

Reconnections Evaluation Interim Report

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David McDaid, A-La Park & Jose-Luis Fernandez

**Personal Social Services Research Unit (PSSRU), London School of
Economics and Political Science**



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Executive Summary

Loneliness is a significant societal challenge. It is particularly acute in older people and has been associated not only with poor wellbeing but with an increased risk of poor health and premature mortality. Given these adverse impacts it is important to improve our understanding of what works to tackle loneliness; this report has been prepared as part of an ongoing evaluation of Reconnections, a multi-component multi-activity programme run by Age UK Hereford and Worcestershire and a number of other local voluntary and community sector organisations, intended to reduce loneliness in people over the age of 50 in Worcestershire. This report focuses in particular on two aspects of the evaluation to-date. Part 1 concentrates on insights and themes from qualitative interviews with Reconnections clients, volunteers and delivery partners, while Part 2 focuses on work to assess the potential economic costs of loneliness that may be avoided through effective intervention.

Interviews with a small number of clients, volunteers and delivery partners indicated that Reconnections is valued by clients and can often provide an opportunity to have a break from difficult isolated personal circumstances.

All of the participants were able to indicate different positive changes in their lives linked in some way to Reconnections; moreover participation in Reconnections had been a catalyst for some of the participants to engage in further social activities, or for instance, to regain the confidence to start driving or volunteering, or even just leave the house on their own again.

Many examples of positive benefits for confidence and wellbeing were identified, many of which go beyond measures of loneliness. Some participants also indicated positive impacts on their physical health. In some cases this may have been due to participation in physical activity classes, but in others the change may have been linked to a return of confidence and self-esteem through engaging with others. Other comments were also made by several participants about making less use of health services, including scope for coming off/reducing antidepressant medication.

Challenges include transportation, both the cost and availability. Interviews also suggest that some people who experience loneliness do not have any great desire to engage in new activities but simply really value the opportunity to have a regular conversation with a volunteer. They may prefer the option of a befriender, particularly if they have mobility difficulties. The programme also depends on the success in recruiting and sustaining

volunteer commitment, and it is important to carefully consider ways in which to further encourage and then support new volunteers to get involved.

The second element of this report is to estimate some of the potential longer and broader economic benefits associated with any reduction in loneliness. This can help provide information to potential commissioners of the return on their investment in measures to tackle loneliness. It can include an estimate of avoidable costs to NHS organisations, local authorities and families over different time periods if loneliness is averted.

To do this a decision analytical model has been constructed. Parameters for the model were identified through a rapid review of the literature, but in future some assumptions about the level of uptake and engagement with loneliness alleviating interventions drawn from insights in our interviews with Reconnections clients, volunteers and delivery partners, as well as observed changes in levels of loneliness, can be used to help assess the economic case for Reconnections compared to taking no action.

Impacts on GP and hospital contacts, self harm, depression, coronary heart disease, stroke, dementia and mortality were included in the model. Using an incidence-based costing approach, where the long term costs of each 'case' of loneliness are estimated, the model suggests that effective action to avoid loneliness in a general population cohort, some of whom will already be lonely, could help avoid net present value costs of more than £1,700 (2015 values) per person over ten years. The majority of these savings (59%) are due to the avoidance of unplanned hospital admissions, with further substantive savings (16%) from the avoidance of excess GP consultations. The delay in the use of dementia services accounts for most (20%) of the remaining averted costs. If actions can be targeted solely at those who are lonely most of the time these avoidable costs increase to £6,000 over ten years.

These estimates give an indication of the potential to realise savings if effective approaches to addressing loneliness can be identified. It must be stressed that the actual level of potential economic benefits will depend on many factors, not least of which would be the costs of implementing any programme at scale to tackle loneliness, as well as the ability of targeted programmes to actually identify those individuals who would benefit most from measures to tackle loneliness. These potential economic payoffs also emphasise the importance of improving our understanding of what works to tackle loneliness, including learning from the ongoing evaluation of Reconnections.

1. Introduction and background

As many as 15% of older people aged 65 to 79 and 30% of those aged more than 80 report having high levels of loneliness on a daily basis (Thomas 2015). As well as the immediate impacts on wellbeing and quality of life, loneliness has been associated with an increased risk of poor health and premature mortality (Perissinotto, Stijacic Cenzer et al. 2012; Holt-Lunstad, Smith et al. 2015).

It is important to improve our understanding of what works in tackling loneliness and whether this in turn can foster healthier ageing. It is also important to assess the cost effectiveness of different approaches and identify barriers and facilitators to the implementation of measures to tackle loneliness. This interim report has been prepared as part of an ongoing evaluation of Reconnections, a multi-component multi-activity programme in Worcestershire, intended to reduce loneliness in people over the age of 50 in Worcestershire. The programme provides tailored one to one support for lonely older people with the intention of helping them identify, talk about and overcome their feelings of loneliness. They are then ‘reconnected’ with interests and activities in their local community, using a network of volunteers and community-based organisations. Age UK Herefordshire and Worcestershire lead the programme, and manage a county-wide system through which public services, community organisations, families and individuals themselves can make referrals into the programme. Six voluntary and community sector organisations manage the service in local areas, including overseeing the work of volunteers.

The programme has been established through a Social Impact Bond by Worcestershire County Council and the three Clinical Commissioning Groups in the county (and with additional support from the Cabinet Office and Big Lottery Fund). Socially motivated investors cover the upfront costs of the programme and payment for the service only if, and when, the loneliness of the people using the service becomes less severe (See <http://www.socialfinance.org.uk/wp-content/uploads/2016/05/Introduction-to-Reconnections.pdf> and <http://www.reconnectionsservice.org.uk/> for more detailed information on Reconnections.) The investors are Nesta Impact Investments, the Care and Wellbeing Fund and Age UK nationally. Social Finance supports the management of the investment and the programme.

The overall objective of this evaluation is to assess the impact of the scheme on wellbeing, health and the use of health and care services, and through these measures draw conclusions on the overall economic impact of the programme. It complements empirical work being undertaken by Social Finance to collect and analyse changes in loneliness outcomes over time for individuals who participate in Reconnections.

There are five interlinked elements in the evaluation:

- Collection and quantitative analysis of changes in the use and cost of health and social care services, as well as other economic resource impacts, for participants in Reconnections
- High level quantitative analysis of changes in health and social care service use and cost for one or more matched cohorts of older people over the age of 50 who do not receive the service
- Synthesis of the economic costs and consequences of investing in Reconnections from the perspective of Worcester County Council (WCC), local Clinical Commissioning Groups, older people, volunteers and society.
- Qualitative analysis of experiences of participants and volunteers
- Modelling the longer term costs and consequences of Reconnections

This interim report focuses in particular on two aspects of the evaluation to-date. Part 1 concentrates on qualitative interviews with Reconnections clients, volunteers and delivery partners, while Part 2 focuses on work to assess the economic costs of loneliness which will inform our economic assessment of the longer term costs and consequences of Reconnections. We briefly provide an update on the approach that we have taken for both these tasks, together with some insights on emerging findings and model development.

