



# Return on Investment: Prevention in mental health

## Educational interventions to reduce older persons' loneliness

### Background

A growing body of literature has shown that loneliness and social isolation are important risk factors for the development of depression (1-5). Loneliness has been defined as the discrepancy between a person's desired and actual social relationships. Social isolation, on the other hand, is an objective measure of social interactions and relationships (6). Recent statistics indicate that 19% of Australians aged 75 and above experience loneliness (7). Older adults are particularly prone to feeling lonely due to the death of partners and friends, retiring from work, deterioration in physical health, being more likely to live alone, and having fewer close relationships (8). Evidence shows that loneliness is also linked to chronic physical conditions, such as coronary heart disease and stroke (9), as well as to dementia (10-14). It follows that loneliness has an indirect effect on mortality through associations with these health conditions, as well as a direct effect on mortality (15). Higher levels of loneliness have also been significantly associated with suicidal ideation and suicide attempts (16).

In addition to the implications of loneliness on health and wellbeing, there is also an increase in health and social care spending associated with loneliness (17). Evidence has found that lonely older adults use more healthcare services compared with those who are not lonely (17-20). There is an even greater increase in healthcare spending if lonely older adults develop other health conditions, such as depression. Therefore, to prevent depression in older adults, there is a compelling case for addressing loneliness to mitigate the harmful effects of subsequently developing depression.

### Intervention modelled

Educational interventions targeted at a specific group with characteristics in common, such as women over 55, have been demonstrated to be effective in tackling loneliness (21). One such intervention is the Friendship Enrichment Programme (FEP) (22-27). This program has been developed in the Netherlands to help women aged 55 and over to improve their wellbeing and alleviate loneliness by enhancing current friendships or developing new friendships (25). Two previous studies have examined the effectiveness of the FEP (22, 25). The results of these studies showed that when they received the intervention the number of women who were lonely decreased by 11% compared with a 6% decrease for women who did not participate in the FEP.

The eligible population for the intervention includes women aged 55 years and above residing in private dwellings and experiencing loneliness. Participants would find out about the FEP through various advertising channels (e.g. media and leaflets in general practitioner (GP) practices) and decide to enrol in the program (assumed to be 30% of the eligible population).

The FEP consists of 12 lessons that focus on topics related to friendship including: expectations of friendship, early experience in friendship, self-evaluation as a friend, making new friends, improving existing friendships, and setting goals in friendship (25). Each lesson is supplemented by practicing skills that are important in friendship, role playing and a homework assignment. The lessons are delivered to a group of 10 women. Six months after the program, participants have a final meeting to evaluate their success and redefine goals for their future (22). The program is usually delivered in centres for adult education, community mental health centres and social service

agencies (25) by an instructor with a professional education level (for example social work) or university-level psychology training (28).

The primary outcome of this evaluation is the return on investment (ROI) ratio. This ratio includes the cost of the intervention in relation to any cost savings. In the current model, cost savings were only related to direct healthcare costs associated with loneliness and the subsequent treatment of depression. In addition, for women aged 55-65 years who may still be engaged in the workforce, productivity gains were considered. For an intervention to be considered cost effective, it would need to have a ROI ratio greater than 1. This means that the cost savings are greater than the costs of the intervention (e.g. a ROI ratio of 1.5 means that for every \$1 invested, there will be a gain of \$1.50).

### Assumptions

The cost of the FEP was calculated by summing the cost of advertisement, training, and delivery of the intervention. All salary costs described below include 30% on-costs, such as annual leave loading and superannuation.

**Advertisement:** This included the cost of advertising in the local press and the cost of placing leaflets in the waiting rooms in GP practices, including printing and transport costs of leaflets. A project manager was also included, costed at an hourly rate of \$50 (29).

**Training:** It was assumed that the intervention would be delivered by social workers, who would need to familiarise themselves with the content of the FEP for five hours, costed at \$45 per hour (29). It was also assumed that each social worker would deliver the intervention to three groups with an average size of 10 women per group.

**Delivery of intervention:** The FEP is delivered in 12 two hour lessons over 12 weeks, followed by a final meeting six months after the program to evaluate participants' success and redefine goals for their future. It was assumed that 60% of the lessons are delivered in facilities that have existing rooms available, and for 40% of the lessons, the venue hire was considered. Material costs of \$230 per group have also been also included.

