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## **Geographic inequalities in need and provision of social prescribing link workers**

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## Abstract

### Background

Long-term health conditions are major challenges for care systems. Social prescribing link workers have been introduced via Primary Care Networks (PCNs) across England since 2019 to address the wider determinants of health by connecting individuals to activities, groups, or services within their local community.

### Aim

To assess whether the rollout of social prescribing link workers was in areas with the highest need.

### Design and Setting

A retrospective study of social prescribing link workers in England from 2019 to 2023.

### Method

We combined workforce, population, survey, and area-level data at the PCN-level from April 2020 to October 2023. We measured population need prior to the rollout of link workers using reported lack of support from local services in the 2019 GP Patient Survey. To assess if rollout reflected need, we used linear regression to relate provision of link workers (measured by full-time equivalent (FTE) per 10,000 patients) in each quarter to population need for support.

### Results

Populations in urban, more deprived areas and with higher proportions of minority ethnicities had the highest reported lack of support. Geographically these were in the North West and London. Initially, there was no association between need and provision; then from July 2022, this became negative and significant. By October 2023, a 10-percentage point higher need for support was associated with a 0.035 (95%CI(-0.634 to -0.066)) lower FTE per 10,000 patients.

### Conclusion

Rollout of link workers has not been sufficiently targeted at areas with the highest need. Future deployments should be targeted at those areas.

**Keywords:** Social prescribing, Workforce, Health Service Research, Inequalities, Primary Care

## **How this fits in**

Social prescribing link workers were proposed in the 2019 NHS Long Term Plan to address health inequalities.

Using national administrative data, we find that the subsequent roll-out of link workers has not been sufficiently targeted at areas of highest need.

Higher need areas require additional support for employing link workers to tackle health inequalities and better support population needs.

## **Introduction**

Long-term health conditions and social isolation are major challenges for healthcare systems(1,2) One policy solution being introduced in England is social prescribing, where patients are connected to activities, groups or services within their local community(3). This is typically facilitated by social prescribing link workers in primary care, who work with patients to create personalised care and support plans for their health and well-being needs. Depending on their needs, link workers can refer patients to a range of services such as legal and benefits advice, outdoor and physical activities, volunteering, or social support. It is important to note this requires sufficient community infrastructure within the area to facilitate this.

NHS England rolled out their national social prescribing link worker programme in July 2019 as part of the Long-Term Plan(4), aiming to employ 1,000 link workers by the end of 2020/21 and refer 900,000 people by 2023/24. This policy was further extended with a mandate that by September 2022, every Primary Care Network (PCN) must provide a social prescribing service to their patients(5). There are also link workers employed outside of this scheme from additional funding from local authorities, voluntary and charity sectors, or different NHS funding streams(6).

Primary Care Networks are a relatively new entity within England. They were first announced in 2019 as part of the NHS long-term plan(4). They constitute a group of general practices that work together for the needs of the population they serve(7). The networks have access to additional funding as well as sharing resources. These PCNs feed into larger sub-Integrated Care Boards, which pre-2022 were Clinical Commissioning Groups (106 in total).

There are known geographic inequalities in the prevalence of long-term conditions(8,9). The availability of healthcare is often found to be inversely related to such needs(10). The funding scheme for social prescribing link workers in primary care in England seeks to reflect these variations in need by adjusting for age and deprivation(11). Older and more deprived populations receive higher weights. However, these adjustments may not be sufficient. In

addition, there may be variations in the capacity of systems to recruit link workers and the ability to attract them to work locally. PCN social prescribing link workers are employed through the additional roles reimbursement scheme (ARRS). This enables PCNs to recruit additional roles to help increase access for patients, but Hutchinson et al.(12) has shown that overall, the scheme had not reduced deprivation-related inequality in staffing by 2022.

Previous research has highlighted that the uptake of social prescribing activities is higher amongst individuals and areas of higher socio-economic status(13). However, there are potentially greater health and well-being returns in social prescribing activities among individuals of lower socio-economic status(14). These varying returns were reflected in a social prescribing pilot in the North East of England with greater reductions in health care costs for individuals from minority ethnic groups and those with less complex health needs(15).

To date, social prescribing studies have been assessed on smaller pilot schemes, and it is well documented that the existing evidence base is sub-optimal(16,17). There has not been a national analysis of social prescribing within England, particularly since the introduction of link workers who are employed through PCNs. This paper aims to assess the characteristics of PCNs who have the highest need for social prescribing and examine whether these are the areas in which link workers have been concentrated.

