
Contributions of traffic to daily PM_{2.5} exposure and links to cancer mortality

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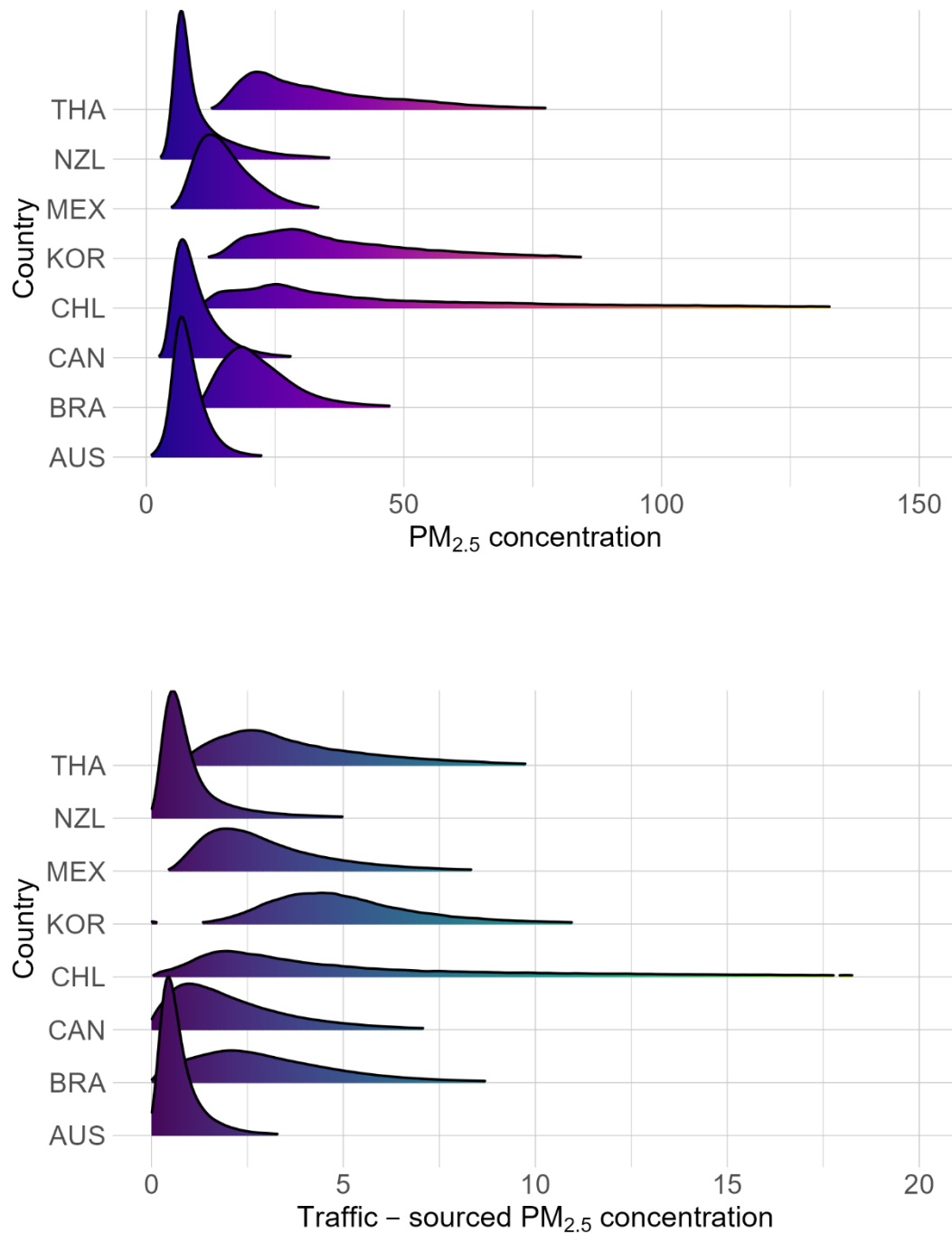


Figure S1. All-source and traffic-sourced PM_{2.5} concentrations (µg/m³) distribution by country during the study period. Density curves show the distribution of daily concentration values within each country. AUS=Australia; BRA=Brazil; CAN=Canada; CHL=Chile; KOR=Korea; MEX=Mexico; NZL=New Zealand; THA=Thailand.

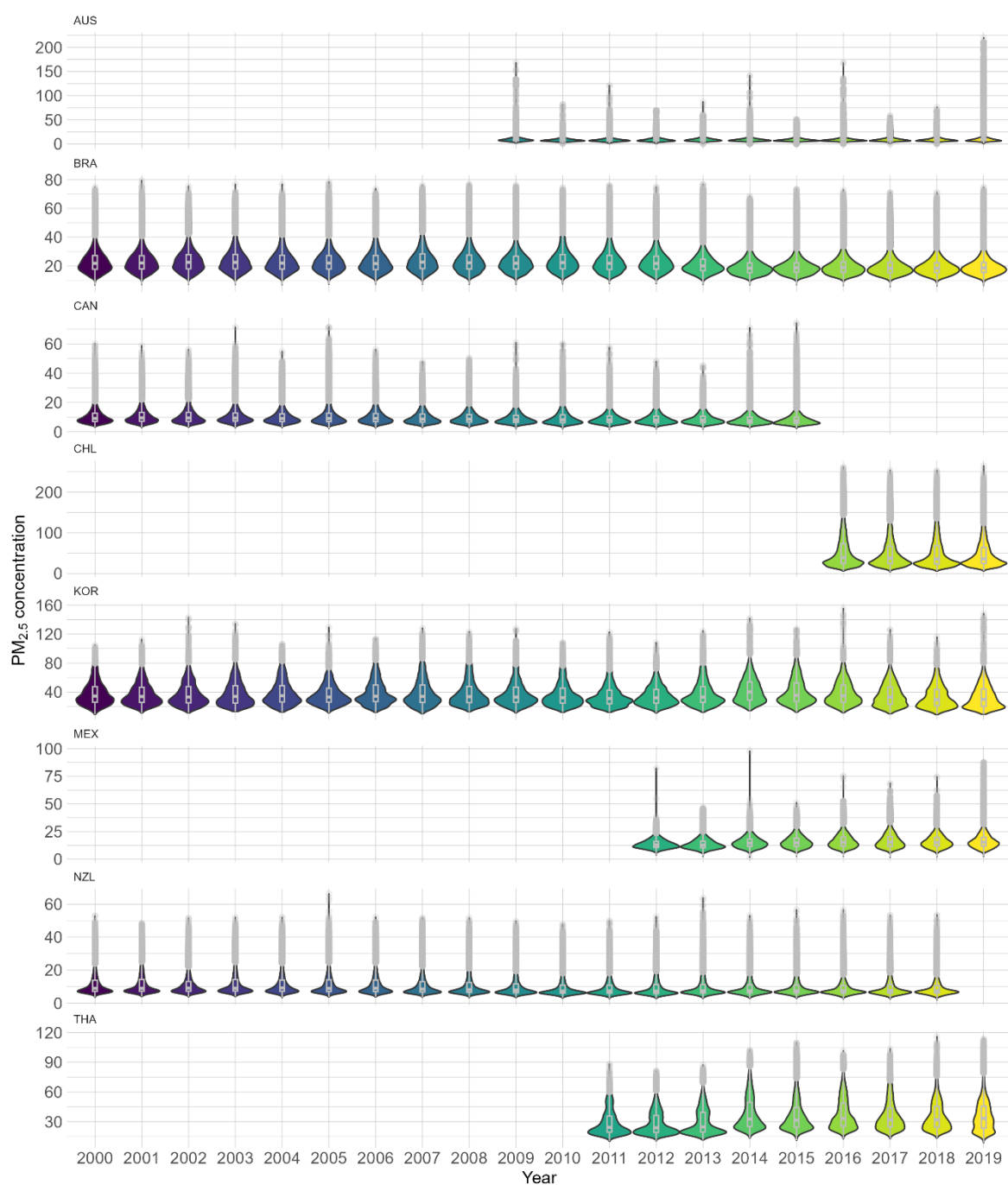


Figure S2. All-source PM_{2.5} (µg/m³) violin plot by country and year during the study period. The lower, mid and upper hinges of the box correspond to the 25th, 50th and 75th percentiles and whiskers extend to 1.5 times the interquartile range. AUS=Australia; BRA=Brazil; CAN=Canada; CHL=Chile; KOR=Korea; MEX=Mexico; NZL=New Zealand; THA=Thailand.

