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Assessing the value for money of an integrated health and wellbeing service in the UK

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**Competing interests**

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The other authors declare that they have no competing interests.

1 **ASSESSING THE VALUE FOR MONEY OF AN INTEGRATED HEALTH AND WELLBEING SERVICE IN THE**  
2 **UK**

3

4 **ABSTRACT**

5 Lay health workers have been utilized to deliver health promotion programmes in a variety of  
6 settings. However, few studies have sought to determine whether these programmes represent  
7 value for money, particularly in a UK context. The present study involved an economic evaluation of  
8 Wellbeing for Life, an integrated health and wellbeing service in northern England. The service  
9 combined one-to-one interventions delivered by lay health workers (known as health trainers),  
10 group wellbeing interventions, volunteering opportunities and other community development  
11 activities. Value for money was assessed using an established economic model developed with input  
12 from a panel of commissioners and providers, and the main data source was the national health  
13 trainer data collection and reporting system. Between June 2015 and January 2017, behaviour  
14 change outcomes (i.e. whether client goals in relation to diet, physical activity, smoking or other  
15 behaviours, had been achieved) were recorded for 2433 of the 3179 individuals who accessed one-  
16 to-one interventions. The level of achievement observed gave an estimated total health gain of  
17 287.7 quality-adjusted life years (QALYs). In addition, there were 4669 health-promoting events, five  
18 asset mapping projects and 1595 occurrences of signposting to other services. Combining the value  
19 of individual behaviour change with the value of these additional activities gave an overall net cost  
20 per QALY gained of £3,900 and a total estimated societal value of at least £3.45 for every £1 spent  
21 on the service. These results suggest that the Wellbeing for Life service offered good value for  
22 money. Further research is needed to systematically and comprehensively determine the societal  
23 value of similar holistic, asset-based and lay-led approaches.

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26 **Key words:** UK; lay health workers; behaviour change; wellbeing; value for money; economic

27 evaluation; cost-effectiveness; QALY

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**32 INTRODUCTION**

33 Lay health workers (LHWs) have been deployed in numerous settings to offer services that span the  
34 healthcare continuum, from primary prevention to disease management (Moore & Earp, 2007).  
35 These services often involve working primarily with disadvantaged, vulnerable or marginalised  
36 communities, and thereby aim to address health inequalities as well as supporting general health  
37 and wellbeing improvement. In many cases, LHWs are recruited from their target communities, in  
38 part to help build capacity within those communities. This has been described in one particular  
39 programme – the UK Health Trainers Initiative – as a shift from ‘advice from on high to support from  
40 next door’ (Department of Health, 2004). Health trainers, like many LHWs, receive specialised  
41 training but have no formal professional certification, although there is evidence that the role has  
42 become increasingly professionalised over time (J Mathers, Taylor, & Parry, 2014). Ambiguity exists  
43 with respect to many LHW roles and what exactly constitutes ‘layness’ in particular contexts (Carr et  
44 al., 2011). However, most published descriptions reference LHWs as being from or like the target  
45 population in relevant ways (Swider, 2002). Other common components include conducting  
46 outreach to under-served communities and delivering culturally sensitive health education and  
47 counselling (Haines et al., 2007; Nemcek & Sabatier, 2003; Witmer, Seifer, Finocchio, Leslie, & O’Neil,  
48 1995).

49 Systematic reviews have demonstrated the diversity of LHW programmes in terms of intervention  
50 aims, content and outcomes (Carr et al., 2011; S. Lewin et al., 2010; S. A. Lewin et al., 2005;  
51 Viswanathan et al., 2009). The literature is suggestive of effectiveness in some settings and for  
52 certain health conditions; for example, there is good evidence to support the use of LHWs in  
53 promoting disease self-management, smoking cessation, and uptake of cancer screening  
54 (Pennington et al., 2013). Much of the existing literature comes from either North America or  
55 developing countries, where differences in the organisation and funding of health services, as well as  
56 demographic factors, are likely to mean that the findings are poorly generalizable to a UK context.

57 Furthermore, there is a dearth of data relating to intervention component costs and few studies  
58 report a standard measure of costs per quality adjusted life-years (QALYs) saved. The feasibility and  
59 acceptability of many lay-led programmes is well established (for examples, see: Reinschmidt et al.,  
60 2006; Springett, Owens, & Callaghan, 2007; Visram, Clarke, & White, 2014), but there remains a  
61 need to determine whether or not they represent value for money (VfM). This paper reports the  
62 results of an economic evaluation of a UK-based LHW programme, the Wellbeing for Life (WFL)  
63 service. The purpose of the study was to assess whether WFL represented VfM, using a combination  
64 of techniques to determine the cost-effectiveness and societal value of the service.

