n	545	496	627	2170	426	304	705	1885	2300	777	3174	1060	1274	96	15839
	Evts/ 1000	2026.0	1540.4	6741.9	8611.1	3408.0	1037.5	7663.0	13464.3	22115.4	22852.9	48830.8	5353.5	11477.5	950.5	7202.8
Physical medicine	n	23	77	6	81	10	11	45	170	27	67	9	29	30	59	644
	Evts/ 1000	85.5	239.1	64.5	321.4	80.0	37.5	489.1	1214.3	259.6	1970.6	138.5	146.5	270.3	584.2	292.9
Plastic surgery	n	79	44	22	53	17	19	18	46	80	10	6	24	26	5	449
	Evts/ 1000	293.7	136.6	236.6	210.3	136.0	64.8	195.7	328.6	769.2	294.1	92.3	121.2	234.2	49.5	204.2
	n	852	454	189	1139	449	88	308	448	627	228	842	182	364	44	6214

Physician/Service Type		LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Private physiotherapy facility	Evts/1000	3167.3	1409.9	2032.3	4519.8	3592.0	300.3	3347.8	3200.0	6028.8	6705.9	12953.8	919.2	3279.3	435.6	2825.8
Psychiatry	n	256	111	47	225	46	49	253	366	264	13	400	98	28	2	2158
	Evts/1000	951.7	344.7	505.4	892.9	368.0	167.2	2750.0	2614.3	2538.5	382.4	6153.8	494.9	252.3	19.8	981.4
Respiratory disease	n	69	83	49	266	12	51	164	158	106	123	388	21	97	9	1596
	Evts/1000	256.5	257.8	526.9	1055.6	96.0	174.1	1782.6	1128.6	1019.2	3617.6	5969.2	106.1	873.9	89.1	725.8
Rheumatology	n	44	1	5	49	4	3	4	29	90	0	22	10	15	0	276
	Evts/1000	163.6	3.1	53.8	194.4	32.0	10.2	43.5	207.1	865.4	0.0	338.5	50.5	135.1	0.0	125.5
Therapeutic radiology	n	22	39	41	110	40	68	59	148	175	15	189	34	80	11	1031
	Evts/1000	81.8	121.1	440.9	436.5	320.0	232.1	641.3	1057.1	1682.7	441.2	2907.7	171.7	720.7	108.9	468.8
Urology	n	139	90	121	323	74	63	58	338	309	15	87	149	103	7	1876
	Evts/1000	516.7	279.5	1301.1	1281.7	592.0	215.0	630.4	2414.3	2971.2	441.2	1338.5	752.5	927.9	69.3	853.1
Total	n	13894	17775	9779	33083	9809	10715	12370	28798	32330	5643	20292	10978	14838	2864	223168
	Evts/1000	5849.4	55201.9	105150.5	131281.7	78472.0	36570.0	134456.5	205700.0	310865.4	165970.6	312184.6	55444.4	133675.7	28356.4	101486.1

Evts= Events per 1000 patients.

Table 31 Prescription Medication Use by LHIN and Overall

AHC Category	Stat.	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Anti-Infective Agents	n	527	573	447	1214	293	285	290	813	833	158	652	375	423	217	7100
	RX/ 1000	1959.1	1779.5	4806.5	4817.5	2344.0	972.7	3152.2	5807.1	8009.6	4647.1	10030.8	1893.9	3810.8	2148.5	3228.7
Antineoplastic Agents	n	69	103	40	374	38	71	48	80	141	27	149	42	110	7	1299
	RX/ 1000	256.5	319.9	430.1	1484.1	304.0	242.3	521.7	571.4	1355.8	794.1	2292.3	212.1	991.0	69.3	590.7
Autonomic Drugs	n	170	302	177	688	209	69	324	392	687	187	475	125	377	82	4264
	RX/ 1000	632.0	937.9	1903.2	2730.2	1672.0	235.5	3521.7	2800.0	6605.8	5500.0	7307.7	631.3	3396.4	811.9	1939.1
Blood Formation and Coagulation	n	559	464	647	1537	431	218	768	849	997	241	612	438	634	133	8528
	RX/ 1000	2078.1	1441.0	6957.0	6099.2	3448.0	744.0	8347.8	6064.3	9586.5	7088.2	9415.4	2212.1	5711.7	1316.8	3878.1
Cardiovascular Drugs	n	1617	2219	1393	6177	1094	597	1898	2710	3606	1226	3148	1311	1809	315	29120
	RX/ 1000	6011.2	6891.3	14978.5	24511.9	8752.0	2037.5	20630.4	19357.1	34673.1	36058.8	48430.8	6621.2	16297.3	3118.8	13242.4
Central Nervous System Drugs	n	4300	5060	2766	12724	3209	1214	4939	4295	5818	1402	6548	2779	2913	1796	59763
	RX/ 1000	15985.1	15714.3	29741.9	50492.1	25672.0	4143.3	53684.8	30678.6	55942.3	41235.3	100738.5	14035.4	26243.2	17782.2	27177.4
	n	544	1203	566	1256	339	120	554	615	686	310	1093	233	643	143	8305

AHC Category	Stat.	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Electrolytic. Caloric and Water Balance	RX/ 1000	2022.3	3736.0	6086.0	4984.1	2712.0	409.6	6021.7	4392.9	6596.2	9117.6	16815.4	1176.8	5792.8	1415.8	3776.7
Expectorants and Cough Preparations	n	19	23	9	18	23	9	19	51	44	5	14	5	9	1	249
	RX/ 1000	70.6	71.4	96.8	71.4	184.0	30.7	206.5	364.3	423.1	147.1	215.4	25.3	81.1	9.9	113.2
Opthalmic Preparations	n	167	347	30	508	127	81	270	472	603	33	328	195	194	18	3373
	RX/ 1000	620.8	1077.6	322.6	2015.9	1016.0	276.5	2934.8	3371.4	5798.1	970.6	5046.2	984.8	1747.7	178.2	1533.9
Gastrointestinal Drugs	n	3173	3913	1697	7529	1546	1025	2149	3498	4357	1344	5973	1432	2318	686	40640
	RX/ 1000	11795.5	12152.2	18247.3	29877.0	12368.0	3498.3	23358.7	24985.7	41894.2	39529.4	91892.3	7232.3	20882.9	6792.1	18481.1
Hormones	n	1271	2637	1165	3490	939	612	1897	2016	2576	905	2475	793	1100	247	22123
	RX/ 1000	4724.9	8189.4	12526.9	13849.2	7512.0	2088.7	20619.6	14400.0	24769.2	26617.6	38076.9	4005.1	9909.9	2445.5	10060.5
Skin and Mucous Membrane Preparations	n	268	210	148	367	182	196	239	377	388	48	277	78	100	28	2906
	RX/ 1000	996.3	652.2	1591.4	1456.3	1456.0	668.9	2597.8	2692.9	3730.8	1411.8	4261.5	393.9	900.9	277.2	1321.5
Smooth Muscle Relaxants	n	6	0	0	0	0	0	0	0	0	0	8	0	0	0	14
	RX/ 1000	22.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	123.1	0.0	0.0	0.0	6.4

