Supplementary information

Appendix

Ambient air pollution and prostate cancer in a population-based Canadian case-control study

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┌──────────────────────┐                          ┌──────────────────────┐
│  2781 cases identified│                          │ 4235 men identified  │
│  by cancer registries │                          │ in the population as │
└──────────────────────┘                          │ potential controls   │
                                                    └──────────────────────┘
         │                ┌─────────────────────┐            │
         │                │ 414 excluded:       │            │           ┌──────────────────────┐
         │                │ - Date of diagnosis/ │           │           │ 1688 excluded:       │
         ├───────────────▶│ no confirmed         │            ├──────────▶│ 287: Wrong address   │
         │                │ diagnosis            │            │           │ 1401: Refusal to     │
         │                │ - deceased           │            │           │ participate          │
         │                │ - Residence          │            │           └──────────────────────┘
         │                │ - Difficulty locating│            │
         │                │ (patient/treating    │            │
         │                │ physician)           │            │
         │                │ - treating physician │            │
         │                │ refusal              │            │
         │                └─────────────────────┘            │
         ▼                                                    ▼
┌──────────────────────┐                          ┌──────────────────────┐
│ 2367 questionnaires  │                          │                      │
│ sent                 │                          │                      │
└──────────────────────┘                          │                      │
  ┌──────────────┐                                 │                      │
  │568 patient   │◀──┤                             │                      │
  │refusals to   │                                 │                      │
  │participate   │                                 │                      │
  └──────────────┘                                 │                      │
         ▼                                          ▼
┌──────────────────────┐                          ┌──────────────────────┐
│ 1799 completed and   │                          │ 2547 completed and   │
│ returned             │                          │ returned             │
│ questionnaires       │                          │ questionnaires       │
└──────────────────────┘                          └──────────────────────┘
              ╲                                     ╱
               ┌──────────────────────┐
               │  4346 participants   │
               └──────────────────────┘
                        │        ┌────────────────────────────────────┐
                        │        │ 1502 excluded:                     │
                        ├───────▶│ - 90: No address                   │
                        │        │ - 649: Under 50 years old          │
                        │        │ - 19: No address + Under 50 years old│
                        │        │ - 744: Less than 20 years of        │
                        │        │   residential history              │
                        ▼        └────────────────────────────────────┘
               ┌──────────────────────┐
               │ 2844 included in the │
               │ study population     │
               └──────────────────────┘
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Participants with 20 years of exposition available for the exposure variable