65 The concept of VfM is high on the political agenda in the UK, given the ring-fencing of public health  
66 budgets, increasing demand on health and social care services, and reductions in central  
67 government funding for local authorities (Chu, 2018; Graham Lister & Merritt, 2013). Effort is  
68 increasingly being devoted to making the economic case for investment in prevention (A. O. Banke-  
69 Thomas, Madaj, Charles, & van den Broek, 2015; Newton & Ferguson, 2017). However, valuing the  
70 health, wellbeing and societal impacts of preventative services is not always straightforward. This is  
71 particularly true of lay-led health promotion programmes, which generally involve limited resources,  
72 multi-component interventions, and multiple outcomes for communities and health providers.  
73 Consequently, the VfM of many LHW programmes has not been extensively or systematically  
74 assessed (Vaughan, Kok, Witter, & Dieleman, 2015). According to Banke-Thomas *et al* (2017), VfM is  
75 a broad concept 'encompassing economy, efficiency and effectiveness, in addition to cost-  
76 effectiveness', whereby economy relates to minimizing resources or inputs, efficiency involves  
77 maximizing the outputs achieved from those resources, and effectiveness is the relationship  
78 between intended and actual results (Bond, 2012; NAO, 2011). Methods typically used to  
79 demonstrate cost-effectiveness include cost-utility analysis (CUA), cost-benefit analysis (CBA), cost-  
80 consequences analysis (CCA) and, more recently, social return on investment (SROI) (A. Banke-  
81 Thomas et al., 2017; NICE, 2013). In their guidance for local authorities, the UK National Institute of  
82 Health and Care Excellence (NICE) advocates for a dual approach, combining CUA and either CBA or

83 CCA to 'ensure all relevant benefits (health, non-health and community benefits) are taken into  
84 account' (2013, p.2). Increasingly, SROI is seen as a more comprehensive and accessible, albeit time-  
85 consuming, approach, particularly in a global health context (A. O. Banke-Thomas et al., 2015). The  
86 study described here combined CUA, CCA and elements of SROI methodology to strengthen the VfM  
87 assessment of the WFL service and generate generalizable results for those seeking to implement  
88 similar programmes.

89

## 90 **MATERIALS AND METHODS**

### 91 **Intervention**

92 WFL set out to provide an integrated health and wellbeing service by combining one-to-one  
93 behaviour change interventions, group wellbeing improvement sessions, volunteer support and  
94 capacity building, and other community development-related activities. The service employed an  
95 asset-based and community-centred approach, drawing on existing strengths within the target  
96 communities and offering clients the opportunity to tailor the intervention to their needs (Foot &  
97 Hopkins, 2010; South, 2015). For example, a client might request one-to-one advice on stopping  
98 smoking, attend a short course on healthy eating, or be supported to join a friendship group  
99 involving art- and craft-based activities (or all of the above).

100 The service aimed to work predominantly with the 30% most deprived communities in County  
101 Durham, a mixed rural and urban area of northern England where health is generally worse than the  
102 national average (PHE, 2018). WFL staff were based in one of three hubs located in north, east and  
103 south-west Durham, although most engaged in outreach activities as well as intervention delivery.  
104 The service also targeted specific 'high need' populations: veterans, socially isolated older people,  
105 those with mild to moderate mental health issues, manual workers, and lesbian, gay, bisexual and  
106 transgender groups. Staff members working with these populations provided a service across the  
107 county, rather than working exclusively in the 30% most deprived communities. One-to-one



108 behaviour change clients received up to eight sessions with a health trainer, or 12 sessions in the  
109 case of the 'high need' intervention, and group-based activities lasted for at least four sessions. The  
110 WFL service was funded by Durham County Council, delivered by a consortium of public and third  
111 sector providers, and launched on 1<sup>st</sup> April 2015.

