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Economic evaluation of participation in community led organisations for individuals living in disadvantaged areas in the UK

Helen Mason [a,*], Nicola Irvine [a], Sarkis Manoukian [a], Jack Rendall [a], Cam Donaldson [a,b], Artur Steiner [a], Michael J. Roy [c], Jennifer McLean [d], Michael P. Kelly [e], Marcello Bertotti [f], Karen Galway [g], Rachel Baker [a]

[a] Yunus Centre for Social Business and Health, Glasgow Caledonian University, Glasgow, Scotland, UK
[b] National Center for Epidemiology and Population Health, Australian National University, Australia
[c] Stirling Business School, University of Stirling, Stirling, UK
[d] Glasgow Centre for Population Health, UK
[e] Department of Public Health and Primary Care, The University of Cambridge, UK
[f] Institute for Connected Communities, University of East London, UK
[g] School of Nursing and Midwifery, and QUB Innovation Zones, Queen's University Belfast, UK

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ABSTRACT

This paper presents an economic evaluation of community-led and -owned organisations that deliver activities to support health and wellbeing. Because community-led organisations (CLOs) are a vital part of the social and solidarity economy, they increasingly feature in public health policies targeting disadvantaged populations. However, little is known about the value CLOs generate as few economic evaluations of them exist and those available focus on isolated activities (such as exercise classes) and/or specific populations (e.g., men-only collectives). The novelty of our work lies in the inclusion of multiple CLOs, comprehensive coverage of their activities, breadth of participants studied, and control group methodology applied in creating new knowledge of the health and wellbeing outcomes of CLOs and resources consumed to achieve them.

We conducted cost-effectiveness and cost-consequence analyses of data collected via a 12-month longitudinal study. We compared 331 CLO participants in 14 UK-based CLOs to a 'do nothing' synthetic control group (n = 100). Health and wellbeing were measured using the ICECAP-A capability measure for adults, EuroQol EQ-5D-5L, Short-form Warwick Edinburgh Mental Wellbeing Scale and the Revised Social Connectedness Scale. Resource use data included health, social care, and other community sector resources. Data collection occurred at four-points over the study period supported by publicly available accounts and data provided by each CLO.

We found an incremental cost per year in full capability of £35,813 and an incremental cost per quality adjusted life year of £29,827. Statistically significant improvement in both social connectedness, and mental wellbeing were observed over the 12 month follow up. This work supports CLOs as an intervention to improve health and wellbeing in disadvantaged communities and identifies challenges for traditional evaluation methodology with regards to costing and comparator groups.

1. Introduction

This paper presents an economic evaluation of community led organisations (CLOs) that deliver activities to support health and wellbeing. There are several different terms in the literature and so our use of 'CLO' warrants some explanation. We use the term CLOs to describe organisations that are place-based, community-led and governed, accountable and responsive to the needs of their local community. CLOs operate as community hubs, usually with premises or space used for gatherings, events and group activities. In short, they are part of communities' social infrastructure.

Because CLOs respond to local needs and contexts, the activities they

* Corresponding author.
E-mail addresses: Helen.mason@gcu.ac.uk (H. Mason), Nicola.irvine@gcu.ac.uk (N. Irvine), sarkis.manoukian@gcu.ac.uk (S. Manoukian), jack.rendall@gcu.ac.uk (J. Rendall), cam.donaldson@gcu.ac.uk (C. Donaldson), Artur.steiner@gcu.ac.uk (A. Steiner), michael.roy1@stir.ac.uk (M.J. Roy), Jennifer.mclean@glasgow.ac.uk (J. McLean), mk744@medschl.cam.ac.uk (M.P. Kelly), m.bertotti@uel.ac.uk (M. Bertotti), k.galway@qub.ac.uk (K. Galway), Rachel.baker@gcu.ac.uk (R. Baker).

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offer and the resources required vary between organisations. There are many activities and services offered by CLOs, too many to detail here (see Supplementary Material Table S4), but to give some impression, their range of activities cover: healthy living (e.g. diet and affordable food, exercise classes, walking groups), work and productive activities (e.g. gardening, men's sheds), social connectedness (e.g. events, meals, festivals), education and training (e.g. computer skills), family and children (e.g. toddler and parenting groups, autism and ADHD support), arts and creativity (e.g. knitting, art groups), advice services (e.g. debt, welfare, housing) and some deliver health services (e.g. podiatry services, hospital discharge support). All CLOs support volunteering both as part of their operational model and as an opportunity for personal development, so benefits arise to volunteers as well as those who engage in CLOs' activities run by volunteers. Many CLOs participate in social prescribing schemes and have wide partnerships across health and public sectors, often signposting outwards to services as well as accepting referrals from external agencies.

Such variations in context and activities create differences in size and complexity. Some CLOs function with few paid staff and annual incomes under £500,000 whilst others are large, complex organisations whose annual incomes exceed £1,000,000. They take different legal forms and business models, some are charities, others social enterprises, community businesses, companies limited by guarantee, or community development trusts. In the UK most depend on public funding and local authority or government contracts.

Despite their differences, CLOs are fundamentally very similar because they have a commitment to a set of common principles, a way of working which is often termed an *assets-based approach* to community development. They recognise, and mobilise, both local physical resources (e.g., green space) and community members (as volunteers and community experts) to achieve their health and wellbeing goals (Hopkins and Rippon, 2015). Distinct from a deficits approach to health improvement, which targets illnesses, assets-based approaches focus on 'salutogenesis' and creating conditions for health, build on and develop existing strengths in communities and move the public health gaze upstream. Although CLOs vary in response to community needs, their common way of working means that we can conceptualise and evaluate CLOs as a complex 'intervention' (Roy et al., 2017; Shearn et al., 2017).

CLOs have the potential to impact health and wellbeing of participants by addressing the social determinants of health (Caló et al., 2019; Roy et al., 2014, 2017). Drawing on previous qualitative work, theory and practice-based models, a conceptual model was developed as the starting point for the evaluation reported in this paper (Baker et al., 2023). This model highlights a common set of intermediate determinants of longer-term health outcomes including social networks and relationships, trust and safety, sense of belonging, confidence and control/empowerment, and sense of meaning or purpose in life. These emphasise, for our evaluative space and outcome measurement, dimensions of wellbeing and capability to flourish in life (Mitchell et al., 2017).

Although CLOs have been a feature of the UK voluntary, community and social enterprise sector for many decades (Bailey, 2012; Murray, 2019; Roy, 2017), there has been growing policy interest in their potential to tackle and mitigate the impact of health inequalities via the social determinants of health (NHS England, 2025; Scottish Government, 2025).

