Public transport policy, social engagement and mental health in older age: a quasi-experimental evaluation of free bus passes in England

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ABSTRACT

Background Social engagement and social isolation are key determinants of mental health in older age, yet there is limited evidence on how public policies may contribute to reducing isolation, promoting social engagement and improving mental health among older people. This study examines the impact of the introduction of an age-friendly transportation policy, free bus passes, on the mental health of older people in England.

Methods We use an instrumental variable (IV) approach that exploits eligibility criteria for free bus passes to estimate the impact of increased public transportation use on depressive symptoms, loneliness, social isolation and social engagement.

Results Eligibility for the free bus travel pass was associated with an 8% (95% CI 6.4% to 9.6%) increase in the use of public transportation among older people. The IV model suggests that using public transport reduces depressive symptoms by 0.952 points (95% CI −1.712 to −0.192) on the Center for Epidemiologic Studies Depression Scale. IV models also suggest that using public transport reduces feelings of loneliness (β −0.794, 95% CI −1.528 to −0.061), increases volunteering at least monthly (β 0.237, 95% CI 0.059 to 0.414) and increases having regular contact with children (β 0.480, 95% CI 0.208 to 0.752) and friends (β 0.311, 95% CI 0.109 to 0.513).

Conclusion Free bus travel is associated with reductions in depressive symptoms and feelings of loneliness among older people. Transportation policies may increase older people's social engagement and consequently deliver significant benefits to mental health.

INTRODUCTION

Depressive disorders are the second leading cause of disability worldwide.[1] Social isolation,[2] loneliness[3] and social engagement[4] have been identified as critical risk factors for depression in older age, and the WHO[5] has emphasised the need for age-friendly policies to promote social inclusion and engagement among older people. However, there is limited evidence of how specific policies targeted at older people may promote social engagement, reduce loneliness and isolation, and in turn influence mental health.

Evidence suggests that access to public transportation may promote social engagement in older age.[6 7] In April 2006, the government implemented a policy of free bus travel on local services for people aged 60 and older in England.[8] In April 2008, the concessionary fare was extended to free bus travel nationwide.[8] Recent research suggests the bus passes have been associated with increases in public transportation use[9 10] and physical activity levels,[11] and with lower rates of obesity.[10] Findings from qualitative studies suggest the free bus passes may have also improved quality of life and increased social engagement.[12–15] However, to our knowledge, no quantitative study has examined the effects of the free bus pass policy on mental health.

In this paper, we exploit the natural experiment provided by the introduction of free bus passes and data from a large, representative cohort of older people in England to examine the impact of increased public transport use on depressive symptoms. In addition, we explore whether social isolation, loneliness and social engagement may explain the link between transport use and depressive symptoms.

METHODS

Data

We used data from seven waves of the English Longitudinal Study of Ageing (ELSA), a representative cohort of residents of England aged ≥50 years and their younger partners.[16] The sample consisted of 18 453 participants residing in England who were surveyed at one or more time points between 2002 and 2014.

Statistical analysis

We used a two-stage least squares (2SLS) instrumental variable (IV) regression model,[17–19] a common econometric technique used to examine the relationship between an outcome and an 'endogenous' exposure—a variable determined by other variables in the model.[20] An endogeneity test indicated IV was preferable to ordinary least squares (OLS) (online supplementary appendix table 1). The IV model exploits the semirandom variation in public transport use generated by the introduction of the policy and the age-eligibility threshold. Online supplementary appendix figure 1 illustrates the two stages in the IV models. In the first-stage equation, the endogenous exposure (public transport use) is regressed on the instrument (eligibility for free bus travel) and all control variables. In the second-stage equation, the outcome (depressive symptoms) is regressed on the predicted values of transport use derived from the first stage and all control variables. Analyses were conducted in Stata V.14,[21] using the ivreg and ivreg2[22] commands.