**Cost savings:** The total cost savings arising from the intervention were estimated by calculating the aggregate sum of all cost savings attributable to lower healthcare costs associated with fewer physician consultations (20) and self-harm associated hospitalisation due to avoidance of loneliness (16). In addition, cost savings due to avoidance of treatment for depression were included based on the average annual healthcare cost attributable to a diagnosed case of depression from an Australian study (30). Finally, for women aged 55-64 years, productivity gains were also considered.

### *Alternative scenarios*

**Scenario 1)** This scenario included the time and travel costs of women participating in the 12 lessons, the final review meeting, and completing the homework tasks. It was assumed that those women who are still engaged in work, would participate in the intervention outside their normal working hours and so productivity losses were not considered only impacts on their leisure time.

**Scenario 2)** This scenario explored the cost effectiveness of the intervention when advertising costs were not considered, assuming that the identification of older women who are lonely would occur through other pathways. For example, older women aged 65 and above who are lonely could be identified by the Aged Care Assessment Team (ACAT).

**Scenario 3)** This scenario accounted for the potential that more social workers will be required to deliver the group sessions than has been assumed in the base case (three groups per social worker).

**Scenario 4)** This scenario assumed that the effect size of the intervention was reduced by 50%.

**Scenario 5)** This scenario assumed that the intervention would be delivered by a welfare, recreation and community arts worker rather than a social worker (whose salary is higher). Welfare, recreation and community arts workers design and implement programs to meet community and individual needs and assist individuals, families and groups with social, emotional and financial difficulties by educating and supporting them.

**Scenario 6)** This scenario assumed that 1 in 5 women experiencing loneliness, who find out about the program, will ask other women

experiencing loneliness to join the program too. Three scenarios were modelled with respect to the expected benefits to those additional participants, with a 0%, 50% and equal benefit impact on the other person attending the session. Furthermore, it was assumed that these other participants would attend the session outside of employment or other work commitments, i.e. there would be no lost earnings from participating. The number of social workers required to deliver the intervention remained the same, meaning that only an increase in the group size was modelled.

## Results

### *Cost effectiveness findings*

Results for the model analysing the cost effectiveness of the FEP intervention are presented in Table 1. Overall, the total cost of implementing the intervention was approximately \$25 million (or \$155 per woman). The intervention subsequently produced \$34 million in cost savings after three years and \$72.4 million after five years due to reductions in healthcare treatment costs and productivity gains. The aggregate ROI ratio was estimated to be 1.35 after three years and 2.87 after five years. This means that for every \$1 paid to run the intervention, the return will be \$1.35 after three years and \$2.87 after five years.

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When analysing health outcomes, it was found that delivering the intervention resulted in a total of **7 million loneliness free days** after three years or **18 million loneliness free days** over the course of five years.

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### *Results from alternative scenarios*

Alternative scenarios were explored adopting a five year time horizon. Results (see Table 2) from scenario 1 that included the time and travel cost of women resulted in a drop of the ROI ratio from 2.87 to 0.62 after five years, indicating that the increased cost of the intervention were greater than the resulting cost savings. Excluding advertisement costs (Scenario 2) or increasing the number of social workers required (Scenario 3) did not result in considerable changes to the total intervention costs and the resulting ROI ratio. However, in scenario 4, reducing the intervention effect by 50% resulted in a lower ROI ratio of 1.48. The highest ROI was achieved by assuming that the FEP will be delivered by a welfare recreation and community arts worker (Scenario 5), which resulted in a ROI ratio of 3.49. Scenario 6, which accounted for the fact that 1 in 5 women experiencing loneliness attend the session with another woman experiencing loneliness, resulted in a ROI of 1.82, 2.65 and 3.44, depending on the expected benefits to those additional participants that was modelled to be 0%, 50% or 100%.

**Table 1. Summary of results for FEP intervention to reduce older persons' loneliness**

	3 year model	5 year model
<b>Intervention costs</b>	\$25.23M	\$25.23M
<b>Cost saving</b>	\$34.08M	\$72.41M
<b>Healthcare cost savings</b>	\$12.19M	\$25.82M
<b>Productivity gains</b>	\$21.89M	\$46.59M
<b>Total net savings</b>	\$8.86M	\$47.18M
<b>Cost per woman</b>	\$155	\$155
<b>ROI</b>	1.35	2.87
<b>Loneliness free days</b>	7,117,344	18,568,325