AHC Category	Stat.	LHIN														Total
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Vitamins	n	35	205	118	145	284	6	64	117	188	22	87	27	31	0	1329
	RX/ 1000	130.1	636.6	1268.8	575.4	2272.0	20.5	695.7	835.7	1807.7	647.1	1338.5	136.4	279.3	0.0	604.4
Misc.	n	729	805	780	2462	635	530	710	1609	2564	327	1404	565	913	186	14219
	RX/ 1000	2710.0	2500.0	8387.1	9769.8	5080.0	1808.9	7717.4	11492.9	24653.8	9617.6	21600.0	2853.5	8225.2	1841.6	6466.1
Total	n	13454	18064	9983	38489	9349	5033	14169	17894	23488	6235	23243	8398	11574	3859	203232
	RX/ 1000	50014.9	56099.4	107344.1	152734.1	74792.0	17177.5	154010.9	127814.3	225846.2	183382.4	357584.6	42414.1	104270.3	38207.9	92420.2

Patients may have taken more than one type of prescription. Count was used as the frequency at which the prescription was prescribed.

RX=Prescription, Misc=Miscellaneous, Stat= Statistic.

Table 32 Cost (CAD$) for Prescription Medications by LHIN and Overall

AHF Category	LHIN														
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	Total
	Mean Total Cost Per Patient[1]														
Anti-Infective Agents	$54.7	$43.7	$112.5	$115.1	$55.6	$45.6	$70.7	$143.8	$207.6	$114.5	$287.3	$50.7	$92.2	$35.5	$83.3
Antineoplastic Agents	$47.0	$72.1	$99.9	$329.5	$29.0	$56.4	$75.6	$169.7	$191.7	$54.7	$461.2	$74.4	$259.3	$34.2	$126.3
Autonomic Drugs	$55.4	$93.6	$99.5	$146.2	$98.3	$10.0	$232.5	$259.7	$361.8	$526.0	$621.9	$66.0	$274.6	$24.8	$139.2
Blood Formation and Coagulation	$635.6	$699.9	$2,026.1	$1,934.4	$1,372.2	$401.3	$1,399.6	$2,767.9	$2,628.2	$1,613.5	$3,510.5	$1,204.0	$1,898.4	$503.9	$1,334.3
Cardiovascular Drugs	$268.8	$333.9	$567.4	$877.9	$483.7	$114.4	$711.0	$1,145.7	$2,135.2	$1,141.0	$1,989.3	$329.3	$817.9	$160.0	$607.5
Central Nervous System Drugs	$531.3	$380.7	$802.5	$1,197.5	$517.5	$182.3	$886.6	$1,106.8	$1,785.6	$963.6	$3,101.5	$502.2	$1,119.8	$463.9	$767.2
Electrolytic Caloric and Water Balance	$16.4	$32.6	$44.3	$42.4	$29.9	$6.1	$52.7	$61.2	$113.5	$86.0	$137.3	$12.9	$59.6	$15.7	$37.8
Expectorant and Cough Preparations	$1.6	$1.7	$1.6	$1.2	$3.2	$0.4	$3.2	$5.6	$7.1	$2.7	$5.2	$0.9	$2.2	$0.2	$2.1
Opthalmic Preparations	$15.8	$31.5	$6.6	$75.9	$41.7	$6.7	$221.6	$241.3	$730.4	$33.0	$1,617.7	$41.9	$154.8	$20.9	$138.8
Gastrointestinal Drugs	$414.5	$428.3	$882.1	$1,048.2	$484.0	$162.9	$647.6	$1,192.7	$1,848.5	$1,504.3	$2,570.4	$451.0	$914.3	$238.3	$707.5
Hormones	$99.3	$175.0	$182.2	$334.3	$192.7	$57.5	$408.1	$433.3	$851.0	$436.5	$721.1	$87.7	$309.4	$77.3	$242.4

AHF Category	LHIN														
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	Total
	Mean Total Cost Per Patient[1]														
Skin and Mucous Membrane Preparations	$22.6	$15.2	$36.7	$39.6	$34.5	$16.5	$58.8	$72.3	$90.8	$22.8	$118.3	$7.4	$20.0	$6.6	$32.4
Smooth Muscle Relaxants	$1.6	NC	NC	NC	NC	NC	NC	NC	NC	NC	$3.4	NC	NC	NC	$0.3
Vitamins	$1.4	$6.2	$32.8	$26.9	$7.0	$0.2	$32.7	$15.7	$115.3	$30.1	$7.5	$4.8	$12.7	NC	$15.6
Misc.	$363.4	$502.5	$2,259.6	$2,164.2	$794.6	$623.4	$1,615.4	$2,566.0	$5,820.6	$885.9	$4,086.9	$582.5	$1,321.6	$107.5	$1,354.7
Total	$2,529.4	$2,816.8	$7,154.0	$8,333.3	$4,144.0	$1,683.7	$6,416.1	$10,181.8	$16,887.2	$7,414.4	$19,239.5	$3,415.5	$7,257.0	$1,688.6	$5,589.4

[1] Includes acquisition and dispensing cost as indicated in the ODB claims database.
[2] Mean cost was derived by: Count of medication prescribed/total per region * mean total cost
NC=Not Calculable
Misc.=Miscellaneous

