# Exploring the Feasibility of the Expansion of Social Prescribing in the United States: A Policy Analysis

by

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# Abstract

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(Under the direction of Sue Tolleson-Rinehart, PhD)

Consideration of patients' social needs is a chief element of comprehensive primary care, as articulated by multiple American professional societies. A new model of community referral from the primary care setting, known as *social prescribing*, originated in the United Kingdom and seeks to standardize and expand the availability of this longstanding practice. I interviewed three key stakeholders to determine the series of conditions under which an expansion of social prescribing schemes in the United States would be most feasible and for which populations it could be most advantageous. Preliminary results of these interviews confirm the presence of a diverse set of social needs intervention models in the United States. Interestingly, the term *social prescribing* has not been widely adopted to refer to American programs that share its core features, as the moniker has not gained wide traction in this country to date. My findings indicate that community health centers (CHCs) are best positioned to serve as sites of future pilot projects utilizing the social prescribing model in the United States. CHCs are more likely to serve socioeconomically disadvantaged clients and have pre-existing, sophisticated relationships with the community sector required for such schemes. My recommendations include increased international efforts to develop American experts in this area and the identification of American physician advocates for the implementation of social prescribing in well-resourced communities to lead explorations of its feasibility within their local contexts.

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# Introduction

Psychosocial stress is linked to poor mental and physical health outcomes and often stems from unmet social needs (Schneiderman *et al.* 2005). Patients are increasingly turning to primary care clinicians for solutions to their social needs, such as food insecurity, unsafe housing, unemployment, or turbulent interpersonal relationships. However, physicians and other clinicians have not historically possessed the resources necessary to address the social determinants of their patients' health directly. *Social prescribing* is an emerging model of clinical intervention wherein providers "prescribe" community resources to patients in response to their stated social needs (Drinkwater *et al.* 2019). These schemes are also referred to in the literature as *community referral* or *community linkage.* The most prominent program model uses skilled *link workers* stationed in medical practices to identify and connect patients to the most appropriate community resources. Programming to which patients may be referred is diverse and dependent on the activities available in a community's particular voluntary sector. They may include, for example, group exercise, art, or culinary classes, guided nature walks, job training, new skills acquisition, bereavement groups, or chronic illness support groups.

Effectiveness and cost-effectiveness research on social prescribing interventions remains in its infancy. A number of observational studies and independent program evaluations of social prescribing schemes in the United Kingdom have demonstrated modest yet significant improvements in outcomes such as anxiety, depression, and well-being (Grant *et al.* 2000; Friedli *et al.* 2004; Dayson *et al.* 2014). In response to these and other data and high patient demand for these programs around England, National Health System leadership announced its Long Term Plan to make access to social prescribing universal in England by 2023 (Drinkwater *et al.* 2019). Inspired by the British, experimental programs have been developed in Canada, Australia, New

Zealand, and Scandinavia. A handful of social prescribing-like pilots are active in the United States, but none yet rival the sophistication of England's schemes (Alderwick *et al.* 2018).

One of the British government's stated reasons for supporting the proliferation of social prescribing programs is to address social determinants of health, such as the sizable public health threat posed by social isolation. Isolation has been associated with detrimental health behaviors like smoking, physical inactivity, and even early mortality (Cacioppo *et al.* 2002; Holt-Lunstad *et al.* 2015). Social isolation is defined as having "a minimal number of social contacts" leading one to be "deficient in fulfilling and quality relationships" (Nicholson 2012, 137). It is often considered a function of the constraints introduced by one's environment, or aspects of one's identity that may render one marginalized within one's community. Social isolation has commonalities with but is considered distinct from loneliness, which is at base an emotional state independent of one's physical proximity to others. Socially isolated individuals are more likely to utilize healthcare services than are individuals who feel socially connected; in fact, general practitioners in Britain report that over 20% of patient visits are chiefly for psychosocial complaints (Davidson and Rossall 2015).

Community referrals made via a social prescribing mechanism are engaging and participatory by definition, introducing a patient to the new setting of a community resource, as well as to other clients utilizing a resource concomitantly. One may anticipate, therefore, that social prescribing could improve participants' subjective sense of social isolation if pursued for this purpose. While qualitative interview data is primarily being used by British health officials to justify the universal expansion of social prescribing within its primary care services, it remains unclear whether there is strong quantitative evidence to support social prescribing's capacity to improve social isolation. From a policy perspective, what is the specific utility of codifying and expanding existing clinical social needs programs as *social prescribing* interventions? Moreover, in which clinical settings and for what specific populations would this clinical workflow modification be the most meaningful? The following analysis seeks to explore these questions, using the state of North Carolina as a frame of reference from which to consider the feasibility of its implementation.

# Theoretical Perspective

The relevance of social needs, such as one's ability to earn a living wage, maintain secure housing, and access proper nutrition, is increasingly recognized as influencing the capacity to maintain physical and mental health. Unmet needs in this area may also reduce the ability to participate in a plan of care arrived at in consultation with a primary care provider for a co-existing medical condition. From the societal perspective, the aforementioned social needs and an array of other issues comprise the social determinants of health. Although population-level interventions are considered most promising for addressing these determinants, intervening at the community level also has a limited but important role, as interventions can be personalized to the most urgent needs. The cultivation of this type of micro-environment that is responsive to the needs of its citizens can act to promote community cohesion and resilience.