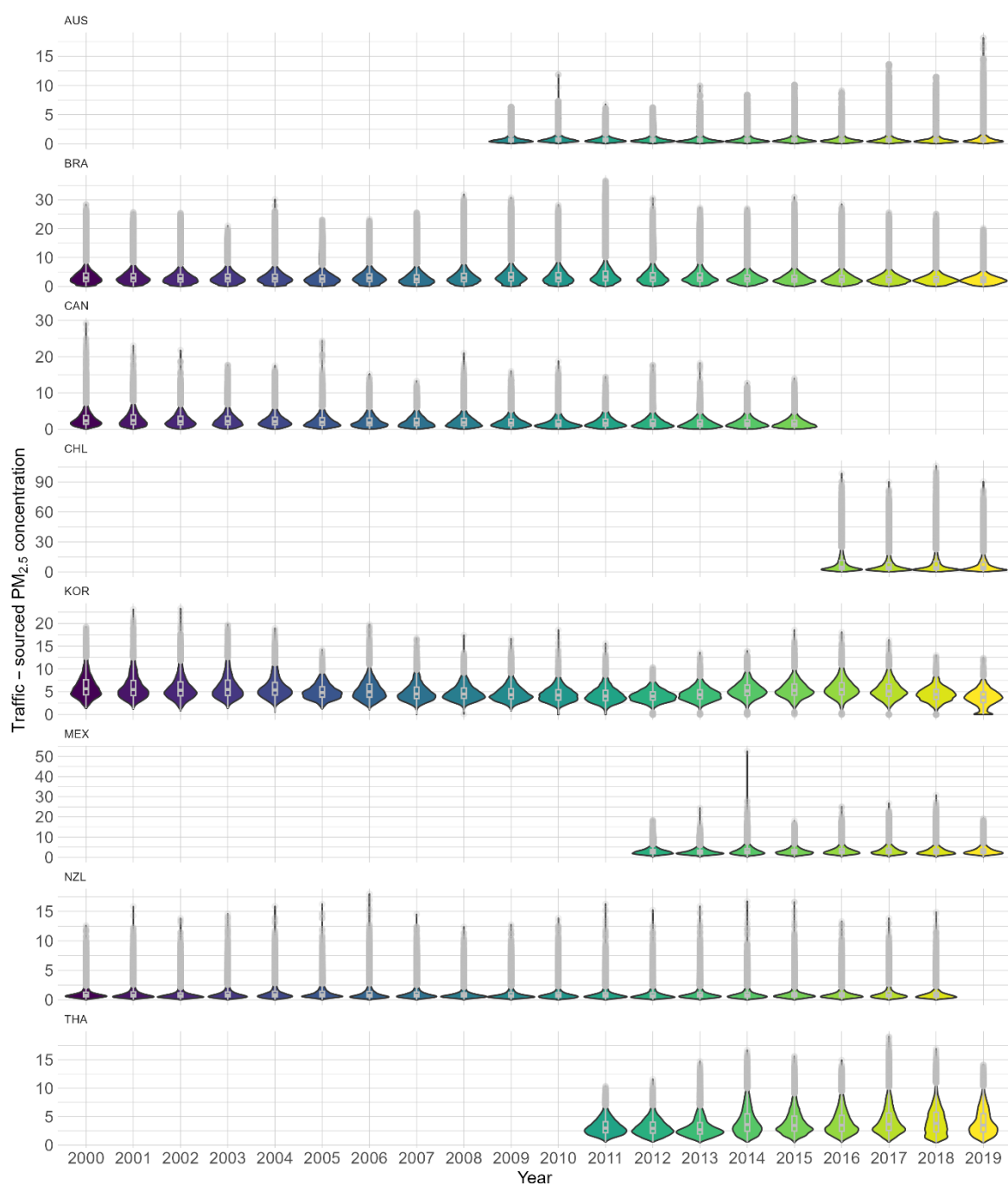


Figure S3. TSPM_{2.5} ($\mu\text{g}/\text{m}^3$) violin plot by country and year during the study period. The lower, mid and upper hinges of the box correspond to the 25th, 50th and 75th percentiles and whiskers extend to 1.5 times the interquartile range. AUS=Australia; BRA=Brazil; CAN=Canada; CHL=Chile; KOR=Korea; MEX=Mexico; NZL=New Zealand; THA=Thailand.

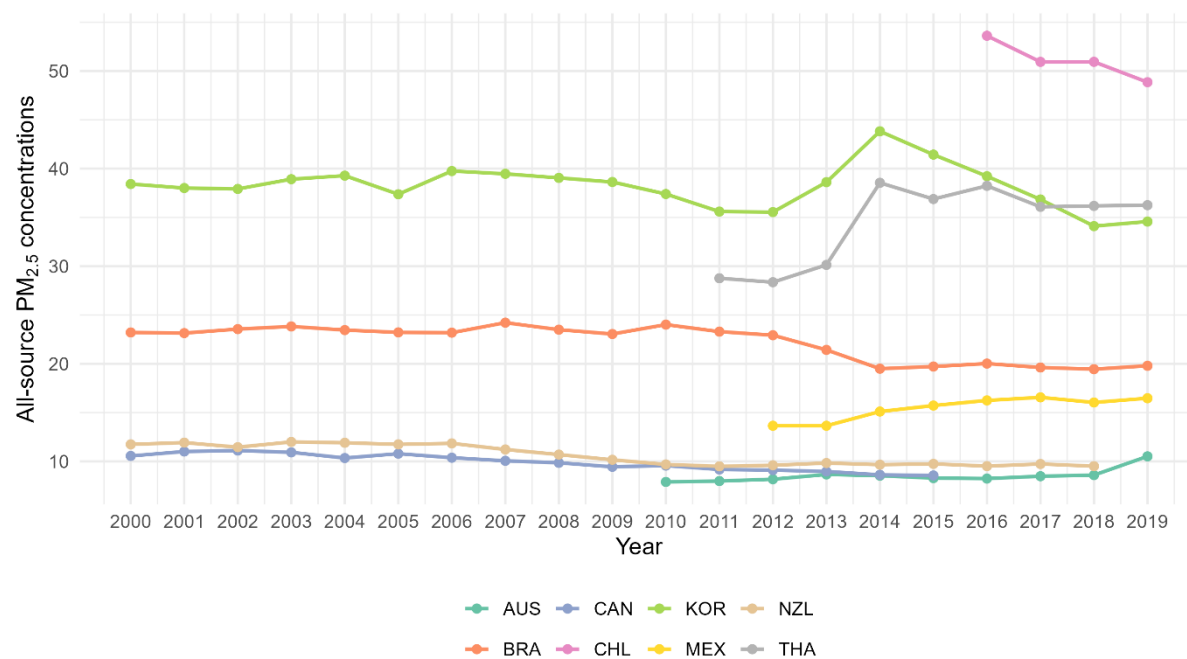


Figure S4. All-source PM_{2.5} concentrations (µg/m³) by country and year during the study period. Points indicate annual mean daily concentrations. AUS=Australia; BRA=Brazil; CAN=Canada; CHL=Chile; KOR=Korea; MEX=Mexico; NZL=New Zealand; THA=Thailand.

