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Citation: Hiepko, A. T., Shoham, N., McManus, S. & Cooper, C. (2024). Population density and receipt of care for common mental disorders: a cross-sectional analysis of English household data from the 2014 Adult Psychiatric Morbidity Survey. BMJ Open, 14(5), e078635. doi: 10.1136/bmjopen-2023-078635

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Link to published version: https://doi.org/10.1136/bmjopen-2023-078635

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BMJ Open

Population density and receipt of care for common mental disorders: a cross-sectional analysis of English household data from the 2014 Adult Psychiatric Morbidity Survey

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To cite: Hiepko AT, Shoham N, McManus S, *et al*. Population density and receipt of care for common mental disorders: a cross-sectional analysis of English household data from the 2014 Adult Psychiatric Morbidity Survey. *BMJ Open* 2024;**14**:e078635. doi:10.1136/bmjopen-2023-078635

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (https://doi.org/10.1136/bmjopen-2023-078635).

Received 08 August 2023
Accepted 16 April 2024

Check for updates

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ABSTRACT

Objectives People living in less urban areas in the UK may have reduced access to mental healthcare compared with people in urban areas. Although this was not reported in the 2000 Adult Psychiatric Morbidity Survey (APMS) data, subsequent changes to mental health provision and economic recession may have impacted care inequalities. We re-examined this, hypothesising that those living in less urban areas of England received less antidepressant medication and psychological interventions, compared with those living in urban areas, after adjusting for covariates including common mental disorders (CMDs) and socioeconomic status.

Design National cross-sectional study.

Setting Households in England.

Participants We analysed data from 7455 participants aged 16 and above from the 2014 English APMS.

Exposures Residence in an urban or less urban area.

Primary outcome Current receipt of any antidepressant medication or any psychological intervention.

Results Participants living in less urban areas were half as likely to be in receipt of any psychological intervention relative to those living in urban areas (adjusted OR (aOR) 0.49; 95% CI 0.30 to 0.79; p=0.004). There was no association between urbanisation and antidepressant receipt (aOR 1.01; 95% CI 0.81 to 1.25; p=0.944).

Conclusion People living in less urban areas have a lower likelihood of being in receipt of psychological treatment for CMDs, which may indicate barriers to care access. Our findings differ from the results of a study using a comparable sample conducted 14 years previously. While Improving Access to Psychological Therapies services have increased therapy access nationwide, this may have had more impact in urban areas, potentially widening urban/rural inequalities. Further research is needed to understand how to address such geographical inequalities in access to mental healthcare.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The use of data from a nationally representative probability sample increases study generalisability.
⇒ Our analysis adjusted for symptom severity, socioeconomic status and other covariates.
⇒ The small number of participants living in less urban areas who were also in receipt of psychological interventions may have reduced statistical power.
⇒ The use of cross-sectional data does not allow for a temporal relationship between exposure and outcome.
⇒ There may have been residual confounding.

INTRODUCTION

Common mental disorders (CMDs) including depression and anxiety are increasing in the prevalence, posing major health, societal and economic concerns.[1] Several UK-based studies have reported a higher prevalence of CMDs in less urban, compared with urban areas. The suicide rates of men, and rates of CMD among perinatal women living in less urban areas, are higher than their urban-based counterparts.[2–5] Rates of CMD among unemployed adolescents resident in less urban areas are higher than their urban counterparts.[6 7] Discussing how the needs of frail and isolated people living in rural areas are often unmet, Milne *et al* comment that most policy is rurally blind.[8] Several reports have highlighted possible reasons for these inequalities, including difficulties in accessing mental health services in less urban areas, such as longer travel times and limited transport availability.[6] In less urban areas of Scotland, limited availability of mental health professionals may be a further barrier.[9] Such reports have prompted the UK parliament to hold an inquiry on rural mental health.[10]

Across England, rates of mental health treatment receipt are increasing. The 2014 Adult Psychiatric Morbidity Survey (APMS)[11] found that one in three adult respondents

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(34.5%) aged 16–74 living in England with CMD symptoms reported psychotropic medication use, a marked increase from one in five respondents in 2007 (19.6%) and 2000 (19.3%). Correspondingly, Spence *et al* reported a 165% increase in antidepressant prescriptions in England between 1998 and 2012.[12] Psychological treatment use was found to have risen steadily from 8.6% in 2000, 10.4% in 2007 and to 12.6% in 2014 among APMS respondents aged 16–74 with CMD symptoms. We do not know whether these increases have been evenly distributed across urban and less urban areas. While lower mental health service use has been reported in less urban compared with urban areas, it is unclear whether this reflects lower needs or lower availability of mental health services and fewer unmet care needs. Antidepressant drug prescription rates are reportedly lower in less urban than in urban areas.[13–15] Falcaro *et al* speculated that less urban-based participants aged 55 and over with diagnosed depression had a lower likelihood of discontinuing antidepressants compared with their urban counterparts, due to limited access to psychological treatment services.[16] A lack of other treatment options may have increased the duration of antidepressant use, despite a preference for psychological treatment over antidepressant prescription among this age group.[17]