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The instrument: free bus pass eligibility

We used a binary variable to indicate whether individuals were eligible for free bus travel at each wave, based on government eligibility criteria: people aged 60 years or older were classified as eligible between April 2006 and March 2010. Since April 2010, the eligibility age has been increasing in monthly increments in accordance with the increases in women's state pension age.[8] As birth month is not publicly available in ELSA, we rounded up the eligibility age between April 2010 and 2014 as follows: 61 (2010–2012), 62 (2012–2013) and 63 (2014). Between 2010 and 2014, there were 1892 individuals who were not eligible based on our rounded-up eligibility ages, but who may have met the government's actual age criteria. We excluded these individuals from the main analyses during the years their eligibility statuses were potentially misclassified, but we incorporated them under various eligibility assumptions in sensitivity analyses.

Three assumptions about the instrument (eligibility for free bus passes) must be met for the IV model to yield unbiased estimates; it must (1) be associated with the endogenous exposure variable (public transport use) in the first stage, (2) be uncorrelated with the outcome (depressive symptoms) except through its impact on public transport use and (3) be independent of unmeasured confounders. F-statistics from the first stage of the 2SLS model were >10, confirming that bus pass eligibility is strongly associated with public transport use, meeting the first condition.[23] The introduction of the bus pass and the age eligibility threshold were exogenous policy changes. However, a potential concern is that many individuals eligible for the bus pass were also eligible for state pensions. We therefore adjust for receipt of pensions in all models to control for their potential effect on depressive symptoms. Conditional on pension receipt and other observed covariates, we do not expect eligibility for free bus travel to influence depressive symptoms other than by increasing transport use.

Public transportation use

In 2002 and 2004, participants were asked: 'Do you use public transport … a lot, quite often, sometimes, rarely, or never.' In 2006, this question changed to: 'How often do you use public transport … every day or nearly every day, 2 or 3 times a week, once a week, 2 or 3 times a month, once a month or less, or never.' As never was the only consistent category, a binary variable was created that assigned a 1 to users of public transportation and a 0 to non/never-users at each wave. In sensitivity analyses, we tested different cut-off points for the binary variable. We also restricted the range of data to 2006–2014, after the change in questionnaire, to confirm our main results were not an artefact of the question change.

Depressive symptoms, loneliness, social isolation and social engagement

We used the total eight-item Center for Epidemiologic Studies Depression Scale (CES-D) score to assess depressive symptoms.[24 25] The CES-D assesses interpersonal relations, positive affect, depressed affect and somatic activity. Each item was scored as 1 if the participant has the depressive symptom, with reverse coding used for the two positive affect items. This resulted in a CES-D score ranging from 0 to 8.

We also examined potential mechanisms linking transport use and depressive symptoms, including loneliness, social isolation and social engagement. Loneliness was evaluated using the three-item University of California Los Angeles (UCLA) Loneliness scale.[26] The items included in the UCLA Loneliness scale are how often the respondent feels (1) they lack companionship, (2) left out and (3) isolated from others. These items were scored as 1 for a response of 'hardly ever or never', as 2 for 'some of the time' and as 3 for 'often' and then summed for a score ranging from 3 (not lonely) to 9 (very lonely). Social isolation was assessed using the five-item scale developed by Shankar *et al*[27] with each of the following items scored as 1: (1) not married or cohabitating, (2) less than monthly contact (including face-to-face, telephone or written/email contact) with children, (3) less than monthly contact with other immediate family, (4) less than monthly contact with friends, (5) does not participate in any organisations, religious groups or committees. These items are summed for a score ranging from 0 (not socially isolated) to 5 (very socially isolated).

For social engagement measures, we created binary variables to indicate whether respondents volunteered at least monthly, were a member of any group/club/organisation and whether they had a least monthly face-to-face contact with children, other immediate family members and friends.

Controls

We controlled for age, gender, at least one limitation in the activities of daily living (ADLs), at least one limitation in the instrumental activities of daily living (IADLs), car ownership, the natural log of net total non-pension household wealth, the natural log of equivalised household income, marital status (married, cohabitating, single/never married, widowed, divorced, separated), number of children in the household (0, 1, 2, 3+) and household region (North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, East of England, London, South East, South West).