Table 33 Time to Death (Months) from Index Date by LHIN and Overall

LHIN	Mean[a]				Median			
			95% Confidence Interval				95% Confidence Interval	
	Estimate	Std. Error	Lower Bound	Upper Bound	Estimate	Std. Error	Lower Bound	Upper Bound
Central	37.675	1.825	34.099	41.251	33.380	1.776	29.899	36.861
Central East	42.245	2.029	38.269	46.221	41.232	2.876	35.595	46.869
Central West	40.087	3.788	32.663	47.511	31.047	3.067	25.036	37.058
Champlain	41.789	1.786	38.288	45.289	43.893	3.436	37.158	50.628
Erie St. Clair	39.738	3.310	33.251	46.225	39.261	6.834	25.865	52.656
Hamilton Niagara Haldimand Brant	33.356	2.103	29.234	37.479	25.561	2.171	21.305	29.817
Mississauga Halton	36.922	2.633	31.761	42.083	43.532	6.487	30.818	56.245
North East	30.507	2.341	25.919	35.095	33.018	3.999	25.181	40.856
North Simcoe Muskoka	39.536	3.330	33.010	46.062	37.257	8.312	20.966	53.547
North West	22.655	3.184	16.415	28.896	17.478	9.322	.000	35.749
South East	38.130	4.499	29.313	46.947	28.025	3.508	21.149	34.900
South West	30.896	1.780	27.407	34.385	26.086	2.610	20.971	31.201
Toronto Central	41.263	2.838	35.701	46.825	41.955	7.046	28.145	55.765

LHIN	Mean[a]				Median			
			95% Confidence Interval				95% Confidence Interval	
	Estimate	Std. Error	Lower Bound	Upper Bound	Estimate	Std. Error	Lower Bound	Upper Bound
Waterloo Wellington	31.503	2.535	26.534	36.473	24.082	1.596	20.953	27.211
Overall	39.324	.927	37.507	41.141	32.887	1.310	30.320	35.454

a. Estimation is limited to the largest survival time if it is censored.

Overall Comparisons

	Chi-Square	df	Sig.
Log Rank (Mantel-Cox)	41.786	13	.000

Test of equality of survival distributions for the different levels of LHIN.

Figure 1 Time to Death (Months) from Index Date by LHIN

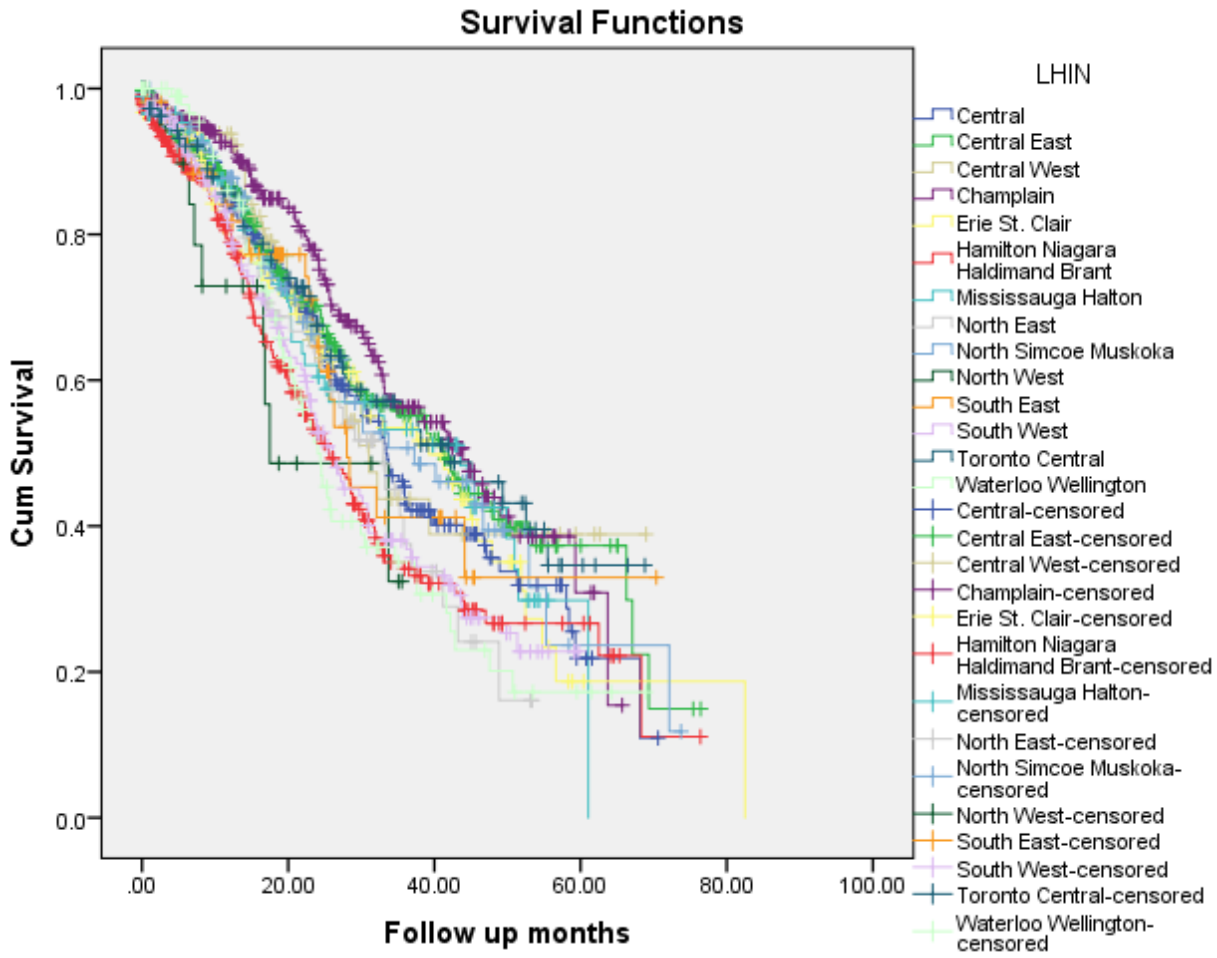


Table 34 Time to Death (Months) from Index Date by Cancer Type and Overall

Cancer Type	Mean[a]				Median			
			95% Confidence Interval				95% Confidence Interval	
	Estimate	Std. Error	Lower Bound	Upper Bound	Estimate	Std. Error	Lower Bound	Upper Bound
Platinum Sensitive	41.242	1.378	38.540	43.943	34.497	2.236	30.115	38.879
Partially Platinum Sensitive	36.186	1.546	33.156	39.216	28.583	2.215	24.241	32.925
Platinum Resistant	36.124	1.450	33.282	38.965	36.435	3.616	29.348	43.523
Platinum Refractory	30.436	3.630	23.321	37.551	26.152	4.801	16.742	35.562
Cannot Determine	39.783	1.843	36.172	43.395	33.117	3.052	27.136	39.098
Missing	25.769	3.366	19.171	32.366	20.928	5.739	9.680	32.176
Overall	39.324	.927	37.507	41.141	32.887	1.310	30.320	35.454

a. Estimation is limited to the largest survival time if it is censored.

Overall Comparisons

	Chi-Square	df	Sig.
Log Rank (Mantel-Cox)	11.794	5	.038

Test of equality of survival distributions for the different levels of Cancer Type.