## 112 **Data collection**

113 A VfM assessment was undertaken as part of a wider evaluation of the WFL service (Cheetham et al.,  
114 2017). The main source of data was the health trainer data collection and reporting system (DCRS),  
115 which was developed to collect information on socio-demographic characteristics, health and  
116 lifestyle indicators, and outcomes from clients of health trainer services across England. DCRS  
117 enabled the collection of standardised behaviour change data, although variations in the  
118 commitment of local services to use a centralised database for this purpose limit the ability to  
119 conduct comparisons (Jonathan Mathers, Taylor, & Parry, 2016). Data were gathered by WFL staff at  
120 the beginning and end of the one-to-one intervention, as part of the process of developing and  
121 agreeing a personal health plan with their clients. Other sources of relevant data included a  
122 'scorecard' completed by the WFL manager and submitted to the service commissioners at the end  
123 of each financial quarter. The scorecard was a Microsoft Excel spreadsheet that included details on  
124 volunteering, training and capacity development, wellbeing improvement group delivery and  
125 community development activities that were not recorded via DCRS. The WFL manager also  
126 provided the evaluators with information on net service costs (i.e. the funding provided by the local  
127 authority commissioners over the evaluation period) and total volunteering hours. A breakdown of  
128 these costs is shown in table 1.

129 [Insert table 1 here]

130 Anonymised, individual-level data relating to all WFL clients during the evaluation period (1<sup>st</sup> June  
131 2015 to 31<sup>st</sup> January 2017) were extracted from DCRS to examine health and lifestyle changes that

132 might be attributable to the intervention. The main outcome measure used in the VfM assessment  
133 (described below) related to whether or not clients had achieved the behaviour change goals set in  
134 their personal health plan on completion of the one-to-one intervention. This was recorded in DCRS  
135 as fully achieved (i.e. achieved all goals), part achieved (i.e. achieved some but not all goals), not  
136 achieved, or outcome unknown (often because clients could not be contacted). Data relating to  
137 other relevant activities were extracted from the WFL scorecard for the same period.

### 138 **Data analysis**

139 VfM was assessed using a 'ready reckoner', or economic model, initially developed by Professor  
140 Graham Lister in 2010 (then updated in 2016 using 2014/15 values) with input from a stakeholder  
141 panel of experienced health trainer service commissioners and providers and leading experts on  
142 health economic evaluation. The process of developing and testing the model is described in detail  
143 elsewhere, along with the evidence and assumptions used (G Lister, 2010). In short, the model  
144 provides a framework to assess health trainer performance in relation to service objectives and  
145 compare this to costs, based on assumptions drawn from published evidence of the short- and long-  
146 term impacts of behaviour change. Other activities, such as asset mapping (identifying the existing  
147 strengths and resources within target communities) and signposting (referring clients to other  
148 services or activities), were valued by comparing the costs and outcomes with broadly similar  
149 primary care interventions. The estimates were then adjusted to take into account impact on health  
150 inequalities by applying a factor derived from the Health England Leading Prioritisation (HELP)  
151 review, to reflect the value of targeting disadvantaged groups (Health England, 2009).  
152 Demonstrating whether or not health trainer services save money for the English National Health  
153 Service (NHS) was identified as a key priority by the stakeholder panel involved in developing the  
154 model (G Lister, 2010). Additional areas for consideration included the impacts on clients,  
155 communities and other public sector services (namely, local authorities and offender management  
156 services), as well as the contribution to health equity.

157 The ready reckoner is an Excel spreadsheet that supports the calculation of health gains, cost savings  
158 and net cost per unit of health gain. It is free to download and use from: [https://www.building-  
161 leadership-for-health.org.uk/evaluating-behaviour-change/health-trainers-health-economics-  
162 behavioural-economics-new-media/](https://www.building-<br/>159 leadership-for-health.org.uk/evaluating-behaviour-change/health-trainers-health-economics-<br/>160 behavioural-economics-new-media/). The values applied can be varied to respond to local  
163 circumstances, as was the case following discussion with the WFL commissioners and providers.  
164 Asset mapping was valued at £60,000 (reflecting the extended period of community and stakeholder  
165 engagement involved in mapping existing assets and the estimated cost of providing such resources  
166 by alternative means) and signposting to other services was valued at £20 for each occurrence  
167 (based on potential benefit and estimated uptake). These figures were derived from the evidence-  
168 based estimates suggested within the ready reckoner but modified to reflect local needs and  
169 perspectives. The spreadsheet does not include group-based interventions and therefore the WFL  
170 wellbeing improvement groups were included instead as 'health-promoting events' (an alternative  
171 category specified within the model). Since it was not possible to determine how many group  
172 sessions each client attended, one occurrence per client was assumed but a relatively high value  
173 (£100) was ascribed. As before, this figure was selected from the estimates within the ready  
174 reckoner (based on evidence regarding the value of group support in increasing the likelihood of  
175 behaviour change maintenance) and agreed through discussion with the WFL commissioners and  
176 providers.