A potential concern was that the bus pass eligibility age overlapped with women's state pension age (online supplementary appendix tables 2-3 and figure 2). Therefore, we also controlled for employment status (employed, unemployed, retired, out of labour force) and indicators of whether the respondent received a state pension or a private pension. In sensitivity analyses, we also (1) controlled for the natural log amount of state and private pensions received, (2) ran subgroup analyses by gender and (3) restricted the sample to people who were out of the labour force and thus less likely to be eligible for pensions.

To further examine the robustness of our results, we implemented a linear fixed-effect model,[28] which did not use the instrument, thus avoiding potential issues from overlap between bus pass eligibility age and women's state pension age. The fixed-effect model exploited the longitudinal nature of the data and estimated whether changes in transport use were associated with changes in depressive symptoms within individuals. Fixed-effect models use each individual as their own control to effectively eliminate all time-invariant confounding. We incorporated a wide range of covariates to control for measured time-varying factors.

RESULTS

Across all waves, 8.9% of the sample used public transport a lot or nearly every day, 11.3% used it quite often or 2–3 times per week, 17.2% used it sometimes or 2–5 times per month, 29.7% used it rarely or less than once a month and 32% never used public transportation (online supplementary appendix table 4). Table 1 indicates that public transport users differed from non-users along several dimensions at baseline. For example, transport users were more likely to be female, retired and to

Table 1 Baseline characteristics of public transport users and non-users

	Users (n=12 554)	Non-users (n=5610)	χ^2 P value	Total (n=18 164)
CES-D score (mean)	1.50	1.75		1.57
Depression*			<0.001	
Not depressed	9440 (77.4)	3868 (72.7)		13 308 (76.0)
Depressed	2754 (22.6)	1449 (27.3)		4203 (24.0)
Loneliness†			0.694	
Not lonely	7318 (80.5)	3027 (80.2)		10 345 (80.4)
Lonely	1774 (19.5)	748 (19.8)		2522 (19.6)
Social isolation‡			<0.001	
Not isolated	5016 (68.7)	1945 (64.1)		6961 (67.3)
Isolated	2284 (31.3)	1091 (35.9)		3375 (32.7)
Group/club membership			<0.001	
Not a group member	2982 (27.8)	1749 (38.9)		4731 (31.0)
Group member	7757 (72.2)	2752 (61.1)		10 509 (69.0)
Volunteering, monthly			<0.001	
Less than monthly	9783 (79.0)	4743 (87.4)		14 526 (81.6)
At least monthly	2594 (21.0)	683 (12.6)		3277 (18.4)
Face-to-face contact with children			< 0.001	
Less than monthly	3414 (34.0)	1287 (30.0)		4701 (32.8)
More than monthly	6638 (66.0)	2999 (70.0)		9637 (67.2)
Face-to-face contact with family			0.121	
Less than monthly	5286 (49.7)	2173 (48.3)		7459 (49.3)
More than monthly	5352 (50.3)	2325 (51.7)		7677 (50.7)
Face-to-face contact with friends			< 0.001	
Less than monthly	2044 (19.0)	1213 (26.8)		3257 (21.3)
More than monthly	8690 (81.0)	3313 (73.2)		12 002 (78.7)
Age (years)			<0.001	
<60	6379 (50.8)	2945 (52.5)		9324 (51.3)
60–74	4602 (36.7)	1797 (32.0)		6399 (35.2)
75+	1573 (12.5)	868 (15.5)		2440 (13.4)
Gender			<0.001	
Male	5243 (41.8)	2989 (53.3)		8232 (45.3)
Female	7311 (58.2)	2621 (46.7)		9932 (54.7)
ADLs			<0.001	
None	10 753 (85.7)	4250 (75.8)		15 003 (82.6)
At least one	1798 (14.3)	1360 (24.2)		3158 (17.4)
IADLs			<0.001	
None	10 692 (85.2)	4167 (74.3)		14 859 (81.8)
At least one	1859 (14.8)	1443 (25.7)		3158 (17.4)
Access to car			<0.001	
Yes car	10 284 (81.9)	5166 (92.1)		15 450 (85.1)
No car	2268 (18.1)	442 (7.9)		2710 (14.9)
Employment status			<0.001	
Employed	5506 (43.9)	2532 (45.1)		8038 (44.3)
Unemployed	178 (1.4)	71 (1.3)		249 (1.4)
Retired	4994 (39.8)	1956 (34.9)		6950 (38.3)
Out of labour force	1876 (14.9)	1051 (18.7)		2927 (16.1)
Marital status			<0.001	
Married/civil partnership	8351 (66.5)	4015 (71.6)		12 366 (68.1)
Cohabitating	772 (6.1)	361 (6.4)		1133 (6.2)
Single, never married	697 (5.6)	227 (4.0)		924 (5.1)
Widowed	1521 (12.1)	604 (10.8)		2125 (11.7)