Figure 2 Time to Death (Months) from Index Date by Cancer Type

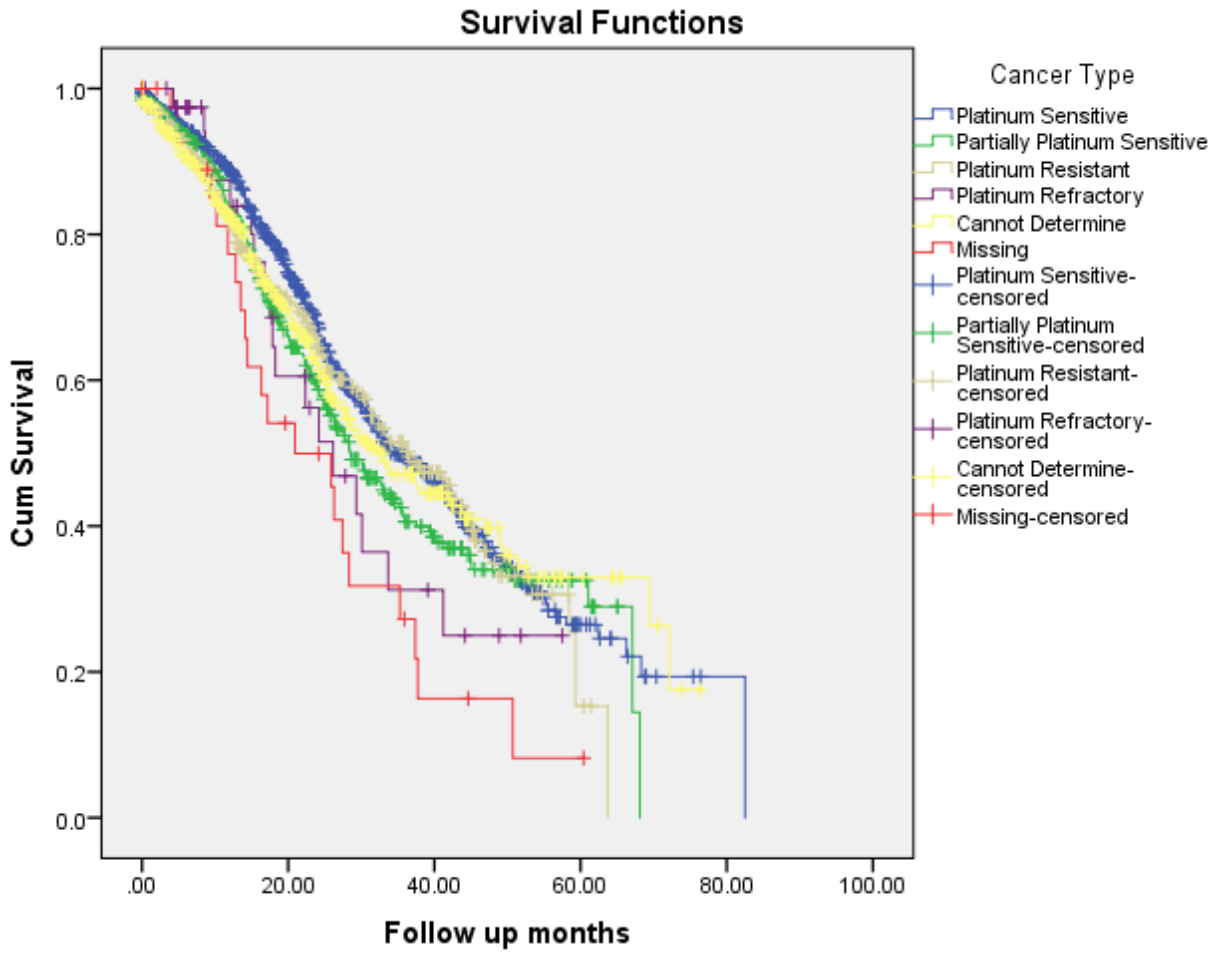


Table 35 Time to Relapse (Weeks) from Index Date by LHIN and Overall

LHIN	Mean[a]				Median			
			95% Confidence Interval				95% Confidence Interval	
	Estimate	Std. Error	Lower Bound	Upper Bound	Estimate	Std. Error	Lower Bound	Upper Bound
Central	92.179	5.743	80.923	103.435	67.714	4.556	58.785	76.644
Central East	88.630	4.676	79.464	97.796	74.286	3.779	66.880	81.692
Central West	74.689	6.854	61.254	88.124	55.623	7.906	40.127	71.118
Champlain	70.992	5.043	61.107	80.878	49.324	6.132	37.305	61.342
Erie St. Clair	76.605	6.186	64.481	88.728	63.515	8.068	47.701	79.329
Hamilton Niagara Haldimand Brant	84.087	4.771	74.735	93.439	68.286	4.411	59.641	76.931
Mississauga Halton	90.195	8.126	74.269	106.122	62.061	7.861	46.653	77.469
North East	72.756	5.251	62.465	83.048	58.404	7.651	43.407	73.400
North Simcoe Muskoka	97.315	9.689	78.324	116.306	72.488	8.846	55.150	89.826
North West	71.266	9.089	53.452	89.080	70.666	10.512	50.062	91.270
South East	73.317	6.805	59.979	86.655	62.014	8.967	44.439	79.590
South West	74.375	4.308	65.930	82.819	64.823	4.771	55.471	74.175
Toronto Central	82.425	6.489	69.706	95.145	68.711	5.862	57.221	80.201
Waterloo Wellington	73.388	7.141	59.391	87.384	56.641	6.161	44.565	68.717

LHIN	Mean[a]				Median			
	Estimate	Std. Error	95% Confidence Interval		Estimate	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound			Lower Bound	Upper Bound
Overall	83.214	1.876	79.538	86.890	65.000	1.665	61.736	68.264

a. Estimation is limited to the largest survival time if it is censored.

Overall Comparisons

	Chi-Square	df	Sig.
Log Rank (Mantel-Cox)	21.182	13	.069

Test of equality of survival distributions for the different levels of LHIN.

