



Nunavimmi Puvakkt Kaggutimik Aanniaqarniq – Qanuilirqitaa? Lung Cancer in Nunavik: How Are We Doing? Lung Cancer in the Inuit Region of Nunavik, Québec: Descriptive Epidemiology of Patients Diagnosed between 2005 and 2016

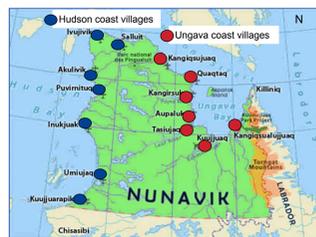
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INTRODUCTION

Canada's Inuit population is reported to have the highest lung cancer incidence in the world.¹⁻³ Few data have been published describing the demographics, trends, and outcomes of Inuit patients with lung cancer, and no direct comparisons have been made with non-Inuit populations. In Nunavik, the northern third of Quebec where over 95% of the inhabitants are Inuit,^{4,5} the rate of lung cancer is much higher than in the rest of the province.⁵

Figure 1: Map of Nunavik



Source: Nunavik Tourism Association www.nunavik-tourism.com/Regional-maps.aspx

Two health networks deliver care in Nunavik: Inuulitsivik on the Hudson coast and Tulattavik on the Ungava coast. All lung cancer patients residing in Nunavik are treated at the McGill University Health Center (MUHC). In this first phase of our RCN project, we used data from the MUHC Lung Cancer Registry to perform descriptive analyses of lung cancer patients in Nunavik, and assess for intra-region differences, as well as inter-region differences in patient characteristics and lung cancer types.

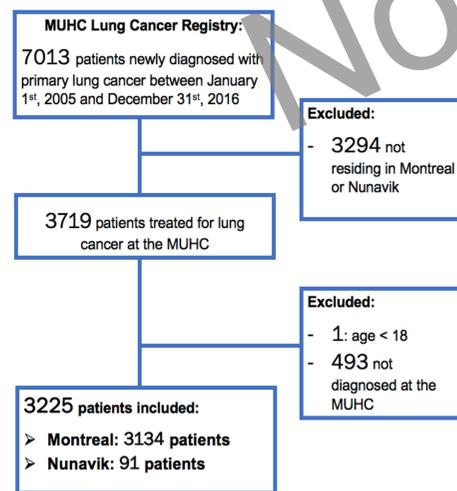
OBJECTIVES

- Amongst lung cancer patients from Nunavik:
 - Describe demographics, year at diagnosis, and mortality of lung cancer patients in the region overall, and stratified by coasts (Hudson or Ungava)
 - Explore trends in the incidence of lung cancer by gender and by region
- Compare lung cancer patients from Nunavik to those from Montreal, with respect to their demographics, year at diagnosis, lung cancer histology, stage at diagnosis, and survival after diagnosis.

METHODS

- Population: Lung cancer patients in the MUHC Lung Cancer Registry (LCR), diagnosed between January 1st, 2005 and December 31st, 2016, who resided in either Nunavik or Montreal.
- Patient Selection:
 - From the LCR: we identified all new cases of primary lung cancer, excluding lymphomas.
 - We used postal codes to select only patients residing in either Nunavik or Montreal.
 - We excluded:
 - Patients under 18 years of age
 - Patients diagnosed outside the MUHC.
- Methods:
 - Histological subtypes grouped into categories: Non-Small-Cell Lung carcinoma (NSCLC) Squamous, NSCLC Adenocarcinoma, NSCLC Not Otherwise Specified, Small Cell Lung Cancer (SCLC), Neuroendocrine, Unsure, and Other.
 - Vital status was determined through the Régistre des Usagers of the Ministry of Health and Social Services (MSSS).
 - Data were analysed through descriptive statistics and univariable comparisons, using SAS v9.4 and Excel.
 - Differences were quantitatively evaluated using Chi-square, Fisher's exact, or Wilcoxon tests, as appropriate; p-value <0.05 (statistical importance threshold).

Figure 2: Selection of patients from the MUHC lung cancer registry for current analysis



RESULTS

Table 1: Age, gender and mortality of lung cancer patients residing in Nunavik, overall and stratified by coast

Variables	Overall	Ungava Coast	Hudson Coast	P-value
Number of patients – N (%)	91	24 (26.4)	67 (73.6)	
Age at Diagnosis – Median (IQR)	68.2 (61.8 – 74.5)	68.7 (63.5 – 75.2)	68.1 (60.1 – 73.9)	0.53
Female – N (%)	40 (44.0)	15 (62.5)	25 (37.3)	0.03
Male – N (%)	51 (56.0)	9 (37.5)	42 (62.7)	
Year of diagnosis – Median (IQR)	2010 (2008 - 2013)	2010 (2006 - 2013)	2010 (2008 - 2013)	
Number known to have died – N (%)	72 (84.62)	20 (83.3)	57 (85.07)	0.25

Figure 3: Number of lung cancer cases by gender and year of diagnosis in Nunavik

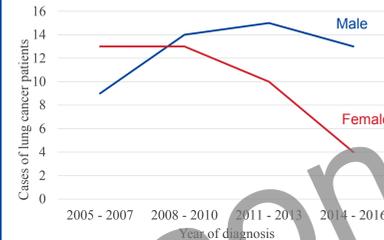


Figure 4: Number of lung cancer cases by region and year of diagnosis in Nunavik

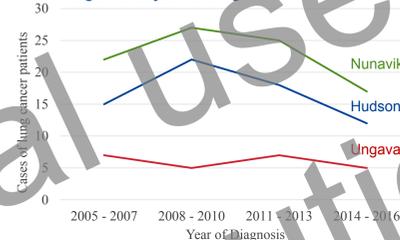


Table 2: Age, year of diagnosis and gender of lung cancer patients residing in Nunavik, compared to those residing in Montreal