177 Following agreement of these values and assumptions, the ready reckoner was used to generate  
178 estimates of: potential health gains available per one-to-one behaviour change client; potential cost  
179 savings to the NHS per unit of health gain; and potential savings to other stakeholders. The net costs  
180 of WFL after savings were then compared with the value of health gain (with and without weighting  
181 for disadvantage), to produce the estimated societal value of the service. Two QALY values were  
182 used in the VfM assessment: the first came from the initial ready reckoner and was agreed at that  
183 time with the UK Department of Health and Social Care (G Lister, 2010). This was based on the upper  
184 estimate of the non-fatal injury value derived from a Department of Transport willingness-to-pay

183 survey, which in 2008/09 prices gave an estimate of £27,000 and in 2014/15 prices equated to  
184 £31,000 (Donaldson, 2006). The second value came from guidance on how to quantify the health  
185 impacts of government policies, in which the Department of Health and Social Care estimated that a  
186 human QALY had a monetised value of £60,000 (Glover & Henderson, 2010). The two values were  
187 used in an effort to avoid under- or overestimating the value of the service, although it is  
188 acknowledged that other values within this range could have been used (Mason, Jones-Lee, &  
189 Donaldson, 2009). The ready reckoner was used to test the sensitivity of outcomes to higher or  
190 lower assumptions (+/-10%) concerning the extent of any health gain and maintenance of behaviour  
191 change achieved over the remaining life expectancy of the participants, and also test the application  
192 of a discount rate of 3.5% (following the recommendation of HM Treasury (2018)) to long-term  
193 outcomes.

194 See the completed ready reckoner (Supplementary Material 1) for further detail on the values,  
195 assumptions and calculations described here.

196

## 197 **RESULTS**

### 198 **Sample characteristics**

199 Between June 2015 and January 2017, the WFL service initiated contact with 4152 potential clients,  
200 through a combination of outreach activity, self-referrals and signposting (mainly from general  
201 practice). Of these individuals, 3518 were assessed as being eligible for the intervention, although  
202 444 chose not to proceed. A further 25 requested information only, 151 were signposted to other  
203 services and 434 could not be contacted. The characteristics of the 3179 individuals who went on to  
204 become WFL clients are shown in table 2, which demonstrates that the majority were female, White  
205 and living in more socio-economically disadvantaged areas. Clients were broadly similar to the wider

206 population of County Durham, where only 1.5% of residents are non-White and 42.2% of residents  
207 live in the 30% most deprived areas nationally (Durham County Council, 2015; ONS, 2013).

208 [Insert table 2 here]

### 209 **Valuing individual behaviour change**

210 Behaviour change was valued by identifying the numbers of clients who selected specific behaviour  
211 change goals and then went on to fully or partially achieve those goals at completion of the one-to-  
212 one intervention. This outcome was recorded for 2433 individuals (76.5% of the client population).  
213 Of these, 1860 set goals related to diet and physical activity (54.0% fully achieved, 18.5% part  
214 achieved); 224 set goals related to their emotional wellbeing (50.9% fully achieved, 22.7% part  
215 achieved); 100 set goals related to smoking (47.0% fully achieved, 10.0% part achieved); and 15 set  
216 goals related to alcohol (46.7% fully achieved, 26.7% part achieved). A further 234 clients set  
217 behaviour change goals categorised by the model as 'other', which included social interaction,  
218 volunteering and education (33.2% fully achieved, 19.5% part achieved). These data highlight that, in  
219 many cases, around three-quarters of clients achieved some or all of their goals. They also illustrate  
220 that the majority of WFL clients set out to change diet and physical activity-related behaviours.

221 The ready reckoner estimated that the level of achievement observed in relation to clients' health-  
222 related goals equated to a gain of 259.7 QALYs. A further 18.9 QALYs were gained in relation to  
223 clients seeking help with emotional wellbeing and 26 QALYs were gained through signposting to  
224 other elements of the WFL service, giving a total of 304.6 QALYs arising from the one-to-one  
225 intervention. After adjusting for the proportion of clients from the least deprived communities, this  
226 figure is reduced slightly to give an estimated total health gain of 287.7 QALYs. It was assumed that  
227 individuals from these communities would access services without signposting, based on the  
228 behaviour change literature highlighting lower take-up of interventions by disadvantaged groups  
229 (Michie, Jochelson, Markham, & Bridle, 2009; White, Adams, & Heywood, 2009). The weighted cost  
230 saving to the NHS from this element of the service is £1,477,911.