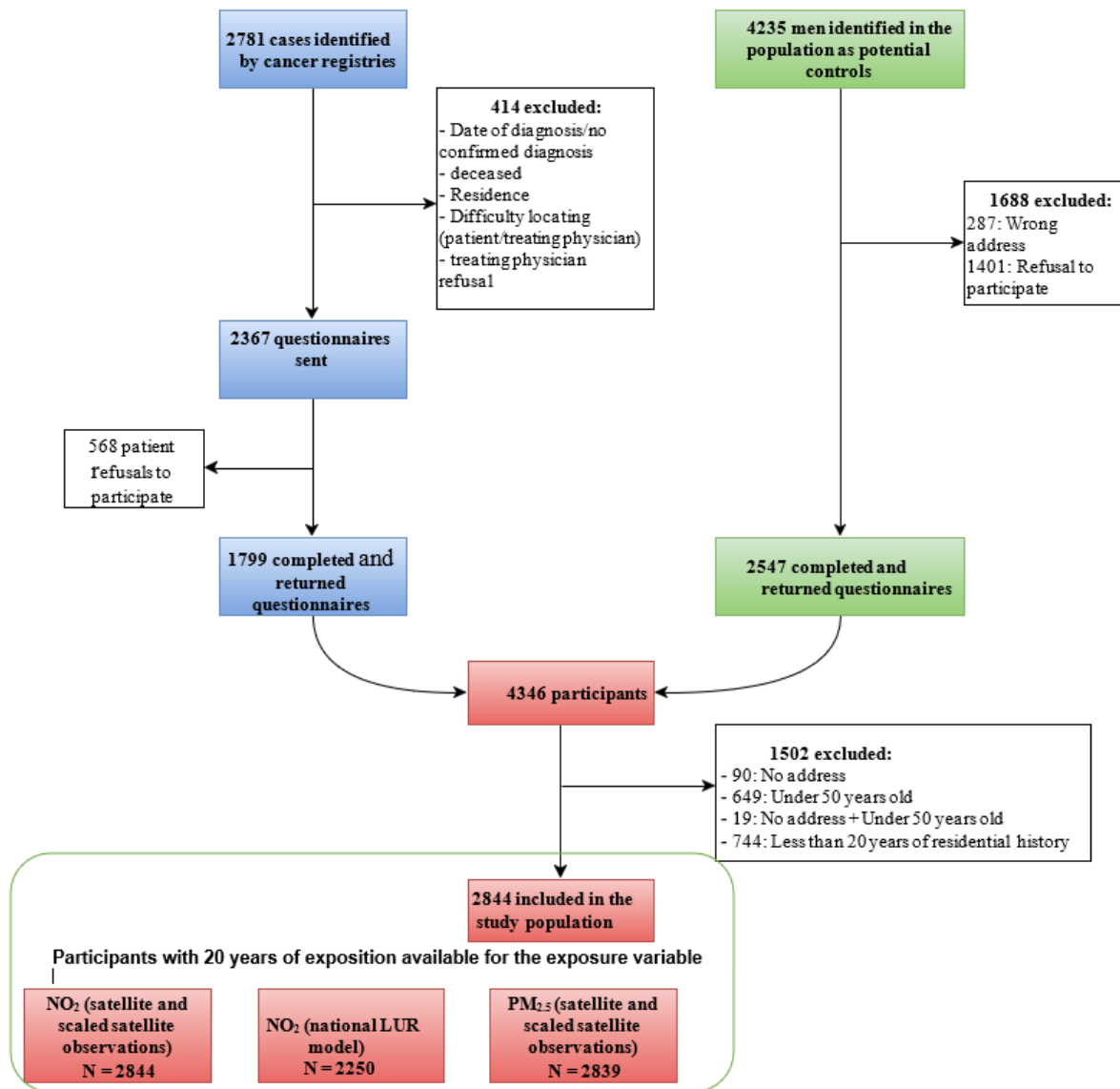| NO_2 (satellite and scaled satellite observations) N = 2844 | NO_2 (national LUR model) N = 2250 | $PM_{2.5}$ (satellite and scaled satellite observations) N = 2839 |

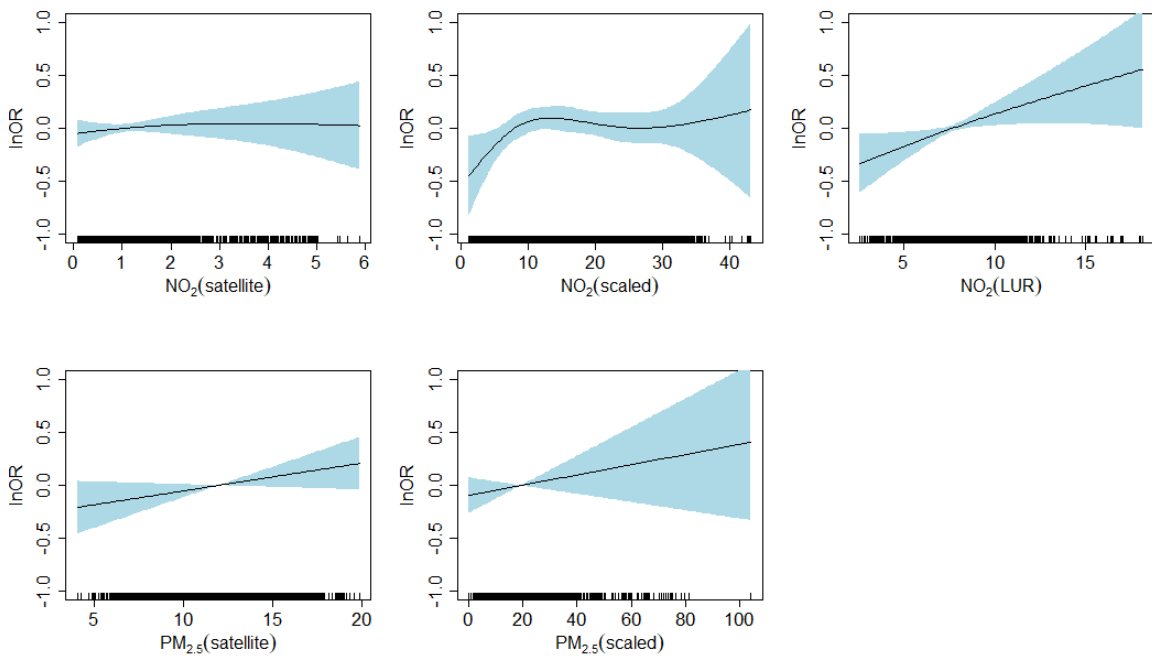Figure S1. Flow-chart of study population

