

CASE REPORT
DELORAINÉ'S COMMUNITY CANCER PROGRAM - SAVING LIVES, TIME AND MONEY

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Home for the Summer Program - May to August 2017

Souris, Brandon and Deloraine, MB

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Introduction

Cancer is the uncontrolled replication of cells stemming from the accumulation of mutations that cause dysregulation of cellular proliferation (Holt, 2018). These malignant

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tumors can spread into or invade nearby tissues in the body leading to morbidity and mortality. In Canada, nearly half of the population will develop cancer, and 30% will ultimately die from the disease (Statistics Canada, 2012). In 2016, Manitoba experienced the third highest incidence rate (526.3 per 100,000) in Canada, with 6,900 new cases (Public Health Agency of Canada, 2016).

The majority of cancers are treated by a multimodal approach including surgery, radiation and/or chemotherapy. As these treatments have improved over time, there has been a corresponding increase in survival for patients with cancer (Holt, 2018). In Canada, from 2006 to 2008, the five-year age-standardized net survival across all cancer diagnoses was 60%, which is a 7% increase from the early 1990's (Canadian Cancer Society's Advisory Committee on Cancer Statistics, 2016). However, survival is very much dependent on specific diagnoses, with five-year survival estimates ranging from 98% in thyroid cancer to 8% in pancreatic cancer. When we compare survival of the four most common types of cancer across provinces, Manitoba ranks first in survival for lung/bronchus cancer, but in the bottom three for prostate, female breast and colorectal cancers (Canadian Cancer Society's Advisory Committee on Cancer Statistics, 2016).

Roughly 30% of Manitoba's population live rurally, and those who are diagnosed with cancer often rely on the CancerCare Manitoba's Community Cancer Programs Network (CCPN) to receive care close to home (Statistics Canada, 2011). The CCPN is composed of seven Regional CancerCare Programs (RCPs), eight Community Cancer Programs (CCPs), the Western Manitoba Cancer Centre and the Community Cancer Resource and Support Program (Figure 1). The CCPs are outpatient units that provide

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chemotherapy and follow-up care within community hospitals with a team of physicians, nurses, pharmacists, social workers and other specialized support staff. These teams are overseen by a cancer specialist and free of charge to all Manitobans.