Continued

Table 1 Continued

	Users (n=12 554)	Non-users (n=5610)	χ^2 P value	Total (n=18 164)
Divorced	987 (7.9)	325 (5.8)		1312 (7.2)
Separated	226 (1.8)	78 (1.4)		304 (1.7)
Kids in household (n)			0.544	
0	11 069 (88.2)	4964 (88.5)		16 033 (88.3)
1	972 (7.7)	404 (7.2)		1376 (7.6)
2	379 (3.0)	176 (3.1)		555 (3.1)
3+	134 (1.1)	66 (1.2)		200 (1.1)
Region			<0.001	
North East	828 (6.6)	334 (6.0)		1162 (6.4)
North West	1621 (12.9)	767 (13.7)		2388 (13.2)
Yorkshire and the Humber	1323 (10.5)	612 (10.9)		1935 (10.7)
East Midlands	1125 (9.0)	663 (11.8)		1788 (9.8)
West Midlands	1249 (10.0)	729 (13.0)		1978 (10.9)
East of England	1470 (11.7)	681 (12.1)		2151 (11.8)
London	1513 (12.1)	214 (3.8)		1727 (9.5)
South East	2139 (17.0)	866 (15.4)		3005 (16.6)
South West	1279 (10.2)	744 (13.3)		2023 (11.1)
Non-pension wealth (mean)	2 68 774	2 42 244		2 59 529
Equivalised income (mean)	306	290		301
Private pension			<0.001	
Receives private pension	3891 (31.0)	1564 (27.9)		5522 (29.9)
No private pension	8663 (69.0)	4046 (72.1)		12 931 (70.1)
State pension			<0.001	
Receives state pension	5151 (41.3)	2088 (37.5)		7382 (40.3)
No state pension	7308 (58.7)	3482 (62.5)		10 934 (59.7)

Values are numbers (percentages) unless otherwise stated.
*Depression defined as ≥3 item cut-off for CES-D score.
†Loneliness defined as ≥6 cut-off for UCLA Loneliness scale score.[26]
‡Social isolation defined as ≥2 cut-off on Shankar *et al*[27] scale.
ADL, activities of daily living; CES-D, Center for Epidemiologic Studies Depression Scale; IADL, instrumental activities of daily living; UCLA, University of California Los Angeles.

receive pensions, while they were less likely to have physical limitations and be socially isolated or depressed. Online supplementary appendix figure 3 shows that transport use varies with age, and in most years, transport use increases from age 50 to around age 70, after which it declines.

Figure 1 shows locally weighted regression smoothed curves of CES-D scores by age, separately for public transport users and non-users. The U-shaped curves show an average decrease in depressive symptoms around retirement age (60–65 years) followed by an increase in depressive symptoms thereafter for both users and non-users of public transport. Figure 2 suggests that transport users have lower average CES-D scores than non-transport users at every age. On average across all ages, transport users have a 0.31 lower CES-D score than non-transport users.