Figure 3 Time to Relapse (Weeks) from Index Date by LHIN

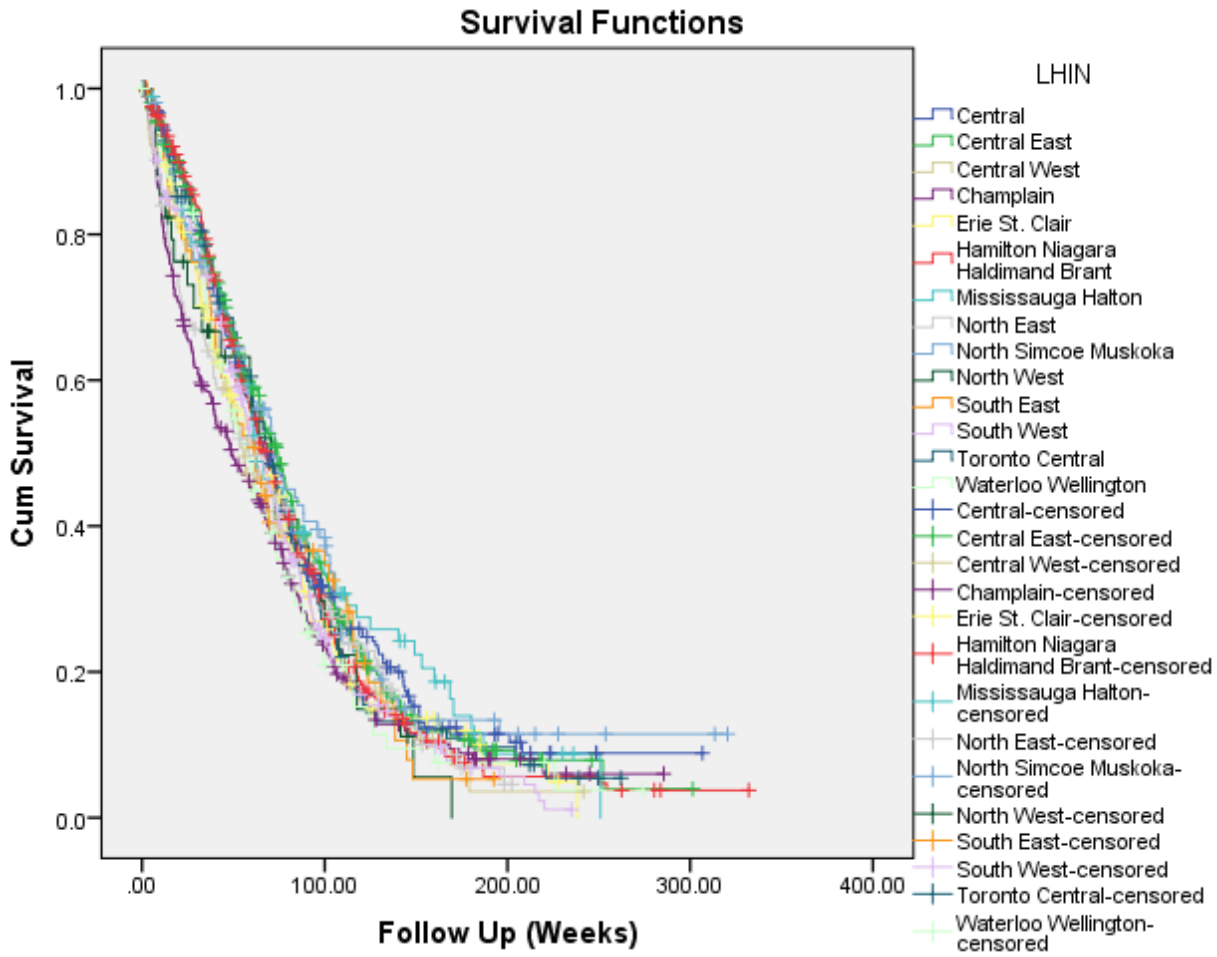


Table 36 Time to 1st Treatment Surgery[1] from Index Date (weeks) by LHIN and Overall

	Mean[a]				Median			
			95% Confidence Interval				95% Confidence Interval	
LHIN	Estimate	Std. Error	Lower Bound	Upper Bound	Estimate	Std. Error	Lower Bound	Upper Bound
Central	9.772	1.135	7.547	11.997	3.857	.694	2.497	5.218
Central East	9.238	.929	7.417	11.059	4.857	.696	3.493	6.221
Central West	8.217	1.324	5.622	10.811	5.143	1.879	1.461	8.825
Champlain	7.658	.883	5.927	9.389	4.429	.610	3.232	5.625
Erie St. Clair	6.512	1.210	4.139	8.885	3.000	.742	1.547	4.453
Hamilton Niagara Haldimand Brant	6.621	.773	5.106	8.135	1.571	.407	.773	2.370
Mississauga Halton	9.034	2.003	5.108	12.960	1.857	.820	.249	3.465
North East	9.496	1.377	6.796	12.196	4.143	.844	2.489	5.797
North Simcoe Muskoka	12.662	2.494	7.775	17.550	4.000	1.700	.669	7.331
North West	6.370	1.520	3.391	9.349	.000	.	.	.
South East	8.851	2.157	4.622	13.079	3.143	2.550	.000	8.141
South West	5.394	.908	3.613	7.175	.714	.	.	.
Toronto Central	10.695	1.640	7.481	13.909	5.286	.860	3.601	6.971

LHIN	Mean[a]				Median			
			95% Confidence Interval				95% Confidence Interval	
	Estimate	Std. Error	Lower Bound	Upper Bound	Estimate	Std. Error	Lower Bound	Upper Bound
Waterloo Wellington	6.656	1.118	4.464	8.848	2.571	.778	1.047	4.096
Overall	8.298	.342	7.629	8.968	3.286	.226	2.842	3.729