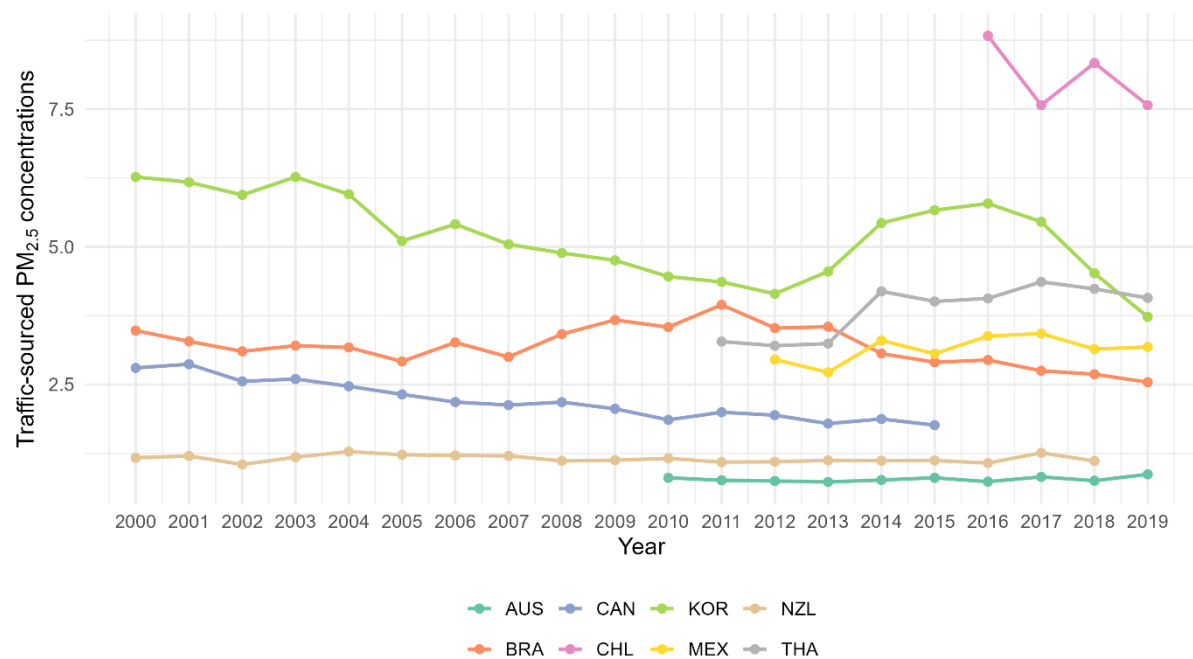


Figure S5. Traffic-sourced PM_{2.5} concentrations (µg/m³) by country and year during the study period. Points indicate annual mean daily concentrations. AUS=Australia; BRA=Brazil; CAN=Canada; CHL=Chile; KOR=Korea; MEX=Mexico; NZL=New Zealand; THA=Thailand.

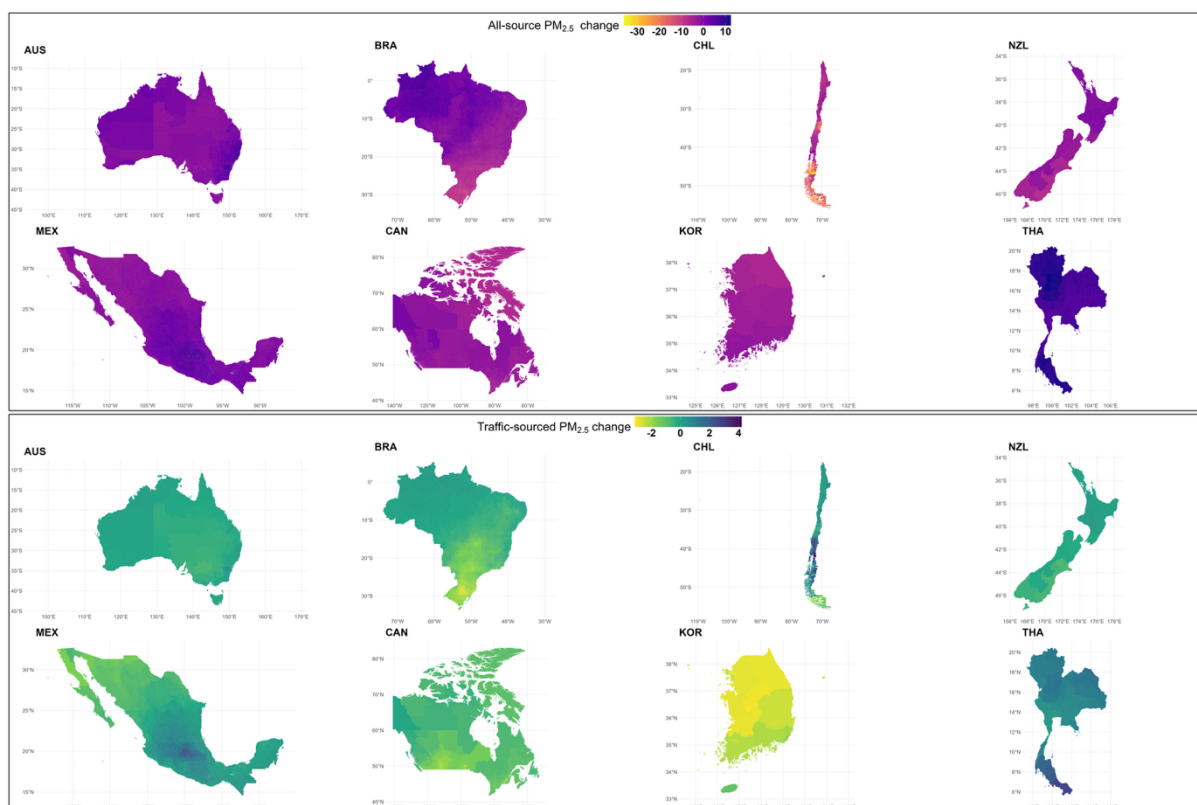


Figure S6. The spatial distributions of changes in daily average concentrations ($\mu\text{g}/\text{m}^3$) of all-source $\text{PM}_{2.5}$ and traffic-sourced $\text{PM}_{2.5}$ in the eight study countries from the earliest to latest period. Map data from the public domain Natural Earth project (source: <https://www.naturalearthdata.com/downloads/>; terms of use: www.naturalearthdata.com/about/terms-of-use/) and OpenStreetMap (available under the Open Database License (ODbL): <https://www.openstreetmap.org/copyright>). AUS=Australia; BRA=Brazil; CAN=Canada; CHL=Chile; KOR=Korea; MEX=Mexico; NZL=New Zealand; THA=Thailand.

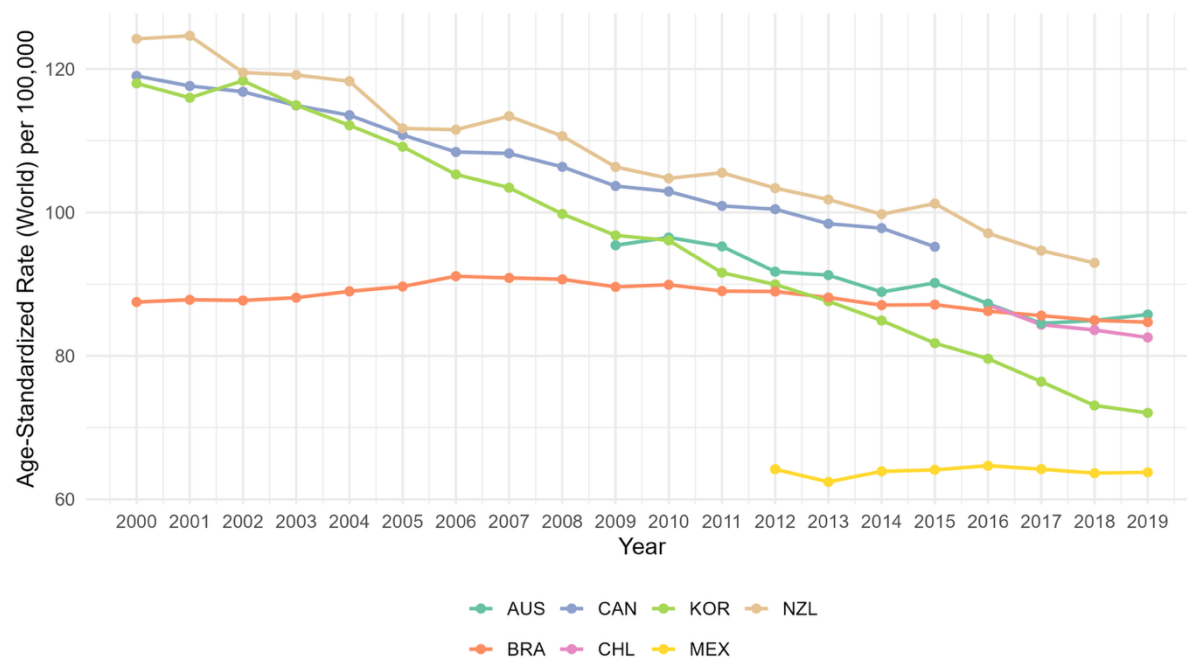


Figure S7. Age-standardized (world) cancer mortality rate per 100,000 in Australia, Brazil, Canada, Chile, Korea, Mexico and New Zealand (Thailand data were not available). (Note: AUS=Australia; BRA=Brazil; CAN=Canada; CHL=Chile; KOR=Korea; MEX=Mexico; NZL=New Zealand; THA=Thailand. Data source: https://gco.iarc.fr/overtime/en/dataviz/trends?populations=36_76_124_152_410_484_554&sexes=0&types=1&multiple_populations=1&cancers=0&years=2000_2019)

