September 29/2025

Selection Committee
Geoffrey Ogram Memorial Research Award

Lung Cancer Canada

Dear Members of the Selection Committee,

On behalf of our research team, I am pleased to submit this Letter of Intent for consideration for the Geoffrey Ogram Memorial Research Award. Our proposed study,” *Understanding Disparities in Early Detection and Guideline-Concordant Care Among Immigrants with Lung Cancer in Ontario: A mixed-methods study*”, directly addresses the award’s mandate to support high-impact projects focused on early detection, prevention, and disparities across populations.

Immigrants comprise one in five Canadians and face unique barriers to healthcare, including language, health literacy, and system navigation challenges. These barriers can lead to delayed detection of lung cancer, later stage at diagnosis, and poorer outcomes. Despite these concerns, little research has systematically investigated disparities in lung cancer detection and care among immigrant populations in Canada.

To address this gap, we will conduct a mixed-methods study combining population-level administrative data with qualitative interviews. Specifically, we will:

1. Explore disparities in stage at diagnosis and healthcare access along the lung cancer care continuum in recent immigrants versus longstanding Ontario residents.
2. Quantify differences in recurrence-free and overall survival between recent immigrants and longstanding Ontario residents
3. Among recent immigrant patients with lung cancer, explore and understand socio-demographic and system-level factors influencing early detection and access to care

By integrating quantitative outcomes with patient perspectives, this project will generate actionable evidence to guide policies, educational initiatives, and healthcare delivery strategies aimed at promoting equitable, timely detection and treatment of lung cancer in immigrant populations.

We believe this project aligns with the goals of the Geoffrey Ogram Memorial Research Award and has the potential to inform systemic changes that reduce disparities in lung cancer detection and outcomes. Thank you for considering our application. We look forward to the opportunity to submit a full proposal for your review.

Sincerely,

Don Thiwanka Wijeratne
Principal Investigator
Queen’s University

Impact Statement:

Our knowledge on immigrant health in Canada is inconsistent. New immigrants arriving in Canada may be healthier than the general population, a phenomenon known as the healthy immigrant effect (HIE)[1-7]. A Canadian systematic review found evidence supporting the HIE among adult immigrants, specifically among those with chronic disease, mental health, disability, functional limitation, and risk behaviour outcomes. Individuals who choose to migrate are often in relatively good health and undergo prior health screening. Despite the initial HIE, evidence has shown that immigrant health worsens over time, narrowing the gap and sometimes even with worse health outcomes than long standing Ontario residents. Another school of thought is that immigrants, due to an array of reasons have poor access to healthcare and may have worse outcomes from the beginning. The timing of when this occurs, why it occurs, and for who it occurs is very poorly understood.

Healthcare access is conceptualized through five domains: i) Approachability; ii) Acceptability; iii) Availability and accommodation; iv) Affordability; and v) Appropriateness[8]. Immigrants are more susceptible to vulnerabilities in each of the above healthcare access domains. Immigrants' healthcare and well-being are strongly influenced by social, environmental and personal factors. Linguistic and economic challenges as well as limited health literacy, difficulties with system navigation, or fear of stigma are barriers that may affect access to healthcare by recent immigrants to Canada. These adverse effects may be further compounded among specific sub-populations of immigrants, including the elderly and those living with chronic conditions.

Early detection of lung cancer is a critical challenge for immigrant populations. In Ontario, lung cancer screening is limited to high-risk individuals, and most diagnoses are made following symptomatic presentation, often at advanced stages. Immigrants face additional barriers that may delay timely detection, leading to later stage at diagnosis and reduced treatment options. Furthermore, there is a well-established role for adjuvant systemic therapy after resection of early-stage lung cancer and for early palliative care in advanced disease, making lung cancer an ideal case to study disparities in both detection and treatment across the care continuum.