Research evidence comparing psychological care receipt in less urban compared with urban areas is scant. Paykel *et al* used data from the 2000 APMS to explore whether there were urban–rural differences in the receipt of any psychotropic medication, or any psychological interventions, after adjusting for CMD symptom severity.[18] They did not find any such differences, in contrast to previous research on antidepressant prescriptions.[13–15]

Since 2000, there have been notable changes in mental health policy and provision in England. In 2008, Improving Access to Psychological Therapies (IAPT) services were launched, enabling self-referral and greater access to psychological interventions.[19] However, research into whether there are inequalities in how this has benefited less urbanised areas compared with more urbanised areas is lacking. Around the same time as IAPT services were introduced, the UK experienced a global economic recession, leading to increased demand for mental healthcare[20] while austerity led to reduced funding for mental health services, affecting service availability.[21 22] Given the history of centralisation[23] and increased resource distribution towards urban mental health services,[24] austerity cuts may have had a worse impact on mental health services in less urban areas.

We, therefore, sought to re-examine the receipt of antidepressant medication and psychological interventions in urban compared with less urban areas, nearly two decades after the initial analysis.[18] We explore whether, in 2014, there were differences in receipt of mental healthcare for CMD between urban and less urbanised areas of England. We hypothesised that people living in less urban areas would have lower rates of receipt of antidepressants and psychological interventions than people living in urban areas, after accounting for CMD symptom-level, area-level deprivation and sociodemographic covariates.

METHODS

Study design

We followed the Strengthening the Reporting of Observational Studies in Epidemiology[25] cross-sectional study statement. We conducted a secondary analysis of the 2014 APMS data.[11]

Participants

The APMS is a nationally representative, cross-sectional household survey conducted every 7 years to measure the prevalence of mental health disorders in the general population in England. It quantifies a range of sociodemographic, physical health and lifestyle factors associated with mental health. The 2014 APMS recruited participants aged 16 and over, living in private households. To recruit a representative sample, the APMS used a stratified random probability sampling method and weighting process, described in detail elsewhere.[11] Briefly, household addresses were randomly selected using the Postcode Address File, covering 97% of private households in England. Following this, interviewers randomly selected one resident for participation from each eligible private household using the Kish grid method, allowing for an equal probability of participant selection.[26] Interviews were conducted by trained interviewers in participants' own homes, with participants self-completing sensitive information directly onto a laptop. Survey data were weighted to account for selection probability and non-response bias, increasing the likelihood that results are representative of the target population. The weighting process is detailed in the APMS report.[11]

Variables

Outcomes

Our main outcomes were current receipt of (1) any antidepressant medication and (2) any counselling or therapy.

The APMS measured the current receipt of any psychotropic medications using a show card approach, where participants were prompted with the generic name of a drug, followed by the brand name. While medications were grouped based on primary indication, one type of medication could be in more than one category. online supplemental appendix A lists medications categorised as antidepressants. As our outcome focused on data regarding the current receipt of antidepressant medication, we used data from a derived binary variable in the APMS dataset, generated by the APMS team prior to the deposit of the data in National Health Service (NHS) Digital, which recorded responses as: in receipt/not in receipt of any antidepressant medication.

Current receipt of any counselling or therapy was ascertained by asking participants: 'Are you currently having any counselling or therapy listed on this card for a mental,

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nervous or emotional problem?'. online supplemental appendix B gives a full list of psychological interventions. We recoded this as a binary variable denoting the current receipt or not.

Exposure

The APMS 2014 dataset recorded participant residences, classed as an address within a postcode. Residences were categorised as either (1) urban, (2) town and fringe or (3) village, hamlet and isolated dwellings. This variable is based on a small area measure of population density, drawing on UK Office of National Statistics census data on the number of persons per hectare.[27] Using this classification, the 2014 APMS defined participant residences as 'urban' if they had a population density of 10 000 or more persons per hectare. Both 'town and fringe', and 'village, hamlet and isolated dwelling' areas were classed as falling outside of settlements with a population density of 10 000 or more persons per hectare.

As the number of participants in the (2) town and fringe and (3) village, hamlet and isolated dwellings categories of the original APMS variable was low, we combined them to increase statistical power. This created our binary exposure variable, where participant residences were classed as either 'urban' or 'less urban'.

Covariates

Covariates were selected based on a review of previous research evidence to ensure we included variables likely to have had an effect on our study outcomes.

Scores on the Clinical Interview Schedule Revised (CIS-R) were used to control for CMD symptom severity. The CIS-R is an interviewer-administered structured interview schedule which measures non-psychotic depression and anxiety symptoms in accordance with ICD-10 criteria. It measures 14 CMD symptom types and provides a total score on a continuous scale reflecting overall CMD symptom severity. A score of 12 or more indicates likely the presence of clinically significant symptoms of depression and anxiety.[11] A more detailed explanation of the CIS-R can be found elsewhere.[28] Previous research has established the reliability and validity of the CIS-R.[28 29] We included CIS-R score in analyses as a continuous variable.

To control for area-level deprivation, we used Index of Multiple Deprivation (IMD) 2010 scores.[30] The 2010 IMD is calculated using the English Indices of Deprivation 2010, a continuous measure of relative deprivation at the small area level, which contains 38 indicators across seven domains of deprivation, including income, employment, education, skills and training, health and disability, access to housing and services, crime and disorders, and overall living environment. The IMD provides an overall measure of multiple deprivation for individuals living in an area and is calculated for each lower layer super output area (LSOA) in England. LSOAs are small areas relatively equal in size (approximately 1500 people), of which there are 32 482 in England. Further details on the 2010 IMD can be found elsewhere.[31] In our analysis, IMD scores were ranked and divided into quintiles ranging from least (1) to most (5) deprived.