Part I – Insights from Reconnections

2. Qualitative analyses

Quantitative analyses on changes in loneliness and use of services are being complemented by qualitative evaluation through interviews and focus groups with a number of Reconnections study participants. In addition, further insights are also being obtained through face to face interviews with some volunteers, delivery partners and potentially local stakeholders, including CCG and local authority representatives.

This analysis is based solely on the interviews themselves. Some of the findings, particularly around reasons for initial contact, subsequent uptake and rate of continued engagement will eventually be used to further inform some of our modelling work on the costs and benefits of Reconnections.

In time full analysis of qualitative data will be able to make use of an adapted grounded theory approach (Bryant and Charmaz 2007), where empirical data collected as part of the wider evaluation of Reconnections will be used to inform future focus group discussions and semi-structured interviews.

2.1 Interview approach

Our aim was to ideally interview at least two clients from each of the five delivery partners, with interviews being held since March 2016 mainly on a face to face basis. We have characterised interviews as ‘group and individual chats’, and have aimed to keep them as informal as possible; being willing to meet with clients at a venue of their choice or alternatively to speak to them over the phone if this was preferable

We aimed for group chats to last between 30 mins and 1 hour (but this could be shorter if this felt to be practical and necessary). There was no limit on number of individuals that could participate, but from a practical perspective we did not expect more than 10 people to be in a group. We anticipated that individual chats would last up to 30 minutes.

Interviewees were identified by delivery partners who would contact clients and ask if they would be willing to participate in these chats. All clients of Reconnections were eligible for these chats; ideally we wanted to speak with a mix of clients to get different perspectives on Reconnections, so we provided a list of essential, desirable and other characteristics (Box 1). In particular we stated that we would have liked to have a spread of ages, a good mix of men and women and include clients with a range of loneliness scores (high and low) at initial screening.

Box 1: Suggested criteria for identification of Reconnections clients for chats

Essential

- Delivery partners: at least 2 participants from each of the 5 delivery partners
- Loneliness scores: aim to have a mix of high and low loneliness scores
- Gender: To have a mixture of men and women (will be dependent on gender balance in projects)
- Age: aim to have at representative from age groups 50-65, 65-80, 80+ (but in part dependant on age distribution of participants)

Desirable but not essential

- Location: ideally have some mixture of participants who live in urban and rural locations
- Duration of participation: sufficient participation time in Reconnections to discuss experience (perhaps at least 2 months?)

Other factors to consider (but not essential)

- Transport: individuals with and without their own transport
- Volunteer experience: individuals who have linked well / or linked not well with their matched volunteer.
- Household composition: different client households including those living alone, those with caring responsibilities, other households
- Level of engagement with Reconnections: those who have successfully and less

successfully engaged with Reconnections – might there be potential to interview participants who have dropped out?

- Social networks: individuals who may / may not have access to other sources of social support e.g. church attendance

Interviews were semi-structured but covered a number of core issues (Box 2). These included looking at motivation to take part in and route to Reconnections, as well as questions focused on experience to date of participation, perceptions of loneliness and perceived impacts on health, confidence and self-esteem, social engagement and social networks. Interviews and focus groups were audio-recorded unless consent was not provided.

Box 2: Themes explored in chats

- Understanding more about the motivation to take part in Reconnections
- Understanding more about what clients would like to get out of Reconnections
- Understanding what clients enjoy about the activities they are involved in
- Understanding what clients think might be improved
- Understanding more about connections with their matched volunteers
- Understanding whether Reconnections had had any impact on other activities that clients get involved in – for instance encouraging them to volunteer themselves or take up paid employment?
- Understanding what are the barriers to participation in activities like those in Reconnections, for instance transportation or caring responsibilities
- Understanding how different experiences of Reconnections may be different depending on age, gender and other factors.
- Understanding what impact participating in Reconnections has had on clients' experience of loneliness? Is it helping to make a difference, have they for instance made new friends?

2.2 Results: characteristics of participants

Table 1 provides a summary of the characteristics of clients interviewed. There were four men and seven women ranging in age from 60 to 87, including one Black and Minority Ethnicity (BME) participant. Clients came from all five delivery partners. With one exception all of the face to face interviews were conducted at a community venue, with one other at a client's home. Two interviews were conducted over the phone. Five clients were interviewed together in a focus group. In addition we have also drawn on notes of conversations with representatives of four delivery partners and three volunteers (one of whom is also a Reconnections client). In addition one further interview is being rescheduled as the client was not at home at a prearranged interview time.

Clients' initial loneliness scores ranged between 8 and 11. Only one of the nine interviewees was still married and lived with a spouse. Nine of the 11 interviewees lived alone and seven had obvious mobility issues. Five interviewees had access to a car and continued to drive, three were involved in voluntary activities and one was also working on a part time basis.

Table 1: Characteristics of clients interviewed

Gender	Age	Status	Ability to Drive	Links with Family	Obvious Mobility Issues	Volunteer Status
Female	80	Single	Yes	No	No	No
Male	78	Bereaved	Yes	Yes	Yes	No
Female	66	Bereaved	No	Not clear	Yes	No
Female	81	Bereaved	No	No	Yes	No
Female	60	Separated	No	Yes	No	No
Female	62	Separated	Yes	No	No	Yes
Male	84	Bereaved	Yes	Yes	No	Yes
Male	86	Married	No	Yes	Yes	No
Male	87	Bereaved	Yes	Yes	Yes	Yes
Female	77	Bereaved	No	Yes	Yes	No
Female	78	Bereaved	No	Yes	Yes	No

* Indicates that client lives in household with children

2.3 Brief overview of key findings

We were struck by the willingness of all clients to speak with us in detail about what were at times very personal and difficult issues. We also noted that some of the most personal reflections were made in the focus group of five clients, which indicates a trust that has developed between these participants and a confidence in sharing these personal stories. The willingness of all participants to share their experiences meant that most group and individual conversations lasted longer than the anticipated 1 hour and 30 minute respective time periods.

2.3.1 Referral routes to Reconnections

While we must be careful in how we interpret some of the common themes of interviews with just 11 Reconnections clients, they do suggest that there are multiple potential referral routes to Reconnections in addition to GP referral. Understanding about different referral pathways is important in increasing awareness and interest in Reconnections with a view to future uptake and participation.

Several individuals were initially referred by their GP to an external service or NHS consultation, from where they heard about Reconnections. For instance one woman (78) ended up at Reconnections by chance having been referred to a befriending scheme at a hospital by her GP: *“They gave me Pals & Buddies. They sent [me] to wrong place to hospital. The lady at hospital said you have wrong group but you are so distressed so she will look into it, which she did and she came up with Reconnections. I did try Buddies and I got nothing, I didn’t get a reply. I said to that lady that was the best mistake I made – a nice accident!”*

A referral for one woman (60) came from the Citizen’s Advice Bureau via her GP : *“Doctor put me in touch with Citizens Advice; and [CAB does sync up the buddies and through them they told me about the [Delivery Partner]. So in June [2015] I said I’d try it and see what it was like and I have been coming ever since”*

Another woman (81) had an encounter with a fitness instructor who also happened to be a Reconnections volunteer. The referral to the fitness instructor came from local social services via the GP. The fitness instructor suggested taking part in a regular exercise dance group that she ran that was linked to Reconnections: *“X (Fitness Instructor) was the one who came to me. The doctor put social services onto me. They came and said that someone would come and see you. X came and explained everything. She said do you want to try it, and I said well I’ll come and I’ll try it and see what its like. That’s all you can do.”* There was also a referral

from a secondary specialist mental health service that felt that an intervention to address loneliness would be more appropriate than medical treatment.