The social ecological model based on the work of Urie Bronfenbrenner considers one's health status as inseparable from his or her social context (McLeroy *et al.,* 2003). When an individual demonstrates maladaptive health behaviors or expresses concern that he or she faces environmental constraints such that one or more unmet social needs prevents them from presently participating in healthier behaviors, interceding at the level of the clinical health interaction may be a fruitful approach in individuals that routinely utilize health services in their community. Intervention at this level of analysis may overflow into other areas and may function to deepen local social networks, reduce trauma in childhood (perhaps due to safer housing), and could even reduce violent crime. Over time and at scale, community referral can clarify the most pressing needs of a community's residents, which can inform local political activism.

The Center for Disease Control and Prevention's Task Force on Community Preventive Services works to advance community-level interventions for health. The body has concluded these initiatives in general have the capacity to "reduce the persistent disparities in health related to socioeconomic status, education, and housing" (Anderson *et al.* 2002, 1). Homelessness in particular has a well-characterized negative effect on health. Indeed, homeless individuals have 4-fold higher odds of mortality compared to individuals in housing (O'Connell 2005).

In the future, data analysis of electronic medical records tracking utilization of community resources accessed via a social prescribing mechanism can help predict which patients are likely to become "super utilizers" of healthcare resources and flag them for preemptive outreach by a case manager or clinical social worker. Addressing pressing social needs can also be seen as a preventive action and has the potential to yield cost savings to the healthcare system if a fulfilled need enables one to avoid a deterioration in health. Quantification of the effect in healthcare utilization, including hospitalizations and emergency room visits, may inform future decision-making in this area. In the shorter term, link workers must be judicious about the community assets to which clients are referred and be proactive about maintaining the voluntary sector relationships presently at their disposal. Frequency and quality of resource utilization should be evaluated via follow-up calls with clients, and a flexible approach should be adopted that encourages clients to pursue a different resource if their need is being unmet.

### ***Findings from the literature***

My original review of the literature for this project focusing on the outcome of social isolation was largely inconclusive. A full discussion of the results of my systematic review can be found in Appendix A. To summarize, I conducted a limited systematic review on the effect of social prescribing interventions on participants' rating of their social isolation. I conducted full text review of seven articles and found no clear direction of effect on social isolation after taking part in a social prescribing referral intervention. The overall strength of this evidence is low.

# Methods

I triangulated multiple methods to best characterize the feasibility of the expansion of social prescribing schemes in the United States. First, I conducted a limited systematic review of the literature on the capacity of social prescribing to improve social isolation. This outcome is of key interest to stakeholders in this area and is often cited as one of the main public health threats that has animated the proliferation of social prescribing in the United Kingdom. The methods and full results of this review can be found in Appendix A. This present paper is based on the first three in-depth interviews with stakeholders I was able to reach at the time of this writing in order to contextualize the status of the implementation of this model of community referral in North America generally, and the United States specifically.

The Institutional Review Board of the University of North Carolina determined that my research was “not human subjects research” and exempt from further review (IRB # 19-0533); after receiving this approval, I contacted prospective interviewees using a standardized invitation email introducing myself and explaining the aims of my research project (Appendix B). I requested their participation in an interview via phone or videoconference given they were each located remotely. My choice of interview respondents was grounded primarily in a Web search of the leading experts in this field. I subsequently sent several more interview invitations after being connected to additional experts by my initial interview respondents, in the normal “rolling reputational” process of identifying further experts.

I interviewed all three respondents whose comments are analyzed here by phone, after receiving verbal consent to be interviewed, to record the conversation, and to refer to them by name and title in my work. Interviews were conducted between May 22, 2019 and June 5, 2019. I used the interview guide in Appendix B as a template to begin the interviews and employed standard interview techniques. I recorded each interview using the Tape A Call smartphone application to ensure accurate representation of responses. I manually transcribed all interviews verbatim.

## Results

I interviewed one American and two Canadian professionals who are actively overseeing social prescribing pilot programs and act as thought leaders in this policy space. All stakeholders agreed to be identified by name and title, although one informant requested not to be quoted directly in my work. The interview respondents, including their professional positions, nationalities and the order in which they were interviewed, can be found in Table 1. I pursued the Canadian perspective because of its geographic and cultural proximity to the United States and given that its health officials are actively mentoring American counterparts on how to translate these schemes to the American context. After speaking with them, my future plans for this work include seeking a more local perspective (North Carolina/Triangle level) to determine the present awareness of social prescribing and discuss the feasibility of its implementation locally.

### *Commentary on social prescribing in the American context*

Interview respondents shared many common views about the utility of social prescribing interventions. One informant believes that there are many models by which social needs can be intervened upon, including but not limited to social prescribing. Another was unreservedly optimistic about social prescribing's capacity to address the needs of American patients. They both identified these kinds of services as fundamental elements of quality primary care as identified by prominent professional organizations. They both also said that the use of a more holistic framing of patients' health, rather than seeing health purely through a medical lens, can aid clinicians' understanding of which patients could be served by community linkage.

One chief officer at a large health care non-profit organization underscored that the social prescribing model is still being refined and expressed the need for its definition to be more properly bounded so that there can be a common understanding of what that term refers to in the literature. While his organization supports many clinical operations that use link workers to refer to community resources, they have not yet labeled these programs *social prescribing.* He said one challenge is that most clinics do not have additional funds to hire a full-time link worker to a care team, but many existing staff (e.g., social workers, care managers, therapists) are already serving this role in an unofficial capacity. Alternatively, he cited an example from the Boston area in which local college students volunteer to serve in shifts as link workers at a community clinic, drawing on an integrated resource database. This example illustrates that link workers must not necessarily be single, discrete individuals to function well in the referral pathway.