We also included self-reported age (as a continuous variable), sex, ethnicity, highest educational qualification achieved, marital status and employment status in our analyses. Categories for each of these variables are shown in table 1.

Statistical methods

Statistical analyses were conducted by using Stata V.17.[32] We performed a complete-case analysis, meaning that participants who had missing data on any variables were excluded from the final model. We applied the weights provided in the archived APMS 2014 dataset to our analysis using the Stata svy command and report weighted percentages, but unweighted absolute numbers.

We used logistic regression models unadjusted and adjusted for covariate variables to test the hypothesis that being resident in a less urban area was associated with a lower likelihood of being in receipt of any antidepressant medication and any psychological intervention, compared with being resident in an urban area. Adjusted models controlled for (1) total CIS-R scores; (2) total CIS-R scores, age and sex; (3) total CIS-R scores, age and sex, IMD scores and other sociodemographic covariates.

Patient and public involvement

We did not involve patients or the public in the design, conduct, reporting or dissemination plans of our secondary analysis of the 2014 APMS data.

RESULTS

Descriptive analysis: sample characteristics

Of the 7546 people who participated in the APMS, 91 (1.2%) were excluded from analyses due to missing data (see online supplemental appendix C for flow chart). Table 1 displays the characteristics of the analytical sample (n=7455) according to residency in an urban (n=5969) or less urban (n=1486) area. Among the analytical sample, 80.7% (n=5969) were classified as being from an urban area, 10.4% (n=775) were from a rural area and 9.5% (n=711) were from a semirural area in the original dataset. In total, 2.9% (n=236) reported receipt of any psychological treatment or counselling and 9.6% (n=842) receipt of antidepressants. Among people scoring 12+ on the CIS-R, these percentages were 12.8% (n=155) and 34.3% (n=417), respectively.

The proportion of individuals from a white British ethnicity was higher in less urban (n=1419, 95.3%) than urban (n=4916, 77.5%) areas. People resident in urban dwellings were more likely to live in areas classified as 'most deprived' by the IMD (23.6%), compared with people resident in less urban dwellings (28.6%). People living in less urban areas were also more likely to be married (58.1%) than people living in urban areas (47.0%). The proportion of males was slightly higher in less urban areas (52.2% vs 48.1%).

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Table 1 Analytical sample characteristics according to residency in an urban or less urban dwelling

Demographic/clinical variable	Urban (N=5969)	Less urban (N=1486)	Total analytical sample (N=7455)
In receipt of any antidepressant medication, n (weighted %)			
Yes	677 (9.6)	165 (9.7)	842 (9.6)
No	5292 (90.4)	1321 (90.3)	6613 (90.4)
In receipt of any psychological interventions, n (weighted %)			
Yes	211 (3.3)	25 (1.3)	236 (2.9)
No	5758 (96.7)	1461 (98.7)	7219 (97.1)
Index of Multiple Deprivation scores, n (weighted %)			
0.53–8.49 (least deprived)	1117 (17.9)	419 (28.6)	1536 (19.8)
8.49–13.79	1034 (17.3)	502 (33.7)	1536 (20.2)
13.79–21.35	1139 (18.6)	403 (26.7)	1542 (20.0)
21.35–34.17	1323 (22.7)	116 (8.0)	1439 (20.1)
34.17–87.80 (most deprived)	1356 (23.6)	46 (3.1)	1402 (19.9)
CIS-R Score, mean (SD)	5.4 (7.5)	4.7 (7.2)	5.3 (7.4)
CIS-R Score of 12 or above/below 12, n (weighted %)			
Score of 12 or above	1009 (16.2)	206 (13.1)	1215 (15.7)
Score below 12	4960 (83.8)	1280 (86.9)	6240 (84.3)
Age (years), mean (SD)	46.3 (18.7)	51.4 (20.2)	47.2 (19.1)
Sex, n (weighted %)			
Male	2350 (48.1)	663 (52.2)	3013 (48.9)
Female	3619 (51.9)	823 (47.8)	4442 (51.1)
Marital status, n (weighted %)			
Single	1825 (36.0)	299 (24.9)	2124 (34.0)
Married/civil partnership	2550 (47.3)	793 (58.2)	3343 (49.2)
Separated	206 (2.5)	36 (1.8)	242 (2.3)
Divorced	712 (8.0)	174 (7.9)	886 (8.0)
Widowed	676 (6.3)	184 (7.2)	860 (6.5)
Level of education, n (weighted %)			
University degree	1414 (25.4)	382 (25.3)	1796 (25.4)
UK teaching, HND, nursing diplomas	468 (7.6)	142 (9.1)	610 (7.9)
A level (high school/secondary school diploma)	967 (18.7)	225 (17.6)	1192 (18.5)
GCSE or equivalent (high school/secondary school diploma)	1392 (24.4)	352 (26.5)	1744 (24.7)
International qualification (non-UK school qualification)/ other qualifications not listed	210 (3.1)	61 (3.3)	271 (3.1)
No qualifications	1518 (20.8)	324 (18.2)	1842 (20.3)
Employment status, n (weighted %)			
In employment	3203 (59.9)	771 (59.2)	3974 (59.8)
Unemployed	178 (3.5)	40 (3.1)	218 (3.4)
Economically inactive (eg, retired)	2588 (36.6)	675 (37.7)	3263 (36.8)
Ethnicity, n (weighted %)			
White British	4916 (77.5)	1419 (95.3)	6335 (80.7)
White other	375 (7.4)	43 (3.0)	418 (6.6)
Black African/Caribbean	194 (3.7)	3 (0.2)	197 (3.1)
Asian/Asian British	342 (8.3)	13 (0.9)	355 (7.0)
Mixed/multiple/other ethnicity	142 (3.1)	8 (0.6)	150 (2.6)