Other than referral via GPs and specialist health services, other routes to participation included responding to an advert in the local paper, while another client found out about the programme because of social network connections built up during time spent as a local political party politician and activist.

Another participant (62) joined Reconnections as both a client and also a volunteer, simply because of a flyer/advert on Reconnections at her grandson's nursery. This nursery was hosted in the same venue as Reconnections activities. *"Young grandson attended nursery here. I just saw an advert in news letter on volunteers."*

2.3.2 Reasons for loneliness

Reconnections clients experienced loneliness in many different ways. In most cases bereavement or family separation was a key trigger. Poor health was also a factor. Two clients lost their confidence to venture outside their homes after traumatic injuries that led to partial loss of vision and chronic pain respectively. The lack of mobility and loss of the opportunity to drive were also highlighted. The loss of role / status, for men in particular, after retirement was also noted as an issue.

It was also possible to be lonely even when living with family. The digital divide across generations may impact on communication in a household. As one man (84) said: *"Even though busy – still lonely. ...Being busy is not the same as being able to talk to people and enjoy peoples company.... Meet people of your own age so you know can talk about things like when we had the 3 day week and there was no coal...."* In house 3 kids *"but all they do is you know"* [indicates using handheld devices] *"all the time...."* *Everybody's into their own thing so you get neglected. Even when I go to church, you sit there and being old they don't seem to want to. There is this definite barrier now between old people and young people. They much rather sit in church and [indicates use smart phone]. This is why I want to have a go [on smartphones]"*

Another man (86) said that he missed the opportunity to talk with other men, as he had mobility issues and lived with his wife and daughter. A skilled professional, without an activity / work role he felt his that his cognitive powers were declining: *"If you are idle your*

mind is not sturdy. If you are working there are things you can do. Mind is going somewhere, somewhere.” One woman (78) still experienced loneliness and missed the opportunity to talk with other people, even though one of her children had returned to live with her.

2.3.3 Views of volunteers and activities

Clients had positive views on volunteers. Having the motivational support from a volunteer can help make the difference to the level of continued engagement that clients have with different activities: One woman (60) said *“I was getting fed up and depressed about sitting on my own all the time and X [the volunteer] came along and suggested doing this and that – so that’s what I have been doing. It’s made a lot of difference to me.”*

Another woman (78) highlighted how the way in which her volunteer nudged her to do things had helped her to rebuild confidence after traumatic injury *“X [the volunteer] is really lovely, she will put you at your ease. If you don’t want to go out she says, now come on get your shoes on, we’ll go out for a little while. She has given me the confidence to try crossing the road - its two years in September [since she had her accident]”*

Another woman (80) spoke about how she receives regular phone call reminders from a volunteer saying that *“I very much welcome that way I get a phone call in the morning to tell me, because, perhaps I wouldn’t come.... The reminder is the trigger that makes me – overcome being withdrawn”*

Volunteers have also been helpful in suggesting multiple activities that might be of interest. As one man (84) put it: *“the volunteer sort of put me in touch with the University of the Third Age”*. The volunteer had noted his love of music; the same volunteer also noticed his desire to learn more about smart phones and has been looking for courses.

It was also clear that clients of the delivery partner which was able to deliver a range of activities in one location were able to choose to participate in additional activities that the centre offered if they so wished. In contrast one man (M 87) interviewed appeared to have only very limited phone contact with a volunteer on a weekly basis and did not appear to be involved in any activity linked to Reconnections. This individual was however involved in group bereavement counselling every few weeks and is also active helping other people with legal and benefits issues. While this individual is interested in participating in activities they did not seem to associate their volunteer with this goal.

Another two women had not progressed to taking up any additional activities; illness and disability had curtailed their motivation to try new things. In both cases their volunteers had been very helpful and supportive, trying to encourage participation in new activities, but both of these clients expressed the view that what they really wanted was an opportunity to have a chat with a friend rather than participating in activities. As one put it *“I like company. I’m on me own a lot of the time. Want more company – - “I don’t need anything just lonely”*

2.3.4 Perceived impacts on wellbeing and health

Positive reported impacts on wellbeing

Although this is a very small sample, and one identified by the delivery partners, it was clear that participation in Reconnections has had a visible positive impact on self-reported psychological wellbeing. All of the participants were able to indicate different positive changes in their lives linked in some way to Reconnections; moreover participation in Reconnections had been a catalyst for some of the participants to engage in further social activities, or for instance, to regain the confidence to start driving or volunteering, or even just leave the house on their own again. The importance of getting out and communicating with other people as a way of coping with recent bereavement was also seen as another benefit of participation by one man (87) who was only in phone contact with a volunteer on a weekly basis.

Quotes from different participants help to illustrate some of these positive impacts:

“I was getting fed up and depressed about sitting on my own all the time and X [the volunteer] came along and suggested doing this and that – so that’s what I have been doing. It’s made a lot of difference to me.” (F 80)

“I meet with all sorts of people now. I’ve joined the University of the 3rd Age. It cost me £25 but it is well worth it and also I joined a recorder club... .. we play for a church in [name of town in Worcestershire]” (M 84)

“I do megamover here which I never used to do and my confidence you know its right up there” It was down here and it is up there now” (F 81)

“Getting confidence back in driving – driving part of the way to activity” (F 80)

“it really helps me enormously after feeling rejected by family” (F 62)

“I used to bake for my husband and stopped for long time after he passed away. Now I am baking 2-3 times per week for my grandchildren and I will be doing water-colouring next week” (F 66)

“I feel a lot better and I have ventured out a couple of time on my own in a taxi and I have been to the bank on my own” (F 78)

Impacts on physical health

Some participants also indicated positive impacts on their physical health. In some cases this may have been due to participation in physical activity classes, but in others the change may have been linked to a return of confidence and self esteem through engaging with others as these quotes illustrate:

“I went to the Garage yesterday to have my MOT. And I go there every year you know. And he said God, X, your looking an awful lot better (Broad laughter) I can’t believe it you know. He saw me last year and I weren’t feeling too grand” – [consequences of poor health].. “You know I seem to be coping quite nicely with this kind of thing.” (M 84)

“Sleep well too, feel healthier. When I first came in I had sticks due to arthritis .I also dropped 2 sizes for dresses. Peaceful now, stress level went down” (F 66)

“I prefer to come here to megamovers rather than go to the [MS] therapy group – feel much better here.” (M 78)

A letter from a specialist secondary care service, noted that one individual that this service had referred to Reconnections (after initial assessment that they did not need specialist health services), had experienced a marked improvement in psychological and physical health. Other comments were also made by several participants (and delivery partners) about less use of health services, including scope for coming off/ reducing antidepressant medication.

Impacts on others

We also heard some anecdotes of the positive impact that Reconnections has had on the children of some participants.

