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Valuing the impact of health and social care programs using social return on investment analysis: how have academics advanced the methodology? A systematic review

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ABSTRACT

Objectives: To identify how social return on investment analysis – traditionally used by business consultants - has been interpreted, used and innovated by academics in one dominant social enterprise sector, that of health and social care. To assess the quality of social return on investment studies published under peer-review in health and social care.

Design: Systematic review

Settings: Community and residential settings.

Participants: A wide range of demographic groups and age groups.

Results: Limited uptake of social return on investment methodology by academics was found in the health and social care sector. From 868 papers screened, 8 studies met the criteria for inclusion in this systematic review. Study quality was found to be highly variable, ranging from 38%-90% based on scores from a purpose-designed quality assessment tool. In general, relatively high consistency and clarity was observed in the reporting of the research question, reasons for using this methodology and justifying the need for the study. However, weaknesses were observed in other areas including justifying stakeholders, reporting sample sizes, undertaking sensitivity analysis and reporting unexpected or negative outcomes. Most papers cited links to additional materials to aid in reporting. There was little evidence that academics had innovated or advanced the methodology beyond that outlined in a much-cited social return on investment guide.

Conclusion: Academics have thus far been slow to adopt social return on investment methodology in the evaluation of health and social care interventions, and there is little evidence of innovation and development of the methodology. The word count requirements of peer-reviewed journals may make it difficult for authors to be fully transparent about the details of their studies, potentially impacting the quality of reporting in those studies published in these journals.

Keywords: health economics, social care, social impact, social return on investment, SROI

Strengths and limitations of this study

- The first systematic review to examine the contribution of academics to social return on investment methodology in the context of the health and social care sector.
- The study reviewed the use of social return on investment methodology across a broad range of settings, interventions and participants in the health and social care sector.
- A useful quality assessment framework tool for comparing the quality of reporting SROI studies was developed, however refinement of the tool may be necessary to improve clarity.
- The review does not incorporate findings of studies published in the grey literature or non-peer reviewed journals, and hence cannot comment on the uptake of social return on investment methodology in health and social care studies more broadly.

BACKGROUND

Social enterprises offer an alternative model to non-profit organisations whereby market focuses are used to provide public or community benefit [1]. The number of social enterprise organisations operating in the health and social care sectors have seen a growth over the last decade [2-4]. This includes developed countries such as the UK and Australia [5-6], as well as developing nations such as Pakistan, Ghana and Vietnam [7-10]. The health and social care sector has been estimated to represent 20-30% of all social enterprise [7-10].

The measurement and valuation of outcomes can provide important information for social enterprises' stakeholders in assessing that funding is maximising social impact [11]. Social return on investment (SROI) methodology allows for values to be placed on personal, social and community outcomes which has not hitherto been possible with more established forms of economic evaluation [12,13].

With SROI methodology, social value is estimated by the allocation of financial proxy values to outcomes identified in an intervention's logic model (known as the theory of change). SROI is expressed as a ratio of the discounted value of benefits divided by total investment. Discounts to social value include estimations based on deadweight (what would have occurred anyway), displacement (what activities were displaced by the intervention), attribution (what other organisations contributed to the outcomes) and drop off (whether the outcomes experienced decline over time). Costs and benefits that occur at different time points are made comparable by adjusting for inflation in order to calculate net present value [13]. As an example, a SROI ratio of 4:1 illustrates that, following appropriate discounts, $4 of social value was created for each dollar invested.

The methodology was initially developed in 2000, and the extant literature acknowledges strengths as well as challenges [4,11,14-18]. Strengths include: engagement with stakeholders, the identifying and valuing of outcomes which may be unique but considered valuable to beneficiaries, how the process reinforces mission and can lead to organisational learning, and the generation of a simple ratio which is easily comprehended [14,16,18]. Noted weaknesses include: the potential high cost of implementing SROI methodology, difficulties in valuing 'soft' outcomes as well as outcomes experienced at the societal level, and that ratios are highly context specific and cannot be compared [11,14,16].

Since its development, SROI methodology has been most commonly implemented by consultants [11,12,17]. Consequently, SROI studies are more likely to be reported in the grey literature, if in the public domain at all. This potentially limits learning from previous studies as well as SROI methodological development [11,12,19]. There has been a call for academics to adopt the SROI approach and further develop the methodology [12,14,16,17], as well as a call for greater standardisation [12,14]. One associated effect of methodological engagement by academics would be an increase in SROI studies being the subject of peer-review. According to a 2015 systematic review of public health interventions evaluated using social return on investment methodology, only 10% were published under peer review [16]. One common feature of SROI studies to date is that of 'assurance'; that is, the process by which information reported is verified. This process is usually conducted by an SROI consultant external to the study [13,16]. With greater academic involvement in SROI, it would be expected that the peer-review process would replace assurance as being a more rigorous means of determining the appropriateness of the analysis and the assumptions on which it is based.

However, some challenges to the adoption of SROI methodology by academics have been identified particularly at the theoretical level [12]. Arvidson et al. argues that the SROI approach, which

privileges the experiences and perspectives of stakeholders over other types of evidence, is essentially at odds with the positivist approach adopted by some academics engaged in evaluation studies [15]. Furthermore, Pathak and Dattani argue that the three functions of SROI (monitoring performance, attracting funding and reinforcing organisational mission) align with positivist, critical theory and interpretative approaches respectively which may present a barrier to the adoption of the methodology by academics [18]. This paper seeks to build on the work of the previous systematic review [16] to examine academic contributions to SROI methodology in one of the largest social enterprise sectors, that of health and social care.