SD is the SD accompanying the mean (both weighted).
N, number in group (unweighted); weighted %, percentage of group weighted.
CIS-R, Clinical Interview Schedule-Revised; HND, Higher National Diploma.

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Table 2 Odds of treatment receipt for common mental disorder in less urban relative to urban residences (urban as reference category)

N	Unadjusted OR (95% CI)	P value	Model 1 aOR (95% CI)	P value	Model 2 aOR (95% CI)	P value	Model 3 aOR (95% CI)	P value
In receipt of any antidepressant medication								
7455	1.01 (0.81 to 1.25)	0.944	1.15 (0.91 to 1.45)	0.233	1.08 (0.86 to 1.36)	0.514	1.06 (0.84 to 1.34)	0.619
In receipt of any counselling or therapy								
7455	0.40 (0.26 to 0.62)	<0.001	0.44 (0.28 to 0.69)	<0.001	0.48 (0.31 to 0.74)	0.001	0.49 (0.30 to 0.79)	0.004

Model 1=adjusted for CIS-R scores; Model 2=adjusted for CIS-R scores, age and sex.
Model 3=Adjusted for CIS-R scores, IMD scores, age, sex, marital status, highest educational qualification achieved, employment status and ethnicity.
aOR, adjusted OR; CIS-R, Clinical Interview Schedule Revised; IMD, Index of Multiple Deprivation.

Analytical results

Table 2 displays results from logistic regression analyses. Participants who lived in less urban areas were half as likely to be in receipt of any psychological interventions compared with those living in urban areas, before and after controlling for levels of deprivation, symptom severity and sociodemographic characteristics (adjusted OR (aOR) 0.49, 95% CI 0.30 to 0.79, p=0.004 in fully adjusted model).

There was no evidence for an association between urban/less urban dwelling and receipt of antidepressant medication (aOR 1.01; 95% CI 0.81 to 1.25; p=0.944). Online supplemental appendix D provides a full breakdown of the individual isolated effects of each covariate on the association between urban or less urban dwelling (urban as reference category) and both outcomes.

DISCUSSION

Main findings

We found that individuals living in less urban areas (ie, town and fringe, village, hamlet and isolated dwellings) were half as likely to be in receipt of counselling or therapy, compared with people living in urban areas, after controlling for symptom severity and other covariates. There was no evidence of an association between urban/less urban dwelling and receipt of antidepressant medication.

Interpretation of findings

While the APMS 2014 report found that provision of psychological treatment has increased in England since 2000,[11] our findings suggest that use is greater in urban, relative to less urban areas. Comparison with the earlier APMS analysis by Paykel *et al*, which found no differences in receipt of psychological care between areas[18] may indicate that the increase in treatment provision in the period between surveys was most significant in urban areas.

These findings could indicate barriers to access to psychological treatments for mental health in less urbanised areas of England. GPs in less urban areas may have sufficient resources to prescribe antidepressants, but less capacity to refer to psychological interventions. In areas facing resource pressures, GPs may be prescribing antidepressants due to non-availability of appropriate psychological therapy services, rather than patient choice.[33 34]

In 2008, England saw the introduction of IAPT services nationwide, aiming to significantly increase the access to evidence-based psychological therapies for individuals with CMDs through large-scale training of therapists.[35] IAPT services have successfully increased access to psychological interventions,[19] with nearly one million clients seen each year. As Clark[36] points out, however, this only represents around 16% of community CMD prevalence, and access for more vulnerable groups, for example, older people, remains an issue. A recent report from the Nuffield Trust mentions that less urban-based IAPT services saw the greatest COVID-19 pandemic-related referral decline in April 2020, 52% from the year before compared with 44% in all other IAPT services.[37] This suggests that less urban-based IAPT services face increased difficulties in response to crises such as the COVID-19 pandemic compared with their urban counterparts.