This officer also said that referrals that may fall under the social prescribing umbrella can be ordered under other existing models of care in the United States, such as the chronic care management model in Medicare. Its billings codes are flexible to the extent that community linkage activities deemed necessary by the clinician can be covered. Finally, this officer drew a distinction between the robust social interventions that are possible in health care systems that bundle public health and healthcare spending, such as Costa Rica and New Zealand. This bundling makes for a more robust community sector in which universal access to community interventions for its population may render moot the need to make referral to these activities from a clinical interaction. He cites the Center for Medicare and Medicaid Innovation as a body working to find effective models to compensate for the fact that this integrated approach has not been historically present in the United States.

Last, he encouraged a reconsideration of the need for a specific type of evidence to justify spending to increase access to social needs interventions, as it is often impossible to conduct a study over the time horizon necessary to assess long-term outcomes resulting from engagement with a particular resource. He would like to see greater visibility of the stories of the lived experiences of community residents who are participating in and benefitting from social prescribing-like interventions considered by policymakers in this area, in addition to the quantitative data that has historically been given ultimate weight.

### ***Lessons from Canada***

Two participants shared how their experiences directing the implementation of nearly two dozen social prescribing pilots across the Canadian province of Ontario may be instructive for the United States. They have built a comprehensive evaluation into the design of the pilots and are beginning to compile the results for multiple outcomes, including physical and mental health, sense of belonging, resilience, and the provider experience of referral. Nearly all their pilot sites are community health centers (CHCs), and all but one center primarily utilize referrals to resources existing within the clinic itself. Multiple sites have designed specific interventions for their patients within the clinic, such as bereavement groups and Alzheimer's support groups, as a direct response to patient demand. This approach also helps ensure that transportation or other costs do not impede patients' participation in the resources. They emphasize that the diversity of their province is such that social needs resources may vary widely by clinic. For example, while one site responds to the needs of a rural Francophone population in the north, another has special programming for LGBTQ populations in urban Toronto.

These informants are engaged in disseminating their knowledge about how to best implement social prescribing to a handful of officials at state health associations in the United States. Dr. Mulligan explained her reasoning for believing social prescribing could easily be translated to the American system by citing recent news that Kaiser Permanente will launch Thrive Local, a comprehensive social health network. *"It seems like it will leapfrog ahead of what we're able to do just because of the sheer scale of it…It would just be structured differently…Not to mention, you've got a robust community health sector, way better than ours,"* she said.

She described the initial approach she believes American actors in this space should take when considering implementing a social prescribing pilot and how to best communicate what clinics are finding out about of the needs of its patient populations.

> *They just need to make a connection with the services they already provide and evaluate it and report back in the kinds of trends that health systems folks understand. Because for the longest time we've been using health promotion and community development language that doesn't necessarily resonate with the clinical world, and for economic, government decision-making.*

She qualified her optimism by stating that the pilot programs she directs were only made possible by the opportune availability of special funding from the Canadian government.

> *"It [original pilot project] emerged from our work on this thing called the Canadian Index of Well-Being, which was an attempt by some Canadian community groups and academics to come up with an alternative to GDP, to measure how we're doing as a society…We happened upon a grant opportunity through the Ministry of Health and Long-term Care here in Ontario, and we used that to launch this pilot."*

The discussion and conclusions to follow result from my understanding of these first three interviews. Additional interviews may change the picture these stakeholders have created.

# Discussion

My preliminary results reveal promising clinical contexts within which to apply wider access to a social prescribing mechanism in the United States. The findings of Ontario's pilot programs are forthcoming, likely in 2020, and will be instructive about whether social prescribing successfully translates out of the British context. New efforts toward international dialogue between health care professionals on this issue are likely to promote increased consideration by potential adopters of this model. Policymakers should take care, however, not to consider this model as a panacea to address the social determinants of health, especially in a country as large and diverse as the United States. Even where universally available, the solutions to these issues are likely structural, resulting from federal policies that affect the economic vitality, the quality and accessibility of health care, and the general well-being of populations. Some posit that a more liberal social safety net, such as a universal healthcare scheme, could reduce some of the psychosocial stressors that may lead patients to pursue social prescribing referral in the first place. Given the status of existing state and federal policy, however, the implementation of a social prescribing mechanism is likely feasible in specific corners of our nation's primary care services. Implementation efforts will require the time commitment of dedicated staff members, as well as efforts to acquire grant funding to cover the costs of program planning and evaluation. The formation of a network of American facilitators of the social prescribing model could support these actors in areas that lack local pilot programs. Replicating the level of policy support for social prescribing that is present in the United Kingdom will require the vocal advocacy of clinicians who work with patients with complex social needs in their daily practice. These physician advocates must also synthesize compelling aspects of the existing evidence base and their clinical experiences to shape an argument to stakeholders.