## **Methods**

### *Data*

For link worker employment, we obtained information from the Primary Care Network Workforce Data(18) for fifteen financial quarters between April 2020 and October 2023. These reflect the first available data point to the most up-to-date financial quarter. We calculated the number of link worker full-time equivalents (FTEs) per 10,000 registered patients within each PCN. Specifically, this variable refers to link workers who are employed by the Primary Care Network through the Additional Roles Reimbursement Scheme.

To assess need, we use data from the General Practice Patient Survey(19) (GPPS) from January to March 2019, before the start of the national programme to employ link workers for social prescribing. We use the proportion of people with at least one (self-reported) long-term condition who responded “No” (rather than “Yes – definitely”, “Yes – to some extent” or “Don’t know/Can’t Say”) to the following question: *“In the last 12 months, have you had enough support from local services or organisations to help you to manage your condition (or conditions)?”*

This measure is reported at the general practice level, and we use the weighted responses that adjusts for age, gender, and practice size to limit both over- and under-representation of

individuals to better reflect the population. To obtain the PCN-level average, we weighted each GP practice 'no support' value using registered populations. As the number and composition of PCNs changed during our study period, we calculated these PCN-specific weighted responses for each financial quarter in the study years.

We obtained data for each financial quarter from NHS Digital on populations registered with general practices by single year of age and by lower-layer super output areas (LSOAs)(20). LSOAs are small geographical areas containing 1,000 to 3,000 people. We linked these to the 2019 Indices of Deprivation Income Deprivation Domain(21) and created a practice-level deprivation measure using shares of the population in each LSOA for each practice. To obtain a measure of rurality, we calculate the proportion of the patients who reside in rural locations, linking LSOAs to Office for National Statistics data on 2011 Rural/Urban Classifications(22). We use the single-year-age estimates to calculate the proportion of patients who are aged over 65 years. From the GPPS, we obtain the ethnicity composition of the general practice; these are in the ONS Ethnic Group 6a classification(23) with the following categories – White (used as the base category), Black, Asian, mixed and other. We exclude “does not apply”. These measures are mapped to PCNs to calculate weighted averages for each financial quarter.

### *Analysis*

To visualise geographical variation, we present summary statistics of our need for support and link worker employment variables in heat maps for the 106 sub-Integrated Care Boards in England. These are calculated using weighted averages of the PCN-level data.

To describe the characteristics of PCNs that have higher proportions of individuals who reported having no support from local services or organisations, we used linear regression models. Patient characteristics considered are linked with funding adjustments for the ARRS, which are age (measured via the proportion of the population aged over 65 years) and deprivation (measured by proportions living in each deprivation decile). Based on previous work(24), we hypothesize that PCNs with older and more deprived populations will have higher levels of respondents reporting no support. We also included two additional characteristics: the proportion of the population whose ethnicity is Mixed, Asian, Black or Other; and the proportion residing in rural areas. Minority ethnic groups and rural populations are known to have worse healthcare access(25), and we expected the same may be found for support from local services.

We then used linear regression models to estimate associations between the number of link workers and the need for support reported prior to the rollout of link workers. We estimate this for each quarter of the rollout between April 2020 and October 2023 and present the results

in a coefficient plot. In a supplementary analysis, we examined the sensitivity of the results to adjusting further for the volume of need using the proportion of patients with long-term conditions.

## Results

In April 2020 (Q1), there was an average of 0.093 FTE link workers within each PCN across England, representing 0.020 FTE per 10,000 patients (Table 1). As time progressed, this increased quarter-on-quarter, and by the end of 2020/21, there were 831 FTE Link Workers within England (number of PCNs multiplied by FTE). This reflected 0.144 FTE per 10,000 patients. This figure nearly doubled by the end of 2021/22 to 0.267 FTE per 10,000 patients, reflecting an average of 1.289 FTE within each PCN, with a standard deviation of 1.513, indicating high variability. By the end of the study period (2023/24 Q3), this further increased to 0.449 FTE per 10,000 patients with an average of 2.198 FTE per PCN.