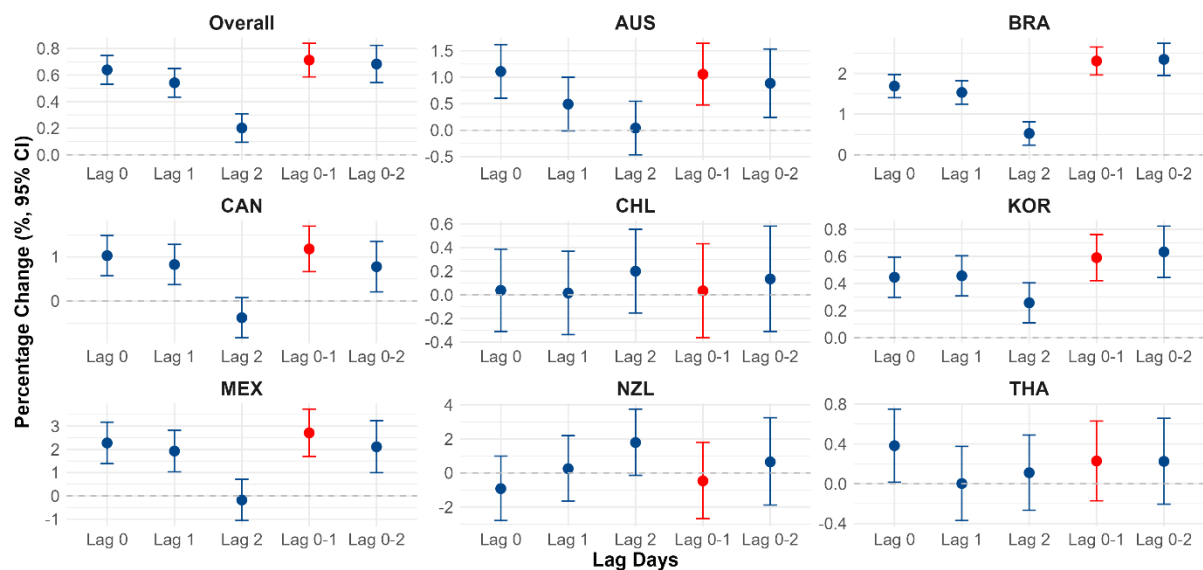


Figure S8. Estimated percentage change in cancer mortality risk for the association between a 10- $\mu\text{g}/\text{m}^3$ increase in single lag0–lag2 and moving average ambient all-source $\text{PM}_{2.5}$ exposure in each country during the study period. The centres of the error bars represent model-based percentage change estimates, with error bars indicating two-sided 95% confidence intervals. Red error bars indicate the main exposure window used in the primary analysis. AUS=Australia; BRA=Brazil; CAN=Canada; CHL=Chile; KOR=Korea; MEX=Mexico; NZL=New Zealand; THA=Thailand.

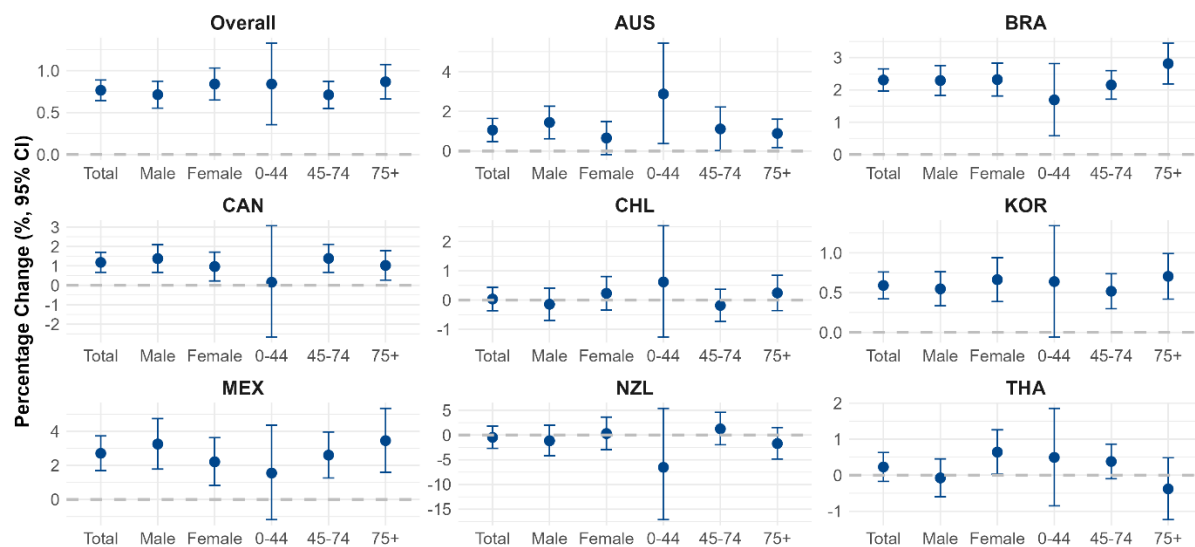


Figure S9. Percentage change in cancer mortality per 10 $\mu\text{g}/\text{m}^3$ increase in 2-day (lag0-1) average ambient all-source $\text{PM}_{2.5}$ exposure in each country by sex and age. The centres of the error bars represent model-based percentage change estimates, with error bars indicating two-sided 95% confidence intervals. AUS=Australia; BRA=Brazil; CAN=Canada; CHL=Chile; KOR=Korea; MEX=Mexico; NZL=New Zealand; THA=Thailand.

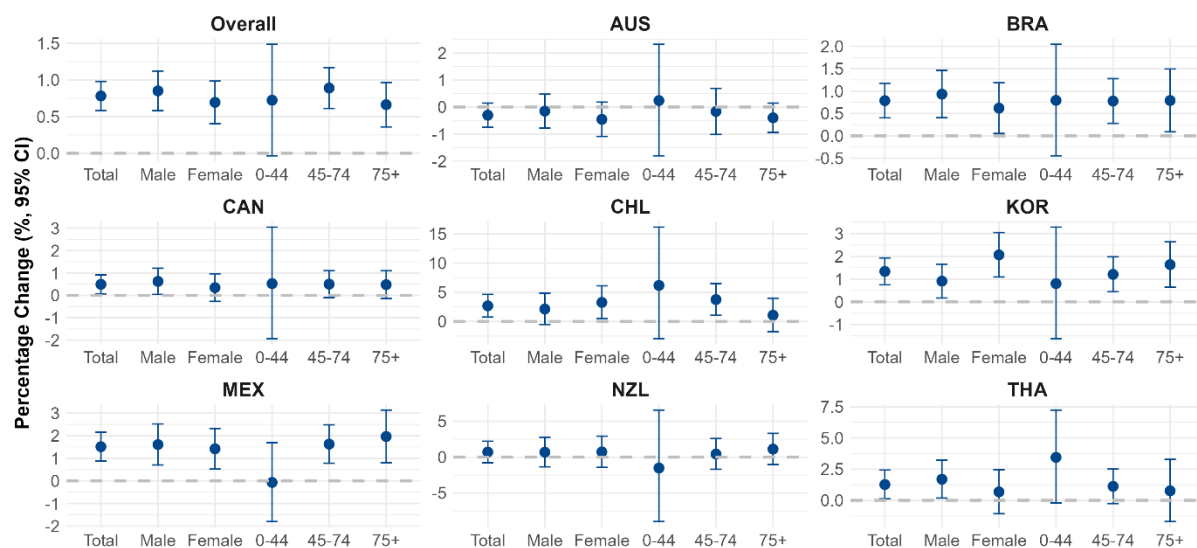


Figure S10. Percentage change in cancer mortality per 10 $\mu\text{g}/\text{m}^3$ increase in 2-day (lag0-1) average ambient TSPM_{2.5} exposure in each country by sex and age. The centres of the error bars represent model-based percentage change estimates, with error bars indicating two-sided 95% confidence intervals. AUS=Australia; BRA=Brazil; CAN=Canada; CHL=Chile; KOR=Korea; MEX=Mexico; NZL=New Zealand; THA=Thailand.

Table S1. Sensitivity analyses for percentage change in cancer mortality risk for the association between a 10- $\mu\text{g}/\text{m}^3$ increase in 2-day (lag0-1) ambient all-source and traffic-sourced PM_{2.5} exposure.