Figure S2a. Exposure-response curves for the relationship between air pollutant concentrations (solid line) and 95% CI (blue shade) over the period from 1975 to 1994 and prostate cancer generated obtained using cubic smoothing splines at 4 df (model 1).
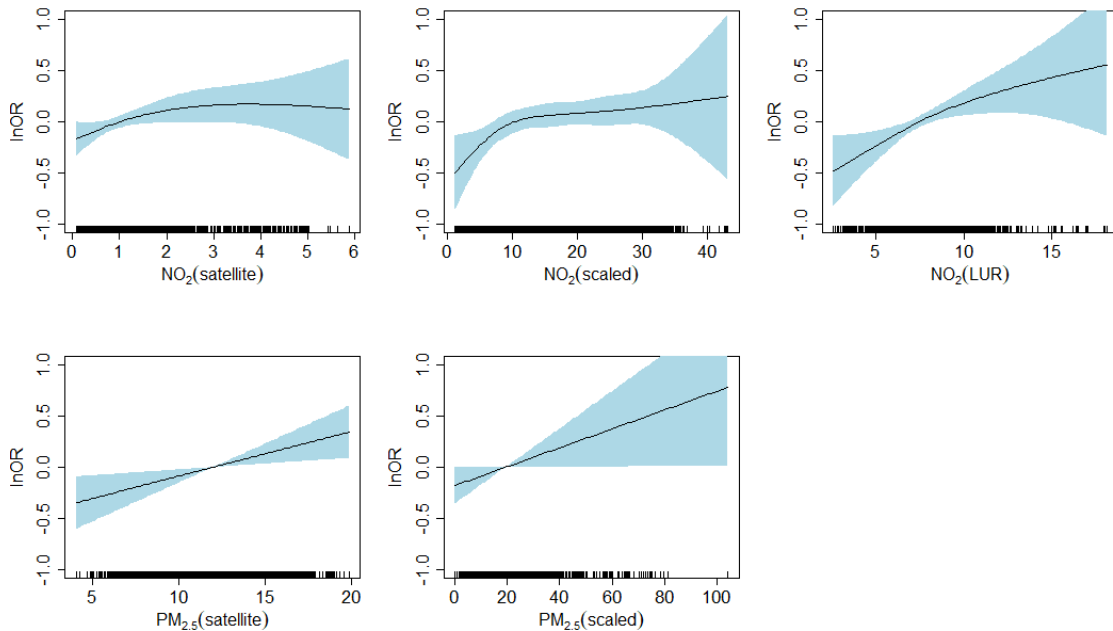

Figure S2b. Exposure-response curves for the relationship between air pollutant concentrations (solid line) and 95% CI (blue shade) over the period from 1975 to 1994 and prostate cancer generated obtained using cubic smoothing splines at 4 df (model 2).

Table S1a. Relationship between prostate cancer risk and having lived near a highway or/and a major road. Unconditional logistic regression on imputed data. Case-control study, NECSS, Canada 1994-1997.

Variable	N	Model 1 * RC (IC 95%)	Model 2 ** RC (IC 95%)	Model 3 *** RC (IC 95%)
Have lived near a highway and/or major road	2 844			
– Never		Ref.	Ref.	Ref.
– Others		1.07 (0.91 -1.25)	1.11 (0.94 -1.30)	1.15 (0.97 -1.38)

*Model 1 adjusted for age and province.

**Model 2 adjusted for: age, province, ethnicity, smoking status, alcohol, BMI, years of education, moderate physical activity, strenuous physical activity, total caloric intake, exposure to pesticides and exposure to cadmium

***Model 3 adjusted for: model 2 variables, neighborhood SSE index and residential surrounding greenness.

Table S1b. Relationship between prostate cancer risk and having lived near a highway or/and a major road. Unconditional logistic regression on complete data. Case-control study, NECSS, Canada 1994-1997.

Variable	N	Model 1 * RC (IC 95%)	N	Model 2 ** RC (IC 95%)	N	Model 3 *** RC (IC 95%)
Have lived near a highway and/or major road	2 838		2 735		2 031	
– Never		Ref.		Ref.		Ref.
– Others		1.07 (0.91 -1.26)		1.12 (0.95-1.32)		1.09 (0.89-1.32)

*Model 1 adjusted for age and province.