Table 1: Summary statistics of link worker employment from financial quarters from April 2020 to October 2023 across Primary Care Networks (Mean and Standard deviation in parenthesis)

		FTE	FTE per 10,000	Number of PCNs
<b>2020/21</b>	Q1	0.093 (0.337)	0.020 (0.071)	1,186
	Q2	0.355 (0.775)	0.074 (0.147)	1,203
	Q3	0.493 (0.872)	0.102 (0.165)	1,215
	Q4	0.683 (1.026)	0.144 (0.201)	1,217
<b>2021/22</b>	Q1	0.878 (1.259)	0.182 (0.236)	1,218
	Q2	1.009 (1.325)	0.208 (0.251)	1,231
	Q3	1.142 (1.404)	0.236 (0.265)	1,233
	Q4	1.289 (1.513)	0.267 (0.284)	1,233
<b>2022/23</b>	Q1	1.392 (1.587)	0.287 (0.294)	1,233
	Q2	1.512 (1.725)	0.311 (0.311)	1,254
	Q3	1.625 (1.800)	0.337 (0.336)	1,257
	Q4	1.861	0.385	1,258

		(1.886)	(0.347)	
<b>2023/24</b>	Q1	2.089	0.434	1,259
		(2.062)	(0.367)	
	Q2	2.164	0.444	1,268
		(2.073)	(0.370)	
	Q3	2.198	0.449	1,270
		(2.098)	(0.372)	

**Note:** FTE – Full-time Equivalent. Data reflects all the PCNs in England that existed in each quarter. NHS England have confirmed the accuracy of these employment numbers only from Q4 of 2022/23(26).

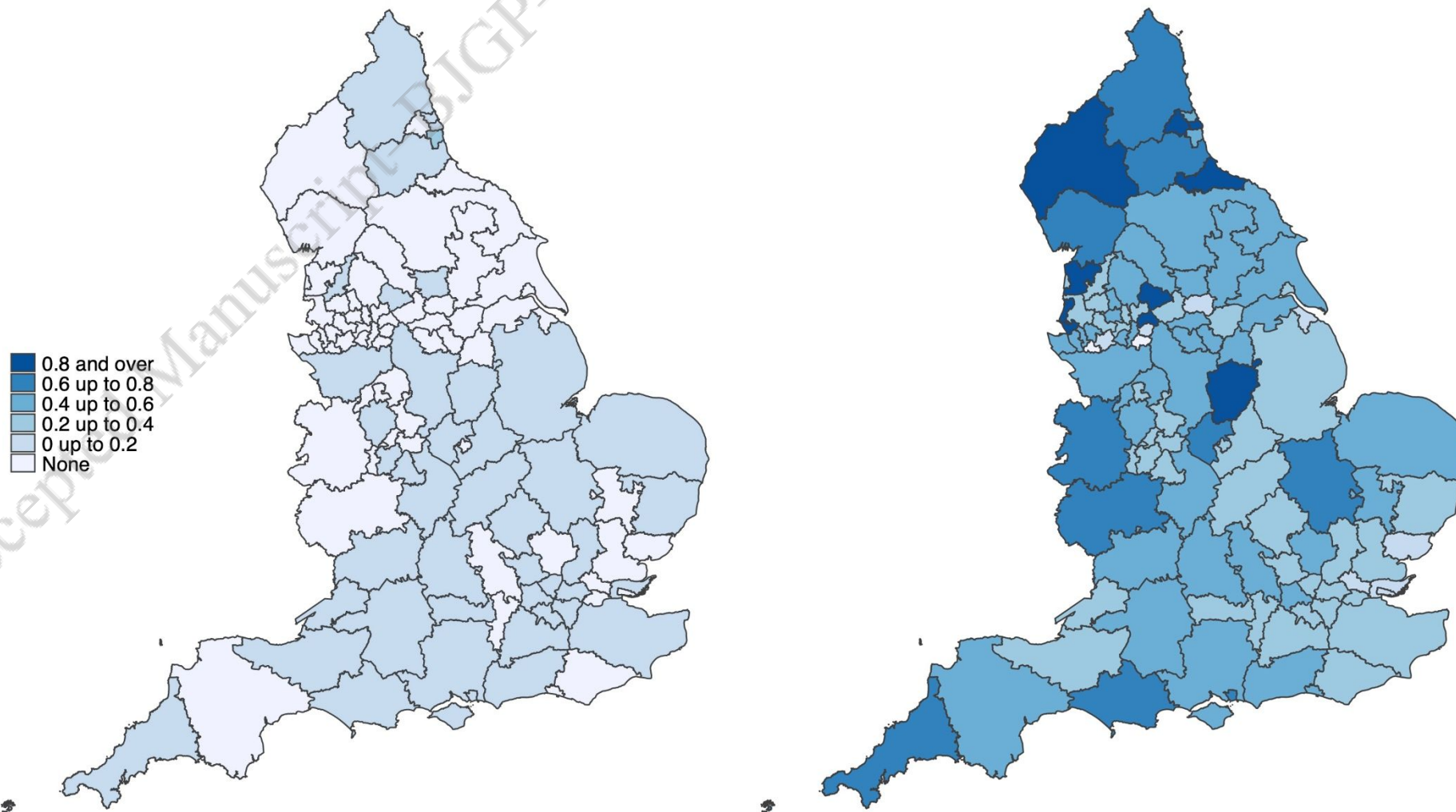
The standard deviations are greater than the means for all but the 2022/23 observations (Table 1); this highlights high variability across PCNs. This is reflected in Figure 1, which shows heat maps of link worker employment across England at the start (panel A) and end (panel B) of our study period. There were low levels of link worker provision in April 2020 (panel A), with areas in the South and North East of England having greater than zero FTE per 10,000 patients. The remaining areas had no link workers.