This project is designed to better understand potential disparities in early detection, access to cancer care, and survival outcomes among recent immigrants, an often under-represented population, through a mixed-method study design which will explore disparities quantitatively through administrative data and qualitatively through structured interviews. Our qualitative analysis will be guided by Andersen's Behavioral Model to generate an equity framework that identifies barriers and facilitators to early detection and care.

To ensure impact beyond academic outputs, we will strengthen our stakeholder engagement platform, involving clinicians, immigrant advocates, cancer networks, and researchers in co-developing recommendations. We have established recruitment strategies with community organizations to ensure diverse immigrant and refugee voices are represented, particularly in the qualitative work. These efforts will culminate in a set of policy- and practice-oriented recommendations—including culturally tailored communication tools, navigation supports, and improved referral pathways—designed for rapid uptake by cancer agencies and immigrant-serving organizations.

The findings from this project will therefore not only advance knowledge on immigrant health and lung cancer disparities but also facilitate informed decision-making, support targeted policy and education initiatives, and provide capacity-building opportunities for trainees.

Together, these deliverables will optimize patient care and promote equitable, high-quality lung cancer care for recent immigrants.

Non-scientific summary:

Immigrants make up an important component of the Canadian population. However, they may experience environmental, personal, socioeconomic, and cultural barriers to receiving high quality health care. This may also be worsened by other factors including lack of awareness of symptoms, language barriers, lack of understanding of Canadian healthcare system, financial status, among others. Such barriers can put immigrant population at a higher risk for poor health outcomes.One of the most important challenges is delayed detection of serious diseases, such as lung cancer, which can result in later stage at diagnosis and fewer treatment options. However, this has not been formally studied in patients with cancer.Lung cancer provides a unique opportunity to study the inequities in early detection, access to treatment, and survival outcomes by immigration status because it is a common cause of cancer and cancer related death. Thus, it is important that we study the differences in stage at diagnosis, receipt of treatment, and follow-up among immigrants versus longstanding Ontario residents. Our research team is made up of a diverse range of scientists with different skill sets including contributors with experience in immigrant research, cancer research, and different research methods. The perspective of immigrant patients and cancer groups will also be an integral component of this research. This study will be conducted using routinely collected healthcare data by the province of Ontario to assess differences in outcomes (such as stage at diagnosis and receipt of treatment or death) between immigrants and longstanding residents. We will explore factors that may be contributing to these disparities and conduct in-depth interviews with immigrant patients to understand their experiences with detection, diagnosis and care. The findings of this research will help to come up with an action plan to address any identified disparities and barriers to access health care. Ultimately, we hope to improve the quality of cancer care for immigrant population in Ontario and Canada, ensuring that timely detection and high-quality treatment are equitably available to all..

Names of Investigators:

Dr. Don Thiwanka Wijeratne (Co-PI)

Dr. Bishal Gyawali (Co-PI)

Dr. Setareh Ghahari

Dr. Zihang Lu

Dr. Andrew Robinson

Dr. Jennifer Flemming

Dr. Paula Rochon

Mr. Matt Jalink

Dr. Jean Mathews

Mrs. Meghan Bowman

Understanding Disparities in Early Detection and Guideline-Concordant Care Among Immigrants with Lung Cancer in Ontario: A mixed-methods study

There is strong evidence that immigrants, who comprise 1 in 5 individuals in Canada, are vulnerable to receiving poor patient-centered health care (Figure 1)[1]. Evidence suggests that immigrants are often diagnosed with cancer at later stages and experience challenges accessing patient-centered care [1,2].While this question has been explored among immigrants broadly, there is a paucity of evidence focused on Canadian immigrant population with cancer. Our project is designed to better understand potential disparities in access to cancer care among recent immigrants in comparison to longstanding Ontario resident counterparts by using Non-Small Cell Lung Cancer (~80% of lung cancers)[3], hereafter referred to as lung cancer, as the case example. Lung cancer was chosen given its high incidence, mortality, relevance to patients with all genders, and established standards of care for treatment that are well captured in population-level databases. This project aims to generate actionable evidence on disparities in early detection, access to care, and survival among immigrants with lung cancer in Ontario. Findings will inform strategies for health system improvement, education, and policy development to ensure equitable care across populations.