CLOs in the UK are funded via a range of sources typically with a significant proportion coming from public service tendered contracts (e.g. NHS and local government) as well as through trading and charitable donations. Recent data published by the UK HM Government UK (2022b) suggests that around 9180 community organisations won public contracts in 2020, generating approximately £9.2 billion in income via procurement. The same organisations also raised about £3.8 billion in grants, showing that they blend contract income with grant funding. Public contracts were mainly awarded by local government (68 %), with about 11 % via the NHS, and 13 % from central government. Funding is often tied to delivery of specific activities. The potential for CLOs to impact on the social determinants of health as well as delivery of services, has led to the third sector being increasingly regarded as part of a picture of whole-system public health (HM Government UK, 2022a; NHS England, 2025; NICE, 2017; PH England, 2020; PH Scotland, 2024) and CLOs as complex public health interventions (Locality, Power to Change & VCSE Health & Wellbeing Alliance, 2023; Roy et al., 2017). For longer term sustainability CLOs frequently rely on investment from public funds but more evidence is required on their health and wellbeing outcomes, the resources needed and their impact on health and social care resource use.

Literature on the cost effectiveness of assets-based approaches like CLOs is scarce. In their 2024 systematic literature review of the economic evidence for an assets-based approaches to health and wellbeing, Wreford et al. (2024) found interventions reported to be mostly cost-effective but raised concerns about publication bias considering the very few examples found. In the economic evaluations identified (n = 9), reporting standards and methodology (cost-effectiveness, cost-utility, value for money) varied. Some assumed cost-effectiveness via cost-savings calculations. Where incremental cost per quality adjusted life year (QALY) gained was presented, estimates varied from £4895 - £67,675 per QALY gained (inflated by us to 2025 prices excluding uncertainty). No studies reported evaluations of organisations that offered a broad range of activities and services, instead evaluating specific activities.

One potential reason for the dearth of evidence is that the complex nature of CLOs as interventions for health and wellbeing challenges traditional methods of economic evaluation for health (Skivington et al., 2021; Wreford et al., 2024). The scope of CLOs and the variations between them (in terms of activities, services, and assets) makes identification of suitable comparators that could be used in a randomised or case control design difficult, if not impossible (see Caló et al., 2019). The perspective for economic evaluation also needs to be wider to reflect the potential impact of CLOs on health and wellbeing via the social determinants of health so resource use by CLO participants should also include the social care and community sector as well as health care. In relation to outcomes, patterns of CLO benefits are likely to differ from those observed in healthcare interventions and health utilities (for estimating quality adjusted life years) may not sufficiently capture them (Rutter et al., 2017; Skivington et al., 2021; Wreford et al., 2024).

Despite the challenges described above, knowledge of the outcomes and costs involved in funding CLOs is necessary if public monies are sought to support them. This economic evaluation is a part of the CommonHealth Assets project (available at: https://commonhealthassets.uk) and addresses current gaps in knowledge of the costs and benefits of CLOs. We follow the NIHR/MRC framework for developing and evaluating complex interventions (Skivington et al., 2021). Specifically, we evaluate the costs and consequences for disadvantaged populations attending a CLO in the UK compared with no intervention. We present these in both cost consequence and cost effectiveness analyses.

2. Methods

2.1. Study design

We conducted a cost consequence analysis (CCA) and cost-effectiveness analysis (CEA) of CLO participation compared to no participation using a synthetic control group. We took the perspective of potential public health funders seeking to address the wider determinants of health.

Data for the economic evaluation was required at two levels: organisational and individual participant. The resources required to provide CLO activities were collected from CLOs directly (e.g., staff, buildings, activities) and publicly available financial reports (secondary source of CLO overheads for missing data). Participant level data was collected via a longitudinal questionnaire study. The questionnaire

included sections on participation in CLO activities, outcome measures, resource use and sociodemographic questions. Baseline data was collected at the point a participant was enrolled into the study and not at first entry into the CLO. Further questionnaires were completed at 1, 6 and 12 months after the baseline questionnaire.

2.1.1. Outcome measures

The primary outcome was capability wellbeing as measured by the ICECAP-A tool (Al-Janabi et al., 2012). The ICECAP-A was selected as the dimensions of the ICECAP-A map across many of the intermediate outcomes presented in our conceptual model (Baker et al., 2023). It is validated and supported for use in economic evaluation in the UK by the National Institute for Health and Care Excellence (NICE) (NICE, 2013, 2014). Secondary outcomes were health related quality of life (EQ-5D-5L) (Herdman et al., 2011), mental wellbeing (SWEMWBS) (Ng Fat et al., 2017), and social connection to community (SCS-R) (Lee et al., 2001).

2.1.2. Participant resource use

Health, social, and community sector service resource use was collected using specifically designed resource use questions. The unit cost and source for each item of resource use is presented in the supplementary material (Table S1). All items were costed in GBP, 2022 prices.

2.2. Setting & participants

Participants were recruited from 14 CLOs in disadvantaged communities in Scotland (n = 4), Northern Ireland (n = 3), and England ((London (n = 3), Bournemouth (n = 4)) between August 2022 and April 2024. CLOs were identified through community network organisations that were part of our research team and some academic team members' local contacts. To support participant recruitment and longitudinal data collection, CLOs needed to be stable (unlikely to close during the study period) and interested in the research. Within those feasibility criteria we looked for variation in location, geography, demographics and size. Our CLOs served a mixture of rural and urban populations in disadvantaged communities as defined by relevant indices of multiple deprivation. Our partners advised that urban CLOs were more likely to see high footfall and churn in populations, including immigrant groups, whereas rural organisations were more static and homogenous. Participant inclusion criteria were age >18 years and participation in an activity at the CLO that involved several contacts over time (i.e. excluding one-off contacts).

2.3. Comparator group

In the absence of a within-study comparator, a 'do nothing' synthetic control group was constructed where we assumed an individual did not attend any other service or activity in the absence of the CLO. This approach is a quasi-experimental method for generating comparators when randomised controls are not feasible. Traditional synthetic control methods (Bouttell et al., 2018) require pre-intervention time series data to construct weights, which were not available. Matching approaches would have required identifying an external comparison group but no suitable datasets existed with comparable populations, identical outcome measures or sufficient follow-up periods. The 'within-study synthetic control' approach adopted here represents the most conservative and methodologically sound option given the available data.