# Conclusion

The universal adoption of a standard model by which clinicians can intervene on social needs would elevate the prominence of these services and promote the visibility of these offerings in the clinical setting. It would also allow for a more robust conversation among public health professionals and researchers in this area who are tasked with devising appropriate methodologies to evaluate whether social prescribing schemes can deliver on the aims that its proponents have articulated. The question of within which type of primary care clinical environment it is most appropriate to pursue this type of expansion in the American context is of immediate salience. Based on my findings, community health centers (CHCs) are best positioned to adopt the social prescribing model. These centers are likely to have pre-existing and sophisticated relationships with partners in the community sector and are also more likely than other type of practices to have active resources within the clinic itself (such as illness support or education groups), which would lower the barrier to entry to participation by its patient population. To this end, I recommend that the leadership of state community health center organizations, such as the North Carolina Community Health Center Association, identify its clinical sites with the most robust resources as sites within which this model could be most easily adopted. A committee of state health center officials should then be convened to determine an implementation plan, which would include the categorization of available resources, the identification of existing staff that could take on the "link worker" role, the creation of a plan to educate providers and promote patient awareness of this model, and, critically, the conception of an evaluation methodology which include a set of outcomes most relevant to its early utilizers.

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# Tables and Figures

Table 1. List of interview respondents in chronological order of interview.

| **Respondent** | **Professional Position** | **Nationality** |
|---|---|---|
| Dr. Damon Francis | Chief Medical Officer<br>Health Leads non-profit organization<br>Boston, MA<br>**Not quoted directly by request* | United States |
| Dr. Kate Mulligan | Chief Policy and Communications Officer<br>Alliance for Healthier Communities<br>Ontario, Canada | Canada |
| Sonia Hsiung | Social Prescribing Pilot Lead<br>Alliance for Healthier Communities<br>Ontario, Canada | Canada |

# Appendix A – Systematic Review of the Literature

*The Effect of Social Prescribing on Social Isolation*

## Abstract

Aim of study: To perform a systematic review of the literature to evaluate the effect of social prescribing schemes on social isolation, which represents a growing threat to public health and well-being in high-income countries.

Method(s): I searched multiple databases (PubMed, Scopus, Cochrane) for randomized trials, observational, pre/post evaluations, and qualitative interview studies published from 2000 to present that report social isolation as an outcome. Eligible studies included adults aged 18 and over, a follow-up period of ≥ 3 months and a referral pathway from primary care or GP practices to the voluntary sector. I graded the strength of the evidence of each study using NIH tools.

Results: A total of 6 studies were included (n=605). In one RCT (n=161), there was no difference between baseline and 4 months on the confidant and affective support scales of the Duke-UNC Functional Social Support Questionnaire (p=0.221 and 0.594, respectively). The results of 4 pre/post survey studies (n=420) were mixed. One study (n=69) demonstrated a significant improvement in isolation measured by the Friendship Scale (p<0.001; ETA 0.4) while 3 others (n=351) found no difference. One qualitative interview study (n=24) found no difference.

Conclusion: This first-of-its-kind review clarifies the state of the evidence regarding the capacity of social prescribing programs to improve social isolation. A minority of studies included isolation as an outcome. Methodological heterogeneity, modest sample sizes, and the broad diversity of interventions evaluated render the quality of the evidence as poor. Given our growing understanding of the burden of suffering posed by isolation, researchers should adopt a standardized approach to measuring social isolation in order to more accurately quantify post-intervention effects. Use of validated tools such as the Duke Social Support Index or the Social Disconnectedness Scale would enable comparison of outcomes among studies and allow for more robust decision-making by policymakers.

## Introduction

Community-level interventions to address social needs are relatively common. A prominent clinical model being advanced in the United Kingdom and other high-income countries to help patients address their social needs is called "social prescribing." When a patient visits a primary care provider and shares that he or she has a particular social need, clinical settings with active social prescribing programs can refer the patient to a trained *link worker,* who will connect the patient with relevant community resources. While recent studies suggest that the evidence base to support social prescribing is mixed, and fairly weak overall, pilot programs continue to proliferate in many Western countries. It is being considered a partial solution to address specific social determinants of health in the U.K., where health officials seek to improve social isolation and other markers of social connectedness within its population. Recent data suggest is a significant threat to public health in Britain and other HICs.

Social isolation has negative consequences for health and has been associated with increased rates of dementia, heart disease, and depression (Valtorta *et al.* 2016; James *et al.* 2011; Cacioppo *et al*. 2006). While data show that isolation impacts all age groups in the U.K., young adults and the elderly have the highest burden of suffering from this social condition. Of the elderly over age 75, the prevalence of living alone has increased by 24% in the last 20 years to 2.2 million seniors (Office for National Statistics UK). Overall, over 1.2 million British older adults are chronically isolated, according to a 2016 Age UK study. The prevalence of social isolation is also high in the United States. Twenty-two percent of Americans endorsed feeling socially isolated in a large-scale survey by the Kaiser Family Foundation, with a majority of these respondents being under age 50 (DiJulio *et al.* 2019). Moreover, a 2016 Cigna survey revealed that 53% of Americans do not have meaningful social interactions on a daily basis and identified Generation Z (ages 18-22) as the most isolated in America (Cigna 2016). Given the concerning nature of these and other data, clinicians and public health professionals are working to determine whether existing clinical or social interventions could match the scale of this problem. Public health professionals in the United States are beginning to look at the capacity of social prescribing programs to address this issue. Introducing this model to the American context has unique challenges, however, as is it a much larger country, a different healthcare system, and community resources tend to vary quite substantially by city and state.

The aim of my partial systematic review is to appraise the evidence for whether social prescribing interventions by primary care providers improves patients' subjective sense of social isolation. This study will be the first review on social prescribing to assess this outcome. The results of this review will serve to inform policy makers in this area and identify methodological areas for improvement on this outcome.