**231 Valuing other WFL activities**

232 Other relevant WFL activities involved asset mapping, signposting to other services and delivery of  
233 health-promoting events. The latter included 2045 group clients, 933 individuals who received mini  
234 'health MOTs' (a brief intervention, linked to the NHS Health Check Programme, which involves  
235 measuring weight, blood pressure and various lifestyle indicators (NHS Choices, 2016)) and 1691  
236 recipients of training and capacity-building activities delivered by WFL staff. The total number of  
237 events was 4669, with an estimated value of £466,900.

238 Staff undertook five asset mapping projects, which were each ascribed an estimated value in the  
239 model of £60,000 (£300,000 in total). Signposting to other services was valued at £31,900, based on  
240 1595 occurrences of signposting and a value per occurrence of £20. The total value of the additional  
241 activities offered by the WFL service is £798,800. Much of this is contributed by the wellbeing  
242 improvement groups and therefore the total is likely to be an underestimate, given that many clients  
243 probably attended multiple sessions. Furthermore, any potential health gains experienced by group  
244 participants are not directly included in the model.

**245 Total health gain and cost-effectiveness**

246 The total health gain from the WFL service (287.7 QALYs) implies an estimated cost saving to the  
247 NHS of £1,477,911, not including £300,000 for costs offset from asset mapping and £498,800 from  
248 signposting and events (see table 3). The results indicate an additional cost saving to social care of  
249 £126,326 (linked to the reduction in adverse health outcomes) and to criminal justice of £3,883  
250 (from reduced alcohol and substance abuse by clients). Therefore, the total public sector cost saving  
251 attributed to the WFL service is £2,406,920.

252 [Insert table 3 here]

253 The net cost per unweighted total QALY for the entire service therefore equates to a cost utility of  
254 £3,900 (i.e. the total public sector cost savings and offset divided by the total health gain). This figure

255 is well below the threshold for cost-effectiveness set by the UK National Institute of Health and Care  
256 Excellence (NICE) (£20,000-30,000 per QALY), suggesting that the WFL service as a whole  
257 represented VfM. The sensitivity analysis showed that discounting at 3.5% and changing all of the  
258 assumptions by +/-10% did not materially change this result. The analysis with more optimistic  
259 assumptions gave an estimated cost per QALY of £5,291, while the pessimistic assumptions gave an  
260 estimated cost per QALY of £8,328. Changing only the health gains (from 252.3 to 324.3 QALYs) gave  
261 an estimated cost per QALY of between £3,460 and £4,443.

## 262 **Societal value**

263 A broader view of the societal impact of WFL must include impacts arising from reduced  
264 unemployment and employer costs relating to a reduction in absence due to illness. The additional  
265 estimated impact on the economy of WFL through employment impacts is £1,340,528, derived from  
266 Dame Carol Black's review of the health of Britain's working age population (Black, 2008).  
267 Additionally, the 7,562 volunteer hours created through the volunteering element of the service  
268 have been valued at £13.75 per hour (based on an average weekly UK wage of £539 (ONS, 2016) and  
269 average hours per week of 39.2 ( $539/39.2=13.75$ )), giving a total value of £103,977.50. This figure  
270 does not include any health, wellbeing or social benefits experienced by the volunteers (or  
271 intervention staff) and is therefore likely to be an under-estimate.

272 Table 4 shows the total estimated societal value of the WFL service. Based on the lower human value  
273 of a QALY of £31,000 (which is related to the impact on NHS costs), the value of QALY improvement  
274 associated with the individual behaviour change and signposting element of the service alone is  
275 £8,917,426. The sum of this figure with the additional benefits shown in table 2 gives an overall  
276 value and long-term public sector savings of at least £12,664,874. Using the higher human value of a  
277 QALY of £60,000 (which relates to the wider social impact on health and wellbeing), the total value  
278 increases to £21,006,983. Taking into account the net cost of delivering the WFL service over the

279 evaluation period (£3,528,894), this equates to an unweighted societal value of between £3.59 and  
280 £5.95 for every £1 spent.