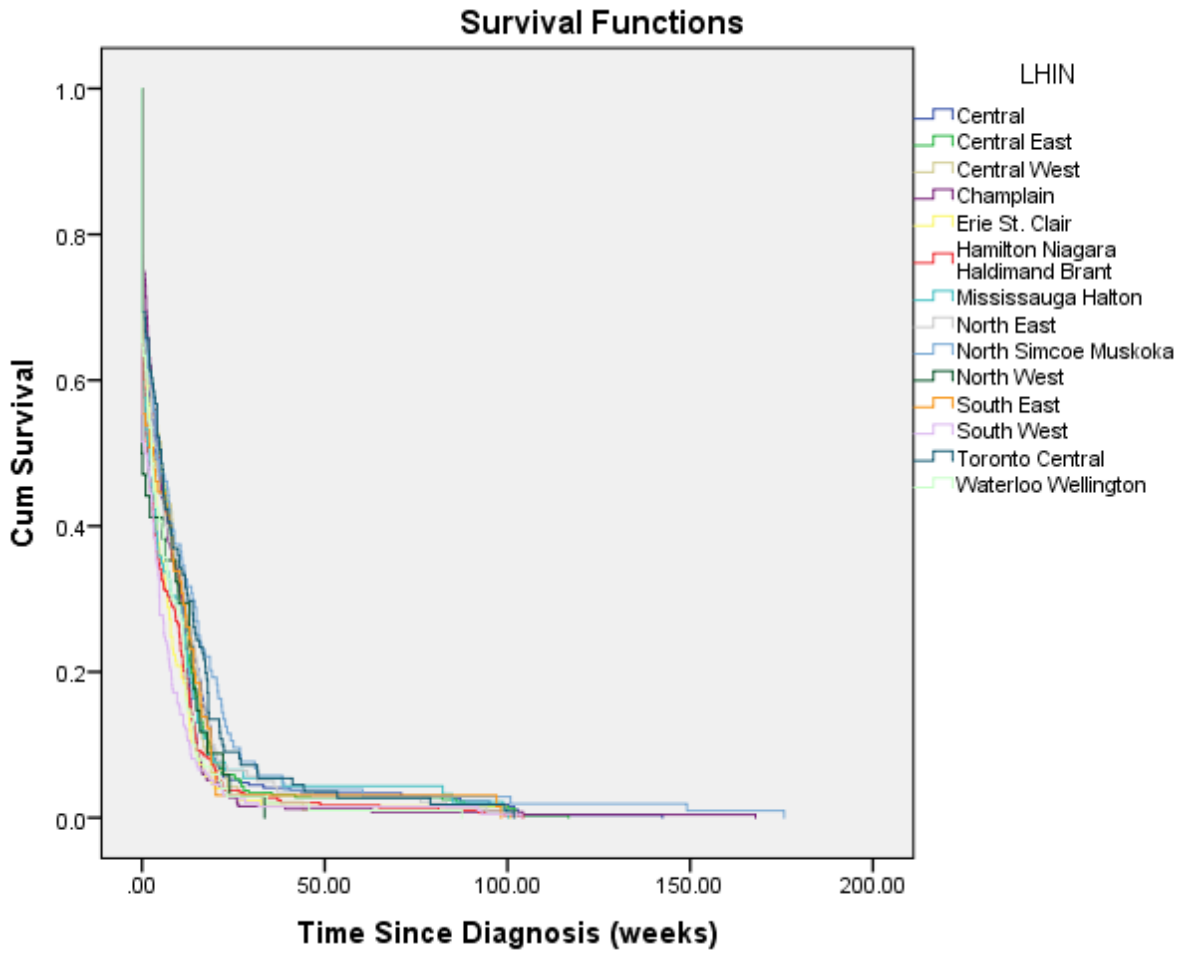
a. Estimation is limited to the largest survival time if it is censored.

Overall Comparisons

	Chi-Square	df	Sig.
Log Rank (Mantel-Cox)	48.476	13	.000

Test of equality of survival distributions for the different levels of LHIN.

Figure 4 Time (Weeks) to 1st Treatment Surgery[1] from Index Date by LHIN



[1]Treatment Surgery = Exploratory Surgery Related, Hysterectomy, Omentectomy, Oophorectomy, Salpingo-Oophorectomy or diagnostic surgery.

Table 37 Time to 2nd Treatment (Weeks) Surgery[1] from 1st Surgery by LHIN and Overall

LHIN	Mean[a]				Median			
			95% Confidence Interval				95% Confidence Interval	
	Estimate	Std. Error	Lower Bound	Upper Bound	Estimate	Std. Error	Lower Bound	Upper Bound
Central	39.471	9.042	21.749	57.192	15.000	2.910	9.296	20.704
Central East	59.795	10.242	39.721	79.869	21.000	10.377	.660	41.340
Central West	15.000	3.236	8.657	21.343	12.000	1.491	9.078	14.922
Champlain	22.093	4.386	13.497	30.689	13.000	.651	11.723	14.277
Erie St. Clair	48.533	11.870	25.268	71.799	29.000	9.661	10.065	47.935
Hamilton Niagara Haldimand Brant	39.964	7.371	25.516	54.412	22.000	7.276	7.739	36.261
Mississauga Halton	27.800	9.125	9.915	45.685	21.000	1.186	18.676	23.324
North East	36.727	9.978	17.170	56.285	19.000	1.730	15.610	22.390
North Simcoe Muskoka	34.000	8.193	17.941	50.059	17.000	18.183	.000	52.639
North West	15.000	5.083	5.038	24.962	13.000	8.500	.000	29.660
South East	41.941	12.372	17.693	66.189	17.000	2.744	11.622	22.378
South West	55.308	10.871	34.000	76.615	63.000	20.970	21.899	104.101
Toronto Central	104.222	34.555	36.494	171.951	72.000	4.472	63.235	80.765
Waterloo Wellington	37.067	8.633	20.146	53.987	14.000	20.610	.000	54.396

LHIN	Mean[a]				Median			
			95% Confidence Interval				95% Confidence Interval	
	Estimate	Std. Error	Lower Bound	Upper Bound	Estimate	Std. Error	Lower Bound	Upper Bound
Overall	41.112	3.026	35.181	47.043	17.000	1.364	14.326	19.674

[1]Treatment Surgery = Exploratory Surgery Related, Hysterectomy, Omentectomy, Oophorectomy, Salpingo-Oophorectomy or diagnostic surgery.