By the end of the study period, in October 2023 (panel B), there had been rising employment of link workers across England. Areas in the North of England have clusters of high employment of link workers, with over 0.8 FTE per 10,000 patients. Parts of the South East and North West of England have the lowest levels of link worker employment with a number of sub-integrated care boards with 0.2 FTE per 10,000 patients or lower. This suggests that uptake has been low since April 2020.

Figure 1: Link Worker Employment (FTE per 10,000 patients) by Sub-Integrated Care Board areas in England

Panel A: April (Q1) of 2020

Panel B: October (Q3) of 2023



The values of the need for support variable across sub-integrated care boards is presented in Figure 2. There is a diagonal strip of sub-ICBs from the North West to the London region where more respondents reported not having support for their condition from local services or organisations. Areas in the North East and South West had the lowest proportion of individuals who reported not having enough support from local services.

Figure 2: Proportions of people with at least one (self-reported) long-term condition who responded “No” when asked “*In the last 12 months, have you had enough support from local services or organisations to help you to manage your condition (or conditions)?*” by Sub-Integrated Care Board areas in England

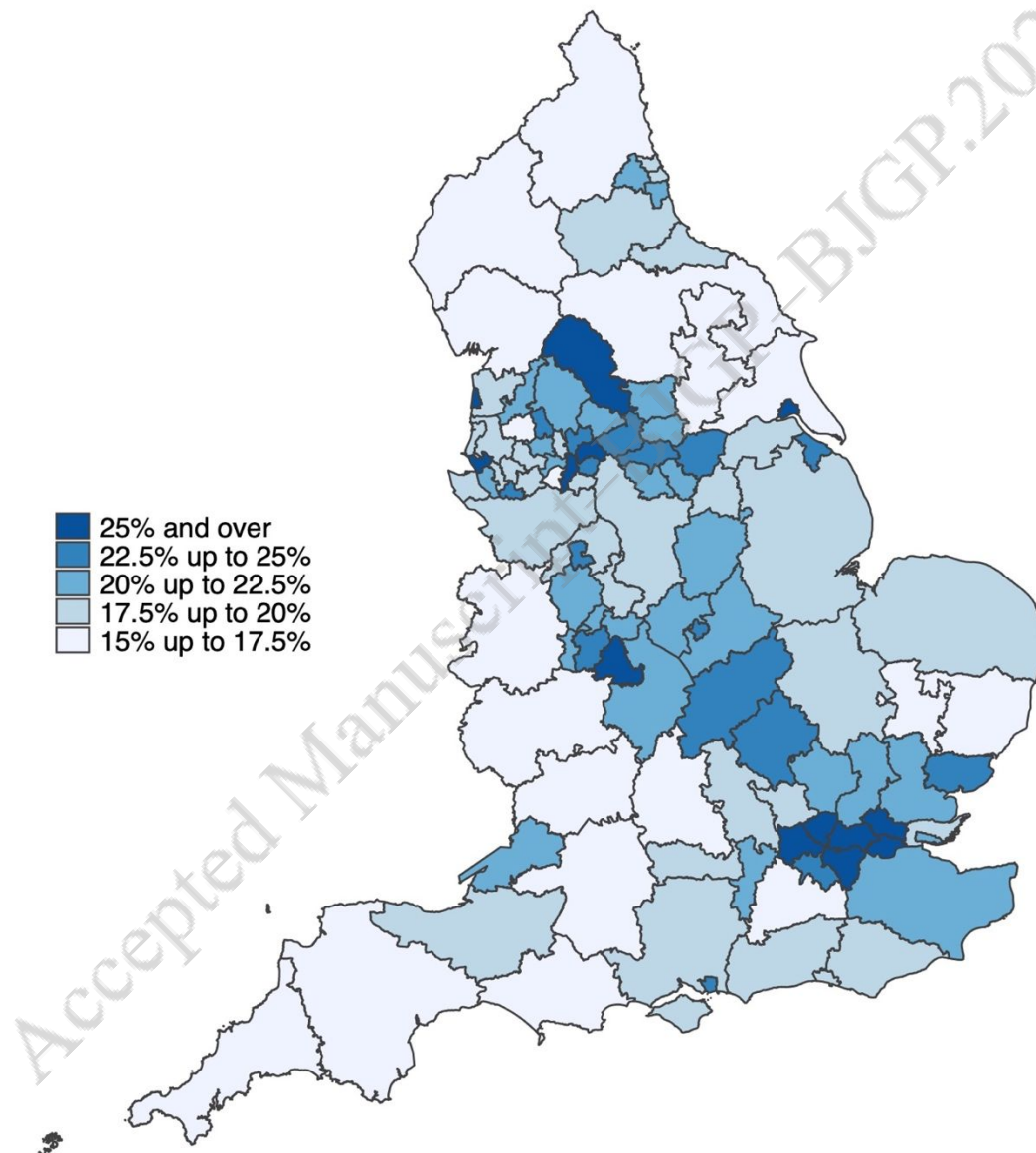


Table 2 shows the characteristics of areas associated with higher levels of not enough support from local services or organisations for their long-term condition(s). PCNs with a higher proportion of over 65s have lower proportions of patients with long-term conditions feeling unsupported. PCNs with higher proportions of patients of Black (+0.258 95 confidence interval (CI) (0.175 to 0.342)) and Asian (+0.078 95%CI(0.050 to 0.107)) ethnicity reported higher rates of no support from local services. PCNs serving rural areas have lower rates of reported not enough support (-0.026 95%CI(-0.040 to -0.012)) than urban areas. There is a deprivation gradient, with the least deprived areas having a lower need for social prescribing. However, this effect is not statistically different from the most deprived areas for deciles of 5 or less.

Table 2: Regression analysis of PCN characteristics on no support

	Mean	No Support
<b>Proportion of population aged over 65 years</b>	0.182	-0.105* (-0.203 to -0.007)
<b>Proportion of population whose ethnicity is:</b>		
White (base category)		
Mixed	0.020	-0.177 (-0.433 to 0.079)
Asian	0.105	0.078*** (0.050 to 0.107)
Black	0.043	0.258*** (0.175 to 0.342)
Other	0.023	0.023 (-0.151 to 0.197)
<b>Rurality</b>	0.179	-0.026*** (-0.040 to -0.012)
<b>IMD Decile – Income Domain (1 – Most base)</b>		
2	0.102	-0.002 (-0.014 to 0.011)
3	0.101	0.001 (-0.013 to 0.015)
4	0.099	-0.012 (-0.026 to 0.001)
5	0.101	-0.008 (-0.022 to 0.005)
6	0.102	-0.017* (-0.031 to -0.003)
7	0.100	-0.031*** (-0.045 to -0.017)
8	0.101	-0.034*** (-0.048 to -0.021)
9	0.098	-0.033*** (-0.047 to -0.019)
10 - Least	0.098	-0.054*** (-0.070 to -0.038)
Constant		0.238*** (0.215 to 0.261)

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**Note:** 95% confidence intervals are calculated on robust standard errors. \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

Figure 3 depicts the coefficient plot from the quarterly regression models of link worker employment on the need for support. The table of results for this model is in the Supplementary Table (Table S1). There is an upward trend, as expected, in the number of link workers across the study period.

