Palliative Care Provision to Patients Dying from Cancer in Halifax and Cape Breton, Nova Scotia, Canada

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1 Cancer Care Nova Scotia 2 Dalhousie University Inspiring Minds 3 Capital Health 4 Cape Breton District Health Authority Making Healthier Choices Together

Context

Palliative care (PC) programs began in 1988/9 in Halifax and Cape Breton counties. By 1997/8 both programs were seeing more than 70% of all adults dying of cancer with Cape Breton seeing over 80% in 2003.

Identifying barriers to PC access will enable health care policy makers, administrators, and providers to achieve equity in PC services.

Purpose

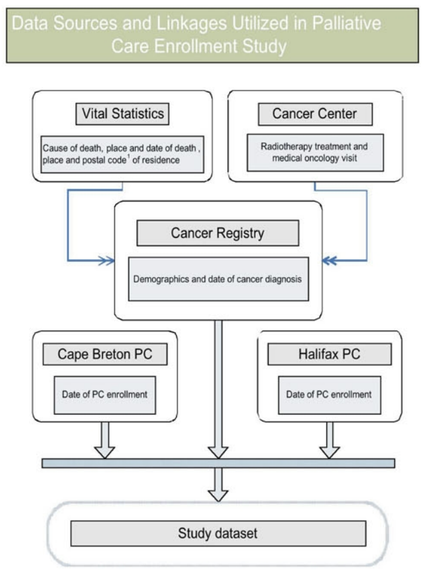
Determine predictors of timely PC program enrollment.

Compare the utility of logistic regression with that of classification and regression tree (CART) analysis.

Study Subjects

4137 residents of Cape Breton and Halifax counties who died from cancer between January 1, 2000 and December 31, 2003 were identified using Vital Statistics death certificate records.

These decedents account for 54% of all 2000-2003 Nova Scotia cancer deaths.



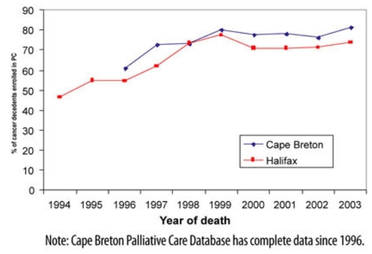
[1] Postal code of death was used to derive community variables using Statistics Canada census data.

Analyses

Traditional: Univariate and multivariate logistic regression.

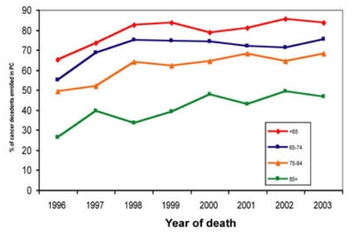
Innovative: CART analysis is a powerful data mining tool for investigating multi-level interactions. CART searches the values of all variables to split the PC and non-PC decedents into maximal homogeneous subgroups.

Trends in palliative care enrollment rates for cancer decedents, Cape Breton and Halifax, 1994-2003

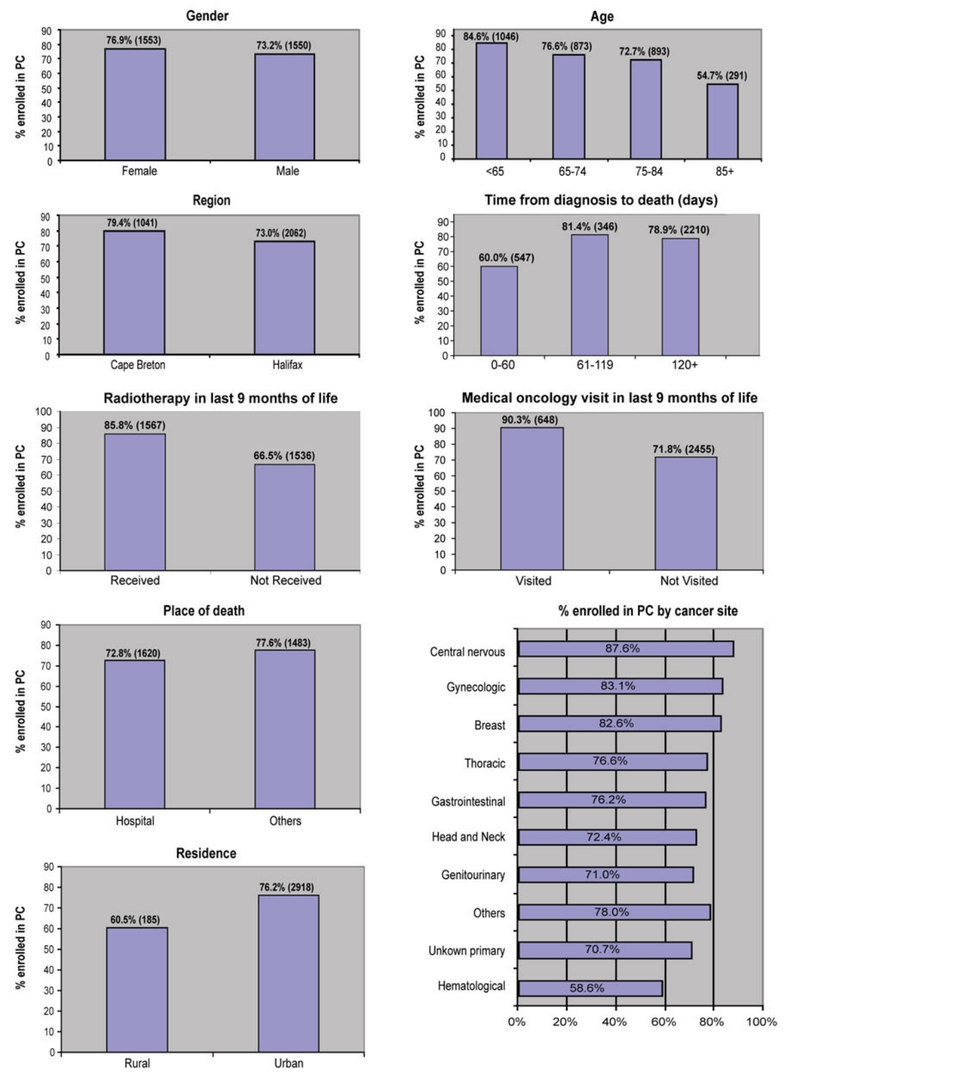


Note: Cape Breton Palliative Care Database has complete data since 1996.