Coinciding with the introduction of IAPT services, the UK faced the 2007/2008 global financial recession. Research suggests that the economic hardships, higher levels of unemployment, cuts to welfare and policies of austerity were associated with an increased prevalence of mental illnesses[20 22] and requirements for care from mental health services.[21] However, Docherty and Thornicroft found that funding for mental health services had decreased since the recession[21]; the British Medical Association also reported that 75% of mental health trusts in England cut their budgets between 2013 and 2015.[38] Evans-Lacko *et al* discussed the projected impact of such cuts to funding alongside dwindling resources, with overburdened mental health services and lower levels of care access.[22]

Less urban areas may be disproportionately affected by funding cuts to mental health services. Historically, mental health services have been centralised within urban areas of the UK,[23] leading to an unequal distribution of resources which favoured urban-based services.[24] Such funding issues could reduce the availability of psychological interventions in less urban areas.[23 39]

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Care provision costs may be higher in less urbanised areas. Mental health services based in areas with greater population dispersal[24] are required to spend more money to provide care equitable to that of urban-based services.[40] Longer commutes to work in more dispersed areas can affect staff recruitment and retention,[23 41] raising the costs of healthcare services in these areas.[42] Clients living in less urban areas may thus have fewer options for therapy and therapists.[23] Nicholson[23] suggests that working in more remote areas leads to 'professional isolation', as access to training may compare unfavourably with urban areas. Due to the lack of specialised staff and training opportunities, professionals in less urban areas may take on 'generalist' roles, delivering care across a wider range of mental health problems.[23 24]

The use of a health service is likely to decrease as the distance of potential users from it increases.[6 43] For those who are socioeconomically disadvantaged (and less likely to have access to a car[44]), transport is a barrier to service access in less urban areas, especially where public transport infrastructure is underdeveloped.

Some literature has suggested that reduced acceptability of mental health services may also play a role in lowered access to psychological treatments in less urbanised areas of the UK. Referring primarily to help-seeking,[45] viewing a service as acceptable depends on a person's beliefs around mental health, their ability to recognise distressing symptoms and their knowledge of available support services.[23] Less urban areas with higher levels of isolation have been argued to foster a 'self-reliant' and 'stoic' approach towards health problems.[23 40] Parr *et al*[46] speculated that less urban areas may hold cultural beliefs of 'traditions, values and expectations' alongside a fear of 'anything out-of-the-ordinary', contributing to increased levels of stigma against mental health, which may negatively impact help-seeking.[23 24] Increased visibility of those with mental health problems, epitomised by the 'glare of rural familiarity',[24] may lead to underutilisation of mental health services, as some patients living in less urban areas fear that undue exposure of their problems may lead to stigmatisation and social exclusion.

There are pronounced variations in the population profiles (age, sex, ethnicity, etc) of urban and less urban areas.[47] Given that previous research has extensively documented marked ethnic inequalities in mental health treatment access, this may have also contributed to the difference in care access between urban and less urban areas of England.[48]

Our finding that there was no evidence of an association between urban/less urban residence and antidepressant receipt, after controlling for symptom severity, agrees with Paykel *et al*.[18] Results from a more recent study[13] also concur with our findings. Grigoroglou *et al* conducted their study using NHS digital data from England in 2015/2016 and used an urban/rural classification based on data from the 2011 national census.[13] Although they found differences in prescription levels between urban and rural areas, this was likely explained by the variations in symptoms, as they found a strong correlation between depression recorded in GP notes and antidepressant prescription rates. While Shevlin *et al*'s analysis of total antidepressant prescriptions from 2011 to 2015 in Northern Ireland did find that rural areas had fewer antidepressant prescriptions, their analysis only controlled for self-rated health and not depressive symptom severity.[15]

Strengths and limitations

The use of a nationally representative probability sample of the English population helps present a realistic snapshot of the state of mental health treatment uptake in England in 2014. We controlled for CMD symptom severity, area-level deprivation and sociodemographic covariates in our analyses.

We note some limitations. First, the small numbers of participants living in less urban areas in receipt of any counselling or therapy are likely to have reduced analytical power. The use of cross-sectional data is also a limitation, as a temporal relationship between urban/less urban living and receipt of treatment cannot be established, nor causation inferred. The association between less urban living and reduced receipt of psychological care warrants confirmation using longitudinal designs such as cohort studies.[49]

We used self-report data to measure receipt of any antidepressant medication and any counselling or therapy. Given the subjective nature of this data, it may have been influenced by recall and social desirability bias.[23 24] Moreover, while the response rate for the 2014 APMS was 57%, which is similar to other surveys,[11] response and selection bias may have been an issue. We weighted the data, to account for non-response. The APMS only records responses from people living in private households. Since 2002, the age gap between less urban and urban areas has increased, such that those living in less urban areas were 5.7 years older than those living in urban areas in 2020.[50] The exclusion of older people living in communal settings in less urbanised areas may have, therefore, influenced the association between less urban living and lower odds of psychological treatment receipt. However, 98% of the UK population are living in private households.[11]

There may have been residual confounding. Our analysis did not consider spatial variables such as social cohesion, which is particularly relevant given Grigoroglou *et al*'s finding that the prevalence of depression was higher in socially cohesive rural, minor urban and small city areas, and lower in socially fragmented urban areas.[13] Individual characteristics, such as open-mindedness, treatment-seeking and job searching behaviours, and other attitudinal differences, may have also confounded our results.[24 46]

Implications and conclusions

Our finding that less urban residence is associated with half the odds of receiving counselling or therapy may

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indicate an inequity in the provision of and/or access to psychological interventions in less urbanised areas of England. Our findings echo recent research, organisational and governmental reports outlining the myriad problems of access to mental healthcare in less urbanised areas.