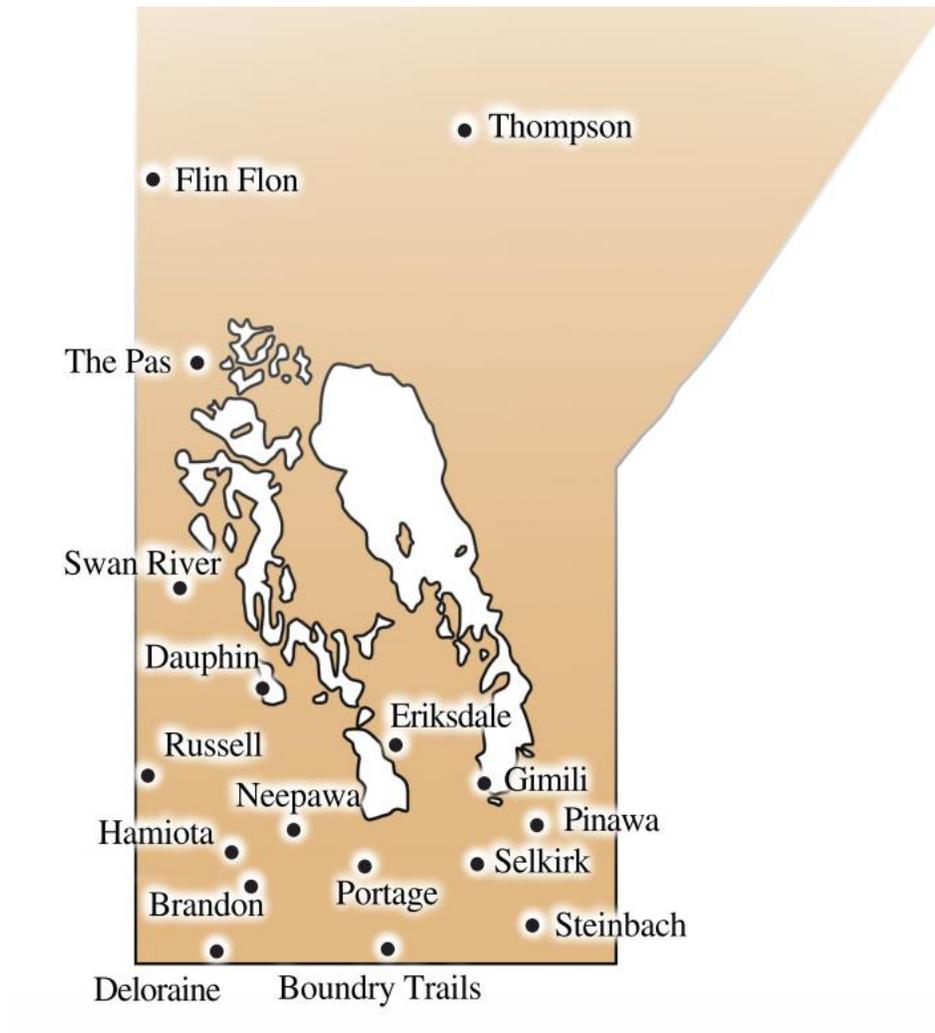


Figure 1 – Locations for the CancerCare Manitoba's Community Cancer Program Network (CancerCare Manitoba, 2017)

The Prairie Mountain Health region covers 67,000 km² in the southwest corner of Manitoba. As of 2014, there were over 100,000 rural residents serviced by seven clinics within the CCPN (Prairie Mountain Health, 2014). The most southern of these clinics is a CCP in the town of Deloraine which is serviced by primarily by one physician,

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two nurses and one nurse navigator, as well as access to TeleHealth and other Manitoba CancerCare resources. Located roughly 15 km north of the US border, Deloraine's CCP provides care to cancer patients from surrounding communities that would otherwise have to drive to clinics in Brandon or Hamiota.

There have been several analyses attempts to determine the inclusive economic burden of cancer in Canada, which have produced wide-ranging estimates. In 2008, cancer was placed as the seventh most costly illness or injury with an estimated \$3.8 billion in direct costs and \$586 million in indirect costs (loss of productivity, premature death, etc). Furthermore, it was the costliest illness in terms of lost productivity due to mortality (Canadian Cancer Society's Advisory Committee on Cancer Statistics, 2016). The goal of this study is to provide a snapshot of the burden experienced exclusively by the patient, and how programs like Manitoba CancerCare's Community Cancer Program help to ease those burdens. I will do this by examining a cross-sectional cohort of patients receiving care at Deloraine's CCP clinic during the summer of 2017, and exploring the amount of time they spend receiving care and commuting to and from the treatment centre. Furthermore, I will compare these metrics with the theoretical burden experienced if the clinic in Deloraine did not exist and the patients had to receive their care elsewhere.

Methods

Chart Navigation

In this cross-sectional cohort study, I reviewed the charts of 46 patients receiving active treatment and follow-up care at Deloraine Cancer Care. I recorded the postal code,

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diagnosis and treatment regimen for all patients. The diagnoses were grouped by system and initial diagnoses was used for patients with metastatic malignancies.

I was blinded to the patient's names and all other identifying information.

Driving distance and mileage

I assigned a home community to all patients that corresponded to the postal code on file. I used Google Maps to calculate the distance and average time of commute to determine how long a round trip to and from Deloraine Cancer Care would take. I also calculated the distance and time to the second closest Manitoba Cancer Care Centre (Hamiota or Brandon, Manitoba) as well as the distance to the nearest major centre (Brandon, Manitoba). To calculate mileage, I used the 2016 and 2017 automobile allowance rate of \$0.54/km (Canadian Revenue Agency, 2016) and multiplied it by the round trip to the Cancer Care facilities. I calculated the mileage to Deloraine, the second closest Cancer Care facility and Brandon, Manitoba.

Data Analysis

I input all data to Excel®, and determined the length and frequency of their treatments from their treatment regimen and extrapolated it over a course of 12 months. I then calculated the average and total driving time, mileage and time receiving care from a nurse or doctor for all patients.