Models estimating the association between transport use and depressive symptoms are summarised in table 2. Column 1 of table 2 presents the estimates from an OLS model and suggests that transport use is associated with less depressive symptoms (β −0.122, 95% CI −0.161 to −0.083). Column 2 summarises results from the IV model. First-stage IV results suggest that eligibility for the free bus pass was associated with an 8% (95% CI 6.4% to 9.6%) increase in public transportation use. A supplementary analysis using a logistic model indicates that eligibility for free bus travel was associated with increased odds of using public transportation (OR 1.51, 95% CI 1.40 to 1.64) (online supplementary appendix table 5). A supplementary model using ordinal categories of transport use also yields consistent results (online supplementary appendix table 6). Results from the second stage of the IV (table 2) suggest that increased transport use—due to eligibility for the free bus pass—leads to a significant decline in CES-D depressive symptom scores (β −0.952, 95% CI −1.712 to −0.192). Results were of a smaller magnitude but significant and in the same direction in the fixed effect model (β −0.059, 95% CI −0.096 to −0.021) (table 2, column 3).

Table 3 shows second-stage results from IV models that estimate the associations between public transport use and loneliness, social isolation and social engagement. Transport use was associated with a reduction in the UCLA loneliness score (β −0.794, 95% CI −1.528 to −0.061) and an increase in volunteering at least monthly (β 0.237, 95% CI 0.059 to 0.414). Transport use was also associated with increased face-to-face contact with children (β 0.480, 95% CI 0.208 to 0.752) and friends (β 0.311, 95% CI 0.109 to 0.513), but less contact with other family members (β −0.320, 95% CI −0.566 to −0.073). We did not find associations between transport use and social isolation or group membership.

Sensitivity analyses

Figure 2 and online supplementary appendix tables 7–13 summarise results from sensitivity analyses. Estimates were

