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EXPOSURE TO GREEN-BLUE SPACES AND MENTAL HEALTH: A RETROSPECTIVE E-COHORT STUDY IN WALES

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Background:
Growing cross-sectional evidence links access to green-blue spaces with mental health benefits, but studies at an individual level and at a national population scale are scarce. This gap can be addressed through the Secure Anonymised Information Linkage (SAIL) Databank, which allows household-level green-blue spaces access and exposure data to be linked to individual-level health-care use.

Methods
Within the SAIL Databank, an e-cohort of the population of Wales (2008–19) was created from green-blue space metrics and the Welsh Longitudinal General Practice database. Green-blue spaces metrics (derived from satellite imagery and planning data) included average ambient greenness within 300 m of the home (designated as the Enhanced Vegetation Index) and average access to green-blue spaces (designated as the number of green-blue spaces within 1600 m of the home). A validated algorithm was applied to create a common mental health disorder flag and linked to green-blue spaces exposure (ambient greenness and access) recorded for individuals not affected by common mental health disorders. We used multivariate logistic regression models to test the hypothesis that greater green-blue spaces exposure is associated with a reduced likelihood of a flagged common mental health disorder. Subgroup analyses were done for socioeconomic deprivation.

Findings
The e-cohort comprised 2 341 591 individuals (1 193 240 men and 1 148 351 women), aged 16 or over and registered with a general practice in the SAIL Databank. After adjusting for individual and area-level covariates, a unit increase in ambient greenness around the home and access to green-blue spaces within 1600 m were associated with lower odds of a common mental health disorder (adjusted odds ratio 0·11 [95% CI 0·11–0·12] for ambient greenness around the home and 0·47 [0·46–0·48] for access to green-blue spaces within 1600 m). A unit increase in ambient greenness was associated with reduced odds of a common mental health disorder for residents of the most deprived areas (n=473 410; 0·22 [0·20–0·24]) and of the least deprived areas (n=480 424; 0·07 [0·07–0·08]).

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Interpretation
People with greater exposure to green-blue spaces were less likely to develop a common mental health disorder and the effect is modified by socioeconomic deprivation. This finding has implications for both public health policy and urban planning. This large, adult-population cohort provides sufficient power to examine variations between subgroups to investigate inequalities.

Authors' contributions and competing interests
Project lead: SER. Data linkage and analysis: DT, RF, AM, AW. Abstract drafting: DT, RF, AW, SER. All authors contributed to study design and reviewed the final abstract before submission. There are no competing interests.

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This study makes use of anonymised data held in the Secure Anonymised Information Linkage (SAIL) Databank, which is part of the national e-health records research infrastructure for Wales. This research uses data provided by patients and collected by the NHS as part of their care and support. We would also like to acknowledge all data providers who make anonymised data available for research. All research conducted has been completed under the permission and approval of the SAIL independent Information Governance Review Panel (IGRP) project number 0562.