“My son is happy that I am coming here – he is less worried now. I am more at peace.” (F 80) ...[another participant says in response]. “My daughter does too” (M 78)

On another occasion the son of one client told us that conversations with their Reconnections volunteer had helped his parent cope with loneliness linked to bereavement and chronic pain.

2.3.5 Capturing all of the impacts of Reconnections

Participation in activities through Reconnections was typically a highlight of the week, and often an opportunity to have a break from difficult isolated personal circumstances. Our initial assessment from this very small set of interviews would therefore suggest that Reconnections is helping to reduce the impact of loneliness and isolation, but participants remain in situations of great personal isolation most of the time. This makes it difficult to rely solely on scales measuring social isolation as a way of assessing the impact of Reconnections. They may not adequately capture impact. We believe that it is quite plausible for individuals to have very positive experiences of Reconnections, as our conversations show, without having a significant impact on formal measures of loneliness. It was clear that additional positive relationships and opportunities for participation in activities both within and/or external to Reconnections or to become a volunteer are emerging, but it may take time for these changes to have an impact on loneliness.

Ideally it would be advisable to consider complementary methods of assessing impact, such as through the measurement of wellbeing – it may be possible for wellbeing to be enhanced even if one is lonely all the time. A way of capturing qualitatively some vignettes of the impacts of personal change would also be useful, and it would also be sensible to look not only at process measures of attendance at Reconnections events, but also to capture more information on additional new activities / experiences – even if these are not directly linked to Reconnections.

2.3.6 Some emerging themes and challenges

Even on the basis of a very small number of conversations there are some strong themes emerging which we will continue to explore. These may change with further interviews, but it would appear that a centre-based delivery partner may be at considerable advantage compared to other delivery partners. It was clear that individuals who went to the centre to

take part in just one activity then discovered other activities taking place in the centre and signed up to these activities. This is more challenging for delivery partners who have to spend time sourcing out individual activities for their clients.

Another key issue is transportation, both the cost and access. The costs of transportation are not covered by Reconnections; some individuals are reliant on Community Transport services to get to activities – these can only be booked on a week by week basis and we have a sense that considerable efforts are sometimes made to logistically organise transport. It can also be expensive. We were told of one case where an individual has to pay £8 each way to get to an activity. In another case the client has to drive and pick up the volunteer who also does not have transport.

These interviews also suggest that some people who experience loneliness do not have any great desire to engage in new activities but simply really value the opportunity to have a regular conversation with a volunteer. They may prefer the option of a befriender, particularly if they have mobility difficulties. One client nearing the end of the six month Reconnections period was subsequently going to look for a befriender to carry on the role that had been played by her volunteer.

The availability of volunteers and the demands placed on their time was also noted. There is an obvious sense of community within the centre-based delivery partner which not only can be welcoming but also may mean that there is greater availability of volunteer support, in effect this can mean that a Reconnections client can be supported by several volunteers.

A lack of volunteers also places more demands on delivery partner staff, including volunteer coordinators, who may find that they themselves have to commit additional time to perform tasks that would normally be left to volunteers. New volunteers will need support to manage their commitments. This was clear from conversation with one experienced volunteer who was very disciplined in limiting his overall time commitments to Reconnections.

Volunteers may also not be well informed about the availability of activities which may again put more onus on delivery partner staff to be more active in setting up activity opportunities. These again are important issues, because if the balance between volunteer and professional input time is not as anticipated then the economics of the programme may be diminished.

Part II – Making an economic case to tackle loneliness.

3. Modelling the costs of loneliness

Part I of this report has focused highlighted a number of themes that will be important to the success of any initiative to tackle loneliness including access to and interest in the service, quality of the interaction between clients and volunteers, and understanding what changes participation can bring to those who use the service.

All of these insights can help inform the development of an economic model to assess long term costs of loneliness and potential to avoid some of these costs by reducing / avoiding loneliness. Initially we have constructed a decision analytical model has been constructed that indicates levels of avoidable costs to NHS organisations, local authorities and families over different time periods if loneliness is averted.

Subsequently, assumptions about the level of uptake and engagement with loneliness alleviating interventions drawn from insights in our interviews with Reconnections clients, volunteers and delivery partners, as well as data on changes in levels of loneliness and in the use of health, social care and other services by Reconnections clients, may be used to look further at the economic case for investing in measures to tackle loneliness.

3.1 Rapid review of the literature: methods and results overview

At this stage most of the inputs and assumptions in the model were identified through a rapid review of the literature; The objectives of the review were to identify:

- 1) What has been documented about the economic impacts of loneliness due to increased risks of poor health?
- 2) Which sectors, e.g. health or social care services bear these costs?
- 3) How much of these impacts potentially are avoidable?

The review focused on studies published since 2010, although citations in included studies to relevant older papers were also included. In addition we have looked at all the sources used to make estimates of costs in a previous report on the costs of loneliness (Fulton and Jupp 2015). The review covered PubMed/Medline, CINAHL and Psychinfo databases,

supplemented by limited search of Google. Decisions on inclusion or exclusion were initially made on the basis of abstracts and full texts were then obtained. In addition to studies that reported on any aspect of the costs of loneliness, studies that looked at loneliness as a risk factor for poor health, premature mortality and other adverse outcomes such as institutionalisation were also included. Studies that focused on loneliness in individuals who already had major health problems were excluded from the review. While evidence on consequences of loneliness is ideally drawn from meta-analyses in high-income countries or from individual studies set in the UK, the review did not have any geographical or language restrictions.

3.2 Model objectives and structure

Using information identified from our literature review a decision analytical model has been constructed to address two issues:

- **To estimate some of the potentially avoidable costs to NHS and social care services, as well as individuals and their families, if loneliness can be averted.**
- **To look at how these levels of avoided costs vary if approaches are targeted or not targeted.**

Initially built using a specialist decision modelling software, Treeage Pro, an Excel version of the model has also been constructed so as to allow an accessible tool to be developed which would provide some indication on the potential level of avoidable costs of loneliness at both an England, CCGs and local authority level over a ten year period.

The model follows a cohort of individuals who are assumed initially to have a mean age of 65. This default version of the model draws on UK Office for National Statistics survey data to identify the initial likelihood that they will either be highly lonely, lonely some of the time or not lonely at all (Thomas 2015). These assumptions can be changed allowing different estimates of costs to be calculated for different levels of loneliness; this could also help policy makers at both national and local levels look at the economic impact of any potential increase in loneliness.

The model runs for ten years. As Figure 4 in the Annex at the end of this report illustrates, at the end of any one year time period an individual may then move between these three levels of loneliness, as well as be identified as having dementia or die. The model also has been designed so as to allow the impact of any loneliness intervention, such as Reconnections, to be compared against the costs of not taking action. To do this the model has been designed so as to allow the option for an end user to input the level of cost per client for the loneliness intervention and the level of effectiveness of the intervention in reducing chronic loneliness. These values of cost and effectiveness can also be varied to identify threshold points at which investing in the intervention generates a positive return on investment. The potential overall return on investment for any intervention is then split over time and between the different sectors that may pay and /or benefit. In doing this we have adopted a conservative approach for the values of parameters used in the model, so that the model will be more likely to underestimate rather than overestimate any one aspect of cost associated with loneliness.