281 [Insert table 4 here]

282 The health trainer ready reckoner makes it possible to weight the societal value of a service by  
283 equity, in recognition that supporting clients from more deprived areas can offer greater benefits in  
284 terms of a reduction in health inequalities. Based on a HELP utility score of 1.01, the weighted total  
285 value of outcomes is estimated as being at least £9,756,450 and the societal value changes to  
286 between £3.45 and £6.03 for every £1 spent on the service. Both the weighted and unweighted  
287 societal value ranges indicate that WFL has made a positive impact on society.

288

## 289 **DISCUSSION**

290 This study demonstrates that clients who participated in the WFL intervention experienced positive  
291 changes in health behaviours and emotional wellbeing that likely resulted in significant health gains.

292 The overall net cost per QALY gained (£3,900) compares favourably with a commonly-used threshold  
293 in UK public health, suggesting that the service offered good VfM. Combined with benefits derived  
294 from the delivery of group-based wellbeing interventions, signposting, asset mapping and other  
295 activities, the total estimated societal value of the WFL service was between £3.59 and £5.95 for  
296 every £1 spent (or between £3.45 and £6.03 using values weighted by equity). These ranges and the  
297 associated long-term public sector savings (i.e. at least £12,664,874) suggest that the service has  
298 made a positive impact on society. The results of our analyses also demonstrate that the WFL  
299 intervention offered a means of encouraging individual behaviour change amongst  
300 socioeconomically disadvantaged groups, thereby offering the potential to reduce health  
301 inequalities. Although the community development and other activities offered as part of the WFL  
302 service were included in the economic model, their impact has likely been underestimated. Further



303 research is needed to comprehensively determine the societal value of similar holistic, asset-based  
304 and lay-led approaches.

305 In terms of previous attempts to assess the VfM of LHW programmes, potential biases in  
306 measurement and methodological challenges have tended to limit interpretation of study results.  
307 For example, an economic evaluation was undertaken of a primary care-based health trainer service  
308 in north-west England (Barton et al., 2012). The control group received health promotion literature  
309 only, while the intervention group also had access to a theory-based intervention delivered by  
310 health trainers. The mean NHS and social service costs fell by slightly more in the intervention group,  
311 resulting in an incremental cost per QALY of £14,480. Limitations of the study included the small  
312 numbers involved; in spite of GP letters being sent to 2,275 patients, only 38 individuals were  
313 recruited to the control group and 72 to the intervention group. Furthermore, the average number  
314 of contacts per patient was 1.25 (compared with at least eight sessions in the WFL intervention) and  
315 many had no face-to-face contact with a health trainer, although those who did had the highest  
316 mean QALY gains. Studies conducted in non-UK contexts have found that there can be diseconomies  
317 of scale, and that any benefits arising from LHW programmes need to be balanced against the costs  
318 of training and supervision (Janowitz, Chege, Thompson, Rutenberg, & Homan, 2000; Makan &  
319 Bachman, 1997). However, these additional costs may be offset by a reduction in demand for  
320 professional-led health care and also result in significant cost savings for users in terms of reduced  
321 travel costs, wasted time and lost economic opportunities while seeking clinic-based care (S. A.  
322 Lewin et al., 2005; Reilly, Graham-Jones, Gaulton, & Davidson, 2004).

323 A realist review by Carr *et al.* (2011) found that lay-led interventions for diet and physical activity  
324 and mental health promotion were amongst the areas where the evidence is either inconclusive or  
325 suggests that these interventions are not cost-effective. This is in direct contrast with the results of  
326 the present study, where the majority of WFL clients had achieved behaviour change goals in  
327 relation to diet and physical activity or emotional wellbeing. Possible explanations include the more

328 holistic, integrated approach of the WFL service, which allowed clients to access a range of health-  
329 promoting activities and tailor the interventions to suit their needs. Areas where the published  
330 evidence suggests that LHW programmes are cost-effective include: smoking cessation, tuberculosis  
331 treatment, management of chronic conditions, reducing under-five mortality and HIV prevention  
332 (Carr et al., 2011; Sinanovic et al., 2003; Vaughan et al., 2015). Few WFL clients had sought help to  
333 achieve smoking-related goals, yet tobacco smoking is known to be linked to socioeconomic  
334 deprivation and also represents a 'high value' behaviour in the health trainer ready reckoner. This  
335 indicates that greater societal value could be achieved by targeting additional smokers through the  
336 WFL service. However, the values compare favourably with those of similar services.