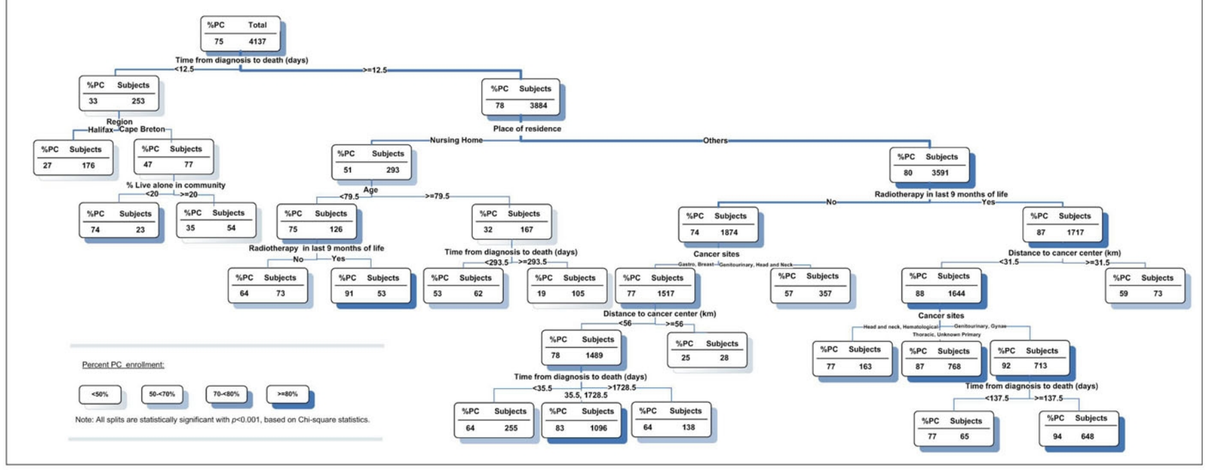
Trends in palliative care enrollment rates for cancer decedents, Cape Breton and Halifax by age, 1996-2003



Proportion and counts enrolled in palliative care program by patient characteristics, Cape Breton and Halifax, 2000-2003 cancer deaths



Classification and Regression Tree Analysis: Percent (%) Palliative Care (PC) Enrollment and Subjects in Node



Multivariate Logistic Regression: Adjusted odds ratios (OR) and 95% Confidence Intervals (CI) for PC enrollment by patient characteristics, Cape Breton and Halifax Counties, 2000-2003 cancer deaths

Characteristic	OR (95% CI)
Gender (Male)	1.0 (-)
Female	1.3 (1.1-1.5)
Age (years) (<65)	1.0 (-)
65-74	0.8 (0.6-0.9)
75-84	0.7 (0.6-0.9)
85+	0.3 (0.3-0.4)
Time from diagnosis to death (days) (0-60)	1.0 (-)
61-119	2.5 (1.8-3.3)
120+	1.8 (1.5-2.2)
Radiation therapy in last 9 months of life (No)	1.0 (-)
Yes	2.4 (2.0-2.9)
Medical oncology visit in last 9 months (No)	1.0 (-)
Yes	1.7 (1.3-2.3)
Cancer diagnosis (Thoracic)	1.0 (-)
Gastrointestinal	1.3 (1.0-1.6)
Head and Neck	0.5 (0.3-0.8)
Hematological	0.5 (0.4-0.7)
Place of death (Out of hospital)	1.0 (-)
Hospital	0.5 (0.4-0.7)
Place of residence (Others)	1.0 (-)
Nursing home	0.3 (0.2-0.4)

Results

75% of the cancer decedents were enrolled in PC program.

The CART results show that being diagnosed with cancer within 2 weeks (12.5 days) of death (n=253) is a primary low PC enrollment factor (33%) with those most affected being decedents from Halifax (27%) and Cape Breton who lived in geographic areas where more than 20% of people lived alone (35%).

The results of CART also show that among the 3884 decedents who survived more than 2 weeks (12.5 days) after diagnosis, 78% were enrolled in PC.

The 105 nursing home residents who were more than 80 years old and who were diagnosed more than 9 months (293.5 days) before death had the lowest PC enrollment rate (19%).

The results of logistic regression show that time from cancer diagnosis to death 61-119 days is an indicator of higher PC enrollment compared to 0-60 days (OR=2.5). It also indicates that being a nursing home resident (OR=0.3) and 85 years or older (OR=0.3) are indicators of lower PC enrollment.

Conclusions

Time from cancer diagnosis to death, geographic location, age, nursing home residency, and radiotherapy treatment and medical oncology visit at end of life influence PC enrollment.

CART analysis provides more specific and therefore more useful results than logistic regression methods for policy and interventions.

Funding and Support

1 NET: Palliative Care in a Cross Cultural Context - CIHR
2 Surveillance and Epidemiology Unit, Cancer Care Nova Scotia
3 Capital Health and Cape Breton Palliative Care Services