# Methods

## *Scope of review*

This review aimed to assess the evidence in regard to the capacity of social prescribing programs to reduce participants' social isolation. I adhered to the PRISMA checklist for systematic reviews when conducting this review. This study was not registered.

## *Eligibility criteria*

I reviewed published literature as well as independent program evaluation reports that met the following eligibility criteria (**Table 1**): (1) participants were adults 18 years of age or older; (2) intervention was labeled as or met the definition of a "social prescribing" or "community referral" program that enrolled patients primarily through PCP referral (i.e. utilized link worker, referred patients to voluntary sector programming, etc.); (3) pre-intervention social isolation metrics OR usual care used as the comparator; (4) post-intervention isolation metrics as outcome of interest; (5) a follow-up period of >3 months prior to assessment of outcome; (6) a primary care or general practitioner (GP) practice setting in any country (although these programs primarily operate in English-speaking HIC); and (7) English language articles since the year 2000, since social prescribing pilot programs began in the late 1990s in the United Kingdom, and program evaluations did not begin until a year or so thereafter. Due to the limited amount of available literature on this topic, I chose not to exclude any specific study designs from this review so as to maximize the potential number of studies eligible and enable a thorough assessment of the state of the literature on social prescribing for our outcome.

### *Search strategy*

PubMed, Cochrane, and Scopus databases were searched for eligible studies. I utilized the following search criteria for all searches: *(Social prescribing OR social prescription OR community referral OR non-clinical prescribing OR non-medical prescribing) AND (social isolation OR isolation OR loneliness OR lonely OR connectedness OR connection).* Specific hedges used to identify distinct study designs were utilized for the PubMed database, as detailed in **Table 2**. I searched ClinicalTrials.gov for unpublished studies on our topic as well as performed a Web search for relevant grey literature. All searches were conducted between 12 March and 15 March 2019. Studies will be selected for inclusion based on whether they meet inclusion criteria (**Table 1***)*.

### *Study selection and data abstraction*

For articles that met inclusion criteria following full-text review, I abstracted a variety of information, including setting, study design, intervention and comparison groups, sample size and characteristics (i.e. age range of participants, presence of psychiatric or medical comorbidities, etc.), outcomes, and measurement tool utilized for the social isolation outcome. I grouped two articles with findings from the pre- and post- results of a single discrete study. Summary measures varied and included percent change or P value data from pre/post intervention or RCT outcome data, in addition to “direction of effect” descriptive data based on the results of qualitative studies. I sought to derive a general interpretation of effect from these data using quantitative and qualitative synthesis strategies.

# Results

## *Study selection*

I identified 589 unique articles and assessed 29 full-text articles for eligibility. Specifically, our PubMed search identified 496 articles, and the Scopus search yielded 12 articles. An additional five reviews were identified in the Cochrane database search, for a total of 513 records identified via database search. None of the 67 unpublished studies found in our search of ClinicalTrials.gov met inclusion criteria. Nine additional records were found by searching the Web for grey literature. All 582 articles remaining following the removal of duplicates underwent abstract review, resulting in the exclusion of 553 articles. I then performed full-text review on 29 records. From this process, 22 articles were deemed ineligible for various reasons, as detailed in the PRISMA diagram in **Figure 1.** The remaining 7 articles (6 studies) underwent data abstraction for inclusion in this systematic review.

## *Direction of effect*

The overall direction of effect could not be determined from this set of studies. The overall strength of the evidence is low. Description of the characteristics and results of each study for the social isolation outcome, including their study designs, sample sizes, and follow-up times can be found in the Evidence Table (**Table 3**). The manner in which social isolation was assessed by study can be found in **Table 4**. I did not perform subgroup analysis or meta-analysis due to concern the results of such analyses would be unreliable.

# Discussion

My review found inconclusive evidence that social prescribing programs can reduce social isolation in their participants. The overall strength of the evidence is low. Although a majority of studies led to significant or non-significant reductions in social isolation, a conclusion toward this direction of effect cannot be responsibly made. Despite this finding, this study is the first review of its kind to evaluate the effect of this emerging model of social intervention on isolation, an increasingly relevant public health outcome.

This review has several limitations. Multiple methodological shortcomings increase the risk of bias both within and across the included studies. Moreover, the overall quality of the studies assessed is low. All studies described British schemes and targeted socioeconomically disadvantaged areas. All but one study utilized a relatively weak pre/post design to measure effects on the outcome. Sample sizes were quite varied but were small on average. In two studies, representations of data are such that the reader cannot determine how the results for isolation were measured and/or calculated. The studies also generally fail to provide data on the utilization rates of various resources, rendering it impossible to determine which resources were best able to promote social connectedness.

I placed special attention on the methodologies used to measure social isolation in each study. While Grant *et al.* and Kimberlee used well-validated tools, other studies asked subjects about their connectedness to others, or even simply about their mental health in general. These latter methodologies are too weak to contribute meaningfully to the determination of a direction of effect. I chose to retain them in this review because they are demonstrative of the shortcomings inherent in how the isolation outcome is measured in social prescribing literature.