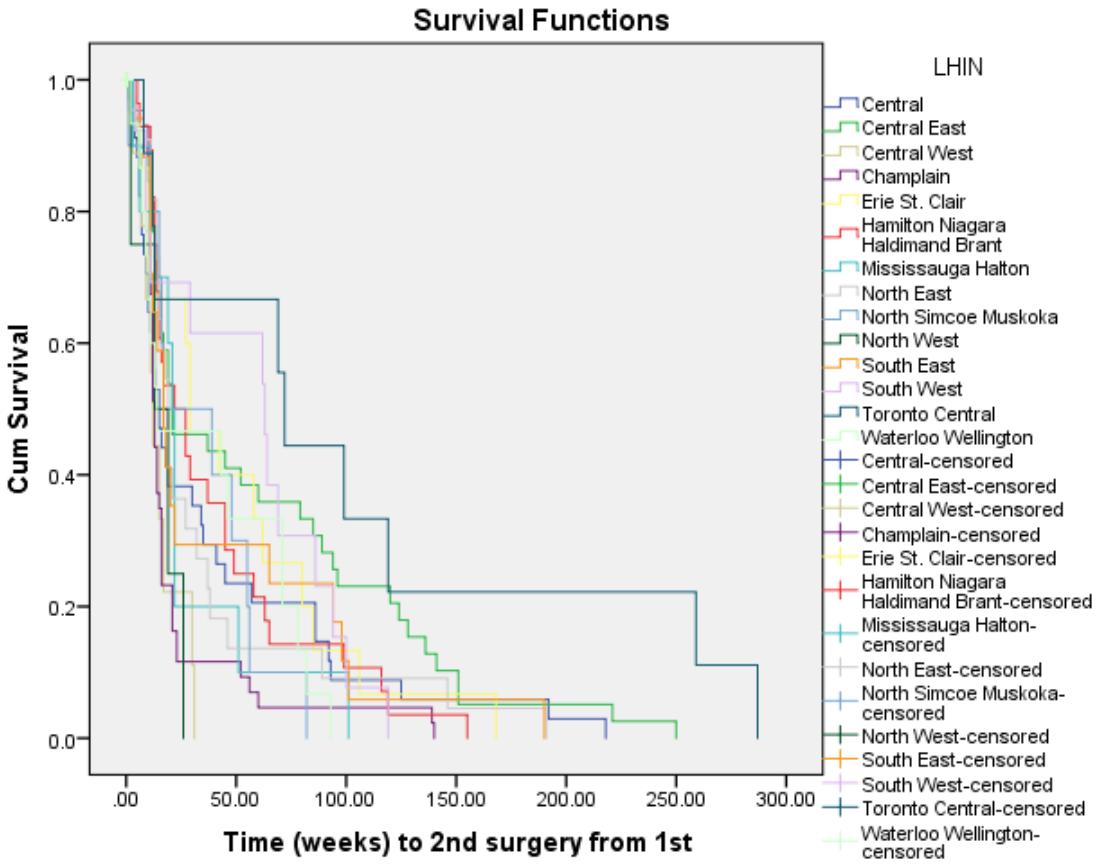
[2] 268(12.2%) of patients had a second surgery, all other patients did not. Patients may have received more than one procedure during the same surgery date.

Overall Comparisons

	Chi-Square	df	Sig.
Log Rank (Mantel-Cox)	33.441	13	.001

Test of equality of survival distributions for the different levels of LHIN.

Figure 5 Time to 2nd Treatment (Weeks) Surgery[1] from 1st Surgery by LHIN



[1]Treatment Surgery = Exploratory Surgery Related, Hysterectomy, Omentectomy, Oophorectomy, Salpingo-Oophorectomy or diagnostic surgery.

[2] 268(12.2%) of patients had a second surgery, all other patients did not. Patients may have received more than one procedure during the same surgery date

Table 38 Cox Regression: Time to Death (Months)

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
Age at Diagnosis	.012	.003	17.286	1	.000	1.013	1.007	1.018
Baseline Presence of Comorbidity	.009	.095	.009	1	.926	1.009	.837	1.216
FUP Comorbidity	.057	.152	.141	1	.707	1.059	.786	1.427
Area Type	.222	.106	4.445	1	.035	1.249	1.016	1.536
Baseline Charlson Score	.025	.023	1.237	1	.266	1.026	.981	1.073
Charlson Score at FUP	.150	.016	92.048	1	.000	1.162	1.127	1.198
Average Household Income ($)	-.018	.071	.065	1	.799	.982	.854	1.129
Hospital Type	.148	.082	3.225	1	.073	1.159	.987	1.362
Cancer Type			6.936	5	.225			
Cancer Type(Platinum Sensitive)	-.508	.228	4.945	1	.026	.602	.385	.942
Cancer Type(Partially Platinum Sensitive)	-.367	.235	2.429	1	.119	.693	.437	1.099
Cancer Type(Platinum Resistant)	-.380	.238	2.551	1	.110	.684	.429	1.090
Cancer Type(Platinum Refractory)	-.333	.325	1.051	1	.305	.717	.379	1.354
Cancer Type(Cannot Determine)	-.424	.236	3.237	1	.072	.654	.412	1.039
LHIN			16.672	13	.215			

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
LHIN(Central)	-.280	.175	2.554	1	.110	.755	.536	1.066
LHIN(Central East)	-.337	.173	3.782	1	.052	.714	.509	1.003
LHIN(Central West)	-.360	.239	2.260	1	.133	.698	.437	1.116
LHIN(Champlain)	-.450	.181	6.190	1	.013	.638	.447	.909
LHIN(Erie St Clair)	-.365	.195	3.492	1	.062	.694	.474	1.018
LHIN(Hamilton Niagara Haldimand Brant)	-.056	.165	.114	1	.735	.946	.684	1.308
LHIN(Mississauga Halton)	-.210	.216	.949	1	.330	.810	.531	1.237
LHIN(North East)	-.130	.221	.347	1	.556	.878	.569	1.354
LHIN(North Simcoe Muskoka)	-.270	.215	1.583	1	.208	.763	.501	1.163
LHIN(North West)	.078	.363	.046	1	.829	1.081	.531	2.201
LHIN(South East)	-.336	.261	1.657	1	.198	.714	.428	1.192
LHIN(South West)	-.030	.174	.030	1	.862	.970	.690	1.365
LHIN(Toronto Central)	-.270	.214	1.583	1	.208	.764	.501	1.162

Reference Category are as follows; Baseline and FUP Presence of Comorbidity: Yes, Area Type: Urban, Cancer Type: Missing, Hospital type: Teaching, LHIN: Waterloo Wellington.

Table 39 Cox Regression: Time to Disease Relapse (Weeks)

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
Age at Diagnosis	.006	.004	2.268	1	.132	1.006	.998	1.014
Baseline Presence of Comorbidity	-.349	.145	5.821	1	.016	.706	.531	.937
FUP Comorbidity	.307	.172	3.190	1	.074	1.360	.970	1.905
Area Type	.113	.150	.559	1	.455	1.119	.833	1.503
Baseline Charlson Score	.014	.036	.149	1	.700	1.014	.945	1.088
Charlson Score at FUP	.017	.022	.643	1	.423	1.018	.975	1.062
Average Household Income ($)	-.275	.103	7.055	1	.008	.760	.620	.930
Hospital Type	.211	.114	3.427	1	.064	1.235	.988	1.545
LHIN			12.648	13	.475			
LHIN(Central)	.261	.263	.982	1	.322	1.298	.775	2.176
LHIN(Central East)	.114	.256	.197	1	.657	1.120	.679	1.850
LHIN(Central West)	.120	.311	.150	1	.699	1.128	.613	2.076
LHIN(Champlain)	-.016	.277	.003	1	.954	.984	.572	1.694
LHIN(Erie St Clair)	-.113	.298	.143	1	.705	.893	.498	1.601
LHIN(Hamilton Niagara Haldimand Brant)	-.027	.254	.012	1	.914	.973	.592	1.601

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
LHIN(Mississauga Halton)	.039	.318	.015	1	.903	1.039	.557	1.939
LHIN(North East)	-.015	.340	.002	1	.966	.986	.506	1.920
LHIN(North Simcoe Muskoka)	-.435	.318	1.875	1	.171	.647	.347	1.206
LHIN(North West)	-.438	.623	.494	1	.482	.645	.190	2.188
LHIN(South East)	-.066	.381	.030	1	.863	.936	.444	1.977
LHIN(South West)	-.279	.278	1.006	1	.316	.757	.439	1.305
LHIN(Toronto Central)	-.256	.329	.604	1	.437	.774	.406	1.476

[1] Reference Category are as follows; Baseline and FUP Presence of Comorbidity: Yes, Area Type: Urban, Hospital type: Teaching, LHIN: Waterloo Wellington.