Since 2014, NHS England has published several plans to reform mental health policy. The NHS Five Year Forward View 2016 aimed for a 'genuine parity of esteem between mental and physical health by 2020', calling for a drastic reduction in waiting times for psychological therapies, increased access to IAPT-based talking therapies for at least 25% of people with a CMD, and the recruitment of 3000 new primary care-based mental health therapists.[51] The UK government committed to these recommendations in the NHS Long Term Plan 2019, planning for £2.3 billion a year to be invested to expand IAPT service access to cover 1.9 million adults with CMDs by 2023/2024.[52] The 2022 UK parliamentary inquiry into rural mental health[10] aside, specific policies to improve access to services in less urban areas are lacking.[53]

Increased use of digital technologies and telemental health approaches for psychological therapies within IAPT services may alleviate resource strains without compromising therapeutic effectiveness.[36] The growing demand for care during the COVID-19 pandemic saw a widespread adoption of remotely delivered telemental health interventions in UK-based mental health services.[54] Given that digitally delivered therapies have been found to be effective for CMDs,[55–57] their use may help increase access to psychological care in less urbanised areas.[58] Digital-based mental health support tools have been shown to alleviate barriers to help-seeking in UK-based less urban samples.[59 60]

However, digital exclusion is a major issue within less urban areas. Not only is there a reduced availability of UK mobile phone networks in less urban areas, but as rurality and population sparsity increases, broadband infrastructure becomes slower, unreliable and in some cases absent.[6 61 62] Nonetheless, digital approaches, as well as services offered by voluntary organisations including peer support, befriending, 24-hour telephone helplines, etc may also help to bridge the gap in access to mental healthcare.[63 64]

Further research into the mediators of the association between urban/less urban residence and mental health treatments is needed. Understanding how and why the use of psychological treatments is reduced in less urbanised areas of England, will inform future policies aimed at improving access, acceptability and availability of services, ultimately working towards achieving nationwide equity of mental healthcare.

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Acknowledgements We are extremely grateful to all individuals who participated in the APMS surveys and the whole APMS team.

Contributors Study design and hypothesis conceived by ATH, NS and CC. Statistical analysis planned by ATH, NS and CC. Analysis conducted by ATH, assisted by NS, CC and SM. Main manuscript text written by ATH. Manuscript reviewed and revised for important intellectual content by all authors. All authors met criteria for authorship according to ICMJE recommendations. CC is the gurantor. She accepts full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

Funding CC is supported by National Institute for Health and Care Research (NIHR) grant number NIHR205009. No specific funding was received for this research.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and the 2014 APMS was reviewed by an independent Research Ethics Committee, to protect the safety, rights, well-being and dignity of those taking part. The Survey of Health and Wellbeing for 2014 was given a favourable opinion by the West London REC (Reference no 14/LO/0411). Ethical approval was not required for our secondary analysis as the data were anonymised. We accessed the data by application to NHS digital. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data may be obtained from a third party and are not publicly available. The data is available via NHS Digital on submission and acceptance of a valid application. The anonymised Adult Psychiatric Morbidity survey datasets can be accessed via the UK Data Service. Further information is available here: https://digital.nhs.uk/data-and-information/areas-of-interest/public-health/national-study-of-health-and-wellbeing#survey-datasets.

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REFERENCES

1 GBD 2019 Mental Disorders Collaborators. Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990–2019: a systematic analysis for the global burden of disease study 2019. *Lancet Psychiatry* 2022;9:137–50.
2 Gartner A, Farewell D, Dunstan F, *et al*. Differences in mortality between rural and urban areas in England and Wales, 2002-04, 2008. Available: https://webarchive.nationalarchives.gov.uk/