We have three objectives:

1. To explore disparities in stage at diagnosis and healthcare access along the lung cancer care continuum in recent immigrants versus longstanding Ontario residents.
2. To quantify differences in recurrence-free and overall survival between recent immigrants and longstanding Ontario residents
3. Among recent immigrant patients with lung cancer, to explore and understand socio-demographic and system-level factors influencing early detection and access to care

Our study will employ a mixed-method design, drawing on the strengths of both quantitative [population-based retrospective cohort, using administrative data available at the Institute of Clinicial Evaluative Sciences (ICES)] and qualitative methodologies. This approach was chosen to leverage the strengths of administrative databases in terms of study power, treatment and outcome data while addressing limitations in the availability of immigrant-relevant variables related to health equity. This combined approach will inform our discussion on the effects of immigrant status and relevant variables on early detection, patient access to healthcare, the quality of care received, and survival. Our accrual window will include those who have a new diagnosis of lung cancer from 2013 to 2020. Individuals who meet our inclusion criteria will be followed up until a maximum of December of 2022. A look back window of two years prior to study inclusion will be done to help inform baseline characteristics and study inclusion.

Objective 1 will compare the following outcomes between recent immigrant's vs longstanding Ontario resident patients with lung cancer. i) Stage at diagnosis as a marker of early versus late detection. ii) Receipt of guideline concordant adjuvant systemic therapy for stage II and III lung cancer patients (using the Ontario Cancer Registry). Guideline-concordant adjuvant systemic therapy will be defined as the first receipt of adjuvant chemotherapy within 120 days (4 months) after surgical resection, consistent with the recommendations from major lung cancer guidelines[4]. Targeted therapy or immunotherapy will not be considered as adjuvant therapy as they have only been available in Canada since 2022. Stage I disease is not included here because the benefit of adjuvant systemic therapy is not straightforward and guidelines are not necessarily consistent[5].

Objective 2 will examine the effect of recent immigrant status on lung cancer recurrence (recurrence-free survival) and overall survival. Recurrence-free survival will be assessed in stage II and III patients at diagnosis. Recurrence will be defined as occurrence of any of the following. i) Repeat surgery, re-staging, or repeat pathology for lung cancer >90 days (>3 months) after initial surgery for lung cancer ii) Initiation of systemic therapy >120 days (>4 months) after surgery or re-initiation >3 months after of completion of initial adjuvant systemic therapy iii) Initiation of palliative intent radiation therapy, defined as radiation to any non-lung site or lung site >180 days (> 6 months) after surgery iv) Death from any cause after initial diagnosis. The above time points will be used as any intervention before would be considered as part of initial treatment[6]. Overall survival will be defined as the time interval between date of diagnosis and death from any cause (over a maximum follow-up period of 10 years). This will be calculated by stage at diagnosis. Individuals who are alive at the end of the study period will be censored. The differences in recurrence-free and overall survival based on immigration status will be visualized using Kaplan-Meier curves and modelled using Cox proportional hazards regression models accounting for covariates that may affect our relationship of interest and individual patient follow-up. As an alternative approach to control for confounders, we will match individual based on their age (± 2 years) and year of diagnosis. Frailty models8 with random effect will account for correlation of individuals within matched pairs. The models will also adjust for demographic, treatment, and system/area-level factors. Similar to above, a sensitivity analysis will be conducted by censoring patient's follow-up in March 2020 to investigate the potential confounding effects of the Covid-19 pandemic on survival outcomes.

Objective 3 will be comprised of a quantitative and qualitative component.