My recommendations for future research in this area include the need to select validated tools to measure isolation in program evaluations where this outcome is of interest. In addition to the UNC-Duke Functional Social Support Scale and the Friendship Scale, two additional validated tools with utility for this outcome include the Duke Social Support Index and the Social Disconnectedness Scale. These latter two tools include especially nuanced questions that seek to characterize the depth of the social network and the frequency of contact with others, which may help clinicians pinpoint which community resource may best intervene for one's need. Over time, the adoption of a standard tool used universally for this outcome will enable comparison among studies. In addition, more rigorous designs, such as the randomized trial elegantly employed by Grant et al., should be utilized by other pilot program evaluation teams. The presence of a control group receiving routine care is an important advantage of the RCT and enables direct contrast of outcomes with those participating in the intervention arm.

This review indicates that social prescribing's effect on isolation remains unclear. The United Kingdom's substantial investments in social prescribing cannot be justified by this evidence alone. Given the growing burden of social isolation, however, it is critical that the public health community continue to evaluate interventions that target this insidious issue. Researchers should continue and expand plans to evaluate social prescribing pilots outside of the United Kingdom in order to see whether a reduction in isolation is seen outside of the British context. I also believe the term *social prescribing* fails to capture qualifying interventions during searches of the literature. The broader codification of social needs interventions utilizing a link worker and community linkage as being *social prescribing* programs will identify existing schemes that should be included in reviews seeking to determine the capacity to reduce isolation.

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# Tables and Figures

Table 1. Eligibility criteria

| Category | Inclusion criteria | Exclusion criteria |
|---|---|---|
| Population | Adults ≥ 18 years | Children and adolescents <18 years |
| Intervention | "Social prescribing" or "community referral" intervention enrolling patients via PCP referral | All social prescribing interventions not utilizing PCP referral as predominant enrollment method |
| Comparator | Pre-intervention measurement/rating of social isolation OR usual care/no intervention | ____ |
| Outcome of interest | Post-intervention measurement/rating of social isolation (or substitute metric) | All other outcomes |
| Timing | Follow-up periods of ≥ 3 months | Follow-up periods of <3 months |
| Setting(s) | Primary care or GP surgery | All other clinical setting types |
| Study design(s) | Systematic reviews, RCTs, observational studies, pre/post evaluations, qualitative studies | ____ |
| Language | English language articles | Non-English language articles |
| Years considered | 2000 to present | Prior to 2000 |

Table 2. Search strategy utilized for PubMed database.

| **PubMed** (Date searched: 3/12/19) | | |
|---|---|---|
| Search | Query | Results |
| 1 | (Social prescribing OR social prescription OR community referral OR non-clinical prescribing OR non-medical prescribing) AND (social isolation OR isolation OR loneliness OR lonely OR connectedness OR connection) | 496 |
| 2 | 1 AND ((randomized[title/abstract] OR randomised[title/abstract]) AND controlled[title/abstract] AND trial[title/abstract]) OR (controlled[title/abstract] AND trial[title/abstract]) OR "controlled clinical trial"[publication type] OR "Randomized Controlled Trial"[Publication Type] OR "Single-Blind Method"[MeSH] OR "Double-Blind Method"[MeSH] OR "Random Allocation"[MeSH] | 23 |
| 3 | 1 AND ("review"[Publication Type] AND "systematic"[tiab]) OR "systematic review"[All Fields] OR ("review literature as topic"[MeSH] AND "systematic"[tiab]) OR "meta-analysis"[Publication Type] OR "meta-analysis as topic"[MeSH Terms] OR "meta-analysis"[All Fields] | 10 |
| 4 | 1 AND "Case-Control Studies"[MeSH] OR "Cohort Studies"[MeSH] OR "Epidemiologic Studies"[MeSH] OR "Cross-Sectional Studies"[MeSH] OR "Organizational Case Studies"[MeSH] OR "Cross-Over Studies"[MeSH] OR "Follow-Up Studies"[MeSH] OR "Seroepidemiologic Studies"[MeSH] OR "Evaluation Studies"[Publication Type] OR “observational study” OR “observational studies” | 148 |
| 5 | 1 AND ((("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face-to-face" or structured or guide) adj3 (interview* or discussion* or questionnaire*))).ti,ab. | 0 |
| 6 | 1 AND evaluation studies/ or evaluation studies as topic/ or program evaluation/ or validation studies as topic/ or ((pre- adj5 post-) or (pretest adj5 posttest) or (program* adj6 evaluat*)).ti,ab. or (effectiveness or intervention).ti,ab. | 0 |