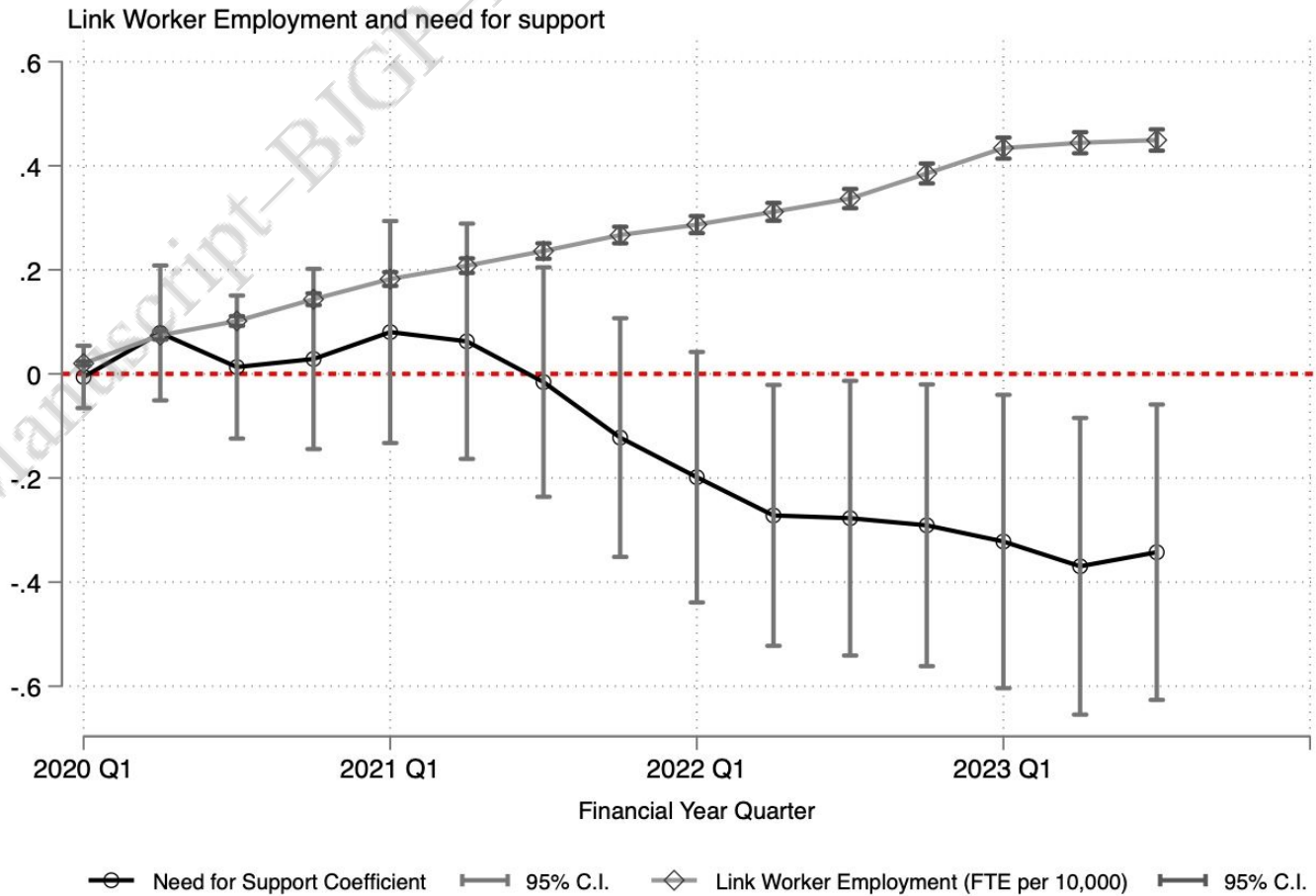
The opposite can be said for the coefficient on the need for support; this is interpreted as PCNs with higher levels of no support having decreasing levels of link worker employment during the study period. Initially, this trend is flat, from Q1 of 2020 to Q2 of 2021. This is at the start of the rollout of link workers. This trend begins to slope downwards from this point. However, it does not become statistically significant until a year later, in Q2 of 2022.

From this point, the coefficients are significant, indicating lower link worker employment in areas of higher need. The coefficients from Q2 of 2022 to Q3 of 2023 begin to flatten and show this sustained difference in employment in link workers. As of October (Q3) 2023, for a PCN with a 10-percentage point higher need for support than another, this is reflected in a 0.035 (95%CI(-0.634 to -0.066)) lower employment of FTE link worker per 10,000 patients (mean value is 0.449).