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ukgwa/20151014023532/http:/www.ons.gov.uk/ons/rel/hsq/health-statistics-quarterly/no--39--autumn-2008/index.html
3 Levin KA, Leyland AH. Urban/rural inequalities in suicide in Scotland, 1981–1999. *Soc Sci Med* 2005;60:2877–90.
4 Middleton N, Sterne JAC, Gunnell D. The geography of despair among 15–44-year-old men in England and Wales: putting suicide on the map. *Journal of Epidemiology & Community Health* 2006;60:1040–7.
5 Ginja S, Jackson K, Newham JJ, *et al*. Rural-urban differences in the mental health of perinatal women: a UK-based cross-sectional study. *BMC Pregnancy Childbirth* 2020;20:464.
6 Seccombe I, Selbie D. Health and wellbeing in rural areas, 2017. Available: https://www.local.gov.uk/sites/default/files/documents/1.39_Health%20in%20rural%20areas_WEB.pdf
7 Levin KA. Pp54 urban-rural differences in adolescent mental health and wellbeing in Scotland. *J Epidemiol Community Health* 2014;68:A68.
8 Milne A, Hatzidimitriadou E, Wiseman J. Health and quality of life among older people in rural England: exploring the impact and efficacy of policy. *J Soc Pol* 2007;36:477–95.
9 Voluntary Health Scotland. Mental Wellbeing, Social Isolation and Loneliness in Rural Scotland, 2019. Available: https://vhscotland.org.uk/wp-content/uploads/2019/11/Key-Messages-Mental-Wellbeing-in-Rural-Scotland-1.pdf
10 UK Parliament. Rural mental health. 2022. Available: https://committees.parliament.uk/work/1627/rural-mental-health/news/
11 McManus S, Bebbington PE, Jenkins R, *et al*. Data resource profile: adult psychiatric morbidity survey (APMS). *Int J Epidemiol* 2020;49:361–362e.
12 Spence R, Roberts A, Ariti C, *et al*. Focus On: Antidepressant prescribing, 2014. Available: www.health.org.uk/sites/health/files/QualityWatch_ FocusOnAndidepressantPrescribing.pdf
13 Grigoroglou C, Munford L, Webb RT, *et al*. Prevalence of mental illness in primary care and its association with deprivation and social fragmentation at the small-area level in England. *Psychol Med* 2020;50:293–302.
14 Morrison J, Anderson M-J, Sutton M, *et al*. Factors influencing variation in prescribing of antidepressants by General practices in Scotland. *Br J Gen Pract* 2009;59:e25–31.
15 Shevlin M, Rosato M, Boyle S, *et al*. Rates and predictors of anti-depressant prescribing in Northern Ireland 2011–2015: a data linkage study using the administrative data research centre (NI). *Ir J Psychol Med* 2020;37:32–8.
16 Falcaro M, Ben-Shlomo Y, King M, *et al*. Factors associated with discontinuation of antidepressant treatment after a single prescription among patients aged 55 or over: evidence from English primary care. *Soc Psychiatry Psychiatr Epidemiol* 2019;54:1545–53.
17 Gum AM, Areán PA, Hunkeler E, *et al*. Depression treatment preferences in older primary care patients. *Gerontologist* 2006;46:14–22.
18 Paykel ES, Abbott R, Jenkins R, *et al*. Urban–rural mental health differences in great Britain: findings from the National morbidity survey. *Psychol Med* 2000;30:269–80.
19 Wakefield S, Kellett S, Simmonds-Buckley M, *et al*. Improving access to psychological therapies (IAPT) in the United kingdom: A systematic review and Meta-Analysis of 10-Years of Practice-Based evidence. *British J Clinic Psychol* 2021;60:1–37.
20 Barr B, Kinderman P, Whitehead M. Trends in mental health inequalities in England during a period of recession, austerity and welfare reform 2004 to 2013. *Soc Sci Med* 2015;147:324–31.
21 Docherty M, Thornicroft G. Specialist mental health services in England in 2014: overview of funding, access and levels of care. *Int J Ment Health Syst* 2015;9:34.
22 Evans-Lacko S, Knapp M, McCrone P, *et al*. The mental health consequences of the recession: economic hardship and employment of people with mental health problems in 27 European countries. *PLoS ONE* 2013;8:e69792.
23 Nicholson LA. Rural mental health. *Adv Psychiatr Treat* 2008;14:302–11.
24 Philo C, Parr H, Burns N. Rural madness: a geographical reading and critique of the rural mental health literature. *J Rural Stud* 2003;19:259–81.
25 Elm E von, Altman DG, Egger M, *et al*. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. *BMJ* 2007;335:806–8.
26 KISH L. Sampling organizations and groups of unequal sizes. *Am Sociol Rev* 1965;30:564–72.
27 Bibby P, Brindley P. The 2011 Rural-Urban Classification For Small Area Geographies: A User Guide and Frequently Asked Questions (v1.0), 2013. Available: https://assets.publishing.service.gov.uk/media/5a7cab23e5274a38e5756044/RUC11user_guide_28_Aug.pdf
28 Lewis G, Pelosi AJ, Araya R, *et al*. Measuring psychiatric disorder in the community: a standardized assessment for use by lay interviewers. *Psychol Med* 1992;22:465–86.
29 Jordanova V, Wickramesinghe C, Gerada C, *et al*. Validation of two survey diagnostic interviews among primary care attendees: a comparison of CIS-R and CIDI with SCAN ICD-10 diagnostic categories. *Psychol Med* 2004;34:1013–24.
30 Noble S, McLennan D, Noble M, *et al*. The English Indices of Deprivation 2019, 2019. Available: https://dera.ioe.ac.uk/34264/1/IoD2019_Research_Report.pdf
31 Lad M. The English Indices of Deprivation 2010, 2011. Available: https://assets.publishing.service.gov.uk/media/5a79556ee5274a2acd18bf12/1871208.pdf
32 StataCorp. Stata statistical software: release 16. 2019.
33 Parr H, Philo C. Rural mental health and social geographies of caring. *Soc Cult Geog* 2003;4:471–88.
34 Hyde J, Calnan M, Prior L, *et al*. A qualitative study exploring how Gps decide to prescribe antidepressants. *Br J Gen Pract* 2005;55:755–62.
35 Pickersgill M. Access, accountability, and the proliferation of psychological therapy: on the introduction of the IAPT initiative and the transformation of mental Healthcare. *Soc Stud Sci* 2019;49:627–50.
36 Clark DM. Realising the mass public benefit of evidence-based psychological therapies: the IAPT program. *Annu Rev Clin Psychol* 2018;14:159–83.
37 Palmer B, Rolewicz L. Rural, remote and at risk: Why rural health services face a steep climb to recovery from Covid-19, 2020. Available: https://www.nuffieldtrust.org.uk/files/2020-12/covid-19-rural-health-services-final.pdf
38 British Medical Association. Health in all policies: health, austerity and welfare reform: A briefing from the board of science, 2016. Available: https://www.bma.org.uk/media/2086/bos-health-in-all-policies-austerity-briefing-2016.pdf
39 Pugh R. Social work and rural mental health in the UK. *Rural Society* 2009;19:283–5.
40 British Medical Association. Healthcare in a rural setting, 2005. Available: https://www.researchgate.net/profile/Caroline-Seddon/publication/281282876_Healthcare_in_a_rural_setting_BMA_January_2005/links/55df218608ae45e825d50bda/Healthcare-in-a-rural-setting-BMA-January-2005.pdf
41 Nuffield Trust. Nuffield Trust Submission to the Environment, Food and Rural Affairs Select Committee: rural mental health, 2022. Available: https://committees.parliament.uk/writtenevidence/43105/pdf/
42 Palmer B, Appleby J, Spencer J. Rural health care: A rapid review of the impact of rurality on the costs of delivering health care, 2019. Available: https://www.nuffieldtrust.org.uk/research/rural-health-care
43 Piranty B. APPG Rural Health and Care Major Inquiry – February 2022, 2021. Available: https://committees.parliament.uk/writtenevidence/108243/default/
44 Lucas K, Tyler S, Christodoulou G. Assessing the 'value' of new transport initiatives in deprived Neighbourhoods in the UK. *Transport Policy* 2009;16:115–22.
45 Rickwood D, Thomas K. Conceptual measurement framework for help-seeking for mental health problems. *Psychol Res Behav Manag* 2012;5:173–83.
46 Parr H, Philo C, Burns N. Social geographies of rural mental health: experiencing inclusions and exclusions. *Trans Inst British Geog* 2004;29:401–19.
47 Office for National Statistics. 2011 census analysis - comparing rural and urban areas of England and Wales. 2013. Available: https://www.basw.co.uk/system/files/resources/basw_41648-6_0.pdf
48 Cooper C, Bebbington P, McManus S, *et al*. The treatment of common mental disorders across age groups: results from the 2007 adult psychiatric morbidity survey. *J Affect Disord* 2010;127:96–101.
49 Sedgwick P. Cross sectional studies: advantages and disadvantages. *BMJ* 2014;348:g2276.
50 Department of Environment Food & Rural Affairs. Statistical digest of rural England. 2021. Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1028819/Rural_population__Oct_2021.pdf
51 NHS England. Implementing the Five Year Forward View for Mental Health, 2016. Available: https://www.england.nhs.uk/wp-content/uploads/2016/07/fyfv-mh.pdf
52 Parkin E, Garratt K, Laing J. Mental health policy in England. 2022. Available: https://researchbriefings.files.parliament.uk/documents/CBP-7547/CBP-7547.pdf