Results

In the summer of 2017, I recorded the home community of 46 patients receiving active (Figure 2) and follow-up (Figure 3) care at Deloraine Cancer care. Altogether there were 12 communities represented in this cohort. There was one out-of-province patient who resides in Manor, Saskatchewan; all other patients reside in Southwest Manitoba. The community of Deloraine had the highest percentage of patients receiving active or follow up care with 27% and 59% respectively.

Figure 2– Community profile of patients receiving active care. Percentage of patients receiving active treatment at Deloraine Cancer Care from communities in Southwest Manitoba and Southeast Saskatchewan during the summer of 2017 (N = 19).

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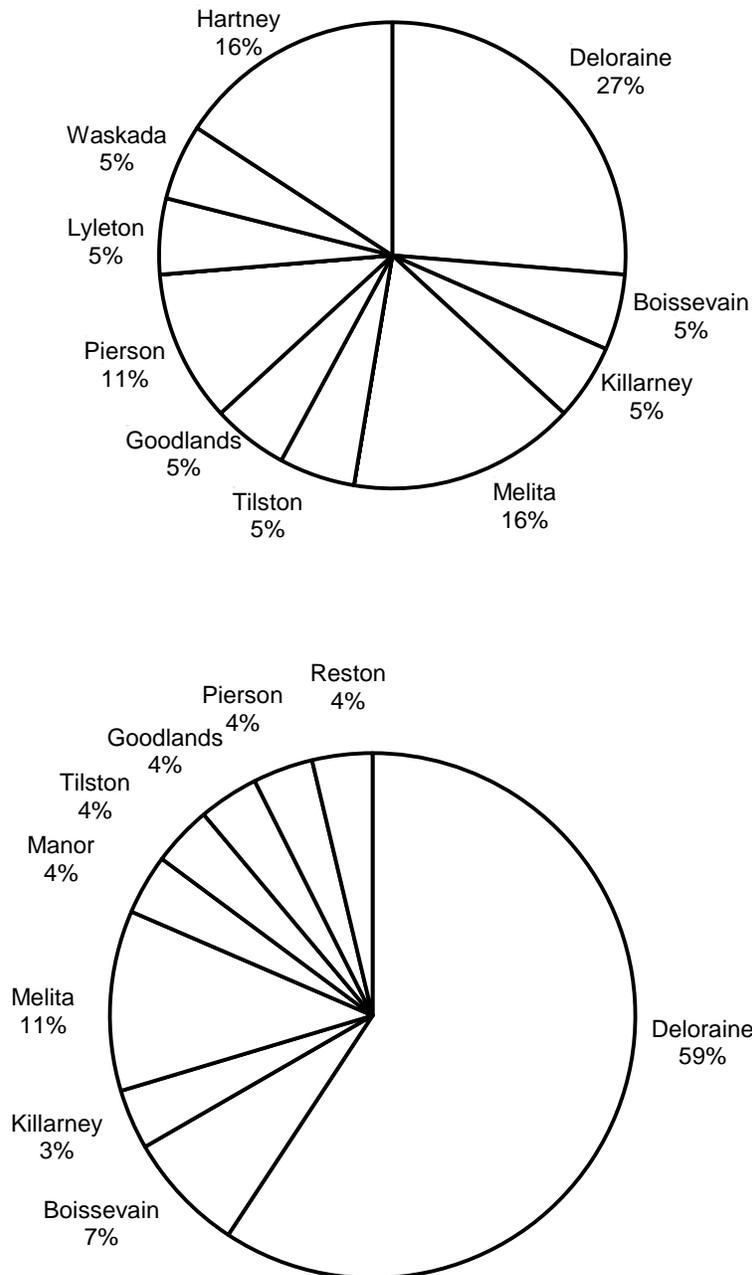


Figure 3 – Community profile of patients receiving follow-up care. Percentage of patients receiving follow-up care at Deloraine Cancer Care from communities in Southwest Manitoba and Southeast Saskatchewan during the summer of 2017 (N = 27).