Model	Percentage Change, % (95% CI)	
	All-source PM _{2.5}	Traffic-sourced PM _{2.5}
Main model	0.77 (0.64, 0.89)	3.87 (3.28, 4.47)
Main model + Ozone	0.78 (0.68, 0.85)	
Main model + non-traffic-sourced PM _{2.5}		3.03 (2.37, 3.70)
df=1	0.76 (0.64, 0.89)	3.86 (3.23, 4.44)
df=2	0.77 (0.65, 0.89)	3.88 (3.28, 4.47)
df=3	0.77 (0.64, 0.89)	3.88 (3.28, 4.47)
df=4	0.77 (0.64, 0.89)	3.88 (3.28, 4.47)
df=5	0.77 (0.64, 0.89)	3.88 (3.28, 4.78)
Comparison of outcomes using primary cause of death vs. primary + other causes (Brazil)		
Primary cause of death	2.31 (1.96, 2.65)	6.55 (5.40, 7.71)
Primary + other causes of death	2.33 (1.23, 3.44)	6.64 (6.29, 7.00)

Note: the cross-basis function of daily mean temperature (lag 0-21, df=4) and relative humidity (lag 0-7, df=3) were used in the model.

Table S2. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient all-source PM_{2.5} exposure

Cancer site	Percentage Change, % (95% CI)	<i>P</i> Value	<i>P</i> Value adjusted
Gallbladder	0.57 (-0.02, 1.17)	0.06	0.13
Leukaemia	0.31 (-0.43, 1.06)	0.41	0.44
Liver	0.29 (-0.07, 0.64)	0.11	0.16
Lung	0.80 (0.51, 1.09)	<0.001	<0.001
Prostate	1.39 (0.73, 2.05)	<0.001	0.00
Pancreas	0.47 (-0.07, 1.02)	0.09	0.13
Breast	1.42 (0.83, 2.02)	<0.001	<0.001
Colon-rectum	0.79 (0.38, 1.19)	0.00	0.00
Bone	1.09 (-0.67, 2.88)	0.23	0.27
Oesophagus	0.98 (0.18, 1.79)	0.02	0.04
Stomach	0.76 (0.38, 1.15)	<0.001	<0.001
Larynx	1.89 (0.56, 3.24)	0.01	0.02
Brain	1.41 (0.57, 2.26)	0.00	0.00
Oral	0.88 (-0.07, 1.85)	0.07	0.13
Lymphoma	0.35 (-0.31, 1.01)	0.30	0.35
Thyroid	1.77 (-0.06, 3.63)	0.06	0.13
Ovary	0.76 (-0.24, 1.78)	0.14	0.18
Kidney	0.84 (-0.09, 1.78)	0.08	0.13
Nasopharynx	2.13 (-0.30, 4.61)	0.09	0.13
Uterus	1.20 (-0.13, 2.55)	0.08	0.13
Bladder	0.71 (-0.26, 1.68)	0.15	0.19
Cervix	1.20 (0.25, 2.15)	0.01	0.04
Skin	0.35 (-1.32, 2.05)	0.68	0.68
Testis	1.59 (-2.27, 5.60)	0.43	0.44

Table S3. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient all-source PM_{2.5} exposure in Australia during 2009-2019.

Cancer site	Percentage Change, % (95% CI)	<i>P</i> Value	<i>P</i> Value adjusted
Bladder	2.55 (-4.64, 10.29)	0.50	0.75
Bone	0.96 (-22.00, 30.69)	0.94	0.97
Brain	-1.17 (-7.35, 5.43)	0.72	0.87
Breast	1.56 (-2.47, 5.76)	0.45	0.75
Cervix	5.77 (-9.97, 24.25)	0.5	0.75
Colon-rectum	1.01 (-2.51, 4.65)	0.58	0.81
Gallbladder	-16.68 (-28.18, -3.33)	0.02	0.19
Kidney	3.65 (-2.66, 10.38)	0.26	0.75
Larynx	3.96 (-11.79, 22.50)	0.64	0.81
Leukaemia	1.27 (-4.01, 6.85)	0.64	0.81
Liver	4.74 (-0.63, 10.41)	0.08	0.68
Lung	0.93 (-1.56, 3.50)	0.47	0.75
Lymphoma	-2.14 (-6.48, 2.40)	0.35	0.75
Nasopharynx	-18.1 (-40.7, 13.12)	0.23	0.75
Oesophagus	-4.42 (-10.26, 1.79)	0.16	0.75
Oral	-3.03 (-10.63, 5.22)	0.46	0.75
Ovary	-4.09 (-11.09, 3.46)	0.28	0.75
Pancreas	-0.59 (-4.72, 3.72)	0.79	0.90
Prostate	-2.23 (-6.11, 1.82)	0.28	0.75
Skin	-0.14 (-6.19, 6.30)	0.97	0.97
Stomach	2.36 (-3.97, 9.10)	0.47	0.75
Testis	3.01 (-38.89, 73.62)	0.91	0.97
Thyroid	-8.91 (-25.96, 12.07)	0.38	0.75
Uterus	12.76 (2.30, 24.29)	0.02	0.19

Table S4. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient all-source PM_{2.5} exposure in Brazil during 2000-2019.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	1.71 (-0.73, 4.20)	0.17	0.23
Bone	3.71 (-0.02, 7.58)	0.05	0.09
Brain	3.21 (1.55, 4.90)	<0.001	<0.001
Breast	3.25 (1.98, 4.54)	<0.001	<0.001
Cervix	2.38 (0.21, 4.59)	0.03	0.06
Colon-rectum	2.19 (1.00, 3.40)	<0.001	<0.001
Gallbladder	-0.22 (-2.85, 2.48)	0.87	0.87
Kidney	3.96 (1.25, 6.73)	<0.001	0.01
Larynx	3.20 (0.87, 5.59)	0.01	0.02
Leukaemia	0.73 (-1.09, 2.60)	0.43	0.52
Liver	1.09 (-0.54, 2.74)	0.19	0.24
Lung	1.80 (0.86, 2.75)	<0.001	<0.001
Lymphoma	1.57 (-0.14, 3.31)	0.07	0.11
Nasopharynx	-1.14 (-9.22, 7.66)	0.79	0.83
Oesophagus	2.71 (1.09, 4.36)	<0.001	0.00
Oral	1.64 (-0.15, 3.46)	0.07	0.11
Ovary	1.85 (-0.73, 4.51)	0.16	0.23
Pancreas	1.72 (0.13, 3.34)	0.03	0.06
Prostate	3.30 (1.96, 4.66)	<0.001	<0.001
Skin	-0.46 (-3.78, 2.98)	0.79	0.83
Stomach	2.40 (1.15, 3.67)	<0.001	<0.001
Testis	1.28 (-6.3, 9.48)	0.75	0.83
Thyroid	6.50 (0.56, 12.79)	0.03	0.06
Uterus	2.86 (0.30, 5.49)	0.03	0.06

Table S5. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient all-source PM_{2.5} exposure in Canada during 2000-2015.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	-0.76 (-3.87, 2.45)	0.64	0.89
Bone	7.16 (-3.72, 19.28)	0.21	0.81
Brain	0.60 (-2.58, 3.88)	0.71	0.89
Breast	1.83 (-0.05, 3.73)	0.06	0.45
Cervix	4.63 (-2.24, 11.98)	0.19	0.81
Colon-rectum	0.64 (-0.89, 2.19)	0.41	0.83
Gallbladder	0.48 (-5.38, 6.70)	0.88	0.95
Kidney	0.89 (-2.44, 4.34)	0.60	0.89
Larynx	-1.18 (-7.22, 5.24)	0.71	0.89
Leukaemia	1.07 (-1.67, 3.88)	0.45	0.83
Liver	1.41 (-1.65, 4.56)	0.37	0.81
Lung	1.68 (0.67, 2.70)	<0.001	0.03
Lymphoma	0.09 (-1.98, 2.21)	0.93	0.95
Nasopharynx	7.22 (-5.43, 21.55)	0.28	0.81
Oesophagus	0.20 (-3.14, 3.65)	0.91	0.95
Oral	2.01 (-2.16, 6.34)	0.35	0.81
Ovary	-0.69 (-3.92, 2.66)	0.68	0.89
Pancreas	1.13 (-1.09, 3.40)	0.32	0.81
Prostate	1.78 (-0.46, 4.07)	0.12	0.72
Skin	1.11 (-3.29, 5.71)	0.63	0.89
Stomach	3.37 (0.33, 6.51)	0.03	0.35
Testis	0.79 (-19.59, 26.34)	0.95	0.95
Thyroid	-1.72 (-11.32, 8.91)	0.74	0.89
Uterus	2.34 (-2.22, 7.11)	0.32	0.81