[2] Cancer type was not included in this model.

Table 40 Cox Regression: Time to first Surgery (Weeks) from Index Date

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
Age at Diagnosis	-.006	.002	9.856	1	.002	.994	.990	.998
Baseline Presence of Comorbidity	-.294	.067	19.498	1	.000	.745	.654	.849
FUP Comorbidity	.205	.081	6.329	1	.012	1.227	1.046	1.439
Area Type	.010	.072	.019	1	.891	1.010	.877	1.163
Baseline Charlson Score	-.017	.016	1.153	1	.283	.983	.953	1.014
Charlson Score at FUP	-.019	.011	2.693	1	.101	.981	.960	1.004
Average Household Income ($)	-.054	.048	1.240	1	.265	.948	.862	1.042
Cancer Type			2.517	5	.774			
Cancer Type(Cannot Determine)	-.142	.195	.533	1	.465	.867	.592	1.271
Cancer Type(Platinum Resistant)	-.155	.197	.624	1	.429	.856	.582	1.258
Cancer Type(Partially Platinum Sensitive)	-.150	.195	.594	1	.441	.860	.587	1.262
Cancer Type(Platinum Refractory)	-.271	.243	1.249	1	.264	.763	.474	1.227
Cancer Type(Platinum Sensitive)	-.201	.192	1.103	1	.294	.818	.562	1.191
Hospital Type	.122	.054	5.168	1	.023	1.130	1.017	1.256
LHIN			32.619	13	.002			

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
LHIN(Central)	-.166	.126	1.743	1	.187	.847	.661	1.084
LHIN(Central East)	-.094	.123	.581	1	.446	.910	.715	1.159
LHIN(Central West)	-.176	.151	1.350	1	.245	.839	.624	1.128
LHIN(Champlain)	-.002	.126	.000	1	.989	.998	.780	1.277
LHIN(Erie St Clair)	.028	.140	.039	1	.844	1.028	.781	1.354
LHIN(Hamilton Niagara Haldimand Brant)	.110	.121	.820	1	.365	1.116	.880	1.415
LHIN(Mississauga Halton)	-.031	.155	.041	1	.839	.969	.716	1.312
LHIN(North East)	-.073	.165	.198	1	.656	.929	.673	1.283
LHIN(North Simcoe Muskoka)	-.444	.155	8.253	1	.004	.641	.474	.868
LHIN(North West)	.079	.254	.097	1	.755	1.082	.658	1.779
LHIN(South East)	.151	.181	.696	1	.404	1.163	.815	1.659
LHIN(South West)	.116	.128	.812	1	.368	1.123	.873	1.444
LHIN(Toronto Central)	-.195	.148	1.738	1	.187	.823	.616	1.100

Reference Category are as follows; Baseline and FUP Presence of Comorbidity: Yes, Area Type: Urban, Cancer Type: Missing, Hospital type: Teaching, LHIN: Waterloo Wellington.

Table 41 Cox Regression: Time to 2nd Surgery (Weeks) from 1st Surgery

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
Age at Diagnosis	.000	.002	.017	1	.895	1.000	.997	1.004
Baseline Presence of Comorbidity	-.024	.068	.130	1	.718	.976	.854	1.114
FUP Comorbidity	-.045	.084	.294	1	.588	.956	.811	1.126
Area Type	.030	.072	.168	1	.682	1.030	.894	1.187
Baseline Charlson Score	.015	.017	.848	1	.357	1.015	.983	1.049
Charlson Score at FUP	-.015	.010	2.158	1	.142	.985	.965	1.005
Average Household Income ($)	.010	.048	.047	1	.829	1.010	.920	1.109
Cancer Type			1.611	5	.900			
Cancer Type(Cannot Determine)	.213	.196	1.183	1	.277	1.238	.843	1.817
Cancer Type(Platinum Resistant)	.201	.197	1.044	1	.307	1.223	.831	1.799
Cancer Type(Partially Platinum Sensitive)	.160	.196	.667	1	.414	1.174	.799	1.724
Cancer Type(Platinum Refractory)	.214	.247	.755	1	.385	1.239	.764	2.010
Cancer Type(Platinum Sensitive)	.197	.192	1.049	1	.306	1.218	.835	1.775
Hospital Type	.007	.054	.016	1	.900	1.007	.906	1.119
LHIN			2.355	13	.999			
LHIN(Central)	.061	.126	.236	1	.627	1.063	.831	1.360
LHIN(Central East)	.004	.122	.001	1	.972	1.004	.790	1.276
LHIN(Central West)	.035	.154	.051	1	.822	1.035	.766	1.400
LHIN(Champlain)	-.038	.125	.094	1	.760	.962	.753	1.231
LHIN(Erie St Clair)	.078	.141	.306	1	.580	1.081	.820	1.425

LHIN(Hamilton Niagara Haldimand Brant)	.027	.120	.050	1	.823	1.027	.812	1.300
LHIN(Mississauga Halton)	.020	.155	.016	1	.899	1.020	.753	1.382
LHIN(North East)	-.003	.167	.000	1	.984	.997	.718	1.384
LHIN(North Simcoe Muskoka)	.059	.152	.148	1	.700	1.060	.787	1.429
LHIN(North West)	.060	.271	.049	1	.824	1.062	.624	1.808
LHIN(South East)	-.060	.176	.114	1	.735	.942	.667	1.331
LHIN(South West)	.035	.127	.074	1	.786	1.035	.807	1.328
LHIN(Toronto Central)	.076	.148	.266	1	.606	1.079	.808	1.442

Reference Category are as follows; Baseline and FUP Presence of Comorbidity: Yes, Area Type: Urban, Cancer Type: Missing, Hospital type: Teaching, LHIN: Waterloo Wellington