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I recorded the diagnoses of patients receiving active (Figure 4) and follow-up (Figure 5) treatment. Of the patients receiving active treatment, there were seven different diagnoses with prostate (37%) and colorectal (26%) being the most common. There was also one patient that was receiving treatment for a non-malignant aplastic anemia. Of the patients receiving follow-up care, there were seven different diagnoses with breast (29%) and colorectal (26%) making up the majority of cases.

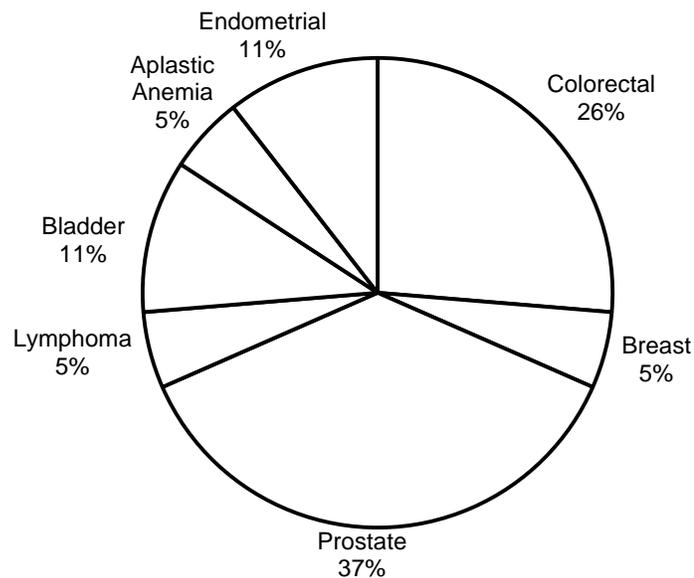


Figure 4 – Profile of diagnoses for patients receiving active care. Percentage of diagnoses of patients receiving active care at Deloraine Cancer Care in the summer of 2017 (N = 19).

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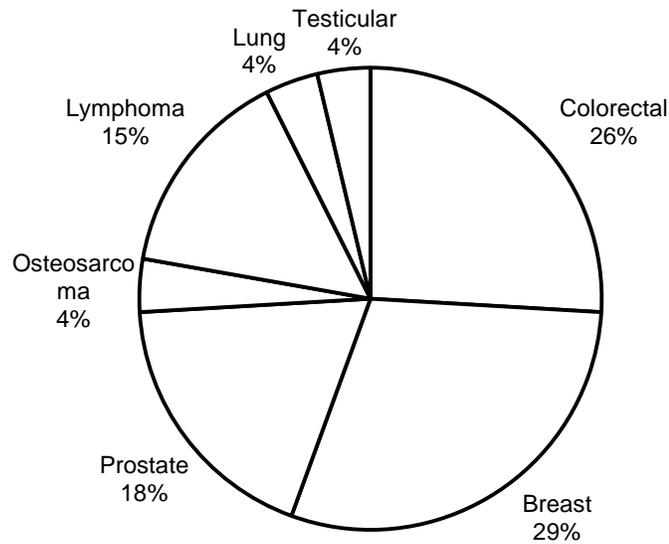


Figure 5 - Profile of diagnoses for patients receiving follow-up care. Percentage of diagnoses of patients receiving follow-up care at Deloraine Cancer Care in the summer of 2017 (N = 27).

Patients receiving active treatment at Deloraine Cancer Care spend on average 151 minutes at each appointment receiving care and 48 minutes driving to and from their appointment. Over the course of the year, patients spend 51.58 hours receiving treatment and 12.57 hours driving to and from Deloraine Cancer Care (Figure 6A). If they were to receive their treatment at the second closest cancer care facility or in Brandon, their driving time would increase by roughly 330% and 360% respectively. Patients receiving their treatment in Deloraine spent a total of 1219 hours receiving care and in transport to and from their appointments, 20% of that time is driving. If the patients were required to receive their Cancer Care at the next closest centre or Brandon, their combined total time requirements per year would reach 1770 and 1845 hours, with roughly 45% of that being spent in transport (Figure 6B).

