

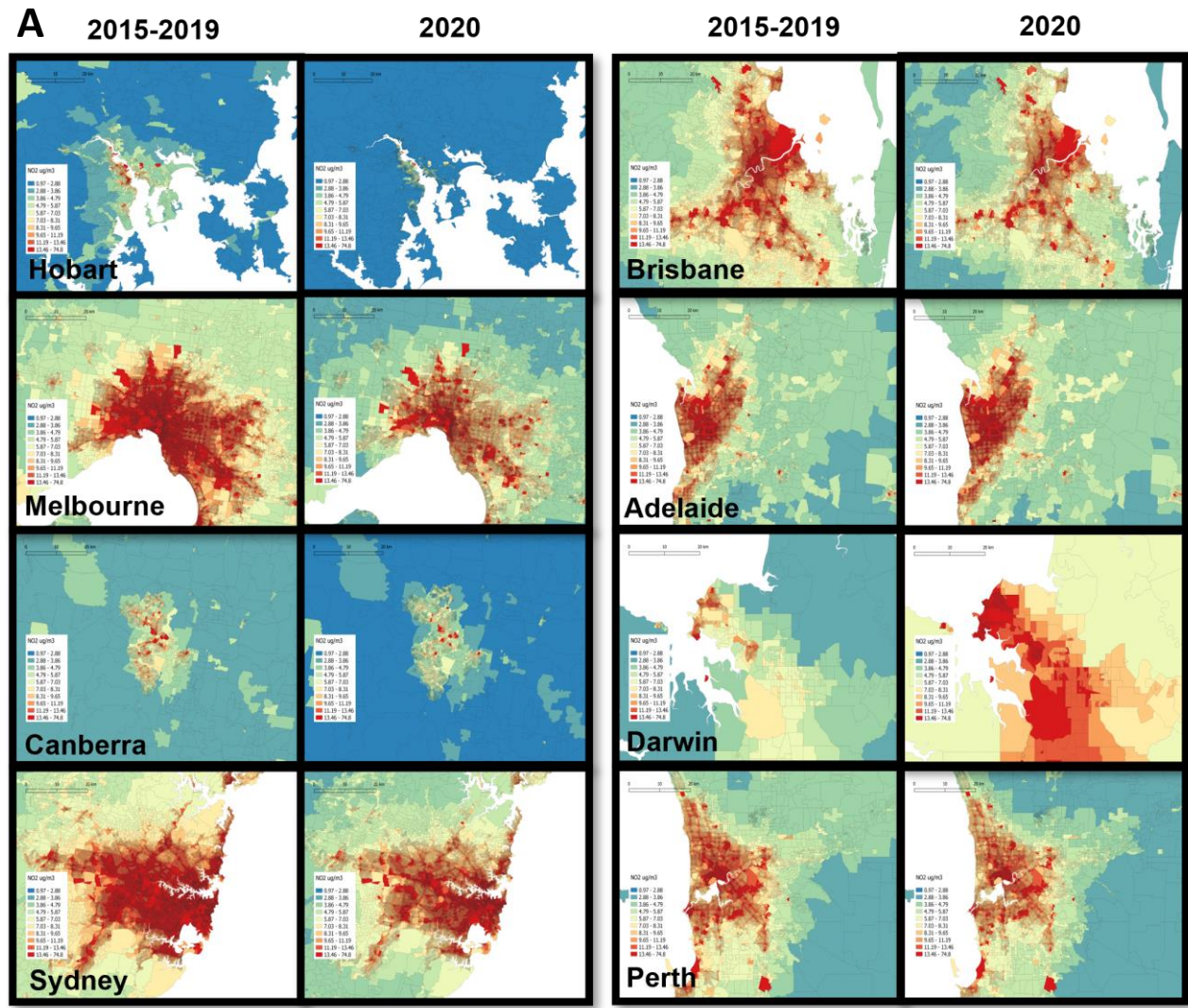


Introduction: Traffic emissions are a major source of NO₂ exposures in Australian cities. The mobility restrictions of April 2020 led to 40% reductions in traffic volumes in Sydney and Melbourne (Sokhi et al. 2021). We observed corresponding reductions in NO₂ using satellite records and compared the current mortality burden of NO₂ with that under equivalent but enduring transport policy scenarios in all Australian capital cities.

Methods: NO₂ scenarios were informed by comparisons of stratospheric NO₂ column densities during April 2020 with those of 4 previous April's. Ground level ambient NO₂ concentrations from a geospatial land use regression model were then adjusted to estimate April 2020 levels for each city. Health burden was calculated using population attributable fraction and life table methods with an unadjusted NO₂ exposure-response coefficient (RR = 1.023, 95% CI: 1.008–1.037, per 10 μg/m³ annual average).

Results: During April 2020, mobility restrictions led to varying reductions in NO₂ exposures in Australian capital cities (A, B). Cumulatively, we attribute 28956 years of life lost (YLL) to anthropogenic NO₂ annually. Transport interventions equivalent to the April 2020 mobility restrictions could reduce this health burden by 1/4 (C).

Conclusions: The health burden of NO₂ is considerable in Australian cities, but could be mitigated by policies that produce sustained reductions in traffic emissions. Future traffic policy interventions may produce NO₂ reductions equivalent to those observed under the mobility restrictions of April 2020. Under those conditions, Australians would cumulatively enjoy 7049 extra years of life annually.



B

City	Baseline NO ₂ (ug/m ₃)	April 2020 NO ₂ (ug/m ₃)	April 2020 NO ₂ reduction
Hobart	5.17	2.43	53%
Melbourne	11.30	8.02	29%
Canberra	7.32	5.56	24%
Sydney	10.91	8.62	21%
Brisbane	8.00	6.80	15%
Adelaide	9.03	9.66	-7%
Darwin	7.47	14.65	-96%
Perth	8.00	7.44	7%

C

City	YLL baseline NO ₂ (95% CI)	YLL Reduction
Hobart	227 (80, 363)	200
Melbourne	8857 (3099, 14171)	3342
Canberra	272 (95, 434)	111
Sydney	11123 (3893, 17793)	2969
Brisbane	3084 (1080, 4931)	664
Adelaide	2460 (861, 3935)	-239
Darwin	195 (68, 312)	-273
Perth	2738 (959, 4377)	39
Australia	28956 (10135, 46316)	7049