The synthetic controls represent a 'do nothing' counterfactual where we assume new participants would maintain their baseline outcomes without CLO intervention. This differs from a before-and-after study because: (1) we compare a mixed intervention population vs. new participants only, that reflects real-world CLO usage, and (2) we test both initial effectiveness (new participants) and sustained benefits (experienced participants) within a single analysis. By using participants as their own counterfactuals, this method inherently controls for time-invariant measured and unmeasured confounders that might influence both CLO seeking behaviour and outcomes. This substantially reduces selection bias that would arise from comparing CLO participants to any external control group.

The 'do nothing' comparator group was constructed using data from new participants (<6 months attendance at the CLO) on their previous 1-month health, social and community resource use and outcomes (ICECAP-A, EQ-5D-5L, SWEMWBS, SCS-R) reported in the baseline questionnaire. This 6-month threshold was selected as a pragmatic choice, balancing sample size requirements with considerations about the time needed for CLO engagement to meaningfully affect outcomes. We assumed the pattern at baseline would be the same during the next 12 months under a no CLO exposure assumption. This assumption is reasonable given: (1) the relatively short 12-month follow-up period, (2) the baseline characteristics of participants who were new to CLOs (≤6 months attendance), suggesting they had not yet experienced substantial change from CLO participation, and (3) the absence of alternative interventions that these participants would have accessed instead. Linear extrapolation was chosen as the most parsimonious approach, minimising assumptions about natural progression of costs and outcomes in the absence of the intervention. As we assumed no participation at the CLO, no intervention costs were included for the comparator group in the analysis.

2.4. Data collection

Four project researchers, one based in each locality (Glasgow, Scotland; Belfast, Northern Ireland; and London and Bournemouth; England), worked closely with 3 or 4 CLOs in surrounding areas. Participants were recruited for the survey through posters and flyers within the CLOs, or through researchers attending activities to recruit face-to-face, and liaising with CLO managers to identify candidates. CLOs were paid £11.50 per participant recruited to the survey in addition to an annual sum for participation to reflect the added administrative cost per participant. Each CLO required a slightly different approach to recruitment depending on, among other elements, their location, type of activities offered, and size of community. For example, working with rural CLOs required prior planning by the researchers due to their remote location, whereas urban CLOs facilitated walk-in appointments.

Following information and consent procedures, the baseline face-to-face questionnaire was completed. To maximise retention, the project researchers built relationships with their CLOs by maintaining local presence and visibility. The study follow-up questionnaires at 1, 6, 12 months could be completed in-person, by telephone, or online, maintaining the same approach used for the baseline questionnaire where feasible. Participants were offered £10 incentive upon completion of each questionnaire from baseline to 6-month, increasing to £50 upon completion of their 12-month questionnaire.

2.5. CLO intervention resource use and costing

Costs were estimated per-participant for delivery of a single CLO activity session. Unit costs for attendance at a single session of CLO activity were specific to the CLO attended and the activity category reported (see Box 1).

An initial micro-costing of activities attended by the survey participants was insufficient to capture all costs borne by CLOs in delivering activities (i.e., costs of buildings insurance, accounting and legal fees, etc.) so costs were estimated by combining information on yearly running costs from publicly available accounts filings, with total activities and capacity for participation over 12 months.

CLOs were asked to provide 12 months of total activities and capacity data from 2022 onwards (outside of the COVID-19 pandemic restrictions that might affect attendance) and additional services that might distort figures (such as vaccination programmes in CLOs).

Activities included all CLO-reported timetabled activities, infrequent events (e.g., day trips, parties), 1:1 sessions, unscheduled drop-in sessions, and instances of assistance via telephone as reported by CLOs. Paid services (such as contracted social care delivery) were excluded.

For 11 CLOs, a cost was applied for each instance that a study participant reported attending an activity session (excluding volunteering) thus costing according to frequency of engagement across activity categories at their own CLO. For the remaining 3 CLOs an alternative costing strategy was required as they operated with predominantly 1:1 activities (2 CLOs) or because we had insufficient descriptions of activities. For participants at these CLOs, a single CLO-specific cost reflecting 12 months of CLO attendance was applied to reflect resource use across the study duration. A detailed account of the derivation of costs, and management of missing data for each CLO is presented in the supplementary materials.

It was not possible to estimate the opportunity cost of volunteering at a CLO for 12 months. We did not have sufficient data from CLOs on how many volunteer hours were required to support activities and participants only reported the frequency of attending any activity as a volunteer not the hours or specific activities supported. As such, we could not specify which of Box 1 activities volunteering supported nor the total hours of volunteering required to deliver, meaning we could not estimate the volunteer resources required per CLO over 12 months beyond the volunteer expenses (e.g., training, travel) already accounted for within the annual CLO running costs. One exception to this was a CLO dedicated to training and supporting voluntary works. The alternative costing strategy described above was applied to this CLO.

Capital costs were excluded from our analyses. Variations in assets meant no two CLOs' capital costs were alike. For example, 50 % of our CLOs ran a café, but with different opening hours, food provision, and ownership (e.g., subsidised subletting to private businesses). Although we could capture a cafe's running costs in the accounts, we had no justifiable way to estimate equivalent annual cost for set-up nor to account for out-sourcing of activities to an external business (Drummond et al., 2015). Additionally, some resources (e.g., laptops) were used for multiple activities. Finally, the CLOs had existed in their location for a median of 21.5yrs (IQR 8.2yrs) limiting accuracy of original outlays.

2.6. Analysis

A prespecified analysis plan was developed to guide analysis. Recognising the complementary nature of CLOs and the wider impacts on resource use and outcomes beyond a health focus, a CCA was used to present disaggregated costs and benefits of CLOs compared to a do nothing comparator to enable decision makers to observe the trade-offs consequent upon different courses of action in their various contexts (Drummond et al., 2015).

For the four outcome measures, all were scored according to developer guidelines (Flynn et al., 2015; Lee et al., 2001; Stewart-Brown et al., 2009; Van Hout et al., 2012) and group differences were tested at each follow up time point.

The cost-effectiveness analysis compared the costs and benefits over a period of 12 months; therefore, no discounting was applied. The primary outcome was defined in Years in Full Capability (YFC), elicited via ICECAP-A using the UK index values (Flynn et al., 2015). A secondary cost utility analysis was conducted using EQ-5D-5L responses mapped to EQ-5D-3L utility values after adjusting for age and gender following current NICE guidance (Alava et al., 2020; NICE, 2022), with the UK population tariff applied for valuation to estimate QALYs (Dolan, 1997). Both YFC and QALYs were calculated using the area under the curve method with regression-based baseline utility adjustment (Manca et al., 2005).