Variables	Montreal	Nunavik	P-value
Number of patients	3134	91	
Age at diagnosis – Median (IQR)	70.6 (62.5 – 77.7)	68.2 (61.8 – 74.5)	0.02
Year of diagnosis – Median (IQR)	2011 (2009 - 2014)	2010 (2008 - 2013)	
Female – N (%)	1477 (47.1)	40 (44.0)	0.55
Male – N (%)	1657 (52.9)	51 (56.0)	

Figure 5: Lung cancer histology, stratified by residence at diagnosis, comparing Nunavik and Montreal

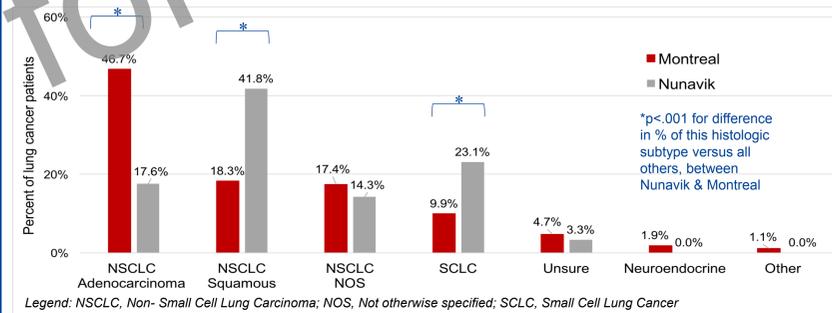


Figure 6: Stage at diagnosis for non-small cell lung cancer patients, Nunavik versus Montreal

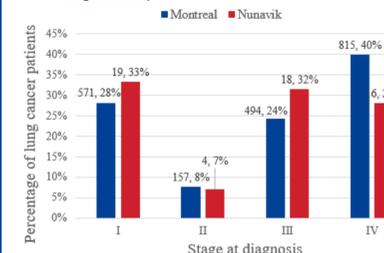


Figure 7: Stage at diagnosis for small cell lung cancer patients, Nunavik versus Montreal

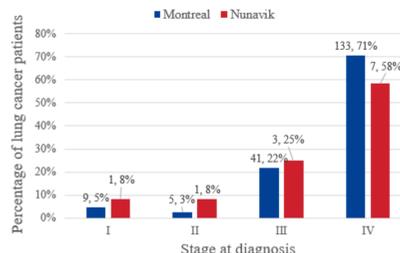


Figure 8: Survival for patients with Small Cell lung cancer, stratified by region

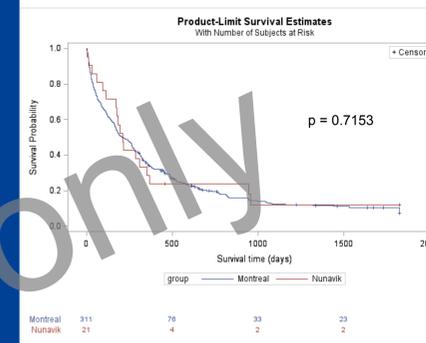
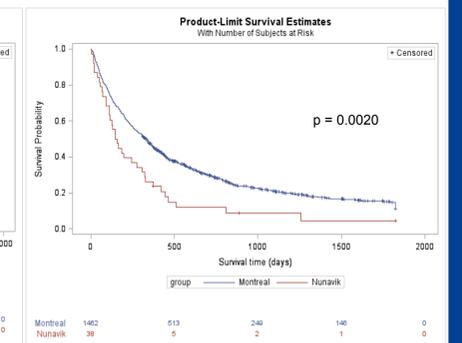


Figure 9: Survival for patients with Non Small Cell lung cancer and Stage at diagnosis > II, stratified by region



MAIN POINTS

- 74% of lung cancer patients in Nunavik resided on the Hudson coast.
- The majority of patients were male on the Hudson coast (63%), vs. female on the Ungava coast (63%).
- Possibly a decreasing number of cases diagnosed in women each year, in Nunavik
- Patients from Nunavik were younger than patients from Montreal.
- The forms of lung cancer showed different distributions between Nunavik patients and Montreal patients (Figure 5). The most common forms (top 2) were:
 - Montreal: NSCLC adenocarcinoma (47%) and NSCLC squamous (18%)
 - Nunavik: NSCLC squamous (42%) and SCLC (23%)
- Montreal patients had better survival after diagnosis of a NSCLC, compared to Nunavik. When NSCLC was further stratified by subtypes, differences between Nunavik and Montreal remained significant for squamous cell (p=0.0169), but not for adenocarcinoma (p= 0.1473).

STRENGTHS

- First direct comparison of Inuit and non-Inuit lung cancer patients.
- Captured all patients from Nunavik due to the Réseau Universitaire Intégré de Santé (RUIS) relationship.
- Within-Nunavik comparisons have revealed new insights on the demographics of lung cancer.

LIMITATIONS

- Important amount of missing data on stage at diagnosis.
- Challenges in identifying time trends due to the small number of cases diagnosed annually in Nunavik.
- Comparisons have not assessed for potential confounding variables in this analysis.

CONCLUSION

Differences in demographics of lung cancer patients exist within Nunavik. Differences in the histologic subtypes of lung cancer exist between Montreal and Nunavik. Survival following lung cancer diagnosis may be lower amongst Nunavik residents, but analyses taking into account confounding variables are needed.

NEXT PHASE OF THE PROJECT

- A detailed chart review is underway to collect detailed data on lung cancer diagnostic and treatment trajectories, which will be used in a matched cohort analysis to shed light on whether there are differences in survival, and to identify potential mediators.
- We will engage with stakeholders in Nunavik to begin knowledge sharing activities, and strengthen relationships.

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