Table S6. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient all-source PM_{2.5} exposure in Chile during 2016-2019.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	2.78 (-0.25, 5.90)	0.07	0.87
Bone	-1.31 (-6.53, 4.21)	0.64	0.95
Brain	1.63 (-1.28, 4.63)	0.28	0.89
Breast	-0.50 (-2.13, 1.15)	0.55	0.95
Cervix	-1.96 (-4.55, 0.7)	0.15	0.89
Colon-rectum	1.44 (0.19, 2.69)	0.02	0.56
Gallbladder	0.69 (-0.88, 2.29)	0.39	0.95
Kidney	0.35 (-1.76, 2.50)	0.75	0.95
Larynx	-0.50 (-6.15, 5.49)	0.87	0.95
Leukaemia	-0.15 (-2.39, 2.16)	0.90	0.95
Liver	0.09 (-1.68, 1.88)	0.93	0.95
Lung	0.49 (-0.68, 1.68)	0.41	0.95
Lymphoma	-0.51 (-2.27, 1.29)	0.58	0.95
Nasopharynx	-7.57 (-20.3, 7.19)	0.30	0.89
Oesophagus	-0.07 (-2.54, 2.45)	0.95	0.95
Oral	2.65 (-1.52, 6.99)	0.22	0.89
Ovary	1.65 (-1.28, 4.65)	0.27	0.89
Pancreas	0.10 (-1.58, 1.80)	0.91	0.95
Prostate	-0.18 (-1.51, 1.18)	0.80	0.95
Skin	-0.42 (-4.42, 3.74)	0.84	0.95
Stomach	-0.33 (-1.43, 0.79)	0.56	0.95
Testis	-0.32 (-6.68, 6.47)	0.92	0.95
Thyroid	-2.96 (-7.78, 2.10)	0.25	0.89
Uterus	0.16 (-3.28, 3.73)	0.93	0.95

Table S7. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient all-source PM_{2.5} exposure in Korea during 2000-2019.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	0.22 (-1.11, 1.57)	0.75	0.89
Bone	0.27 (-2.93, 3.57)	0.87	0.91
Brain	0.71 (-0.57, 2.01)	0.28	0.49
Breast	0.67 (-0.34, 1.69)	0.19	0.42
Cervix	1.33 (-0.12, 2.79)	0.07	0.25
Colon-rectum	0.61 (0.08, 1.14)	0.02	0.12
Gallbladder	0.63 (-0.12, 1.38)	0.10	0.26
Kidney	0.15 (-1.20, 1.51)	0.83	0.90
Larynx	0.82 (-1.22, 2.89)	0.43	0.65
Leukaemia	-0.28 (-1.38, 0.83)	0.62	0.83
Liver	0.52 (0.09, 0.95)	0.02	0.11
Lung	0.63 (0.26, 0.99)	<0.001	0.01
Lymphoma	0.14 (-0.81, 1.09)	0.78	0.89
Nasopharynx	5.96 (2.30, 9.75)	<0.001	0.01
Oesophagus	0.86 (-0.33, 2.06)	0.16	0.37
Oral	0.84 (-0.7, 2.39)	0.29	0.49
Ovary	0.40 (-1.09, 1.91)	0.6	0.83
Pancreas	0.14 (-0.55, 0.83)	0.69	0.88
Prostate	0.51 (-0.73, 1.77)	0.42	0.65
Skin	1.80 (-1.39, 5.09)	0.27	0.49
Stomach	0.73 (0.28, 1.18)	<0.001	0.01
Testis	12.01 (0.27, 25.13)	0.04	0.18
Thyroid	2.13 (-0.29, 4.60)	0.08	0.25
Uterus	-0.04 (-2.39, 2.37)	0.97	0.97

Table S8. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient all-source PM_{2.5} exposure in Mexico during 2012-2019.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	11.38 (2.52, 21.01)	0.01	0.13
Bone	-1.75 (-10.08, 7.36)	0.70	0.80
Brain	-1.96 (-7.59, 4.01)	0.51	0.74
Breast	3.38 (-0.07, 6.94)	0.06	0.22
Cervix	3.75 (-0.84, 8.54)	0.11	0.27
Colon-rectum	0.74 (-2.83, 4.45)	0.69	0.80
Gallbladder	1.58 (-5.00, 8.62)	0.65	0.80
Kidney	5.78 (0.08, 11.81)	0.05	0.22
Larynx	4.57 (-6.4, 16.84)	0.43	0.69
Leukaemia	1.19 (-3.00, 5.56)	0.58	0.78
Liver	1.57 (-1.97, 5.23)	0.39	0.67
Lung	5.79 (2.07, 9.65)	<0.001	0.05
Lymphoma	1.97 (-2.22, 6.34)	0.36	0.67
Nasopharynx	-4.35 (-32.04, 34.62)	0.80	0.87
Oesophagus	8.37 (-0.89, 18.49)	0.08	0.25
Oral	-5.55 (-13.35, 2.95)	0.19	0.42
Ovary	4.58 (-0.97, 10.43)	0.11	0.27
Pancreas	4.46 (0.06, 9.06)	0.05	0.22
Prostate	3.24 (-0.40, 7.02)	0.08	0.25
Skin	-10.89 (-19.72, -1.08)	0.03	0.22
Stomach	-0.06 (-3.57, 3.57)	0.97	0.97
Testis	0.52 (-9.68, 11.87)	0.92	0.96
Thyroid	3.15 (-6.24, 13.48)	0.52	0.74
Uterus	4.55 (-3.52, 13.30)	0.28	0.55

Table S9. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient all-source PM_{2.5} exposure in New Zealand during 2000-2018.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	-7.81 (-20.65, 7.12)	0.29	0.54
Bone	29.26 (-18.53, 105.09)	0.28	0.54
Brain	-14.84 (-25.3, -2.92)	0.02	0.20
Breast	-5.02 (-12.45, 3.04)	0.22	0.54
Cervix	22.04 (-8.88, 63.45)	0.18	0.54
Colon-rectum	7.48 (1.43, 13.90)	0.01	0.20
Gallbladder	4.79 (-17.68, 33.39)	0.70	0.77
Kidney	-8.83 (-20.99, 5.21)	0.21	0.54
Larynx	-21.18 (-44.98, 12.9)	0.19	0.54
Leukaemia	-4.60 (-15.4, 7.58)	0.44	0.62
Liver	-7.72 (-20.52, 7.15)	0.29	0.54
Lung	-2.65 (-7.61, 2.58)	0.31	0.54
Lymphoma	8.18 (-1.38, 18.67)	0.10	0.54
Nasopharynx	-26.58 (-64.57, 52.14)	0.41	0.61
Oesophagus	3.25 (-10.02, 18.47)	0.65	0.74
Oral	12.34 (-7.89, 37.02)	0.25	0.54
Ovary	-10.97 (-23.52, 3.65)	0.13	0.54
Pancreas	-2.71 (-11.98, 7.54)	0.59	0.71
Prostate	2.89 (-5.49, 12.02)	0.51	0.64
Skin	-1.88 (-12.9, 10.53)	0.76	0.79
Stomach	-4.21 (-15.56, 8.67)	0.50	0.64
Testis	6.92 (-56.52, 162.96)	0.88	0.88
Thyroid	24.78 (-21.03, 97.17)	0.34	0.55
Uterus	-12.65 (-30.09, 9.14)	0.23	0.54

Table S10. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient all-source PM_{2.5} exposure in Thailand during 2011-2019.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	-0.53 (-4.47, 3.58)	0.80	0.94
Bone	-0.21 (-3.63, 3.33)	0.90	0.94
Brain	0.90 (-1.74, 3.62)	0.51	0.91
Breast	1.27 (-0.49, 3.06)	0.16	0.63
Cervix	2.15 (-0.23, 4.59)	0.08	0.61
Colon-rectum	-0.78 (-2.44, 0.90)	0.36	0.90
Gallbladder	0.65 (-1.02, 2.36)	0.45	0.90
Kidney	1.41 (-3.29, 6.34)	0.56	0.91
Larynx	3.85 (-0.23, 8.09)	0.06	0.61
Leukaemia	1.60 (-0.61, 3.86)	0.16	0.63
Liver	-0.70 (-1.53, 0.14)	0.10	0.61
Lung	0.25 (-0.70, 1.21)	0.60	0.91
Lymphoma	1.87 (-1.35, 5.19)	0.26	0.89
Nasopharynx	-0.34 (-4.35, 3.84)	0.87	0.94
Oesophagus	-0.34 (-3.06, 2.45)	0.81	0.94
Oral	0.42 (-1.96, 2.87)	0.73	0.94
Ovary	1.30 (-2.01, 4.72)	0.45	0.90
Pancreas	1.38 (-1.66, 4.52)	0.38	0.90
Prostate	1.27 (-1.74, 4.38)	0.41	0.90
Skin	1.02 (-14.45, 19.29)	0.90	0.94
Stomach	-0.07 (-2.53, 2.45)	0.96	0.96
Testis	-5.45 (-21.97, 14.57)	0.57	0.91
Thyroid	5.74 (-0.47, 12.33)	0.07	0.61
Uterus	-0.67 (-4.82, 3.67)	0.76	0.94