337 A systematic review conducted to examine the use of SROI in different areas of public health  
338 identified 12 studies involving health promotion interventions and three involving nutrition-focused  
339 interventions (A. O. Banke-Thomas et al., 2015). The SROI ratios ranged from 1.1 to 11.0 for health  
340 promotion and 2.05 to 5.28 for nutrition, in comparison with 3.45 and 6.03 for WFL (using the values  
341 weighted by equity). However, the review authors suggested that 'it is not appropriate to compare  
342 the ratios to identify the most impactful or the intervention with the most value for money', due to  
343 heterogeneity in the SROI methodologies used (A. O. Banke-Thomas et al., 2015, p. 8). A more recent  
344 systematic review located 12 studies examining the return on investment (ROI, a separate metric  
345 from SROI) from health promotion interventions; the median ROI was 2.2 and the range was 0.7 to  
346 6.2 (Masters, Anwar, Collins, Cookson, & Capewell, 2017). In contrast, the median ROI was 5.1 for  
347 healthcare public health interventions, 5.6 for wider determinants interventions, 34.2 for health  
348 protection interventions and 46.5 for legislative interventions. The authors concluded that, although  
349 local interventions average an impressive ROI, 'upstream interventions delivered on a national scale  
350 generally achieve even greater returns on investment' (Masters et al., 2017: 831). The recent cuts to  
351 public health funding as part of the UK government's programme of 'efficiency savings' can  
352 therefore be seen as a false economy, which may be mirrored in other public health systems that  
353 tend to be characterised by chronic underinvestment. Several local authorities have

354 decommissioned their health trainer services; many have replaced them with integrated approaches  
355 similar to WFL, albeit with relatively short-term funding that limits opportunities for assessment of  
356 longer-term impacts (Cheetham et al., 2017).

357 Limitations of the present study include the lack of a control or comparator group, which would have  
358 enabled us to draw more robust conclusions about the definitive impact of the WFL service.

359 However, this was not feasible within the available resources or timescales, particularly given the  
360 political context of local authority public health and pressures to deliver against ambitious targets  
361 regarding client numbers. Using routine WFL monitoring data meant that we had access to relatively  
362 large datasets, but there were large quantities of missing data at the post-intervention period. This  
363 represents a source of bias in that those who took part in the assessments may have been the  
364 healthier or more motivated clients. Alternatively, those who did not complete the assessments may  
365 have experienced benefits that were not captured in our analyses, resulting in an under-estimation  
366 of the true cost-effectiveness of WFL. The economic model is based on a number of assumptions  
367 from the behaviour change literature, which may have resulted in over- or under-estimation of the  
368 longer-term costs and benefits. Additional healthcare costs linked to QALYs gained may offset any  
369 potential savings, but are often ignored in economic evaluations of health promotion interventions  
370 (Rappange, Brouwer, Rutten, & PH van Baal, 2010). In this case, we were reliant solely on net service  
371 costs, which included all aspects of WFL implementation and delivery but did not include healthcare  
372 costs. The ready reckoner was developed specifically for use with health trainer services, whereas  
373 WFL involves a number of additional elements and it is likely that their health and societal impacts  
374 have been underestimated. Many elements of similar LHW programmes, such as building trust,  
375 social mobilisation and changing community norms, are not easily quantifiable and therefore do not  
376 lend themselves to economic analyses, meaning that these analyses are often insensitive to the full  
377 range of social benefits (Lehmann & Sanders, 2007; Walker & Jan, 2005). There are no consistently  
378 applied approaches to economic evaluation of these programmes and therefore caution must be  
379 exercised in conducting comparisons or generalising results.

380

381

382 **CONCLUSION**

383 This paper presents an assessment of the estimated cost-effectiveness and societal value of the WFL  
384 service in northern England, using data on costs and volunteering provided by the service manager  
385 and data on outcomes extracted directly from the routine data reporting system. These data were  
386 entered into a 'ready reckoner' designed to determine the VfM of similar LHW programmes. It was  
387 not designed specifically for use with more holistic, multi-component services and therefore it is  
388 possible that the results represent an over- or under-estimation of the true value of WFL. We have  
389 been cautious in selecting the values used in the economic model and are reasonably confident that  
390 we have provided an 'at least' assessment of the benefits of this service. This study adds to the  
391 existing evidence base on both integrated health and wellbeing services and LHW programmes. It  
392 demonstrates that such services improve the health of individuals who engage with and successfully  
393 complete the interventions (including those from disadvantaged or marginalised groups), and may  
394 also offer longer-term societal benefits. Evaluating and demonstrating VfM of these interventions is  
395 necessary to ensure their sustainability, particularly in a wider context of austerity and cuts to public  
396 health funding. Recommendations for the future include: methodological developments to capture  
397 the full range of health and social benefits from lay-led programmes; policy measures to establish  
398 long-term funding streams that support similar community-centred approaches; and commitment to  
399 funding upstream interventions that tend to achieve greater returns on investment.