3.3 Approach to costing in the model

This model uses an incidence based approach to costing. This aims to identify all new cases of loneliness for a specific geographical population in a specific time period (typically one year) and then estimates the costs associated with treating them, as well as other financial and non-financial costs (e.g. indirect costs such as impacts on families and quality of life) over a longer time period (in this case ten years). Total costs represent the net present value of current and future costs incurred due to new cases of loneliness in the year in question.

3.4 Resource impacts included in the model

We identified 175 papers looking at different aspects of resource use, cost and loneliness and a separate review paper is being prepared for journal submission on this issue. In this report we highlight sources of literature that have been used in estimating the costs of loneliness that have been included in the model. This literature allows the model to include a number of different resource impacts (Box 3) that the literature review suggest can be linked to loneliness:

Box 3: Potential areas of cost included in the economic model

GP Consultations	Treatment for depression
Unplanned Hospital Admissions	Treatment for coronary heart disease
Accident and Emergency Attendances	Treatment for stroke
Hospital presenting self-harm cases	Services and support for people living with dementia.

3.4.1 GP consultations

If loneliness has an adverse impact on health we would expect to see an increased level of consultation with general practice. In 2013 the Campaign to End Loneliness (CTEL) also conducted a survey of more than 1000 GP practices in 2013; this reported that 76% of GPs estimated that between one and five consultations per day were due to loneliness, which CTEL estimate would be as much as 10% of all consultations per day (Campaign to End Loneliness 2013).

Perhaps surprisingly there appears to be very little recent evidence on the association between loneliness and the use of primary care services. One recent Glasgow-based study reported that there was an association tending towards significance between loneliness and an increase in individuals asking GPs about mental health problems (Kearns, Whitley et al. 2015). A Canadian study, looking at a group of older frequent attendees at primary care services also reported that isolation may be one key factor for their high rate of attendance (Hand, McColl et al. 2014). However, analysis of GP practice use by older individuals identified as being at risk of social isolation in London did not find any association with increased use of health services, or with hospital admission (Iliffe, Kharicha et al. 2007).

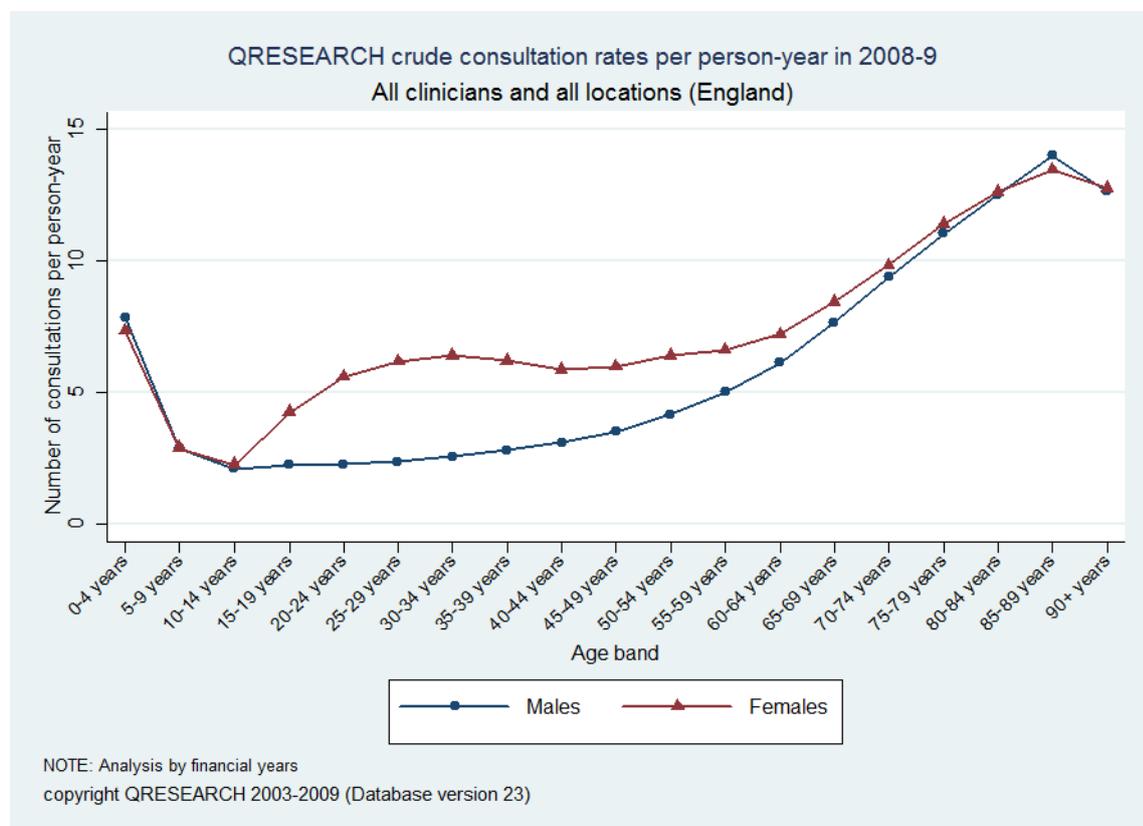
This economic model thus makes use of very old data from a survey in Glasgow in 1992 (Ellaway, Wood et al. 1999). Individuals were asked about utilisation of GP services over a one year period and also asked ‘Loneliness can be a serious problem for some people and not for others. At the present moment do you ever feel lonely?’ If they answered with a yes then information on whether this was ‘mostly/quite often’, ‘occasionally’, or ‘seldom/ never’ was obtained. 6.7% of the over 60s reported being lonely most of the time. In adjusted multi-variate analysis the annual number of contacts was 7.8 for those lonely most of the time

compared with 4.2 for those who were never lonely. Those who were occasionally lonely had a lower rate of contact than those lonely all the time.

This increased rate of consultation in those who have high levels of loneliness has been combined with the most recent national data on average number of GP consultations by age group (albeit this is from 2009) (Hippisley-Cox 2009) to estimate the additional number of consultations per year. We have conservatively used the male mean per person cost per GP practice consultation rate of 7.63 contacts per year (comparable rates for women were 8.42 contacts per year). Two thirds of these contacts are with GPs and one third with practice nurses and the latest weighted costs combining GP and GP nurse consultations are used in the model (Curtis and Burns 2015). This analysis may be conservative: the increase in the number of consultations may be even greater for older cohorts. Mean consultation rates for the over 70s in the 2009 analysis were 9.82 and 9.36 for women and men respectively while rates for older age groups rise to more than 12 in the over 80s (Figure 1).

Figure 1: Crude GP consultation rate per person per year 2008-2009

Source: (Hippisley-Cox 2009)



3.4.2 Unplanned contacts with secondary health care services

The increased rate of hospital admissions in those with high levels of loneliness was taken from analysis of unplanned admissions to hospital using data from all of the island of Ireland remain appropriate (Molloy, McGee et al. 2010). Each hospital admission was valued at a conservative value of £608 – being the unit cost for a short hospital stay (Curtis and Burns 2015).