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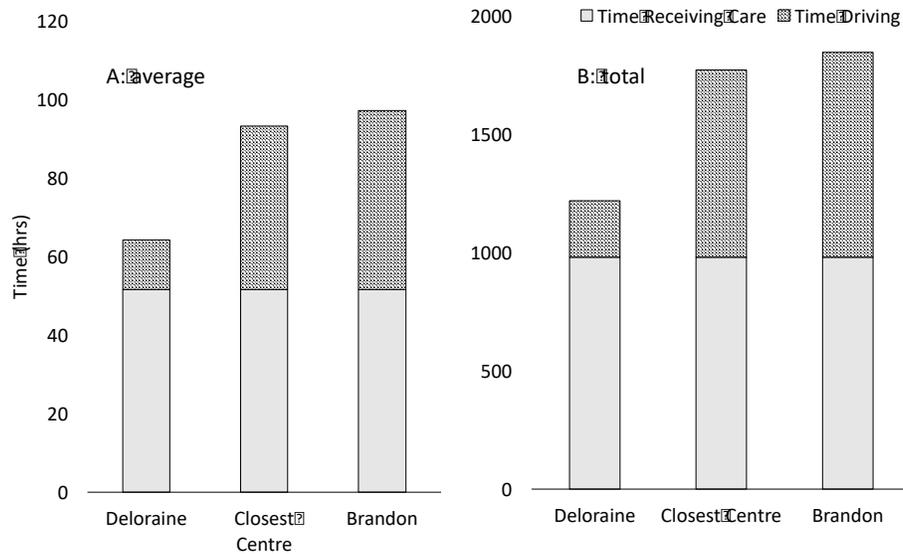


Figure 6 - Inclusive time requirements for receiving cancer treatment in Southwest Manitoba. A: The average time spent driving and participating in TeleHealth or with physician to follow-up cancer treatment at Deloraine Cancer Care compared to the nearest Community Cancer Care and Brandon, Manitoba. B: The total time spent driving and participating in TeleHealth or with physician to follow-up cancer treatment at Deloraine Cancer Care compared to the nearest Community Cancer Care and Brandon, Manitoba (N=19).

Over the course of a year, patients receiving follow-up treatment at Deloraine Cancer Care spend on average 124 minutes with a physician or nurse and 73 minutes driving to and from their appointment (Figure 7A). If they were to receive their treatment at the second closest cancer care facility or in Brandon, their driving time would increase by roughly 430% and 440% respectively. There is a total of 56 hours a year spent receiving follow-up care and 33 hours driving combined across the 27 patients, for a total of 89 hours. If the patients were required to receive their Cancer Care at the next closest centre or Brandon, their combined total time requirements per year would reach 199 and 202 hours, with over 70% of that being spent in transport (Figure 7B).

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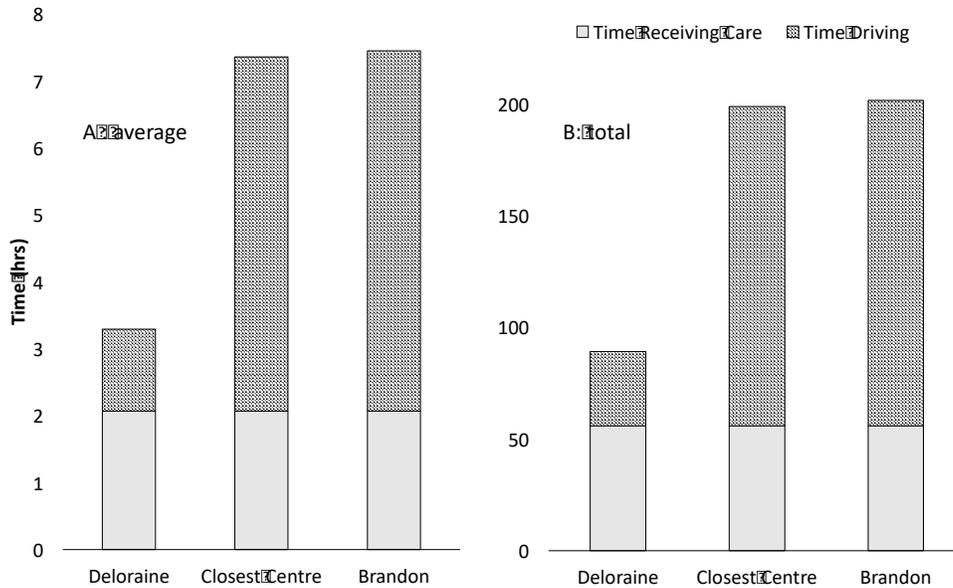