Quantitative -Among recent immigrants, we will assess the effect of specific socio-demographic variables only available in the Citizen and Immigration Canada database in addition to known important prognostic factors on stage at diagnosis and receipt of adjuvant systemic therapy[4]. These variables of interest include Canadian language ability (Language ability will be measured dichotomously as knowledge of an official language of Canada (English, French or neither), region of migration, date of landing (to determine duration of time spent in Canada), educational qualification (measured categorically), skill level of occupation (e.g., managerial, skilled/technical) measured categorically, and family status (dichotomized as married/common-law or other)[7]. Confounders including age, sex, comorbidities, socio economic status, and area of residence will be controlled for. We will analyze these associations using both bivariable and multivariable modified Poisson regression models accounting for potential confounding variables.

Qualitative -We will qualitatively explore the experience of immigrants accessing lung cancer-related services given the inherent limitations of ICES data in describing health equity. The themes of exploration will be informed by the quantitative analysis. We will use the purposive (non-probability) sampling method to ensure the inclusion of diverse individuals in terms of ethnicity, sex, gender, age, and duration of time in Canada. Interviews will be conducted within 6-12 months of their lung cancer diagnosis. This period was selected as most patients would have completed the majority of their therapy and still recall their experiences in their cancer journey.

Knowledge translation - The findings obtained through this study will be communicated to provincial and national bodies for cancer and immigrant health to better inform future strategic planning of early detection and cancer care delivery to potential vulnerable populations.

Impact Statement References

1. Adjei JK, Adu PA, Ackah BBB. Revisiting the healthy immigrant effect with diabetes risk in Canada: why race/ethnicity matters. Ethnicity & Health 2020;25:495-507.

2. Halli SS, Anchan JP. Structural and behavioural determinants of immigrant and non-immigrant health status: Results from the Canadian community health survey. Journal of International Migration and Integration / Revue de l'integration et de la migration internationale 2005;6:93.

3. Kwak K. An evaluation of the healthy immigrant effect with adolescents in Canada: Examinations of gender and length of residence. Social Science & Medicine 2016;157:87-95.

4. McDonald JT, Farnworth M, Liu Z. Cancer and the healthy immigrant effect: a statistical analysis of cancer diagnosis using a linked Census-cancer registry administrative database. BMC Public Health 2017;17:296.

5. McDonald JT, Kennedy S. Insights into the ‘healthy immigrant effect’: health status and health service use of immigrants to Canada. Social science & medicine 2004;59:1613-27.

6. Vang ZM, Sigouin J, Flenon A, Gagnon A. Are immigrants healthier than native-born Canadians? A systematic review of the healthy immigrant effect in Canada. Ethnicity & Health 2017;22:209-41.

7. Hyman I. Immigration and health: reviewing evidence of the healthy immigrant effect in Canada: Joint Centre of Excellence for Research on Immigration and Settlement; 2007.

8. Levesque J-F, Harris MF, Russell G. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. International journal for equity in health 2013;12:1-9.

Proposal Summary

1. Levesque J-F, Harris MF, Russell G. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. International journal for equity in health 2013;12:1-9

2.Herbach EL, Weeks KS, O'Rorke M, Novak NL, Schweizer ML. Disparities in breast cancer stage at diagnosis between immigrant and native-born women: A meta-analysis. Annals of epidemiology. 2021;54:64-72.

3. Adjorlolo S. Can Teleneuropsychology Help Meet the Neuropsychological Needs of Western Africans? The Case of Ghana. Applied neuropsychology Adult 2015;22:388-98.