The sensitivity analysis is contained in the Supplementary Table (Table S2); our findings are robust to changing the outcome to adjust for volume so that it is FTE per 10,000 patients with long-term conditions.

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Figure 3: Coefficient plot of roll-out of FTE link workers per 10,000 patients from Q1 2020 to Q3 2023



**Note:** 95% confidence intervals are calculated on robust standard errors. Link worker employment refers to the constant in the model NHS England have confirmed the accuracy of these employment numbers only from Q4 of 2022/23(26).

## **Discussion**

### *Summary*

We find areas that would require additional support from services such as social prescribing have lower levels of link worker employment across England. Those PCNs which require support are from more deprived and urban areas with a higher population of Black and Asian minorities. Despite the funding for social prescribing being adjusted for deprivation(11) and the 2022 mandate(5), our findings indicate that this may not be the case and supports the past research that PCNs have not changed the inequalities across England(12). Pre-existing health inequalities, may be exacerbated by an inequitable distributions in the primary care workforce as a consequence(27,28).

### *Strengths and Limitations*

We use administrative data to report the employment of social prescribing link workers within Primary Care in England. This allowed for a national analysis of the supply of link workers on PCN-level characteristics. This has built on past research, which has been on smaller pilot studies within England(16).

The data recording in the early quarters of the study has been found to be underreporting staff members due to PCNs not reporting staffing. NHS England stated these employment numbers are accurate from Q4 of 2022/23(26). This is evident in the results, in that the coefficients did not become statistically significant till Q2 2022/23.

The measures for the outcome and explanatory variable have some drawbacks. The outcome measure does not measure the quality of the link workers or the onward referrals, nor the quantity of the local services that deliver them. The explanatory variable, the need for support, is quite general, and the question does not specifically discuss social prescribing. This has implications for findings, in that increasing employment of link workers in areas of higher needs for support may not be the only mechanism to improve service user outcomes.

In this study, we look into link workers who are funded via the additional roles reimbursement scheme. This means there could be additional link workers in the area who are funded from other sources, such as via GP or local authorities. This means we could be underestimating the true effects and that there could be additional inequalities in areas of higher need.

### *Comparison with existing literature*

Our findings highlight issues of inequity around social prescribing activities. We find lower link worker employment in areas with higher need, which are generally composed of areas of low socioeconomic status. Past findings highlight that there is a lower uptake for those service

users in more deprived areas(13) despite greater returns to both health and well-being(14). Similarly, we find a greater need for Black and Asian minorities and lower employment in those areas despite the evidence indicating greater cost reductions for those individual(15). We find that older populations had lower levels of no support from organisations/services prior to the rollout of link workers. This is contradictory to what we hypothesized, as we expected them to have higher needs as the PCN and ARRS funding is adjusted to account for this(11). This could be because practices are already supporting this group well for their long-term condition(s) or it may reflect differences in expectations. For social prescribing to deliver an equitable response to health, this requires additional support for areas of higher need.

Our findings support the notion that the availability of healthcare is inversely related to need(10) and that despite funding being adjusted for age and deprivation(11), this may not address these issues. We find comparable results with Hutchinson et al.(12) who found that PCN staffing has not reduced deprivation-related inequality which could be linked to capacity to recruit and/or ability to attract them to work in the local area. This is demonstrated geographically with areas of the South East and North West of England having low uptake of link workers across the study period.

#### *Implication for research and/or practice*

The findings suggest the NHS did not meet their target of employing 1,000 link workers by 2020/21(4) (Table 1: Q4 2020/21); although, we did find that each PCN was offering a social prescribing service, as per the 2022 mandate(5). However, there are geographical inequalities in provision with some areas of England having very low levels of link worker employment as shown in the heat maps (Figure 2, panel B). With the results highlighting link workers being rolled out in areas of lower need, this highlights the necessity for a more targeted approach. This can be achieved through understanding the local PCN needs better and what are their barriers to employing link workers.

PCNs covering deprived areas require additional support to recruit and retain link workers. However, funding link workers is only one part of the issue. For an optimal social prescribing pathway to function, adequate voluntary and charity sector infrastructure is necessary to support local population needs. PCNs need to work closely with the local community to identify sources of support and services that match patients' needs. These onward referral destinations also need to be funded not only to meet the demand for services but also to ensure the long-term economic sustainability of social prescribing as a whole.

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**Competing Interests:** Authors declare no competing interests

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**Data:** Data available on request to lead author

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