Cost-effectiveness was assessed using incremental cost-effectiveness ratios (ICERs), calculated as the difference in mean costs between the CLO intervention and synthetic control groups divided by the difference in mean outcomes. Uncertainty in the ICER estimates was explored through non-parametric bootstrap analysis with 10,000 replicates, generating a joint distribution of incremental costs and effects. Results were visualised on cost-effectiveness planes and used to calculate cost-effectiveness acceptability curves (CEACs). A CEAC shows the probability of cost-effectiveness across different willingness-to-pay (WTP) thresholds for a YFC. We constructed these curves using the net monetary benefit approach, where we calculated the net benefit at various WTP thresholds and used regression analysis to determine the probability of the intervention being cost-effective. Results are presented for a range of WTP values between £0 and £50,000 per capability-year.

The primary analysis was complete cases for participants who had data available at all time points. Sensitivity analysis was conducted to account for missing data. Multiple imputation was conducted using methods specifically designed for longitudinal cost-effectiveness data (Leurent et al., 2020). The imputation model included effectiveness variables ICECAP-A and EQ-5D-5L scores at baseline, 1-month, 6-month, and 12-month timepoints, cost variables (intervention, healthcare and non-healthcare costs at each timepoint), and baseline covariates (age and gender). Missing values were imputed in two ways: 1) a Missing at Random (MAR) assumption, which utilised baseline values, follow-up values where available, and patterns from similar individuals, 2) a reference-based assumption (Baseline Mean Carried Forward), a Missing Not at Random approach, which used baseline observations to impute missing follow-up values. One hundred imputations were performed for each approach to create 100 complete datasets with intervention and controls, running the CEA simultaneously across all datasets (Carpenter et al., 2013; Leurent et al., 2020). Analyses were performed across the imputed datasets with appropriate combination of estimates and standard errors to account for both within- and between-imputation variability.

All cost-effectiveness and multiple imputation analyses were conducted using Stata 18 (StataCorp, 2023).

Box 1
Activity Categories

Café
Art & Crafts
Music lessons
Physical activity/exercise
Outdoor activity (e.g., gardening)
Psychological support services
Advice (e.g., debt, welfare)
Educational classes
Health service
Cultural and social events
Early learning/Childcare
Volunteering

3. Results

3.1. Participant characteristics

The baseline characteristics of participants attending CLOs (n = 331) and the synthetic control group (n = 100) are shown in Table 1. No statistically significant differences were observed between the groups across key sociodemographic characteristics, although a higher proportion of retired individuals in the intervention versus the synthetic group approached statistical significance (31 % vs. 21 %, p = 0.057).

3.2. CLO characteristics

We present an overview of CLO characteristics in Table 2 and refer readers to the supplementary materials for details of activities delivered (Table S4). According to the National Council for Voluntary Organisations' definitions (NCVO, 2024), seven CLOs were large organisations, six were medium-sized, and one was small. One CLO was a subsidiary of a large Co-operative and Community Benefits Society consisting of five subsidiaries including a housing association with yearly income of £10-£100million. We assumed this subsidiary to function as a single, medium-sized CLO for our analyses based upon activities, staffing, and participant numbers similar to other medium sized-organisations in the study. The youngest organisation had been running for 7 years and the oldest for 38 years.

3.3. Participant resource use

Participant resource use is provided in Table 3 and the supplementary materials (Table S5). NHS 24/111 service use was lower among CLO participants compared to the synthetic control (0.51 vs. 0.84 contacts, $p = 0.10$), but the difference was not statistically significant. In terms of services beyond traditional health care settings, two notable differences emerged between the groups. Mental health support services use was lower among intervention participants compared to the synthetic controls (1.96 vs. 3.16 contacts, $p = 0.06$) and approached statistical significance. Housing advice and support services were accessed less frequently by CLO participants with the difference being statistically significant at the 5 % level (0.70 vs. 1.52 contacts, $p = 0.02$).

Intervention participants reported attending 1 to 2 activities (mean 1.88, range 0–10) per week. The most frequently reported activities were café attendance, arts/crafts, and physical activities. See Table S5 for detailed descriptions.

3.4. Health outcomes

Outcomes for each measure over the 12-month follow up are presented in Table 4.

ICECAP-A capability scores showed progressive improvement over the 12 months follow-up period in the intervention group, while (by construction) remaining stable in the synthetic control group. At baseline, capability scores were similar between groups. The intervention group demonstrated incremental improvements at both the 1-month and 6-month follow-up, although differences from the synthetic control group remained non-significant. By the 12-month follow-up, the intervention group showed a marked improvement in mean capability score (0.775) that was significantly higher than the synthetic control group (0.704, $p = 0.001$). EQ-5D utility scores in both groups were similar at baseline (CLO: 0.554 vs. Controls: 0.573, $p = 0.593$). The intervention group showed gradual improvements over the follow-up period while synthetic control values remained stable at 0.573 by construction. The differences between groups were not statistically significant at any time point. SWEMWBS scores showed consistent improvement in the CLO group over 12 months, from 21.78 at baseline to 22.52 at final follow-up. While differences between the groups were not statistically significant at baseline ($p = 0.225$), by 12 months the improvement in the intervention group reached statistical significance ($p = 0.017$). The SCS-R scores in the intervention group increased from 4.07 at baseline to 4.27 at 12 months. The difference between groups was not significant at baseline ($p = 0.201$), it became statistically significant from 1 month onward ($p = 0.033$ at 1 month, $p = 0.009$ at 6 months, $p = 0.003$ at 12 months).

Table 1
Baseline Characteristics (overall sample).

	Intervention (N = 331)	Synthetic Controls (N = 100)	p-value
Age	54.73	51.73	0.102
Female	65 %	70 %	0.380
Non-white	18 %	23 %	0.249
Post-16 years education	53 %	60 %	0.251
Employed	16 %	20 %	0.357
Benefits	78 %	71 %	0.183
Retired	31 %	21 %	0.057
Has children in household	25 %	30 %	0.328
Chronic condition	65 %	62 %	0.599
Long term sickness	29 %	31 %	0.613
Carer	24 %	24 %	0.998
Living alone	40 %	40 %	0.974

3.5. Cost effectiveness analysis

3.5.1. Sample

Of the 331 participants who took part in the survey, complete data on ICECAP-A and resources use was available at all four times points for 248 participants in the CLO intervention group and 99 synthetic controls. For the EQ-5D 5L, complete data was available for 256 participants in the CLO intervention group and 100 synthetic controls participants.

Multiple imputation was utilised to include the data from 53 people who had completed three questionnaires, and 20 people who had completed two questionnaires. We excluded 20 people who either withdrawn or had missing baseline outcome data.