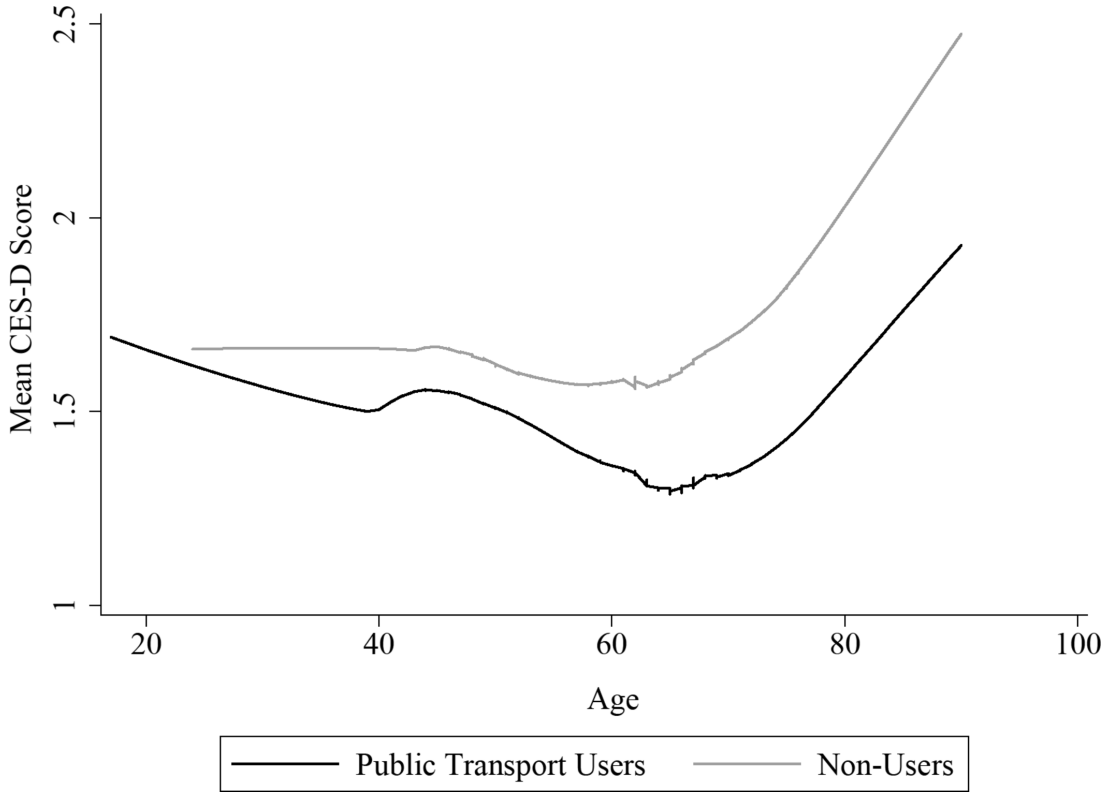

Figure 1 Locally weighted regression, mean Center for Epidemiologic Studies Depression Scale (CES-D) score by age for public transport users and non-users.

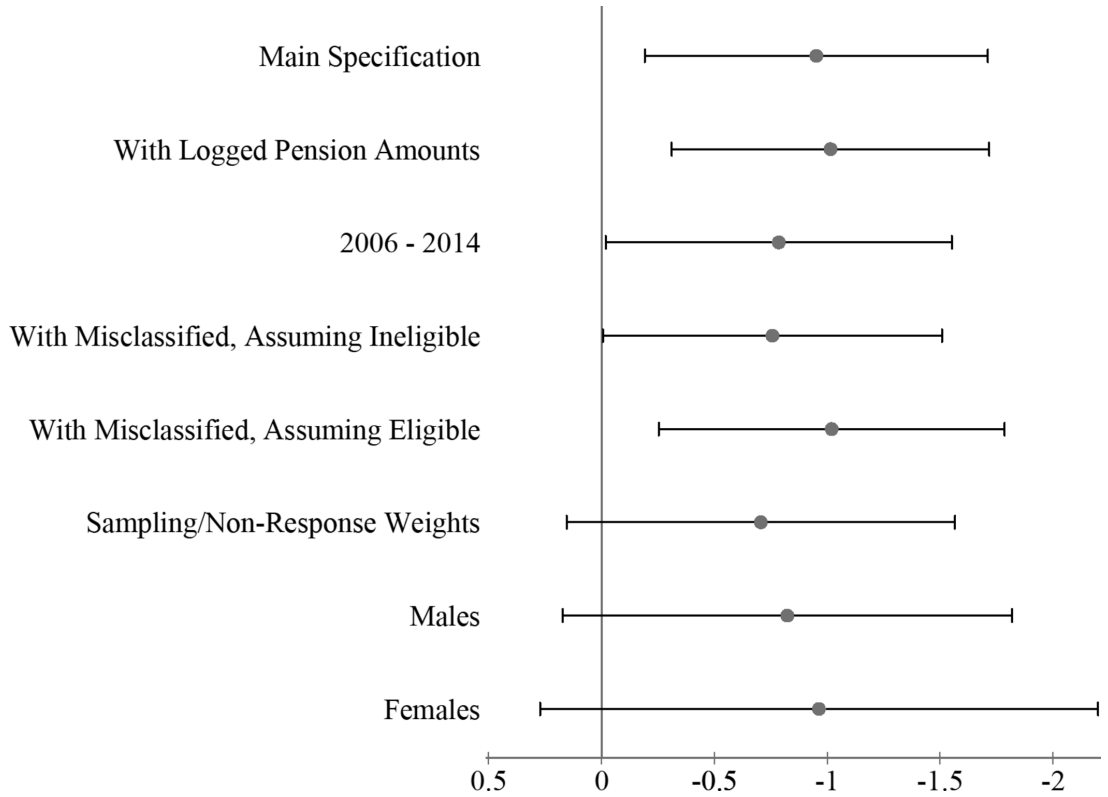

Figure 2 Beta coefficients and 95% CIs from the second-stage two-stage least squares instrumental variable main specification and sensitivity analyses.