4. Pisters K, Kris MG, Gaspar LE, Ismaila N. Adjuvant Systemic Therapy and Adjuvant Radiation Therapy for Stage I-IIIA Completely Resected Non–Small-Cell Lung Cancer:

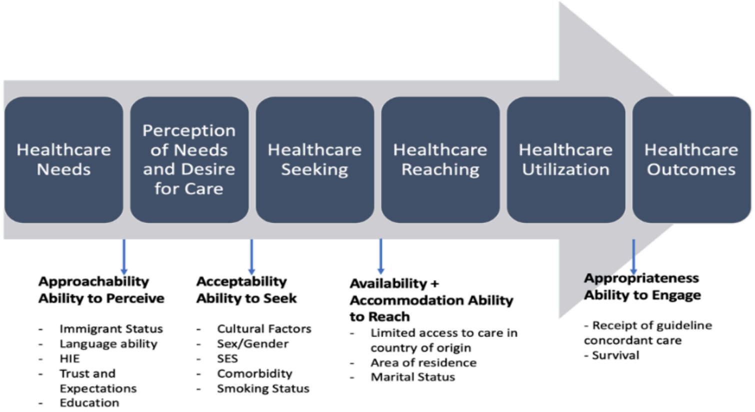
ASCO Guideline Rapid Recommendation Update. Journal of Clinical Oncology 2022;40:1127-9.

5. Govindan R, Aggarwal C, Antonia SJ, et al. Society for Immunotherapy of Cancer (SITC) clinical practice guideline on immunotherapy for the treatment of lung cancer and mesothelioma. J Immunother Cancer 2022;10.

6. Institute NC. recurrent cancer. NCI Dictionaries.

7. Hougaard P. Frailty models for survival data. Lifetime data analysis 1995;1:255-73.

Figures:



HIE = Healthy Immigrant Effect; SES = Socioeconomic status

Figure 1: Conceptual model adapted from Levesque et al., of a patient's healthcare journey and associated factors