The increased rates of contact with Accident and Emergency Departments by those that are lonely are taken from a US analysis which reported contact rates of 1.6 per annum compared to 0.4 per annum for the non-lonely (Geller, Janson et al. 1999). One more recent source of evidence from Sweden for community dwelling people over the age of 65 reports significantly higher rates of contact with A&E departments over a one year period for those that were lonely. Roughly contacts doubled from one visit to two per annum. They also reported poorer overall levels of quality of life and higher numbers of health problems (Taube, Kristensson et al. 2015). In our model costs of contacts with A&E were valued using the English National Tariff for Emergency Medicine Category 2 investigation with Category 3 treatment.

Another risk of loneliness in older people is self-harm. One recent English study looked at the impacts of loneliness on suicidal behavior (Stickley and Koyanagi 2016). Using cross-sectional data from the 2007 Adult Psychiatric Morbidity Survey it suggests that increased feelings of loneliness are significantly associated with higher levels of suicidal ideation and attempted suicide events. The risks of serious deliberate self-harm in a year are 17.37 times greater for those who are highly lonely and 3.6 times greater for those that are sometimes lonely. In our model the baseline rate for hospital presenting self harm in the general population in this age group is taken using data from the Irish national register of deliberate self harm (Corcoran, Reulbach et al. 2010). Costs of self harm are conservatively assumed only to include the cost of an attendance at an accident and emergency department followed by a psychosocial assessment. The costs of subsequent treatment for self-harm, such as drugs to counter poisoning, are not included.

3.4.3 Depression, coronary heart disease and strokes

Loneliness had also been associated with depression (Holvast, Burger et al. 2015; Peerenboom, Collard et al. 2015). Meta analyses of the prevalence rates of depression in

older people range from between 4.6% and 9.3%, with subthreshold rates ranging between 4.5% and 37.4% (Meeks, Vahia et al. 2011; Rodda, Walker et al. 2011). However, the analysis needs to reflect the low rate of the use of the use of GP services in England by older people who experience depression. Typically less than 1 in 6 older people discuss depression with their GP; and less than half receive treatment (Rodda, Walker et al. 2011). The incidence of new cases of depression that we use in our analysis therefore are based on Public Health England analysis of GP Quality and Outcomes Framework reporting data for new cases of depression in 2015 (<http://fingertips.phe.org.uk/>). The increased rate of depression in those that are highly lonely was based on a meta-analysis (Steptoe, Shankar et al. 2013). We have assumed that the costs of depression treatment are equivalent to reported average costs for delivering IAPT (individual access to psychological therapy) (Radhakrishnan, Hammond et al. 2013).

Loneliness is also a risk factor for coronary heart disease (CHD) and stroke (Heffner, Waring et al. 2011; Cene, Loehr et al. 2012; Valtorta, Kanaan et al. 2016). The incidence of coronary heart disease in the general population for this age group is taken from recent UK data (British Heart Foundation 2014) and the incidence of stroke from data from the Stroke Association for England (Stroke Association 2015). The increased risks for both CHD and stroke are taken from a recent meta analysis (Valtorta, Kanaan et al. 2016). The costs of treatment for coronary heart disease are very conservatively estimated to be the annual costs of atorvastatin treatment; this is an off-patent medicine recommended as a first line treatment for coronary heart disease. The unit costs of stroke are taken from adjustments of an estimate of the five year cost of stroke care in the UK (Saka, McGuire et al. 2009).

3.4.4 Loneliness and Premature Mortality

The model also takes account of the increased risk of premature mortality in people who are highly lonely. We make use of data from the Dutch AMSTEL study, a ten year follow up of individuals aged 65 to 84 which reported that men that were lonely had a 1.3 times greater chance of being dead compared to those that were not lonely (Holwerda, Beekman et al. 2012). The current version of the model conservatively does not attach any costs, e.g. for lost productivity, to premature mortality.

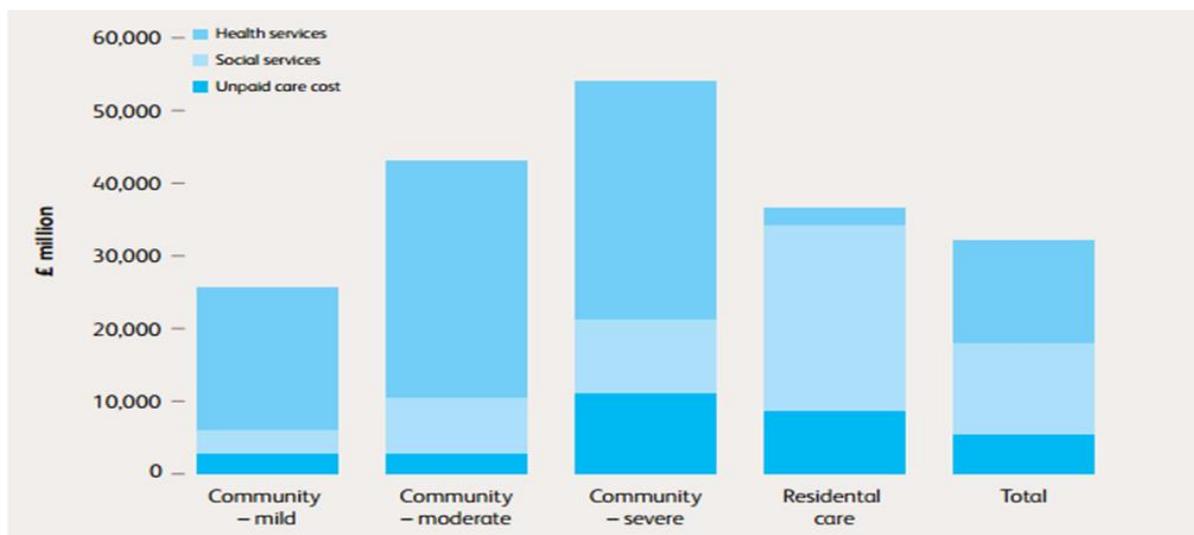
3.4.5 Loneliness and Dementia

A number of studies have looked at the association between loneliness and mild cognitive impairment and / or dementia. For instance Holwerda and colleagues in the Netherlands also

explored the impacts of loneliness and social isolation on risk of dementia over 3 years in 2173 community-dwelling older adults participating in the Amsterdam Study of the Elderly (AMSTEL) (Holwerda, Deeg et al. 2014). Older adults who felt lonely were found to have a 64% higher risk of developing dementia than those who did not. A recent meta-analysis of 19 studies conducted by a Dutch team (Kuiper, Zuidersma et al. 2015) suggests that the risk of developing dementia with high levels of loneliness is 1.58 that for those who are not lonely. This increase in risk is used in our economic model. The model also conservatively assumes that those who are diagnosed with dementia have no further costs other than those for dementia itself; their mortality risk is also assumed to be greater than the underlying rate we use for the whole model. The incidence rate for dementia in this population is taken from the UK CFAS-2 study (Cognitive Function and Ageing Study 2014). Our model uses costing data from the recent Dementia UK report (Prince, Knapp et al. 2014). This suggests mean costs to society of £32,000 per case per annum, which in the model we split as in the Dementia UK report between health (16%), social services (39%) and families (45%) to account for unpaid care.

