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Georgiou, Michail; Tieges, Zoë; Morison, Gordon; Smith, Niamh; Chastin, Sebastien

*Published in:*  
The Lancet Planetary Health

*DOI:*  
[10.1016/S2542-5196\(22\)00268-6](https://doi.org/10.1016/S2542-5196(22)00268-6)

*Publication date:*  
2022

*Document Version*  
Publisher's PDF, also known as Version of record

[Link to publication in ResearchOnline](#)

*Citation for published version (Harvard):*  
Georgiou, M, Tieges, Z, Morison, G, Smith, N & Chastin, S 2022, 'Does living near blue space modify the effect of socioeconomic deprivation on mental health in urban areas: a population-based retrospective study', *The Lancet Planetary Health*, vol. 6, no. S6, pp. 6-6. [https://doi.org/10.1016/S2542-5196\(22\)00268-6](https://doi.org/10.1016/S2542-5196(22)00268-6)

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# Does living near blue space modify the effect of socioeconomic deprivation on mental health in urban areas: a population-based retrospective study



Michail Georgiou, Zoë Tieges, Gordon Morison, Niamh Smith, Sebastien Chastin

## Abstract

**Background** The incidence of mental health disorders in urban areas is increasing and there is a growing interest in using urban blue spaces as nature-based therapy to prevent and manage mental health. However, there is a dearth of longitudinal evidence of the mechanisms and effect of blue spaces on clinical markers of mental health to support and inform such interventions. Restoration of the north Glasgow branch of the Forth and Clyde canal began in 2000 as part of Glasgow's Smart Canal project, which is the largest programme of canal regeneration in the UK. The canal was completely closed and left to dereliction for more than 40 years and the first canal lock reopened as a space for recreation in 2006. Situated within the most deprived neighbourhoods in Europe and characterised by a clustering of environmental and socioeconomic deprivation, physical and mental health challenges, substantial health disparities, and climate change vulnerabilities, this is a unique natural experiment that was primarily developed to increase the communities' resilience to climate change.

**Methods** To investigate the mental health cobenefits deriving from the canal regeneration project, we conducted a population-based retrospective cohort study and explored whether living near blue space modified the negative effect of socioeconomic deprivation on the mental health of the population of north Glasgow, Scotland, using routinely collected NHS data, over a 10-year period (2009–18). We developed two Cox proportional hazards models; a base model estimating the effect of socioeconomic deprivation on mental health and a second identical model with an additional variable of distance to blue space. We then investigated the modifying effect of living near blue space by comparing the effects between the two models.

**Findings** Our findings indicate that living near blue space modified the risk of mental health disorders deriving from socioeconomic deprivation by 6% (hazard ratio [HR] 2.48, 95% CI 2.39–2.57) for those living in the most deprived tertile, and 4% (1.66, 1.60–1.72) for those in the medium-deprivation tertile.

**Interpretation** The findings of this study support the notion that living near blue space could play an important role in reducing the burden of mental health inequalities in urban populations.

**Funding** The Data Lab (to SC).

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### Contributors

MG, SC, and ZT conceptualised the study. MG, SC, and ZT did the study design. MG, SC, and ZT did the data analysis. MG, SC, ZT, and NS wrote the manuscript and prepared the draft. MG, SC, ZT, NS, and GM revised the manuscript. All authors approved the final version of the manuscript. MG, SC, ZT, NS, and GM accessed and verified the data.

### Declaration of interests

We declare no competing interests.

Published Online  
October 31, 2022

Glasgow Caledonian University,  
Glasgow, Scotland

(M Georgiou MSc, Z Tieges PhD,  
Prof G Morison PhD,  
N Smith MA, Prof S Chastin PhD)

Correspondence to:

Mr Michail Georgiou, Glasgow  
Caledonian University,  
Glasgow G4 0BA, Scotland  
michail.georgiou@gcu.ac.uk