3.5.2. Complete case analysis

The complete case cost-effectiveness results are presented in Table 5. For the capability (YFC) analysis, mean total costs were £4010 in the CLO group compared to £3204 in synthetic controls, yielding an incremental cost of £805. The CLO group has an ICECAP-A utility score of 0.727 compared to 0.704 in the synthetic control group, with an incremental gain of 0.022 years and an incremental cost-effectiveness ratio of £35,813 per YFC gained.

For QALYs, mean total costs were £4036 in the CLO group compared to £3201 in synthetic controls, with an incremental cost of £836. The CLO group achieved 0.601 QALYs compared to 0.573 in the synthetic control group, representing an incremental gain of 0.028 QALYs. The resulting incremental cost-effectiveness ratio was £29,827 per QALY gained, with a 52 % probability of cost-effectiveness at £30,000 per QALY gain WTP threshold.

The incremental cost-effectiveness scatterplot (Fig. 1) provides a visual representation of the uncertainty surrounding the cost-effectiveness results for the ICECAP-A complete-case analysis. Analysis was based on 10000 bootstrap replicates of comparisons of the intervention group versus synthetic controls (10 % of values shown for clarity). Each dot represents one bootstrap point, and the green dot represents the average point across all bootstrapped values. The red-dashed ellipse delineates the 95 % confidence interval. Most points fall in the northeast quadrant, indicating that CLO participation is both more costly and more effective than no participation. The clustering of points suggests a consistent positive effect on capability wellbeing, though with notable variation in incremental costs.

Fig. 2 displays the cost-effectiveness acceptability curves. The green line represents the YFC, showing that the probability of cost-effectiveness reaches 50 % at a willingness-to-pay threshold of approximately £35,000 per year of full capability gained. The curve for the QALY analysis, the probability of cost-effectiveness reaches 50 % at approximately £30,000 per QALY.

3.5.3. Sensitivity analysis: multiple imputation analysis

The multiple imputation results under missing at random (MAR) and baseline mean carried forward (BMCF, the non-MAR approach) are presented in Table 6.

Under MAR assumptions, incremental costs were £1143 for

Table 2
Characteristics of community-led organisations.

Region	CLO ID	Years in operation (to 2022)	Staff (n)	Location	Annual Income	Annual premises costs (incl. amenities)	Owned premises	Café on site	Own vehicle	Employees per volunteer	Activities per year (n)	Scope of activities available	Distinguishing features
Scotland	1	36	10	Urban	£400K	£15.8K	No	Yes	Yes	0.60	1268	Full spectrum	Mostly support for social, cultural and economic lives of adults
	2	25	19	Urban	£1.0M	£71.3K	No	No	No	0.34	2642	Full spectrum	All ages, learning/skill building, community radio, cycling hub
	3	19	20	Rural	£1.40K	£43.2	No	No	Yes	0.44	2278	Full spectrum	All ages, skill building, early years family support, community strengthening
	4	21	35	Urban & Rural	£1.34M	£69.6	No	Yes	Yes	2.25	6200	Full spectrum	All ages, education, new services, co-ordination and integration of services, prisoner family support
South England	5	23	2	Urban	£54K	£16.5K	No	No	No	0.29	419	Creative arts, music, advisory, educational, volunteering, cultural/social	Adults in addiction recovery, creative arts skill development & productions
	6	18	42	Urban	£906K	£42.5K	No	No	Yes	0.16	not available	Healthy living, advisory, free/affordable food, educational, early learning/childcare, cultural/social	Adult-focus, food, finance, homelessness and lone parenting
	7	37	150	Urban & Rural	£4.45M	£28.2K	Yes	No	No	1.35	not available	Advisory, educational, and volunteering	Older adults focus, information, advice, carer & daily living support
	8	7	6	Urban	£1.83M	£52.8K	Yes	Yes	No	0.17	2407	Full spectrum	All ages but focus on children, young people & families, community participation, skill building, food poverty
London	9	38	104	Urban	£3.25M	£1.25M	Yes	Yes	Yes	0.87	15866	Full spectrum except for music	All ages, support for organisations and communities to develop community services, skill development, business start-up support
	10	22	350	Urban	£10.6M	£32K	Yes	Yes	No	0.25	2668	Full spectrum	All ages, young adult support, skills and education, housing and community regeneration
	11	25	19	Urban	£564K	£37.1K	No	No	No	0.02	not available	Full spectrum	Adult-focus, training and supporting volunteers and volunteer well-being
Northern Ireland	12	23	20	Urban & Rural	£2.05M	£52.8K	No	No	No	0.90	3297	Full spectrum except for music	All ages, community, schools & workplace health and wellbeing, community trauma
	13	19	10	Urban	£967K	£22.8K	No	Yes	No	2.80	not available	Full spectrum except for music	All ages, community safety, men's shed, vulnerable adults, first aid, autism support, early years health support
	14	23	7	Rural	£364K	£19.9K	No	Yes	Yes	0.05	4122	Full spectrum	All ages, addiction support, mental health, older adult health, first aid

Notes.
All data from organisations or publicly available data (archived/current organisational webpages, His Majesty's Revenue & Customs HMRC database).
All data presented is for the year 2021-22 except for activities per year (2022-23 – see main text for explanation).
One London organisation is a subsidiary of a large charity and registered society that aggregates annual accounts across all subsidiaries. Annual premises costs are reported for CLO subsidiary only.
Full spectrum of activities describes the regular provision of at least one activity type in all following categories: art & crafts, music, physical activity/exercise, outdoor activity, psychological support, advisory (e.g., debt, welfare), educational (e.g., digital skills), health services (e.g., podiatry), cultural/social events, early learning/childcare.
Activities per year represent all sessions of activity delivered including estimates of signposting (of potential participants to other services) events for 2022. Total activities data not available four organisations. See main article text and supplementary materials for further details.

Table 3
Mean participant healthcare, public, and third sector resource use over 12-months.

Service[a]	Intervention (n = 331)	Synthetic Controls (n = 100)	p-value[b]
GP (Surgery, Phone, Home)	6.01	7.00	0.32
Nurse (Surgery, Phone, Home)	2.99	3.40	0.51
NHS 24/NHS 111 (phone consultation)	0.51	0.84	0.10
Occupational Therapy (community-based)	0.55	0.84	0.39
Physiotherapy (community-based)	0.73	0.92	0.51
Hospital outpatient clinic (doctor)	1.50	1.24	0.38
Hospital outpatient clinic (Specialist nurse or other health professional, e.g., physiotherapist)	1.29	1.12	0.59
Emergency Department (A&E)	0.40	0.48	0.59
Hospital in-patient admission	3.90	4.24	0.11
Social Work	0.86	0.96	0.79
Mental Health Support	1.96	3.16	0.06
Addiction helpline	0.23	0.08	0.24
Community advice organisation (e.g., Citizen's Advice Bureau)	0.76	0.80	0.86
Housing advice and support	0.70	1.52	0.02
Police	0.29	0.20	0.46
Pharmacy	4.07	4.88	0.13

[a] Cumulative resource use per person at each time point (in the last month), includes zero resource use.
[b] p-values calculated using two-sample t-tests comparing means between intervention and synthetic control groups.

capability outcomes and £1149 for QALYs. YFC showed an incremental effectiveness of 0.028 years (95 % CI: 0.004, 0.052), with a ratio of £41,154 per YFC gained. For QALYs, the incremental effectiveness was 0.033 QALYs (95 % CI: 0.002, 0.065), yielding an incremental cost-effectiveness ratio of £34,556 per QALY.