Figure 2: Average annual cost per capita by severity of dementia

Source: (Prince, Knapp et al. 2014)



For people with dementia in residential care, the inputs from unpaid carers are considerably smaller, with costs averaging £1,067 (mild), £2,901 (moderate) and £2,119 (severe). Over all severity levels, 6.7% of the total cost of residential care is accounted for by unpaid care. For the full prevalent population of people with dementia (and all severity levels), unpaid care costs average £14,237 per person per year (44.2% of total cost).

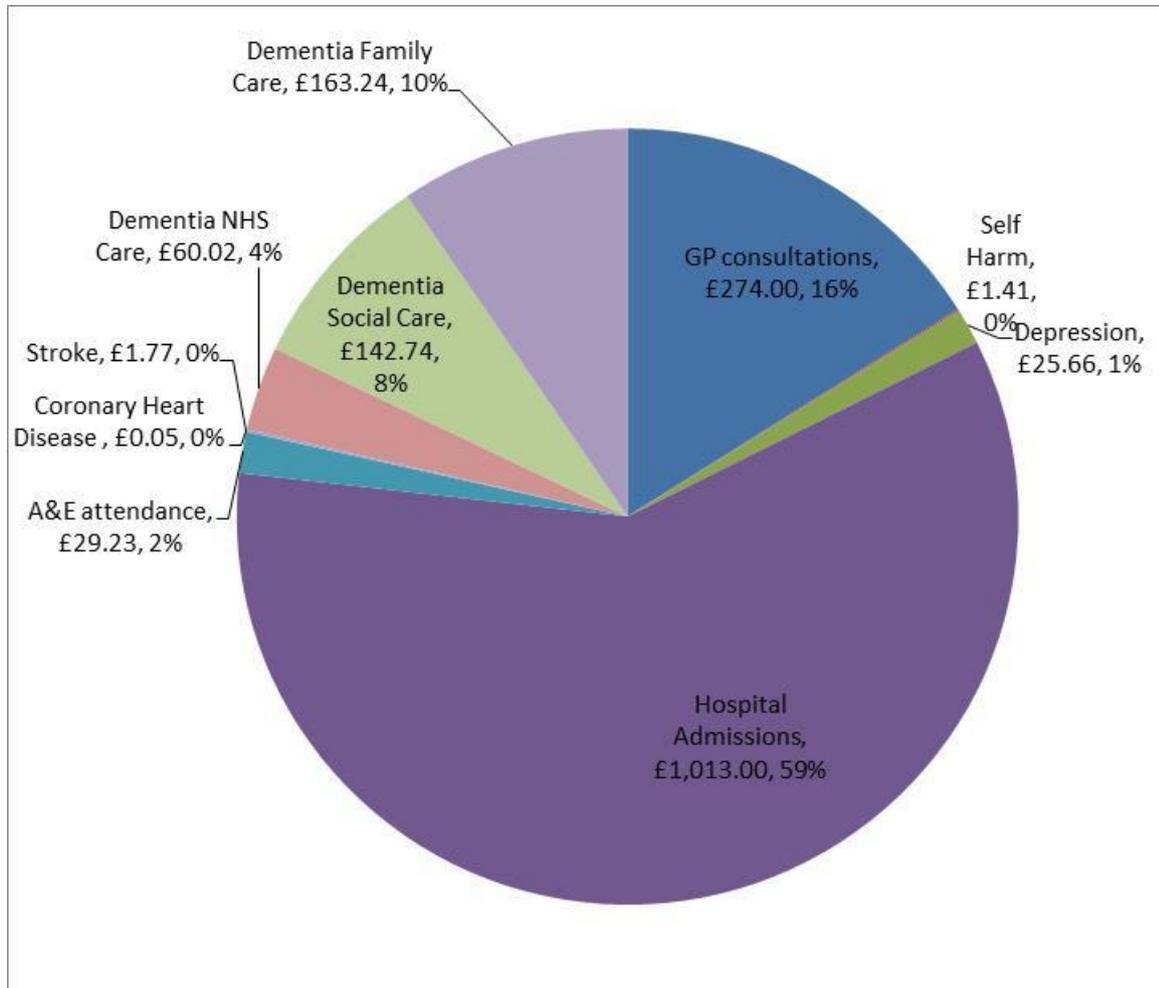
3.4 Results

Table 2 shows that if effective action could be taken to avoid loneliness in a general population cohort, some of whom will already be lonely, net present value costs of more than £1,700 (2015 values) per person over ten years might be averted. As Figure 3 shows the majority of these savings (59%) are due to the avoidance of unplanned hospital admissions, with further substantive savings (16%) from the avoidance of excess GP consultations. The delay in the use of dementia services accounts for most (20%) of the remaining averted costs. Families would avoid having to provide informal care as a result of the reduction in observed cases of dementia, while 8% of dementia cost savings accrue to local authorities as a result of a lower need for social and residential care services. If it is possible to target efforts so that actions only affect **those who are lonely most of the time** these avoidable costs increase to £6,000 per person over ten years.

Table 2: Expected 10 year costs avoidable for an individual aged 65 (general population)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total costs avoided
Intervention cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	£0.00
GP cost	-18.00	-27.00	-31.00	-31.00	-31.00	-29.00	-29.00	-28.00	-26.00	-24.00	-£274.00
Self Harm	-0.09	-0.13	-0.15	-0.16	-0.16	-0.15	-0.15	-0.15	-0.13	-0.14	-£1.41
Depression Treatment	-1.68	-2.48	-2.81	-2.90	-2.89	-2.80	-2.70	-2.54	-2.51	-2.35	-£25.66
Hospital Admissions	-66.00	-97.00	-110.00	-115.00	-114.00	-110.00	-107.00	-103.00	-97.00	-94.00	-£1,013.00
A&E attendance	-1.97	-2.88	-3.26	-3.35	-3.31	-3.18	-3.04	-2.90	-2.74	-2.60	-£29.23
Coronary Heart Disease	-0.01	0.00	-0.01	-0.01	0.00	-0.01	0.00	-0.01	0.00	0.00	-£0.05
Stroke	-0.12	-0.18	-0.20	-0.18	-0.23	-0.20	-0.18	-0.17	-0.16	-0.15	-£1.77
Dementia NHS	-1.31	-2.95	-4.59	-5.74	-6.56	-7.38	-7.87	-7.71	-8.20	-7.71	-£60.02
Dementia LA	-3.12	-7.02	-10.92	-13.65	-15.60	-17.55	-18.72	-18.33	-19.50	-18.33	-£142.74
Dementia Families	-3.57	-8.03	-12.49	-15.61	-17.84	-20.07	-21.41	-20.96	-22.30	-20.96	-£163.24
Total costs avoided	-101.87	-154.67	-184.43	-196.60	-201.59	-200.34	-198.07	-191.77	-186.54	-178.24	-1,711

Figure 3: Potential costs avoided per individual through avoidance of loneliness in older population



3.5 Model conclusions

We have tried to be conservative in our assumptions about the costs of loneliness, as well as on the potential opportunity to avoid some of these costs. Nonetheless, applying our model to the entire current population aged 60 to 69 in Redditch and Bromsgrove, South Worcestershire and Wyre Forest CCGs – 75,914 people, the model suggests maximum potential savings over 10 years of almost £130 million to society or £117 million to the public purse if some of the adverse consequences of loneliness could be avoided. This number should be treated with caution as this estimate implies reaching and impacting on every single older person in Worcestershire; the actual level of savings will be lower and dependent on both the reach and success of any loneliness intervention programme.