Figure 1. PRISMA figure on disposition of articles

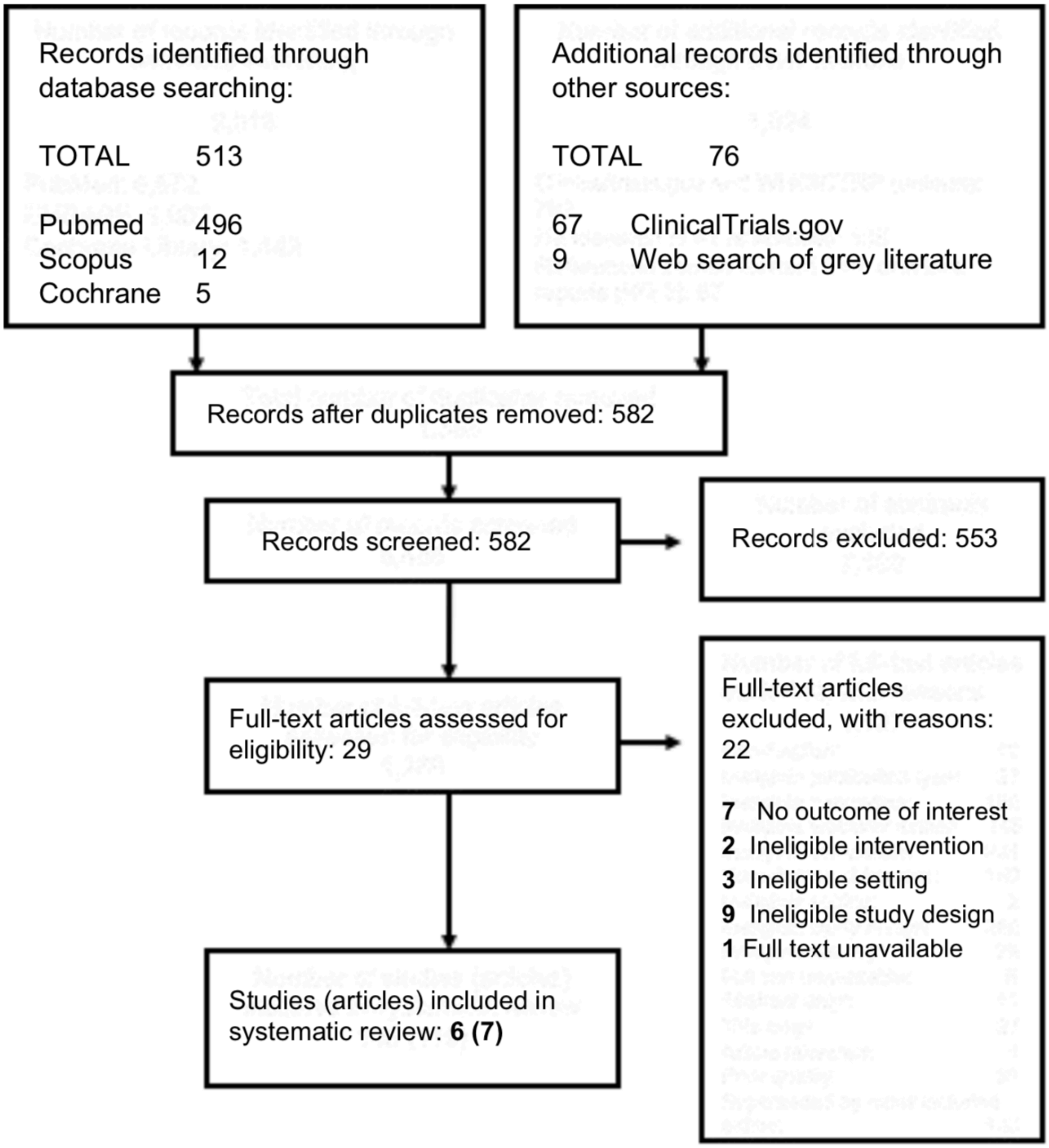

Table 3. Evidence Table of studies.

| **Study** | **Characteristics** | **Design** | **F/u time** (months) | ***n*** | **Effect on social isolation** |
|---|---|---|---|---|---|
| Grant *et al.,* 2000 | Amalthea Project program in 26 general practices in Avon, UK. Referral facilitators assessed pts and recommended voluntary sector resources. | RCT | 4 | 161 | Non-significant reduction |
| Kimberlee, 2016 | Wellbeing Programme at the Wellspring Healthy Living Center five GP surgeries in Bristol, UK. Pt assessment and linkage to community (cooking classes, men's groups, Somali outreach). | Pre/post | 3 | 69 | Significant reduction |
| Moffatt/Wildman *et al.,* 2017/19 | Ways to Wellness program across 17 practices in Newcastle upon Tyne, UK. Link worker assessment, community linkage (i.e. welfare rights advice, walking groups, physical activity classes, arts groups, continuing education), and promotion of volunteering. | Pre/post | >4 | 24 | No effect |
| Potter, 2013 | Arts on Prescription, a 12-week program featuring an array of visual arts activities (i.e. drawing, collage, stitching); delivered by an artist and a mental health counselor | Pre/post | 3 | 26 | Non-significant reduction |
| Potter, 2015 | | Pre/post | 3 | 45 | Significant increase |
| Rotherham, 2014 | Rotherham Social Prescribing Pilot program, featuring 31 distinct SP services in partnership with 24 grant-receiving community organizations. Frequently linked resources include community activity, physical activity, befriending, and enabling." | Pre/post | 4 | 280 | Non-significant reduction |

Table 4. Methodology used to measure social isolation by study.

| **Study** | **How was Outcome measured?** |
|---|---|
| Grant *et al.* | Duke-UNC Functional Social Support Scale<br>(8 items; Confidant and Affective Support) |
| Kimberlee | Friendship Scale (5 items) |
| Moffatt/Wildman *et al.* | Composite MH question: *“Have you experienced low mood, anxiety, depression, loneliness, or social isolation?”* |
| Potter, 2013 | *Not provided* |
| Potter, 2015 | |
| Rotherham | Asked to rate “connectedness to family and friends” on a 1-5 scale |

# References

1. Alderwick, Hugh *et al.* Social prescribing in the U.S. and England: emerging interventions to address patient's social needs. *American Journal of Preventive Medicine* 2018, 54(5): 715-18.

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5. Drinkwater, Chris *et al.* Social prescribing. *BMJ* 2019, 364-9.

6. Grant, Clare *et al.* A randomised controlled trial and economic evaluation of a referrals facilitator between primary care and the voluntary sector. *BMJ* 2000, 320: 419-23.