Table 2 The impact of eligibility for free bus travel on the use of public transport (instrumental variable two-stage least squares (IV 2SLS) first stage) and the impact of transportation use on depressive symptoms (IV 2SLS second stage)

	Model 1: ordinary least squares β (95% CI)	Model 2: 2SLS IV β (95% CI)	Model 3: linear fixed effect β (95% CI)
Impact of public transport use on depressive symptoms	−0.122 (-0.161 to −0.083)***		−0.059 (−0.096 to −0.021)**
First stage: impact of eligibility for free bus pass on public transport use		0.080 (0.064 to 0.096)***	
Second stage: impact of public transport use on depressive symptoms		−0.952 (−1.712 to −0.192)*	

The outcome variable for model 1, OLS, model 2, second-stage IV, and model 3, fixed effect, is total CES-D score (0–8).
Models 1 and 2, OLS and IV, control for age, wave, gender, any ADL limits, any IADL limits, car ownership, log net total non-pension wealth, log equivalised income, receiving a private pension, receiving a state pension, employment status, marital status, number of kids in the household, region
Model 3, fixed effect, controls for age, wave, any ADL limits, any IADL limits, car ownership, log net total non-pension wealth, log equivalised income, receiving a private pension, receiving a state pension, employment status, marital status, number of kids in the household and region.
F-statistic for first-stage IV: 131.47.
*P<0.05, **P<0.01, ***P<0.001.
ADL, activities of daily living; CES-D, Center for Epidemiologic Studies Depression Scale; IADL, instrumental activities of daily living; OLS, ordinary least squares.

similar to the main results in models using logged amounts of private and state pensions, applying sampling and non-response weights provided by ELSA, and including individuals with potentially misclassified eligibility statuses. Results were also consistent in models restricting the sample to the period 2006–2014, during which there was no change in our measure of transport use (figure 2), and in models using different cut-offs for the binary transportation variable (online supplementary appendix table 8). Results for women were similar to the main estimates and to the results for men (figure 2). Estimates were also consistent when restricting the sample to people out of the labour force (online supplementary appendix table 9), as well as in models that excluded all controls (online supplementary appendix table 10) and used multiple imputation for missing values (online supplementary appendix tables 11-13).

For most years, we had no data on frequency of bus pass use. However, in 2012 and 2014, ELSA participants were asked whether they had the bus pass and how often they used it in the past month. Most people who were eligible for the free bus fare reported having the bus pass (81% in 2012, 83% in 2014). In supplementary IV models, we examined the impact of frequency of bus pass use on depressive symptoms (online supplementary appendix table 14). These results suggest a dose–response relationship whereby more frequent use of the bus pass was associated with lower depressive symptoms.

Table 3 The impact of transportation use on loneliness, social isolation and social engagement in two-stage least squares instrumental variable (IV) models

Outcome	Model 1: IV β (95% CI)
Loneliness†	−0.794 (−1.528 to −0.061)*
Social isolation‡	−0.437 (−0.941 to 0.067)
Member of group/organisation/club	0.156 (−0.054 to 0.365)
Volunteers at least monthly	0.237 (0.059 to 0.414)**
Face-to-face contact with friends at least monthly	0.311 (0.109 to 0.513)**
Face-to-face contact with children at least monthly	0.480 (0.208 to 0.752)***
Face-to-face contact with family members at least monthly	−0.320 (−0.566 to −0.073)*

The exposure variable for model 1 is predicted transport use from the first-stage IV.
All models control for age, wave, gender, any ADL limits, any IADL limits, car ownership, log net total non-pension wealth, log equivalised income, receiving a private pension, receiving a state pension, employment status, marital status, number of kids in the household and region.
*P<0.05, **P<0.01, ***P<0.001.
†Loneliness refers to the total score on the three-item UCLA Loneliness scale,[26] total loneliness scale score ranging from 3 (not lonely) to 9 (very lonely).
‡Social isolation refers to the total score on the five-item Shankar *et al*[27] social isolation scale, ranging from 0 (not isolated) to 5 (very isolated).
ADL, activities of daily living; IADL, instrumental activities of daily living; UCLA, University of California Los Angeles.

DISCUSSION

In this study, we show that increased public transportation use, as a result of the free bus pass, reduced depressive symptoms in older age. Our results suggest that benefits from increased transport use likely stem from reduced loneliness, increased participation in volunteering activities and increased contact with children and friends. Our findings provide evidence that age-friendly transportation policies can improve mental health and encourage social engagement among older people.

