



Associations Between Living Near Blue Spaces and Common Causes of Mortality

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Background

- There is limited research that examines the effects of blue space (water resources) on human health and well-being. This study examines relationships between blue space and chronic disease, specifically all-cause specific mortality.
- A secondary aim was to assess the prevalence of skin cancer in NH and RI, to provide public health information to those who enjoy spending time outside near blue spaces.

Methodology

Literature Review:

Online databases were searched for articles containing information about blue spaces and chronic disease treatment/prevention. The search was refined to only include settings listed as blue space, blue infrastructure, or blue prescriptions. Green spaces were not included.

Databases searched included:

- Scopus and Web of Science
- Key words of "blue space", "blue infrastructure", "water environment", "urban blue", "blue prescription", "chronic disease", "cancer", or "cardio disease".

Example:

Associations Between Blue Space and Common Causes of Mortality Among Urban Canadians:

- Population based cohort study
 - observational research study that follows individuals overtime to track relationship between exposures and outcomes
- 1,265,515 subjects ages 25-89 living in the 30 largest Canadian cities were observed over a 10.6 year follow up from (2001-2011). (figure 1)
- Subjects were non-immigrants and must have lived primarily in Canada during the time of the study.

Exposures:

- Large natural water features (lakes, oceans, rivers) within 250m
- Measured using ArcGIS (Esri), created binary variable that indicated blue space presence¹

Next Step:

Behavioral Risk Factor Surveillance Survey (BRFSS):

- Cross-sectional Survey
 - Service of health-related telephone surveys collecting data from US residents about health risk behaviors²
 - After analyzing data on skin cancer predictors, it can be concluded that a p value of <.05 is statistically significant (figure 2).

Exposures:

- Hispanic (yes/no), education level, income level, sex, and physical activity

Results



Figure 3: NH Blue Space

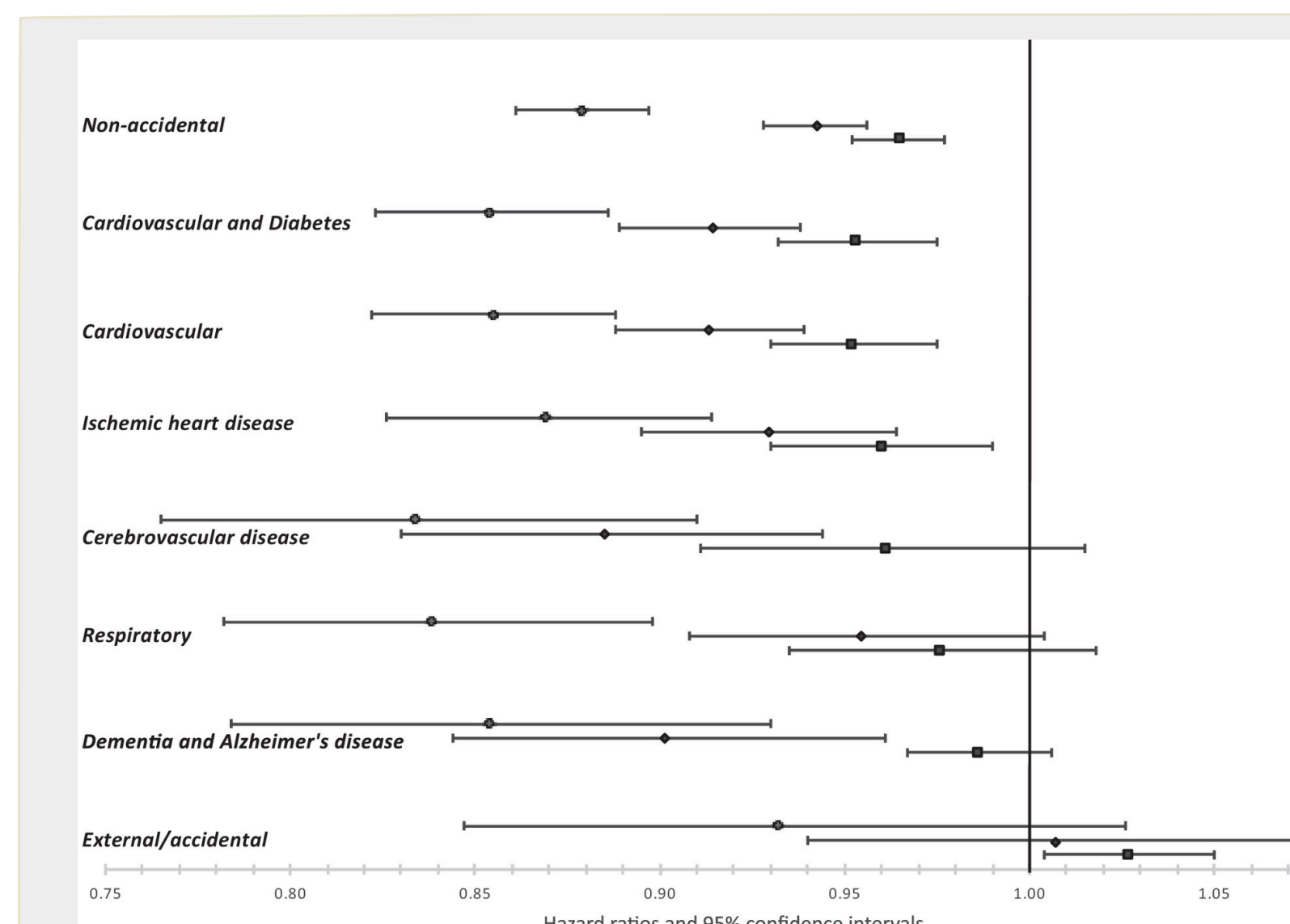


Figure 2: Hazard Ratios 95% CI, Circle = 250m, Diamond = 500m, Square = 1000m HR = 1, No association, HR > 1, Exposure = Higher Risk of Death HR < 1, Exposure = Lower Risk of Death

This study found that subjects who reside within 250m of blue space in rural Canada had a 12-17% reduced risk of dying from common causes of mortality compared to those who lived further. (figure 2)

- Association was stronger among older adults and women compared to younger adults and men
- protective effects were also highest against deaths from stroke and respiratory causes¹
- Associations between mortality and blue spaces within further distances were also reduced as chronic disease mortality and prevalence decreased¹

EFFECT	POINT ESTIMATE	95% CONFIDENCE	95% CONFIDENCE	P VALUE
HISPANIC (Y/N)	0.164	0.105	0.256	<.0001
EDUCATION	1.098	1.002	1.202	<.0001
INCOME	0.92	0.874	0.969	0.0015
SEX	0.862	0.735	1.011	0.0676
PHYSICAL ACTIVITY	0.627	0.523	0.751	<.0001

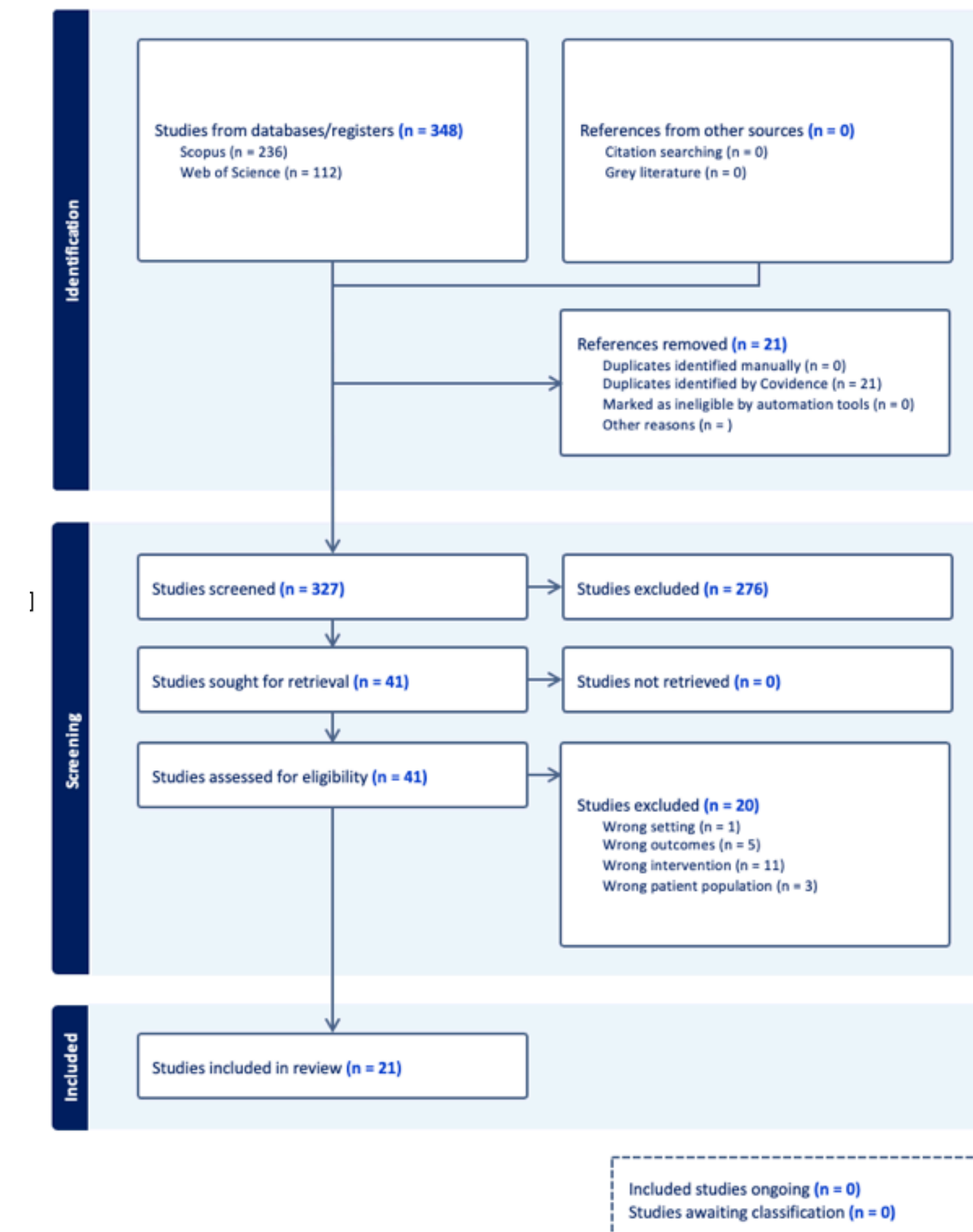
Figure 1: Predictors of Likelihood of Skin Cancer in NH in RI; p value of <.05 is statistically significant; OR >1 equals higher odds of skin cancer