Notes: ROI: return on investment per \$1 invested

**Table 2. Summary of results of alternative scenarios**

	Total Intervention costs	Cost to Government	Cost to Individuals	Cost per woman	ROI
<b>Base case</b>	\$25.23M	\$25.23M	\$0	\$155	2.87
<b>S1: Time and travel costs included</b>	\$116.9M	\$25.2M	\$91.7M	\$717	0.62
<b>S2: Excluding advertisement cost</b>	\$25.0M	\$25.0M	\$0	\$154	2.89
<b>S3: Increase in the number of trainers</b>	\$26.4M	\$26.4M	\$0	\$162	2.74
<b>S4: Reduction in effect by 50%</b>	\$25.2M	\$25.2M	\$0	\$155	1.48
<b>S5: Delivered by a welfare recreation and community arts worker</b>	\$20.7M	\$20.7M	\$0	\$127	3.49
<b>S6: Additional participants</b>	\$25.23M	\$25.23M	\$0	\$155	0%=1.82 50%=2.65 100%=3.44

Notes: ROI: return on investment per \$1 invested

## Implementation considerations

While evidence on cost effectiveness is the focus of this project, there are other criteria apart from cost effectiveness that can influence whether and to what degree interventions are likely to be rolled out in routine practice. These criteria are not captured in the technical cost effectiveness results but are potentially very important from a decision making context. Some of these considerations are summarised in the Table below. The colour coding of each criterion is an attempt to visually summarise whether these secondary considerations impact on the results in a positive or negative way (red = negative, amber = uncertain, green = positive). A code of 'green' implies that the secondary consideration strengthens the case for investing in the intervention. A code of 'amber' means that the secondary consideration reduces certainty in the case for investing and a code of 'red' means that these considerations do not support investment in the intervention.

Implementation considerations		Overall Rating
Potential secondary effects	The potential benefits to carers in terms of less caring required has not been included. This model is conservative and likely underestimates the benefits as it considered only the impact of loneliness on depression and not on other health conditions such as dementia, stroke, or heart disease. Therefore, the ROI analyses have probably underestimated the outcomes of this intervention.	Positive
Equity	Older women who are physically impaired or those on a low income may not be able to attend the group sessions because of mobility constraints or high cost of transport. However, an online adaptation of the FEP was developed (currently available in Dutch only) (31, 32) that could provide access to those unable to attend in person. Additionally, a proportion of older women may have caring responsibilities, which could limit their ability to participate due to additional out of pocket expenses incurred for formal care arrangements. As the intervention is also only focussed on women, it may disadvantage men of the same age. While there is an online adaptation of the FEP that is also targeting men (31), the evaluation of this program and other programs for men, such as 'Men's Sheds Australia', are needed (33).	Uncertain
Strength of evidence	The quality of evidence on the effectiveness of the intervention was low, given that evidence was sourced from non-randomised controlled trials. However, the evidence on the associations between loneliness and depression as well as loneliness and mortality was relatively strong.	Negative
Acceptability	The rate for those who completed the FEP varied between 70% (26) to 82% (22), indicating that the majority of women are willing to use the intervention. Acceptability may also be limited by the inherent symptoms of depression and anxiety, and long term effects of social isolation, which make it difficult to engage in such programs without support of a peer or professional case worker.	Positive
Feasibility	The feasibility of the FEP could be increased by introducing a systematic way of screening for older women who are lonely by the Aged Care Assessment Team (ACAT) and the Regional Assessment Service (RAS). The feasibility of the FEP may be compromised by a potential shortage of social workers for delivering the intervention. However, the FEP can also potentially be delivered by welfare, recreation and community arts workers.	Uncertain
Sustainability	An online adaptation of the FEP was developed but it is only available in Dutch (31, 32). It is possible that the future delivery of FEP could occur online, which will reduce the intervention cost. Is it also possible that the group could be supported to continue regular meetings without the presence of a formal facilitator (like a social worker) after the 12 formal lessons are completed.	Uncertain

## Recommendations

This study found that there is a positive ROI at five years. However the cost savings are likely to have been underestimated, given that the analysis only considered the impact of loneliness on depression and not on other health conditions such as dementia, stroke, or heart disease. As the current evidence on the FEP is limited, it will be beneficial to update the cost effectiveness analyses as more evidence becomes available. As loneliness research is still at its infancy in terms of identifying effective interventions, other programs aimed at reducing loneliness in older women, or older adults generally, should be evaluated for their cost effectiveness. In this context, further research is also needed on the measurement of loneliness and the impacts of interventions on other related concepts, such as social exclusion.

## Take home messages

This study has shown that implementing the FEP within the Australian context seems to be most cost effective when delivered by welfare, recreation and community arts workers. Given the long term gains from reduced healthcare costs and productivity gains, it is reasonable for similar programs to be trialled and evaluated in the Australian community.

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