7. Holt-Lunstad, Julianne et al. Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspectives on Psychological Science* 2015, 10(2): 227-37.

8. Kimberlee, Richard. What is the value of social prescribing? *Advances in Social Sciences Research Journal* 2016, 3(3): 29-35.

9. Moffatt, Suzanne *et al.* Link worker social prescribing to improve health and well-being for people with long-term conditions: qualitative study of service users perceptions. *BMJ Open* 2017, 7: 1-11.

10. Potter, Susan. Arts of Prescription 2010-2012: Research report. 2013.

11. Potter, Susan. Arts on Prescription 2014-2015: Evaluation report. 2015.

12. Schneiderman, Neil *et al.* Stress and health: psychological, behavioral, and biological determinants. *Annual Review of Clinical Psychology* 2005, 1: 607-28.

13. South, J., Higgins, T.J., Woodall, J. and White, S.M. Can social prescribing provide the missing link? *Primary Health Care Research & Development* 2008, 9, 310– 318.

14. Stringhini, Silvia, Severine Sabia, Martin Shipley et al. Association of socioeconomic position with health behaviors and mortality. *JAMA* 2010 303(12): 1159-1166.

15. Wildman, Josephine *et al.* Service-users' perspectives of link worker social prescribing: a qualitative follow-up study. *BMC Public Health* 2019 19: 98-110.

## Appendix B – Interview Materials

Recruitment Email

Hello [Subject's Name],

My name is Zachary McDonald, and I am a medical student at the University of North Carolina-Chapel Hill working toward my Master in Public Health this year.

I am writing to ask if you would agree to participate in a phone or videoconference interview for my Master's Paper project. I am conducting a policy analysis on the feasibility of an expansion of social prescribing schemes in the United States, with special attention to its capacity to reduce loneliness and social isolation. The aims of my analysis are three-fold: (1) to trace the origins of social prescribing policy in the U.K. and its avenues of international dissemination, as well as characterize its present status on the legislative agendas of high-income countries; (2) to identify strong predictors of pilot program success and the populations best positioned to benefit from these schemes; and (3) to consider the capacities of various payers to fund these schemes (i.e. insurers, consumers, and the philanthropic sector) in the context of recent health reforms.

I have a set of questions already drafted for you that are specific to your expertise in this area. My interview would last approximately 30 minutes.

My faculty advisor is Dr. Sue Tolleson-Rinehart in the Department of Pediatrics, and you are welcome to contact her at any time about this project. Her e-mail is suetr@unc.edu.

The UNC IRB has reviewed this study (#19-0933). It is exempted from full review and has been deemed Non-Human Subjects Research.

If you agree to participate, I will work to schedule a time that is convenient for you. Just prior to our conversation, I will ask for your verbal consent to be interviewed, recorded, and identified by name and title, in accordance with standard practice at my university. You will have the option of remaining anonymous.

Please do not hesitate to reach out by phone or e-mail with any questions about my request.

Sincerely,

Zachary McDonald

MD Candidate, Class of 2020
*UNC School of Medicine*
MPH Candidate, Class of 2019
*UNC Gillings School of Global Public Health*
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Interview Protocol

Hello, my name is Zack McDonald. I'm a medical student at UNC-Chapel Hill working toward my Master in Public Health this year. I'm here to facilitate a conversation about the status of social prescribing schemes in the United States. For my Master's Paper project, I am conducting a policy analysis to explore the feasibility of the expansion of these programs into new sectors of the American health system. Thanks for making time for this discussion today.

My faculty advisor is Dr. Sue Tolleson-Rinehart in the Department of Pediatrics, and you are welcome to contact her at any time about this project. Her e-mail is suetr@unc.edu. The UNC IRB has exempted this study from full review. It has been deemed NHSR.

Before we begin, could you give me your verbal consent to be interviewed?

☐ Interviewee CONSENTS to being interviewed.
☐ Interviewee DECLINES to be interviewed.

[Assuming consent granted] Great. With your permission, I will be recording our conversation in order to make sure I have an accurate record of what you have told me.

Do you also consent to being recorded? At your request, I can provide you with a full transcript.

☐ Interviewee CONSENTS to be recorded
☐ Interviewee DECLINES to be recorded (my notes will be sole record).

Finally, I would prefer to identify you by name and position in the course of my project in order to strengthen the credibility of the research. If you prefer to remain anonymous, however, I will simply note your general title, such as "attending physician," "non-profit executive," or "health policy expert."

Do you consent to be identified by name? ☐ YES ☐ NO

Thank you! Do you have any questions before we get started?

Sample Interview Guide

1. I'd like to start by discussing the state of federal policy to address social needs. Which approaches, if any, are gaining legislative traction right now?

2. Are there particular states that have passed innovative policy in this area?

3. Do you see federal or state funding for social services expanding or contracting over the near term? The long term?

4. Describe your personal experience with social prescribing schemes. In your view, which social issues can they best address, if any?

5. What is the most evidence-based (and/or most common) model of community referral used in the primary care setting in the United States today?

6. Are there social prescribing schemes within certain local or regional health systems that are able to offer a wide array of services? If so, where?

7. Do you see social prescribing expanding in the United States over the next decade? If so, where? Who are its chief proponents? Which factors may impede progress here?

8. What lessons can America learn from the UK's experimentation with these schemes? I'm asking this of all of my interview subjects.

9. Where should the public health threat posed by loneliness and social isolation lie on our national priority list? What are the best social interventions for this issue?