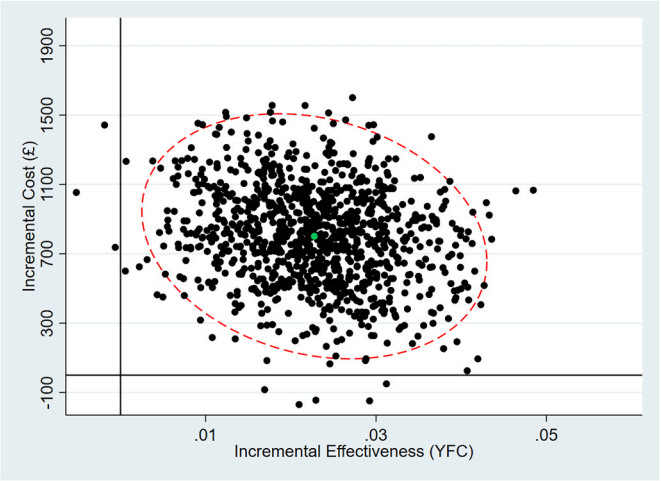

Fig. 1. Incremental cost-effectiveness scatterplot of incremental costs and effects (Incremental Years in Full Capability as measured by ICECAP-A).

BMCF yielded similar incremental costs to MAR but smaller effect sizes. The incremental effectiveness was 0.026 years for YFC (£44,858 per YFC gained). The incremental QALY gain was 0.029, yielding £38,854 per QALY gained.

3.6. Cost consequence analysis

A descriptive comparison of the costs and outcomes of CLO participation are shown in the CCA balance sheet (Table 7).

Table 4
Health and wellbeing outcomes.

Tool		Health and wellbeing outcomes				p-value[a]
		Intervention Mean (SD)	N	Synthetic controls Mean (SD)	N	
ICECAP	Baseline	0.731 (0.187)	327	0.704 (0.199)	99	0.221
	1_Month	0.741 (0.190)	303	0.704 (0.199)	99	0.103
	6_Month	0.745 (0.191)	293	0.704 (0.199)	99	0.069
	12_Month	0.775 (0.183)	290	0.704 (0.199)	99	0.001
EQ 5D5L	Baseline	0.554 (0.315)	331	0.573 (0.313)	100	0.593
	1_Month	0.565 (0.318)	304	0.573 (0.313)	100	0.833
	6_Month	0.591 (0.301)	295	0.573 (0.313)	100	0.595
	12_Month	0.623 (0.297)	291	0.573 (0.313)	100	0.149
WEMWBS	Baseline	21.78 (4.36)	325	21.17 (4.34)	98	0.225
	1_Month	22.12 (4.56)	297	21.17 (4.34)	98	0.072
	6_Month	22.19 (4.66)	293	21.17 (4.34)	98	0.058
	12_Month	22.52 (4.95)	290	21.17 (4.34)	98	0.017
SCS-R	Baseline	4.07 (0.88)	310	3.94 (0.98)	97	0.201
	1_Month	4.17 (0.89)	287	3.94 (0.98)	97	0.033
	6_Month	4.22 (0.91)	287	3.94 (0.98)	97	0.009
	12_Month	4.27 (0.95)	277	3.94 (0.98)	97	0.003

N for synthetic controls varies according to availability of complete cases (see Section 2.6).
[a] p-values calculated using two-sample t-tests comparing means between intervention and synthetic control groups.

Table 5
Complete case cost-effectiveness results.

Outcome	CLO Intervention Total Cost (£)	Synthetic controls Total Cost (£)	Incremental Cost (£)	CLO Intervention Total Effectiveness (£)	Synthetic controls Total Effectiveness (£)	Incremental Effect	ICER	Probability Cost-Effective at £30,000
Years at Full Capability (YFC)	4010	3204	805.39	0.727	0.704	0.022	£35,813 per YFC	–
QALYs	4036	3201	835.81	0.601	0.573	0.028	£29,827 per QALY	52 %

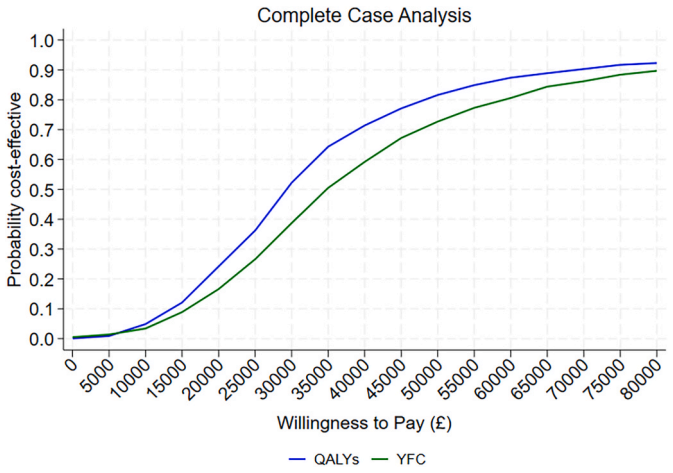

Fig. 2. Cost-effectiveness acceptability curves for complete case analysis showing QALYs and YFC outcomes based on the 12-month follow-up.

4. Discussion

This study presents findings from an economic evaluation of CLOs across both capability and health-related quality of life measures. By widening the evaluation space beyond healthcare and health state utility to include relevant costs and outcomes we revealed the wider value of CLOs. Indications of cost effectiveness can only be made in relation to an external threshold (Drummond et al., 2015). Several thresholds exist, often with different methodological and empirical basis (Baker et al., 2011; Claxton et al., 2015). In the UK, although NICE supports the use of ICECAP as an outcome measure in the evaluation of health and social care interventions (NICE, 2013, 2014), there is no specified cost per YFC threshold against which interventions could be considered to represent good value for money. Empirical studies have suggested appropriate thresholds for capability wellbeing of £33,500 to £36,150 per YFC gain (Kinghorn and Afentou, 2021). Whereas work by Himmler et al. (2020) suggests the UK population value a YFC at a willingness-to-pay >£66, 500 per YFC. Our cost-effectiveness analysis using capability wellbeing estimated an ICERs of £35,813 per YFC gained which sits within this range. NICE has an established willingness to pay threshold of £20–30, 000 per QALY gained for health technology evaluations with our incremental cost per QALY gained of £29,827 at the upper end of this range.