Figure 7 – Inclusive time requirements for following up cancer treatment in Southwest Manitoba. A: The average time spent driving and participating in TeleHealth or with physician to follow-up cancer treatment at Deloraine Cancer Care compared to the nearest Community Cancer Care and Brandon, Manitoba. B: The total time spent driving and participating in TeleHealth or with physician to follow-up cancer treatment at Deloraine Cancer Care compared to the nearest Community Cancer Care and Brandon, Manitoba (N=27).

I averaged the yearly mileage (\$0.54/km) for all patients that receive care at Deloraine Cancer Care and compared it to a theoretical mileage if they were to receive their care at the next closest centre or Brandon. I found that the average yearly mileage for patients receiving active treatment and follow-up care at Deloraine Cancer Care is \$587 and \$60 respectively (Figure 8A). If they were to receive their care at the nearest site or in Brandon, the mileage would increase by over 360% for patients receiving active treatment and over 425% for those needing follow-up care (Figure 8A). The total mileage for all patients at Deloraine Cancer Care is \$12,793 annually, compared to

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\$45,582 and \$48,640 if they were to drive to the next nearest community cancer care site or Brandon, respectively (Figure 8B).

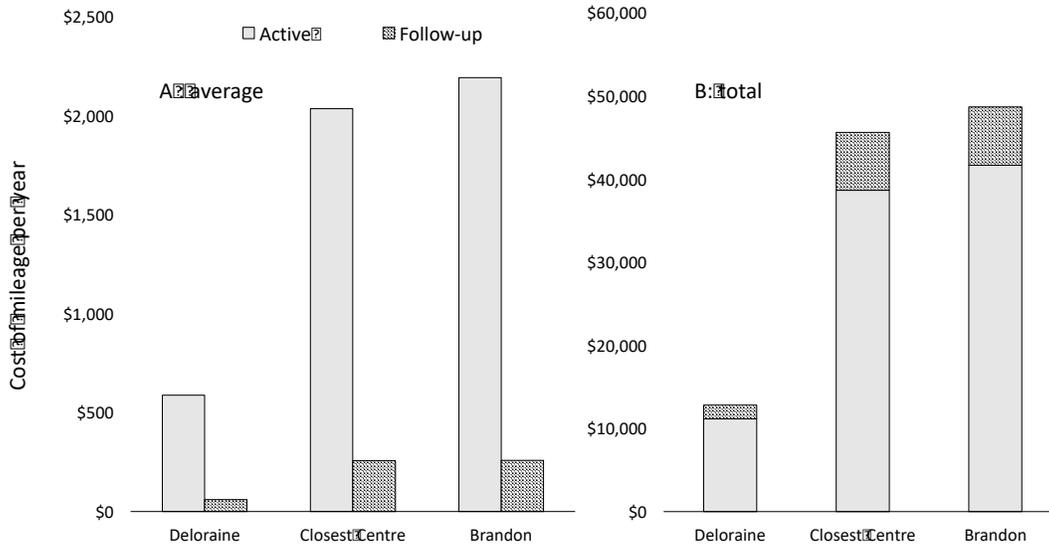


Figure 8 - Cost of mileage per year for patients receiving Cancer Care. A: The average mileage (\$0.54/km) experienced per year by patients receiving active and follow-up care at Deloraine Cancer Care compared to the cost for them to drive to the nearest Community Cancer Care and Brandon, Manitoba. B: The total mileage experienced per year by patients receiving active and follow-up care at Deloraine Cancer Care compared to the cost for them to drive to the nearest Community Cancer Care and Brandon, Manitoba (N = 46).