In the same way, assuming that 14.5% of this population meet the criteria for being highly lonely, as suggested by the ONS (Thomas 2015), and actions could be targeted at every older person in that population, then at a maximum more than £70 million in costs to society might be averted.

These numbers give an indication of the potential to realise savings if effective approaches to addressing loneliness can be identified. It must be stressed that the actual level of potential economic benefits will depend on many factors, not least of which would be the costs of implementing any programme at scale to tackle loneliness, as well as the ability of targeted programmes to actually identify those individuals who would benefit most from measures to tackle loneliness. Moreover, not all of these economic benefits will translate into cashable savings; GP practices will not shut down as a result of the reduction in loneliness related GP visits, but reductions in hospital admissions and outpatient treatment may mean that some costs, such as those for medications, may be avoided.

These potential economic payoffs can only be realised if interventions are effective, thus demonstrating the importance of improving our understanding of what works to tackle loneliness, including learning from the ongoing evaluation of Reconnections.

4. References

- British Heart Foundation (2014). Cardiovascular Disease Statistics 2014, British Heart Foundation.
- Bryant, A. and K. Charmaz, Eds. (2007). The SAGE Handbook of Grounded Theory. London, Sage.
- Campaign to End Loneliness (2013). News release: Family doctors ill-equipped for loneliness epidemic. London, Campaign to End Loneliness.
- Cene, C. W., L. Loehr, et al. (2012). "Social isolation, vital exhaustion, and incident heart failure: findings from the Atherosclerosis Risk in Communities Study." Eur J Heart Fail **14**(7): 748-753.
- Cognitive Function and Ageing Study (2014). "CFAS release updated dementia incidence figures. <http://www.cfas.ac.uk/blog/2016/04/20/incidence-figures-updated/>."
- Corcoran, P., U. Reulbach, et al. (2010). "Suicide and deliberate self harm in older Irish adults." Int Psychogeriatr **22**(8): 1327-1336.
- Curtis, L. and A. Burns (2015). PSSRU Unit Costs of Health and Social Care 2015. Canterbury, University of Kent.
- Ellaway, A., S. Wood, et al. (1999). "Someone to talk to? The role of loneliness as a factor in the frequency of GP consultations." Br J Gen Pract **49**(442): 363-367.
- Fulton, L. and B. Jupp (2015). Investing to tackle loneliness. London, Social Finance Ltd.

- Geller, J., P. Janson, et al. (1999). "Loneliness as a predictor of hospital emergency department use." J Fam Pract **48**(10): 801-804.
- Hand, C., M. A. McColl, et al. (2014). "Social isolation in older adults who are frequent users of primary care services." Can Fam Physician **60**(6): e322, e324-329.
- Heffner, K. L., M. E. Waring, et al. (2011). "Social isolation, C-reactive protein, and coronary heart disease mortality among community-dwelling adults." Soc Sci Med **72**(9): 1482-1488.
- Hippisley-Cox, J. (2009). ONS Consultations Report 22 - QRESEARCH financial year consultations 2008/9. London, Health and Social Care Information Centre.
- Holt-Lunstad, J., T. B. Smith, et al. (2015). "Loneliness and social isolation as risk factors for mortality: a meta-analytic review." Perspect Psychol Sci **10**(2): 227-237.
- Holvast, F., H. Burger, et al. (2015). "Loneliness is associated with poor prognosis in late-life depression: Longitudinal analysis of the Netherlands study of depression in older persons." J Affect Disord **185**: 1-7.
- Holwerda, T. J., A. T. Beekman, et al. (2012). "Increased risk of mortality associated with social isolation in older men: only when feeling lonely? Results from the Amsterdam Study of the Elderly (AMSTEL)." Psychol Med **42**(4): 843-853.
- Holwerda, T. J., D. J. Deeg, et al. (2014). "Feelings of loneliness, but not social isolation, predict dementia onset: results from the Amsterdam Study of the Elderly (AMSTEL)." J Neurol Neurosurg Psychiatry **85**(2): 135-142.
- Illiffe, S., K. Kharicha, et al. (2007). "Health risk appraisal in older people 2: the implications for clinicians and commissioners of social isolation risk in older people." Br J Gen Pract **57**(537): 277-282.
- Kearns, A., E. Whitley, et al. (2015). "Loneliness, social relations and health and well-being in deprived communities." Psychol Health Med **20**(3): 332-344.
- Kuiper, J. S., M. Zuidersma, et al. (2015). "Social relationships and risk of dementia: A systematic review and meta-analysis of longitudinal cohort studies." Ageing Res Rev **22**: 39-57.
- Meeks, T. W., I. V. Vahia, et al. (2011). "A tune in "a minor" can "b major": a review of epidemiology, illness course, and public health implications of subthreshold depression in older adults." J Affect Disord **129**(1-3): 126-142.
- Molloy, G. J., H. M. McGee, et al. (2010). "Loneliness and emergency and planned hospitalizations in a community sample of older adults." J Am Geriatr Soc **58**(8): 1538-1541.
- Peerenboom, L., R. M. Collard, et al. (2015). "The association between depression and emotional and social loneliness in older persons and the influence of social support, cognitive functioning and personality: A cross-sectional study." J Affect Disord **182**: 26-31.
- Perissinotto, C. M., I. Stijacic Cenzer, et al. (2012). "Loneliness in older persons: a predictor of functional decline and death." Arch Intern Med **172**(14): 1078-1083.
- Prince, M., M. Knapp, et al. (2014). Dementia UK update. London Alzheimer's Society.
- Radhakrishnan, M., G. Hammond, et al. (2013). "Cost of improving Access to Psychological Therapies (IAPT) programme: an analysis of cost of session, treatment and recovery in selected Primary Care Trusts in the East of England region." Behav Res Ther **51**(1): 37-45.
- Rodda, J., Z. Walker, et al. (2011). "Depression in older adults." BMJ **343**: d5219.
- Saka, O., A. McGuire, et al. (2009). "Cost of stroke in the United Kingdom." Age Ageing **38**(1): 27-32.
- Stephoe, A., A. Shankar, et al. (2013). "Social isolation, loneliness, and all-cause mortality in older men and women." Proc Natl Acad Sci U S A **110**(15): 5797-5801.

- Stickley, A. and A. Koyanagi (2016). "Loneliness, common mental disorders and suicidal behavior: Findings from a general population survey." J Affect Disord **197**: 81-87.
- Stroke Association (2015). Stroke Statistics. London, Stroke Association.
- Taube, E., J. Kristensson, et al. (2015). "Loneliness and health care consumption among older people." Scand J Caring Sci **29**(3): 435-443.
- Thomas, J. (2015). Insights into Loneliness, Older People and Well-being, 2015. London, Office for National Statistics.
- Valtorta, N. K., M. Kanaan, et al. (2016). "Loneliness and social isolation as risk factors for coronary heart disease and stroke: systematic review and meta-analysis of longitudinal observational studies." Heart **102**(13): 1009-1016.

Annex. Figure 4: Excerpt from model decision tree