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53 Oliver D. David Oliver: how much influence can doctors have over health policy? Bmj. *BMJ* 2022;365.
54 Appleton R, Williams J, Vera San Juan N, *et al*. Implementation, adoption, and perceptions of Telemental health during the COVID-19 pandemic. *J Med Internet Res* 2021;23:e31746.
55 Bashshur RL, Shannon GW, Bashshur N, *et al*. The empirical evidence for Telemedicine interventions in mental disorders. *Telemed J E Health* 2016;22:87–113.
56 Stefanopoulou E, Lewis D, Taylor M, *et al*. Digitally delivered psychological interventions for anxiety disorders: a comprehensive review. *Psychiatr Q* 2019;90:197–215.
57 Stefanopoulou E, Lewis D, Taylor M, *et al*. Are Digitally delivered psychological interventions for depression the way forward? A review. *Psychiatr Q* 2018;89:779–94.
58 Graham AK, Weissman RS, Mohr DC. Resolving key barriers to advancing mental health equity in rural communities using Digital mental health interventions. *JAMA Health Forum* 2021;2:e211149.
59 Cameron G, Cameron D, Megaw G, *et al*. Best practices for designing Chatbots in mental Healthcare–A case study on iHelpr. Proceedings of the 32nd International BCS Human Computer Interaction Conference; 2018
60 Potts C, Ennis E, Bond RB, *et al*. Chatbots to support mental wellbeing of people living in rural areas: can user groups contribute to Co-design *J Technol Behav Sci* 2021;6:652–65.
61 Murphy C, Thorpe L, Trefusis H, *et al*. Unlocking the potential for Digital mental health Technologies in the UK: a Delphi exercise. *BJPsych Open* 2020;6:e12.
62 Williams F, Philip L, Farrington J, *et al*. Digital by default' and the 'hard to reach': exploring solutions to Digital exclusion in remote rural areas. *Local Economy* 2016;31:757–77.
63 Chisholm D, Flisher AJ, Lund C, *et al*. Scale up services for mental disorders: a call for action. *Lancet* 2007;370:1241–52. Available: https://www.semanticscholar.org/paper/Scale-up-services-for-mental-disorders%3A-a-call-for-Chisholm-Flisher/3253f12218cfd9017d4b7ffd0a25503ca4ff88d3
64 Newbigging K, Rees J, Ince R, *et al*. The contribution of the voluntary sector to mental health crisis care: a mixed-methods study. *Health Serv Deliv Res* 2020;8:1–200.

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