Our findings expand on previous studies showing that the free bus passes were associated with benefits to physical health, through increases in physical activity, decreases in adiposity[11] and lower rates of obesity.[10] Our study suggests that the benefits also extend to mental health and social engagement. These results are consistent with findings from qualitative interviews, suggesting that the bus passes improved quality of life and well-being,[12 15] and increased participation in social activities.[15]

There are other mechanisms through which use of public transportation may improve mental health among older people. Increased use of public transportation may provide psychological benefits from exercise and time spent outdoors, both of which have been linked to mental health.[29 30] Additionally, there is evidence that driving cessation is associated with increased depressive symptoms among older people.[31 32] Free bus passes may offset some of these negative effects by offering older people the means to travel without a car.

An important finding from our study is that increased transportation use was associated with reduced loneliness. There is a lack of large-scale interventions targeting loneliness,[33] a measure of dissatisfaction with the quantity and quality of social relations[34] that is relatively common in later life.[33] Using a quasi-experimental approach, our study shows that a policy which increases access to public transport for older people may offer potential to reduce loneliness.

Despite the strengths of our study, there are several limitations. ELSA does not include urban/rural identifiers to examine effect

heterogeneity across regions. Some local areas offer additional concessionary transport fares for older people, which are separate from the national bus fare scheme.[8] Although we could not study these local schemes, in sensitivity analyses, we found that results did not change when excluding participants from London, which has the most extensive set of concessionary fares (online supplementary appendix table 15). Another limitation refers to potential violation of the second and third IV assumptions. For example, although we controlled for pension receipt, there may be some residual confounding, and we cannot fully rule out that some effect we observe in IV models may reflect the impact of pensions. Likewise, bus pass eligibility may have directly influenced depressive symptoms, for example, by making people feel valued by the government. Nevertheless, it is reassuring that our results were robust in fixed-effect models that do not use bus pass eligibility as an instrument but rather exploit longitudinal changes in transport use. In addition, although less precisely estimated, gender-stratified results showed that estimates were similar for women and men, despite the fact that among the latter, state pension age is different from bus pass eligibility age. Overall, notwithstanding the limitations of each approach, these results provide some reassurance that there is a plausible relationship between public transport use and depressive symptoms.

We note that results from the IV model were larger than those from fixed-effect and OLS models. A potential explanation is that the IV estimate captures the local average treatment effect (LATE), which is the effect of increased transport use on people who changed their behaviour as a result of the bus pass policy (the compliers).[17] By contrast, fixed-effect estimates may be closer to the average treatment effect, and therefore of much smaller magnitude than the LATE.

This study suggests that an age-friendly public transportation policy, the free bus pass, positively impacted the mental health of older adults. Concerns have been raised about the high costs of the free bus scheme, which amount to approximately 1 billion pounds per year.[35] These concerns, however, overlook potential savings from reduced depressive symptoms as the annual cost of diagnosed depression in England has been estimated at 7.5 billion pounds.[36] Increased transport use was also associated with increased social engagement, particularly volunteering. This suggests that the free bus pass may also bring wider societal benefits.[11 37] Failure to consider these unanticipated mental health and social benefits of the free bus pass policy may lead to an overestimation of the cost and underappreciation of the value of the policy.

What is already known on this subject

- Free bus travel for older people in England, an age-friendly transportation policy, is associated with increased public transport use and lower rates of obesity.
- Social engagement, social isolation and loneliness are key determinants of mental health in older age, yet there is limited evidence on whether transportation policies can reduce isolation, promote engagement and improve mental health.

What this study adds

- Increased public transportation use as a result of the free bus passes was associated with a decline in depressive symptoms among English older adults.
- Increased transportation use was also associated with reductions in loneliness and increases in social engagement, in the form of volunteering and contact with children and friends.
- Transportation subsides may be a public health policy instrument to improve the mental health and social engagement of older people.

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