Our findings are within the range identified in the Wreford et al. (2024) review of evaluations of assets-based approaches to health improvement, which reports ICERs from £4895 - £67,675 per QALY gained. However, the economic evaluations identified in that review were heterogeneous in their scope, populations and settings and not representative of CLOs as defined for this research. Our findings bring a unique contribution to the evaluation of, and new knowledge about the impacts of community-led organisations on health and well-being.

As the ICECAP is our primary outcome measure it is worthy of some further discussion. There is a lack of guidance within national health technology assessment guidelines on the use of ICECAP for economic evaluation. We report years in full capability, a consequence of this is that our findings are likely to be interpreted by decision makers in the context of an outcome maximisation framework, which has the advantage of some commensurability with the incremental cost per QALY gained. In the context of disadvantaged communities, with poor scores on indices of multiple deprivation, the aims of CLOs might be seen as supporting participants to a level of sufficient capability and evaluations in this context might estimate years in sufficient capability, focussing on maximising the number of people that reach a level of sufficiency (Mitchell et al., 2015). This analysis is beyond the scope of this paper, but we plan to explore further, and regard it as an area that requires research and debate in the context of public health economic evaluation and programmes that address inequalities in health and wellbeing.

Our approach aligns with ISPOR's 2030 strategy calls for 'whole

Table 7
CCA balance sheet showing (net) resource use, costs and outcomes resulting from participation at the CLO compared to the synthetic control group (no participation).

(Net) Resource Use and Costs	(Net) Consequences/Outcomes
• CLOs provide between 2000 and 5000 activity sessions per year • Participants in our sample attended on average 84 (median 70) activities per year at the CLO • Average cost of one years' CLO attendance in our population was £910.76 (IQR: £197.89-£1189.20) per person • The most frequently reported activities were café, physical activity/ exercise, arts and crafts and outdoor activities • For participants who took part in physical activity/exercise activities the mean number of sessions was 29.5 per year • For participants who took part in arts and crafts activities, the mean number of sessions was 27.7 per year • For participants who reported volunteering as an activity the mean number of volunteering sessions was 46.4 per year • The number of volunteers ranged between 5 and 1249 across the CLOs with an average of 150 volunteers per organisation • Mental Health Support Service use was lower in the intervention group, approaching significance in the full sample ($p = 0.059$) and reached significance in complete-case analysis ($p = 0.05$); Housing advice use was significantly lower in the intervention group in all analyses ($p = 0.02$) • No significant difference in reported Primary or Secondary Care resource use between the intervention and synthetic control groups over 12 months	• A statistically significant difference in the ICECAP-A and SWEMWBS between the two groups was observed at the 12-month follow up time point • A statistically significant difference in the SCS-R was observed at 1 month and continued to diverge at the 12-month follow up time point • A statistically significant difference in the SCS-R was observed at 1 month and continued to diverge at the 12-month follow up time point • Participation in outdoor activities was associated with higher ICECAP-A scores versus no participation at 12 months (0.802 vs 0.762, $p = 0.08$), although this difference did not reach significance at the 5 % level. No statistically significant differences in capability were observed for participation in café, art and crafts, or physical activities compared to participation in the activity • The relationship between total activity participation and ICECAP-A scores showed that light participation (<50th percentile) was associated with moderate capability. Moderate-to-heavy participation (50-75th percentile) was associated with the highest capability. The very heaviest users (>75th percentile) were associated with lower capability

Table 6
Multiple imputation cost-effectiveness results.

Outcome	Missing at Random				Baseline Mean Carried Forward			
	Incremental Cost (£) (95 % CI)	Incremental Effect (95 % CI)	ICER	Probability Cost-Effective at £30,000	Incremental Cost (£) (95 % CI)	Incremental Effect (95 % CI)	ICER	Probability Cost-Effective at £30,000
Years in Full Capability	1143 (560, 1725)	0.028 (0.004, 0.052)	£41,154 per YFC	–	1146 (563, 1728)	0.026 (0.002, 0.049)	£44,858 per YFC	–
QALYs	1149 (566, 1731)	0.033 (0.002, 0.065)	£34,556 per QALY	42 %	1147 (564, 1729)	0.029 (−0.002, 0.061)	£38,854 per QALY	35 %

health' reflecting outcomes beyond physical and mental health and taking account of health impacts outside of the health system (Devlin et al., 2025). We advocate the application of CCA to highlight the wide range of costs and outcomes associated with the provision of, and attendance at, CLOs to support decision making. This information also provides further context to the understanding of the ICER values (Kelly et al., 2005).

Our study conceptual model identified a number of outcomes that are likely to be of importance to participants of CLOs. A significant difference was observed in the SWEMWBS scores at the 12-month follow up suggesting a positive effect on participants' subjective mental wellbeing. Although the SWEMWBS score improved over the follow up period, it remained below the mean score for the population of England which, in 2021, was 26 (NHS Digital, 2021). Between group differences in SCS-R scores were observed from the 1-month follow up point and remained significant over time. It may be expected that participation at a CLO - by nature a social space bringing people together - would result in rapid change in social connection. In comparison, the longer time frame observed before a difference in the capability and wellbeing scores emerged would indicate that there is need for long term attendance to realise benefits to the individual beyond an initial connection to others. This has implications for local authority funding models and initiatives such as social prescribing: specific, short term targeted activities may see limited benefits within short time frames. CLOs are more than delivers of services, they are part of a community's social infrastructure (Hutcheon and Steiner, 2022; Kenny and Kelsey, 2021). Stability and continuity are arguably an important part of an assets-based approach to supporting individual's health and wellbeing.