Table S11. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient TSPM_{2.5} exposure

Cancer site	Percentage Change, % (95% CI)	<i>P</i> Value	<i>P</i> Value adjusted
Gallbladder	3.98 (0.94, 7.11)	0.01	0.03
Leukaemia	2.09 (-1.2, 5.49)	0.22	0.25
Liver	2.00 (-0.06, 4.11)	0.06	0.09
Lung	4.10 (2.62, 5.60)	<0.001	<0.001
Prostate	6.27 (3.71, 8.89)	<0.001	<0.001
Pancreas	3.27 (0.67, 5.93)	0.01	0.04
Breast	3.77 (1.32, 6.29)	0.00	0.01
Colon-rectum	5.57 (3.61, 7.58)	<0.001	<0.001
Bone	7.13 (-0.63, 15.49)	0.07	0.10
Oesophagus	2.51 (-0.92, 6.07)	0.15	0.18
Stomach	3.65 (1.72, 5.61)	0.00	0.00
Larynx	5.86 (0.12, 11.94)	0.05	0.07
Brain	6.33 (2.65, 10.13)	0.00	0.00
Oral	4.54 (0.30, 8.96)	0.04	0.07
Lymphoma	2.98 (0.10, 5.94)	0.04	0.07
Thyroid	9.44 (0.64, 19.02)	0.04	0.07
Ovary	3.53 (-0.84, 8.10)	0.11	0.15
Kidney	4.74 (0.74, 8.89)	0.02	0.05
Nasopharynx	7.34 (-6.13, 22.76)	0.30	0.33
Uterus	6.09 (0.64, 11.84)	0.03	0.07
Bladder	3.42 (-0.93, 7.97)	0.13	0.16
Cervix	4.43 (0.23, 8.81)	0.04	0.07
Skin	-0.85 (-6.92, 5.62)	0.79	0.83
Testis	-0.21 (-12.43, 13.71)	0.97	0.97

Table S12. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient TSPM_{2.5} exposure in Australia during 2009-2019.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	-0.74 (-5.94, 4.74)	0.79	0.86
Bone	13.28 (-5.79, 36.20)	0.18	0.69
Brain	-4.63 (-9.05, 0)	0.05	0.40
Breast	-0.69 (-3.84, 2.57)	0.67	0.85
Cervix	5.27 (-6.63, 18.67)	0.40	0.69
Colon-rectum	-0.19 (-2.85, 2.54)	0.89	0.89
Gallbladder	-10.66 (-19.68, -0.62)	0.04	0.40
Kidney	-0.58 (-5.51, 4.60)	0.82	0.86
Larynx	1.80 (-10.71, 16.06)	0.79	0.86
Leukaemia	-4.90 (-8.85, -0.79)	0.02	0.40
Liver	-1.95 (-6.04, 2.33)	0.37	0.69
Lung	0.83 (-1.14, 2.84)	0.41	0.69
Lymphoma	2.13 (-1.35, 5.72)	0.23	0.69
Nasopharynx	-9.98 (-28.09, 12.67)	0.36	0.69
Oesophagus	-1.89 (-6.72, 3.19)	0.46	0.69
Oral	4.26 (-2.54, 11.53)	0.23	0.69
Ovary	2.24 (-3.39, 8.19)	0.44	0.69
Pancreas	2.13 (-1.22, 5.60)	0.21	0.69
Prostate	1.03 (-2.06, 4.22)	0.52	0.73
Skin	-2.42 (-7.09, 2.48)	0.33	0.69
Stomach	2.00 (-3.04, 7.29)	0.44	0.69
Testis	14.31 (-26.64, 78.13)	0.55	0.74
Thyroid	12.09 (-3.11, 29.68)	0.12	0.69
Uterus	1.27 (-6.46, 9.65)	0.75	0.86

Table S13. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient TSPM_{2.5} exposure in Brazil during 2000-2019.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	-1.36 (-4.11, 1.47)	0.34	0.67
Bone	-0.12 (-4.05, 3.97)	0.95	0.98
Brain	1.20 (-0.66, 3.08)	0.21	0.67
Breast	-0.66 (-2.06, 0.76)	0.36	0.67
Cervix	0.34 (-1.96, 2.69)	0.78	0.98
Colon-rectum	1.59 (0.19, 3.00)	0.03	0.31
Gallbladder	3.06 (0.05, 6.16)	0.05	0.37
Kidney	2.33 (-0.77, 5.53)	0.14	0.67
Larynx	-1.29 (-3.84, 1.33)	0.33	0.67
Leukaemia	0.09 (-1.97, 2.18)	0.94	0.98
Liver	0.76 (-1.04, 2.60)	0.41	0.70
Lung	0.91 (-0.17, 1.99)	0.10	0.59
Lymphoma	1.34 (-0.62, 3.34)	0.18	0.67
Nasopharynx	5.17 (-4.6, 15.94)	0.31	0.67
Oesophagus	0.69 (-1.18, 2.59)	0.47	0.73
Oral	0.46 (-1.53, 2.48)	0.66	0.93
Ovary	1.59 (-1.36, 4.63)	0.29	0.67
Pancreas	0.03 (-1.79, 1.87)	0.98	0.98
Prostate	2.13 (0.66, 3.61)	<0.001	0.10
Skin	-0.50 (-4.53, 3.71)	0.81	0.98
Stomach	0.50 (-0.92, 1.94)	0.49	0.73
Testis	-0.13 (-9.13, 9.77)	0.98	0.98
Thyroid	-0.48 (-6.62, 6.07)	0.88	0.98
Uterus	1.75 (-1.08, 4.66)	0.23	0.67

Table S14. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient TSPM_{2.5} exposure in Canada during 2000-2015.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	1.40 (-1.23, 4.09)	0.30	0.79
Bone	-5.80 (-13.82, 2.96)	0.19	0.61
Brain	0.53 (-2.09, 3.21)	0.70	0.91
Breast	0.01 (-1.55, 1.59)	0.99	0.99
Cervix	4.13 (-1.53, 10.10)	0.16	0.61
Colon-rectum	0.35 (-0.92, 1.64)	0.59	0.91
Gallbladder	-1.63 (-6.42, 3.41)	0.52	0.91
Kidney	1.94 (-0.77, 4.73)	0.16	0.61
Larynx	-1.51 (-6.71, 3.99)	0.58	0.91
Leukaemia	1.66 (-0.64, 4.01)	0.16	0.61
Liver	0.53 (-1.97, 3.10)	0.68	0.91
Lung	0.65 (-0.18, 1.48)	0.12	0.61
Lymphoma	1.37 (-0.38, 3.16)	0.13	0.61
Nasopharynx	-0.13 (-10.64, 11.62)	0.98	0.99
Oesophagus	-1.86 (-4.53, 0.87)	0.18	0.61
Oral	0.37 (-3.10, 3.96)	0.84	0.96
Ovary	0.78 (-1.98, 3.61)	0.58	0.91
Pancreas	-0.64 (-2.41, 1.17)	0.49	0.91
Prostate	0.14 (-1.64, 1.96)	0.88	0.96
Skin	0.78 (-2.93, 4.63)	0.68	0.91
Stomach	0.46 (-2.06, 3.05)	0.72	0.91
Testis	12.21 (-5.99, 33.93)	0.20	0.61
Thyroid	4.30 (-4.14, 13.48)	0.33	0.79
Uterus	0.54 (-3.29, 4.53)	0.78	0.94