Discussion and Conclusion

The Community Cancer Program (CCP) clinic in Deloraine, Manitoba is currently servicing 46 patients from 12 communities in Southwest Manitoba and Southeast Saskatchewan. There are 19 patients actively receiving chemotherapy and 27 receiving follow-up care. There are 10 communities represented in the cohort receiving active treatment, with communities located closer to the CCP clinic in Deloraine and/or further

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from Brandon, Manitoba making up larger proportions, relative to population size, of the patient population. This is may be a result of some patients electing to receive their care in a larger centre, such as Brandon, compared to Deloraine. Furthermore, we see a significant portion of the patients receiving follow-up care residing in communities that would receive primary care in Deloraine, regardless of receiving cancer treatment. This likely reflects the decision of patients to return to their primary care physician for cancer care follow-up, when deemed appropriate.

The presence of a CCP clinic in Deloraine has serviced the southernmost communities of the Prairie Mountain Health region by reducing the burden of travel on cancer patients. Without a clinic in Deloraine, cancer patients in surrounding communities would experience a 45% increase in total time required to receive chemotherapy, all of which would be a result of a 230% increase in travel time required to get to and from the next nearest CCP clinic. The burden of travel is magnified in the population receiving follow-up care which would experience a 330% increase in travel time, if the Deloraine CCP clinic was not available. This reduction in travel burden benefits not only the patient, but also the patient's caregivers and family. The burden of travel is almost negligible for urban patients receiving cancer treatment, and would likely account for less than 15% of the total time required for treatments. While patients in Deloraine average 20% of their treatment time traveling, this ratio would increase to over 45% if the CCP did not exist, and lead to further disparity in healthcare provided between rural and urban Manitobans.

Mileage was used as a proxy to assess a portion of the financial burden associated with travelling to receive cancer treatment in Southwest Manitoba. Current

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patients receiving active treatment and follow-up care experience an average cost of \$587 annually that accounts for fuel and wear on their personal vehicles. If these patients were required to drive to the next nearest CCP in Hamiota or Brandon, the average cost would be over \$2,000 annually. The combined savings on mileage alone by having the CCP clinic in Deloraine is \$32,788 annually. These costs serve as a proxy to represent the reduction in financial burden to the patient by having CCP clinics such as the one in Deloraine. Other potential costs such as lost income to the patient and caregiver during transportation, and hotels and restaurant meals associated with added commutes for treatment, would expand the financial burden felt by the patients and their caregivers.

In conclusion, the CCP clinic in Deloraine plays an important role to patients diagnosed with cancer in Southwest Manitoba by allowing them to receive treatment closer to home. This component of CancerCare Manitoba's Community Cancer Network has reduced both the financial and time burden to the patients and helped to reduce the inequity between rural and urban healthcare.

Works Cited

- Canadian Cancer Society's Advisory Committee on Cancer Statistics. (2016). *Canadian Cancer Statistics 2016*. Toronto, Ontario, Canada: Canadian Cancer Society.
- Canadian Revenue Agency. (2016). *Automobile allowance rates*. Ottawa, Ontario, Canada: Government of Canada.

Deloraine's Cancer Care Program - Saving Lives, Time and Money

- CancerCare Manitoba. (2017, June 1). *Information for the Rural Patient*. Retrieved from http://www.cancercare.mb.ca/resource/File/CCPN/CCPN_Information_for_the_Rural_Patient_-_June_2017.pdf
- Holt, N. F. (2018). *Stoelting's Anesthesia and Co-Existing Disease* (7th Edition ed.). (R. L. Hines, & K. E. Marschall, Eds.) Philadelphia, PA, USA: Elsevier.
- Prairie Mountain Health. (2014). *Prairie Mountain Health Physician Recruitment Strategy*. Brandon, Manitoba, Canada.
- Public Health Agency of Canada. (2016). *Canadian Cancer Registry and National Cancer Incidence Reporting System*. Ottawa, Ontario, Canada: Statistics Canada.
- Statistics Canada. (2011). *2011 Census of Population*. Ottawa, Ontario, Canada: Government of Canada.
- Statistics Canada. (2012). *Canadian Vital Statistics Death Database*. Ottawa, Ontario, Canada: Government of Canada.