To capture the operating costs of CLOs required a combination of top-down macro costing and micro costing of individual activities. The incremental cost for the CLO participation group was driven by the cost of attending CLO activities, although this may have been expected given the 'no CLO participation/do nothing' comparator. We did not observe a difference in the mean total cost of health, social and community sector resource use between the two groups. There has been very limited evidence in the literature on the direction in which CLOs impact on the use of health care resource, albeit alluded to or assumed in grey literature (e.g. see Locality, Power to Change & VCSE Health & Wellbeing Alliance (2023)). Our results show reductions in accessing mental health support services and housing advice and support services external to the CLO which may indicate that CLO-facilitated improvements in mental wellbeing reduced participants' needs for other services, or that they now have access to these services through the CLO. We also observed a reduction in the use of NHS 24/NHS111 helplines which are first contact services for urgent health and wellbeing concerns. This, alongside the observed reduction in mental health services use, could be portrayed as supporting qualitative evidence of resilience in self-care when it comes to health and wellbeing for low-risk threats (Kilpatrick et al., 2023; Steiner et al., 2023). This is an area that requires further research.

The analytic decisions made for this economic evaluation were taken to balance the usefulness of the findings for policy alongside methodological rigour and there are limitations to our approach. The study presents both complete case and multiple imputation results. We argue that complete case results may be more policy relevant as they reflect cost-effectiveness among participants who engage with the intervention. While multiple imputation approaches offer methodological rigour in handling missing data, they incorporate participants with fundamentally different engagement patterns and service use trajectories. The asymmetric nature of our imputation, where disengaged intervention participants with high alternative service costs are imputed back into analysis while synthetic controls do not have missing values and remain stable, may inadvertently attribute elevated healthcare and non-healthcare costs to the intervention when they reflect the consequences of reduced CLO engagement. The complete case analysis is important for policy makers seeking to understand the potential value of investing in these services for engaged users but note that the costs and outcomes may be different for those who have different patterns of CLO participation.

The novelty of our approach and complexity of the intervention create limitations which the reader should consider when interpreting our findings. The multi-faceted and adaptive way CLOs function prevented the use of an observable control group for the study. We found no ethical nor feasible way to recruit (or even identify) a control group that was not systematically different from our participants. The within-study synthetic control approach adopted here represents the most conservative and methodologically sound option given the available data. We acknowledge the limitations of this approach, particularly the assumption of no natural deterioration or improvement over time. The alternative approaches - using external controls from existing data sets or other methods such as difference in differences – were either not possible due to data availability or would be likely to introduce greater bias.

We have assumed that the trend for both resource use and outcomes in our control is constant over the 12 months. Our use of 1-month new participant data to inform our control may have overestimated health and social care resource use over 12 months, e.g., seasonal patterns of utilisation, or a 'shock event' prompting initial CLO contact could have realised higher use in the first month. Conversely the assumption that new participants would not deteriorate, nor experience downward shocks would result in an underestimate of effect. It is difficult to say which direction this might impact estimates. The relatively short follow up (12 months) was a pragmatic decision for primary data collection but may limit the opportunity to identify longer term costs and outcomes. Future work could look to model the longer-term impacts drawing on this primary data.

A further limitation is our categorisation of activities in the survey and participants self-report against those categories. For example, a gardening activity may be perceived as an outdoor, social, physical or learning activity or all of these depending upon what was done and why the participant chose to attend. Similarly, cafe attendance could be a social activity and/or the chance to access affordable food. Without observing each activity available to the participants across all CLOs we were reliant upon the activities' descriptions available on CLO websites and the communications from CLO staff. This may also have altered how attendance at an activity was costed. The difficulties in capturing a holistic picture of CLO resource use via micro-costing required us to use public records of income and expenditure as reported to an executive agency of the UK Government (Companies House). The data reported in these public accounts is at an aggregate level without specific breakdown of activities, therefore, we had to make assumptions on how the total funds available were allocated across the individual level activities offered.

A further challenge was how best to reflect the role (and cost) of volunteers in our economic evaluation. Volunteering was self-reported by participants as an activity they took part in, in the same way they reported taking part in activities such as arts and crafts. Volunteering was seen by our CLO stakeholders as personal development, a beneficial step forwards in terms of responsibility, having input, which strengthens the sense of belonging in the CLO. It is likely to have beneficial outcomes in some cases and is part of 'the intervention' in that sense, similar to other activities in this study. On the other hand, it is also part of the resources needed to provide activities or keep the organisations running, in addition to paid staff and management. As outlined in the methods section, we did not have sufficient data to place a cost on volunteering. This is a limitation as it means we do not represent the opportunity cost of the volunteer hours required to support the delivery of activities within the CLO. As such, volunteering is only recognised through the benefits realised to participants who reported volunteering through the four outcome measures.

This economic evaluation is part of a wider project funded by the National Institute for Health and Care Research in the United Kingdom using a realist, multi-method approach to develop, test and refine

programme theories explaining how, for whom and in what contexts CLOs impact on health and wellbeing. There is very little literature and guidance on taking a realist approach to economic evaluation and this is a nascent area of methodological development that we hope to contribute to (Anderson and Hardwick, 2016; Dalkin and Bate, 2022). Realist evaluation is a theory driven approach to explore 'generative causality. It is concerned with understanding the contexts and interventions that trigger mechanisms and outcomes for particular groups. Economic evaluation does not conventionally examine mechanisms (though many studies are grounded in theories of change) and there would appear to be merit in bringing the two approaches closer together. A programme of research is ongoing developing realist economic evaluation methods (Dalkin and Bate, 2022) (see also https://www.realist-economic.co.uk/) with the goal of providing guidance for future studies.

Our future research will aim to evidence what works, for whom, in what circumstances, how and at what cost, with an ambition that economic analysis enhances realist evaluation and vice versa. Our next steps are to bring our realist theories to bear and ultimately drawing closer to the findings of the economic evaluation with our programme theories.

CRediT authorship contribution statement

Helen Mason: Writing – original draft, Project administration, Methodology, Funding acquisition, Conceptualization. **Nicola Irvine:** Writing – original draft, Methodology, Formal analysis. **Sarkis Manoukian:** Writing – original draft, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Jack Rendall:** Writing – review & editing, Investigation. **Cam Donaldson:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Conceptualization. **Artur Steiner:** Writing – review & editing, Funding acquisition, Conceptualization. **Michael J. Roy:** Writing – review & editing, Formal analysis, Conceptualization. **Jennifer McLean:** Writing – review & editing, Funding acquisition, Conceptualization. **Michael P. Kelly:** Writing – review & editing, Funding acquisition, Conceptualization. **Marcello Bertotti:** Writing – review & editing, Funding acquisition, Conceptualization. **Karen Galway:** Writing – review & editing, Funding acquisition, Conceptualization. **Rachel Baker:** Writing – original draft, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization.

Ethics approval

Ethical approval was obtained from Glasgow Caledonian University Ethics Committee (Reference HLS/NCH/20/034) and ratified by all participating universities ethics committees. All participants provided written consent for their involvement in the study.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2025.118761.

Data availability

Data will be made available on request.

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