Table S15. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient TSPM_{2.5} exposure in Chile during 2016-2019.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	0.27 (-12.29, 14.62)	0.97	0.97
Bone	10.35 (-14.64, 42.65)	0.45	0.92
Brain	-0.25 (-13.41, 14.92)	0.97	0.97
Breast	7.29 (-0.77, 16.02)	0.08	0.66
Cervix	0.98 (-10.89, 14.44)	0.88	0.97
Colon-rectum	3.84 (-2.03, 10.06)	0.20	0.92
Gallbladder	2.24 (-5.00, 10.05)	0.55	0.92
Kidney	-0.72 (-10.12, 9.66)	0.89	0.97
Larynx	8.73 (-17.74, 43.71)	0.56	0.92
Leukaemia	2.89 (-7.82, 14.84)	0.61	0.92
Liver	-2.41 (-10.32, 6.20)	0.57	0.92
Lung	4.72 (-0.92, 10.67)	0.10	0.66
Lymphoma	-0.89 (-9.27, 8.26)	0.84	0.97
Nasopharynx	-20.49 (-64.72, 79.18)	0.58	0.92
Oesophagus	3.15 (-8.40, 16.17)	0.61	0.92
Oral	5.51 (-13.54, 28.75)	0.60	0.92
Ovary	-1.25 (-14.06, 13.47)	0.86	0.97
Pancreas	3.83 (-4.11, 12.44)	0.35	0.92
Prostate	-0.38 (-6.70, 6.37)	0.91	0.97
Skin	-1.37 (-19.78, 21.27)	0.90	0.97
Stomach	2.98 (-2.34, 8.61)	0.28	0.92
Testis	13.22 (-17.65, 55.68)	0.44	0.92
Thyroid	38.18 (8.97, 75.22)	0.01	0.18
Uterus	14.08 (-2.97, 34.12)	0.11	0.66

Table S16. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient TSPM_{2.5} exposure in Korea during 2000-2019.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	-0.45 (-4.97, 4.28)	0.85	0.97
Bone	8.49 (-3.05, 21.41)	0.16	0.56
Brain	3.24 (-1.29, 7.98)	0.16	0.56
Breast	-1.49 (-4.97, 2.12)	0.41	0.76
Cervix	3.28 (-1.77, 8.59)	0.21	0.62
Colon-rectum	3.55 (1.65, 5.48)	<0.001	0.01
Gallbladder	1.56 (-0.98, 4.15)	0.23	0.62
Kidney	2.52 (-2.18, 7.45)	0.30	0.72
Larynx	1.30 (-5.57, 8.68)	0.72	0.96
Leukaemia	-0.51 (-4.31, 3.45)	0.80	0.97
Liver	1.32 (-0.16, 2.83)	0.08	0.56
Lung	0.92 (-0.34, 2.19)	0.15	0.56
Lymphoma	2.60 (-0.79, 6.11)	0.13	0.56
Nasopharynx	-0.02 (-11.72, 13.23)	1.00	1.00
Oesophagus	-0.92 (-4.82, 3.13)	0.65	0.94
Oral	0.46 (-4.67, 5.87)	0.86	0.97
Ovary	1.54 (-3.63, 6.98)	0.57	0.91
Pancreas	1.00 (-1.37, 3.43)	0.41	0.76
Prostate	0.30 (-3.97, 4.77)	0.89	0.97
Skin	4.91 (-5.8, 16.85)	0.38	0.76
Stomach	1.14 (-0.41, 2.72)	0.15	0.56
Testis	-7.68 (-35.88, 32.92)	0.67	0.94
Thyroid	2.65 (-5.63, 11.66)	0.54	0.91
Uterus	0.33 (-7.57, 8.91)	0.94	0.98

Table S17. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient TSPM_{2.5} exposure in Mexico during 2012-2019.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	0.34 (-4.74, 5.69)	0.90	0.94
Bone	1.24 (-4.41, 7.22)	0.67	0.94
Brain	2.01 (-1.67, 5.84)	0.29	0.77
Breast	0.87 (-1.27, 3.06)	0.43	0.86
Cervix	1.05 (-1.83, 4.01)	0.48	0.89
Colon-rectum	2.45 (0.17, 4.79)	0.04	0.36
Gallbladder	0.43 (-3.83, 4.88)	0.85	0.94
Kidney	2.48 (-1.01, 6.10)	0.17	0.50
Larynx	-1.66 (-7.56, 4.61)	0.59	0.94
Leukaemia	2.40 (-0.36, 5.24)	0.09	0.42
Liver	1.10 (-1.24, 3.50)	0.36	0.84
Lung	1.73 (-0.35, 3.86)	0.10	0.42
Lymphoma	1.20 (-1.49, 3.97)	0.38	0.84
Nasopharynx	3.32 (-17.44, 29.30)	0.78	0.94
Oesophagus	-0.38 (-5.67, 5.19)	0.89	0.94
Oral	0.82 (-4.47, 6.40)	0.77	0.94
Ovary	-0.17 (-3.73, 3.53)	0.93	0.94
Pancreas	3.89 (1.10, 6.76)	0.01	0.14
Prostate	0.71 (-1.53, 3.01)	0.54	0.92
Skin	-0.25 (-6.96, 6.95)	0.94	0.94
Stomach	1.79 (-0.61, 4.25)	0.14	0.49
Testis	-6.89 (-13.48, 0.20)	0.06	0.36
Thyroid	6.61 (-0.25, 13.94)	0.06	0.36
Uterus	0.28 (-5.11, 5.97)	0.92	0.94

Table S18. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient TSPM_{2.5} exposure in New Zealand during 2000-2018.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	7.62 (-2.20, 18.43)	0.13	0.84
Bone	4.10 (-26.11, 46.66)	0.82	0.86
Brain	1.90 (-6.55, 11.12)	0.67	0.86
Breast	0.49 (-4.81, 6.09)	0.86	0.86
Cervix	18.41 (-2.02, 43.11)	0.08	0.84
Colon-rectum	1.34 (-2.49, 5.33)	0.50	0.84
Gallbladder	4.45 (-10.42, 21.78)	0.58	0.85
Kidney	-1.12 (-10.08, 8.73)	0.82	0.86
Larynx	-8.78 (-28.74, 16.76)	0.47	0.84
Leukaemia	2.98 (-4.77, 11.35)	0.46	0.84
Liver	-2.53 (-11.52, 7.36)	0.60	0.85
Lung	-1.12 (-4.50, 2.38)	0.52	0.84
Lymphoma	-2.54 (-8.31, 3.60)	0.41	0.84
Nasopharynx	9.38 (-29.03, 68.58)	0.68	0.86
Oesophagus	5.55 (-3.47, 15.43)	0.24	0.84
Oral	-4.59 (-16.26, 8.71)	0.48	0.84
Ovary	-4.84 (-13.87, 5.13)	0.33	0.84
Pancreas	-4.43 (-10.58, 2.15)	0.18	0.84
Prostate	7.99 (2.15, 14.17)	0.01	0.16
Skin	-4.80 (-11.91, 2.87)	0.21	0.84
Stomach	-0.94 (-8.77, 7.56)	0.82	0.86
Testis	-24.56 (-57.62, 34.28)	0.34	0.84
Thyroid	12.04 (-15.29, 48.18)	0.43	0.84
Uterus	-2.21 (-14.71, 12.13)	0.75	0.86

Table S19. Percentage change in site-specific cancer mortality per 10 µg/m³ increase in 2-day (lag0-1) average ambient TSPM_{2.5} exposure in Thailand during 2011-2019.

Cancer site	Percentage Change, % (95% CI)	P Value	<i>P</i> Value adjusted
Bladder	1.09 (-9.97, 13.50)	0.86	0.90
Bone	0.05 (-9.14, 10.16)	0.99	0.99
Brain	1.60 (-5.3, 9.01)	0.66	0.90
Breast	-3.31 (-8.04, 1.66)	0.19	0.70
Cervix	2.53 (-4.16, 9.68)	0.47	0.87
Colon-rectum	2.13 (-2.87, 7.39)	0.41	0.87
Gallbladder	-1.48 (-6.26, 3.53)	0.56	0.87
Kidney	-2.05 (-14.55, 12.27)	0.77	0.90
Larynx	14.00 (1.60, 27.92)	0.03	0.62
Leukaemia	0.53 (-5.30, 6.72)	0.86	0.90
Liver	0.69 (-1.74, 3.18)	0.58	0.87
Lung	1.60 (-1.17, 4.45)	0.26	0.70
Lymphoma	-2.03 (-10.93, 7.75)	0.67	0.90
Nasopharynx	-6.78 (-17.25, 5.02)	0.25	0.70
Oesophagus	-0.73 (-7.97, 7.08)	0.85	0.90
Oral	5.40 (-1.16, 12.39)	0.11	0.70
Ovary	3.54 (-5.87, 13.89)	0.47	0.87
Pancreas	7.72 (-1.59, 17.91)	0.11	0.70
Prostate	0.75 (-7.60, 9.87)	0.87	0.90
Skin	21.22 (-29.90, 109.64)	0.49	0.87
Stomach	5.14 (-2.45, 13.32)	0.19	0.70
Testis	-28.81 (-57.79, 20.08)	0.20	0.70
Thyroid	-4.96 (-20.10, 13.04)	0.57	0.87
Uterus	-6.88 (-17.76, 5.43)	0.26	0.70