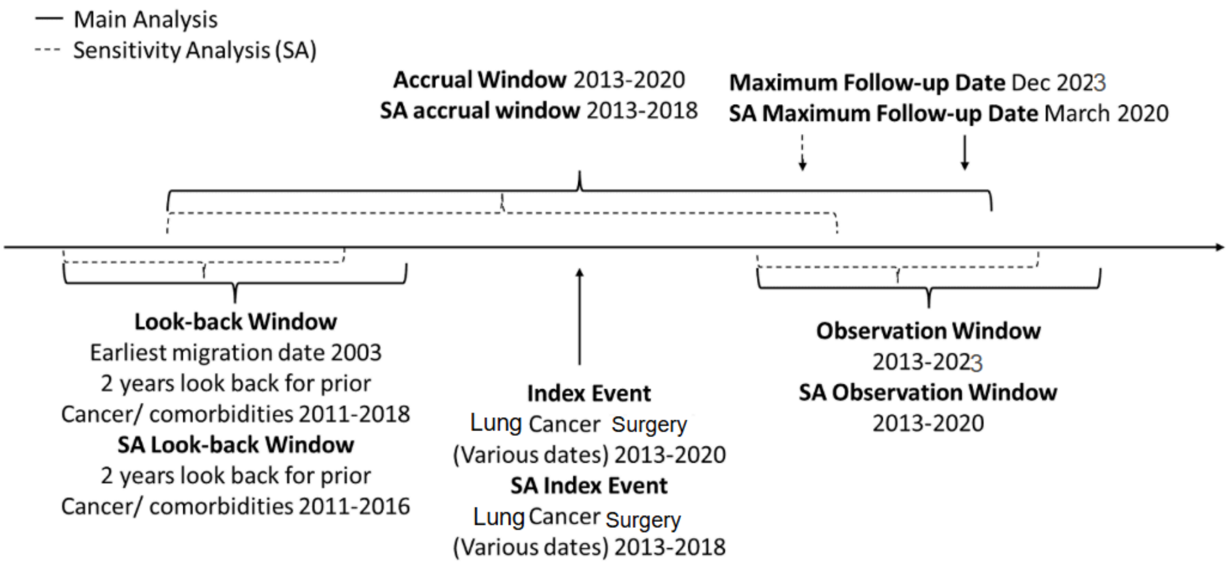


Figure 2: Proposed timelines for the Quantitative component

Budget

Total: $25,000

ICES Contracted Data Services

Under Ontario Privacy legislation, the Institute for Clinical and Evaluative Sciences (ICES) is a Prescribed Entity, which permits ICES to hold and use administrative, population health, clinical and other data files for the purposes of analysis, evaluation, and decision support. Access to ICES data is governed by policies and procedures that comply with the requirements of the Information and Privacy Commissioner of Ontario. ICES is responsible for ensuring that the necessary infrastructure (i.e. privacy office, data linkage and security measures, data sharing agreements) is in place to comply with these policies and to maintain the integrated secure data platform.

This research project will be conducted at the ICES@Queen's Health Services Research Facility site, although some services and costs are incurred by the ICES-Central location where the data platform physically resides.

ICES is a non-profit corporation and presently must recover most of the costs of research (fixed and variable) through a charging process. ICES is not part of, or affiliated with, a university or major teaching hospital and does not benefit from large infrastructure investment. As a result, it is necessary to include some fixed as well as all variable costs in the charges for work done.

This project will require the resources of an ICES Analyst. This will include oversight and quality assurance costs. In the first year of the study, the time allocation is 0.5 FTE.

Year 1:

- Import ICES data to create the project cohort
- Assist with form completion
- Participate in the development and finalization of the Dataset Creation Plan including troubleshooting data definitions
- In consultation with study investigators, assist the statistical analysis

Year 2:

- In consultation with study investigators, conduct data analyses
- Produce Tables, Reports, etc.
- Participates in the production of manuscripts and reports

Analyst costs: $22,150.00

Total: $22,150

Interpreter Services

We estimate that half participants (15) will require interpretation service for the interviews. The estimated time to interview with support of an interpreter is twice as much needed for interviews in English. Interpreter services cost $100.00 per hour.

Year 3: 15 participants *1 hours * $100 = $1500

Transcription Services

We estimate total transcription services for all recorded interviews to cost $1.5 per minute of audio. We will have 45 minutes-1.5 hour interviews with each participant and an estimated 15 participants

Year 3: 15 participants * 60 minutes* 1.5 = $1350

February 28, 2024

Queen's UNIVERSITY

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LUNG CANCER CANADA
Lung Ambition Awards

RE: Letter of support for Dr. Bishal Gyawali's and Dr. Thiwanka Wijeratne's application to Lung Cancer Canada, Lung Ambition Awards

Dear Lung Ambition Awards Committee members,

I am pleased to write a very strong letter of support for Drs. Gyawali and Wijeratne's application to Lung Cancer Canada, Lung Ambition Awards.

The proposed project is designed to better understand potential disparities in access to cancer care among recent immigrants. This research project aligns well with our departmental priorities, is quite feasible and is well supported by our institution. Our department has a proven track record of health services research and collaboration using Queen's Institute for Clinical Evaluative Sciences (ICES) database.

Dr. Gyawali is as an Associate Professor in the Department of Oncology at Queen's University. He has a stellar research and publication portfolio and is one of a handful with proven ability to have a global impact on advancing cancer control.

Dr. Thiwanka Wijeratne, who will be supporting this project as a co-investigator, is an Associate Professor of General Internal Medicine at the Department of Medicine and the Department of Public Health, Queen's University. He is an Adjunct Scientist, Cancer Care and Epidemiology and has a great experience in immigration research. He will be collaborating with Dr. Gyawali on this project.

Both Drs. Gyawali and Wijeratne have the required protected time for this research as well as an excellent background of building successful and impactful collaborations with different stakeholders. The Department remains committed to providing maximal required support. This award will provide a much-needed operating support for this project to be successful.

I strongly endorse this application.

Sincerely,

Khaled Zaza, MB, BCh, MSc, FRCPC
Radiation Oncologist, Associate Professor
Interim Head, Department of Oncology
Faculty of Health Sciences, Queen's University