**Model 2 adjusted for: age, province, ethnicity, pack-years, alcohol, BMI, years of education, moderate physical activity, strenuous physical activity, total caloric intake, exposure to pesticides and exposure to cadmium

***Model 3 adjusted for: model 2 variables, neighborhood SSE index and residential surrounding greenness.

Table S2. Association between ambient concentrations of NO_2 and $PM_{2.5}$ around residences and incidence of prostate cancer according to interquartile range increases, 1975-1994 (complete data).

Variables	N	Model 1 * OR (95% CI)	N	Model 2 ** OR (95% CI)	N	Model 3 *** OR (95% CI)
NO_2 exposure estimates (ppb). for an increase equal to the IQR[a]						
NO_2 (Satellite)	2,838	1.03 (0.92-1.15)	2,735	1.09 (0.97-1.23)	2,031	1.07 (0.93-1.22)
NO_2 (Scaled)	2,838	1.07 (0.92-1.25)	2,735	1.19 (1.01-1.40)	2,031	1.18 (0.97-1.43)
NO_2 (National LUR)	2,247	1.08 (0.95-1.23)	2,165	1.15 (1.00-1.32)	2,031	1.19 (1.02-1.38)
$PM_{2.5}$ exposure estimates (µg/m3). for an increase equal to the IQR[b]						
$PM_{2.5}$ (Satellite)	2,833	1.23 (1.04-1.45)	2,730	1.31 (1.10-1.55)	2,031	1.27 (1.03-1.57)
$PM_{2.5}$ (Scaled)	2,833	1.12 (0.98-1.29)	2,730	1.23 (1.07-1.42)	2,031	1.21 (1.01-1.45)

* Model 1 adjusted for age and province.

** Model 2 adjusted for: age, province, ethnicity, pack-years, alcohol, BMI, years of education, moderate physical activity, strenuous physical activity, total caloric intake, exposure to pesticides and exposure to cadmium

*** Model 3 adjusted for: model 2 variables, neighborhood SSE index and residential surrounding greenness.

IQR[a] =interquartile range: 1.45 ppb for satellite NO_2, 15.18 for scaled NO_2 and 15.39 for national LUR NO_2.

IQR[b] =interquartile range: 3.56 ppb for satellite $PM_{2.5}$ and 4.48 for scaled $PM_{2.5}$.

Table S3. Association between ambient concentrations of NO_2 and $PM_{2.5}$ around residences and incidence of prostate cancer according to interquartile range increases, restricted analysis on those lived in urban areas, 1975-1994 (imputed data).

Variables	N	Model 1 * OR (CI 95%)	Model 2 ** OR (CI 95%)	Model 3 ** OR (CI 95%)
NO_2 exposure estimates (ppb). for an increase equal to the IQR[a]				
NO_2 (Satellite)	2 159	1.03 (0.91-1.17)	1.10 (0.97-1.25)	1.10 (0.96-1.26)
NO_2 (Scaled)	2 159	1.11 (0.93-1.32)	1.26 (1.05-1.50)	1.27 (1.05-1.54)
NO_2 (national LUR)	1 897	1.13 (0.98-1.31)	1.21 (1.04-1.40)	1.24 (1.07-1.45)
$PM_{2.5}$ exposure estimates (µg/m3). for an increase equal to the IQR[b]				
$PM_{2.5}$ (Satellite)	2 154	1.25 (1.03-1.52)	1.31 (1.08-1.60)	1.31 (1.07-1.60)
$PM_{2.5}$ (Scaled)	2 154	1.12 (0.95-1.31)	1.21 (1.03-1.43)	1.21 (1.02-1.44)

* Model 1 adjusted for age and province.

** Model 2 adjusted for: age, province, ethnicity, pack years, alcohol, BMI, years of education, moderate physical activity, strenuous physical activity, total caloric intake, exposure to pesticides and exposure to cadmium

*** Model 3 adjusted for: model 2 variables, neighborhood SSE index and residential surrounding greenness.

IQR[a] =interquartile range: 1.61 ppb for satellite NO_2, 16.04 for scaled NO_2 and 15.02 for national LUR NO_2.

IQR[b] =interquartile range: 3.59 ppb for satellite $PM_{2.5}$ and 4.28 for scaled $PM_{2.5}$.