400

401

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559 TABLES

560 Table 1: Costs of WFL service delivery

	<b>Delivery costs excluding VAT</b>  (in £)
<b>One-to-one intervention</b>  <i>Personalised behaviour change interventions (8-12 weeks) delivered by general or specialist WFL health trainers</i>	2,465,550.50
<b>Volunteer service</b>  <i>Recruitment, training and mentoring of volunteers to support, deliver and sustain community-based activities</i>	291,331.35
<b>Wellbeing groups</b>  <i>Group-based wellbeing improvement interventions, usually involving a minimum of 4 sessions</i>	341,631.50
<b>Capacity building</b>  <i>Training sessions delivered by WFL staff to public health and other relevant practitioners</i>	142,882.25
<b>Community development</b>  <i>Asset mapping, community engagement and other activities carried out by WFL community development workers</i>	287,498.75
<b>TOTAL</b>	<b>3,528,894.25</b>

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562 **Table 2: Sample characteristics**

<b>Characteristics</b>	<b>Sample</b>
<b>Gender (%)</b>	
Female	74.0
Male	26.0
<b>Age (mean in years; SD)</b>	48.3 (17.2)
<b>Ethnicity (%)</b>	
White	97.8
Other	2.2
<b>Deprivation deciles (%)*</b>	
1 (most deprived)	14.5
2	23.0
3	19.8
4	15.0
5	8.6
6	6.9
7	3.9
8	3.7
9	3.7
10 (least deprived)	0.9
<b>Employment status (%)</b>	
In work	30.2
Retired	26.4
Unemployed	23.6
Permanently sick/disabled	9.3

Other	3.4
Full-time carer	2.2
Looking after home/family	2.1
Student	2.0
Volunteer	0.8

563 \*Based on index of multiple deprivation (IMD) ranked scores derived from client postcodes.

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566 **Table 3: Overall gains and cost savings**

<b>Results</b>	<b>Health gain (in QALYs)</b>	<b>Net cost (in £)</b>	<b>Cost savings (in £)</b>
Health gain from individual behaviour change	259.7	2,119,641	1,409,253
Additional gains from emotional wellbeing	18.9	2,050,983	68,658
Health gain from signposting	26.0		
<b>Total health gain and cost savings to NHS (weighted for clients from deprived areas)</b>	<b>287.7</b>		<b>1,477,911</b>
Cost offset to NHS from asset mapping activity			300,000
Cost offset to NHS from signposting and events			498,800
<b>Total NHS cost savings and offset</b>		<b>1,252,183</b>	<b>2,279,711</b>
Cost savings to local authority social care			126,326
Cost savings to criminal justice system			3,883
<b>Total public sector cost savings and offset</b>		<b>1,121,975</b>	<b>2,406,920</b>

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571 **Table 4: Total societal value of WFL**

Results	Human values of QALY improvement	Savings to criminal justice system	Savings to economy	Savings to NHS and LAs	Total values generated and long-term savings	SROI
Unweighted value 1 (QALY valued at £31,000)	£8,917,426	£3,883	£1,340,528	£2,403,037	£12,664,874	<b>£3.59</b>
Unweighted value 2 (QALY valued at £60,000)	£17,259,535	£3,883	£1,340,528	£2,403,037	£21,006,983	<b>£5.95</b>
Weighted* value 1 (lower QALY value)					£9,756,450	<b>£3.45</b>
Weighted* value 2 (higher QALY value)					£18,883,451	<b>£6.03</b>

572 \*N.B. Both weighted values are based on a HELP utility score of 1.01.

**ASSESSING THE VALUE FOR MONEY OF AN INTEGRATED HEALTH AND WELLBEING SERVICE IN THE  
UK**

**HIGHLIGHTS**

- Lay health workers are widely used to deliver health and wellbeing-related services
- These services can represent good value for money
- In this example, the estimated societal value was at least £3.45 for every £1 spent
- Targeting disadvantaged groups also offers potential to reduce health inequalities