In NH, the American Cancer Society estimates 470 new cases will be diagnosed in 2026. Sun exposure is not limited to peak summer heat. It occurs year round and is often ignored, particularly in areas across the state such as lakes, pools, trails, and open recreational areas. Water can reflect up to 90% of UVA rays, increasing exposure even when individuals feel shaded.

NH Cancer Partnership, Dartmouth Cancer Center, and IMPACT Melanoma, are community organizations across the state that have an opportunity to receive free sunscreen dispensers as part of a statewide prevention effort. Our team is encouraged to use "Reef Safe" sunscreen that is less damaging to the environment.³

Discussion

Blue Space in Chronic Disease Prevention



This literature review found two main impacts of blue spaces on chronic disease prevention:

- **Physical Health Benefits:** Increased access to blue space increases physical activity levels which decreases risk of chronic disease.
- **Mental Health Benefits:** Exposure to blue spaces decreases stress which has been linked to several chronic diseases such as cardiovascular disease.

Limitations & Strengths

Limitations¹

- No grey literature included
- Most studies were cross-sectional
- Accessibility of blue spaces was not considered beyond distance measures

Strengths¹

- **Adjusted survival models for urban environmental exposure**
- Null associations to meet hypothesized expectations
- Large cohort

Conclusion

The literature examined suggests that exposure to residential blue space has positive effects on health and well-being, reducing the risk of mortality. However, more research is needed to confirm these relationships further.

References:

1. Crouse, D. L., Balram, A., Hystad, P., Pinault, L., Bosch, M. van den, Chen, H., Rainham, D., Thomson, E. M., Close, C. H., Donkelaar, A. van, Martin, R. V., Menard, R., Robichaud, A., & Villeneuve, P. J. (2018, July). Associations between living near water and risk of mortality among Urban Canadians | Environmental Health Perspectives | Vol. 126, no. 7. Environmental Health Perspectives. <https://ehp.niehs.nih.gov/doi/10.1289/ehp3397>

Figure 1. Predictors of Likelihood of Skin Cancer in NH and RI; Data extracted from the BRFSS survey
Figure 2. Hazard ratios and 95% confidence intervals from fully adjusted models for mortality and living within 250m, 500m, and 1,000m of water. Circle=associations within 250m; diamond=associations within 500m; square=associations within 1,000m. Note: [Circle equals associations] within [250 meters]; [diamond equals associations] within [500 meters]; [square equals associations] within [1,000 meters]. Models stratified by age (5-y categories), sex, and census metropolitan area (CMA); adjusted for visible minority status, Aboriginal identity, marital status, highest level of education, income adequacy decile, and labor force status; and also for contextual variables calculated as census division means subtracted from census tract means using data from the most recent census year: % unemployed (age 25 y and older).

2. Centers for Disease Control and Prevention. (2026, February 4). Behavioral risk factor surveillance system. Centers for Disease Control and Prevention. <https://www.cdc.gov/brfss/index.html>

3. Almeida, C. M. de. (2026, March 31). Free sunscreen dispensers coming to NH communities-apply by April 6. New Hampshire Public Health Association. <https://www.nhpha.org/blog/free-sunscreen-dispensers-coming-to-nh-communities-apply-by-april-6>

Figure 3: Wallace, R.S., Daniell, J.R., Squires, J.D. (2026, April 1). New Hampshire. Encyclopedia Britannica. <https://www.britannica.com/place/New-Hampshire-state>