The current study

This systematic review identifies: (1) the extent to which academics have adopted SROI methodology in evaluating health and social care programs and interventions; (2) how academics have interpreted, used and developed SROI methodology; and (3) how academics have reported SROI studies using a quality review designed for the purpose [20].

METHODS

This review was conducted using the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRSIMA) guidelines [21]. The protocol for this systematic review was registered with PROSPERO international prospective register of systematic reviews (number CRD42018080195) and published following peer-review [20].

Inclusion and exclusion criteria

This systematic review focused on SROI studies in health and social care settings; any age group or population and all empirical study types were therefore included if this criteria was met. Publications which were not peer-reviewed, conference abstracts, thesis, and papers not published in English were excluded.

Search strategy

The key word search was limited to "social return on investment" and "SROI" to ensure that studies using SROI methodology were identified. Electronic searches were based on full text. Due to there being numerous keyword variations for health and social care, additional key words were not added but rather all items screened for relevancy.

Searches were limited to papers published after the year 2000 to October 1st 2018. The following multi-disciplinary databases were searched: Web of Science, Scopus, CINAHL, Econlit, Medline, PsychINFO, Embase, Emerald, Social Care Online, and the National Institute for Health and Care Excellence (Appendix I).

Screening and data extraction

Search results were stored in Covidence systematic review software [22] and duplicate items removed. Two reviewers independently screened all titles and abstracts against the inclusion criteria to reduce the risk of bias. A third reviewer screened all titles and abstracts where there was disagreement between reviewers. Full text manuscripts were obtained for papers that met the inclusion criteria at initial screening and were again independently reviewed by two reviewers. Following full text screening, the reference lists of studies shortlisted – plus the reference list of a previous systematic review [16] – were then hand searched for additional eligible articles and a citation search was performed on Scopus and Google Scholar.

Data on included studies was extracted on the following categories: author, date of publication, country, intervention, study design, article word count, and type of externally referenced results if applicable. To address the second and third aim of the review, innovations or adaptations to the methodology were also identified and quality assessment scores added (Appendix II).

Quality assessment

A SROI-specific quality framework was developed for the purpose of this systematic review as it was identified that there was no relevant established peer reviewed quality framework. Further details of the quality framework and the processes associated with its development are presented in a separate paper [20].

In brief, the quality framework consists of 21 questions in 6 areas: 1) research question, 2) reason for using SROI, 3) scope, 4) theory of change/impact map, 5) study design, and 6) analysis. Each item can be scored according to four categories: yes, no, not clear and not applicable. Data not reported was scored as a 'no', data inadequately reported was scored as 'not clear'. If an aspect of the quality framework was not relevant to a particular study, it was marked as 'not applicable'.

Data synthesis

Data was synthesised to address the three stated systematic review objectives. To address objective one, the number of included studies was compared to the findings of a previous systematic review that included peer-reviewed and grey literature in public health [16], to gain an indication of whether there has been an increase or decrease in SROI studies in recent years. Data to address objective two was determined by a review of the adopted methodology compared to that outlined in the SROI Network's Guide to Social Return on investment [13]. This guide has been established in previous reviews as the most extensively cited resource for the conducting of SROI studies [12, 16].

Finally, we report findings from our quality review in both table and narrative format, highlighting key strengths and weaknesses of the included studies. Only the main manuscript and permalink supplementary information was considered to be part of the peer-reviewed content. As expected, meta-analysis was not possible due to the heterogeneous nature of the results, however, we report on identified meta-biases.

RESULTS

Search Results

The initial searches returned 868 items, reduced to 595 items once duplicates were removed (Figure 1). Following independent title and abstract screening by two reviewers, a third reviewer screened all titles and abstracts where there was disagreement between reviewers (n=63, 10.6%). Full text manuscripts were obtained for 41 studies that met the inclusion criteria. The full text of each study was then independently reviewed by two reviewers (CH, DF), resulting in six studies for inclusion. The searching of reference lists from the included studies and a previous systematic review [15], and an associated citation search performed on Scopus and Google Scholar, resulted in the identified of two further studies. The total number of studies included in this systematic review was eight.

Study Characteristics

Of the eight SROI studies, the majority were undertaken in developed nations with half conducted in the UK, two in Canada and one each in the US and Kenya. One intervention was aimed at children [23], two at pregnant or post-partum women [24,25], two at adults overcoming addiction [26,27], one at adults and families transitioning from homelessness [28], and two at older people [29,30], In conducting their analysis, all but one study [29] referred extensively to the Guide to social return on investment [13].

Though it was expected that peer-reviewed publications would be authored by academics, one paper was written by a consultant and an organisational representative [26]. The remaining papers were published by affiliated academics, though some were published in partnership: academics and consultants [24], and academics and an organisational representative [28]. Two papers highlighted that their findings had also been assured by an SROI consultant [23, 30].

The eight SROI peer-reviewed studies were published relatively recently (between 2011 and 2018) with 3 of these published in 2015. Thereby indicating that academics have thus far been slow to adopt SROI methodology in the evaluation of health and social care interventions given that the methodology was initially developed in 2000 [3].

Potentially due to the limitations imposed by resource constraints, it was observed that data was gathered from a limited number of stakeholder groups in many studies, most commonly intervention beneficiaries, though inclusion of some other groups was noted: families or carers [23,30], volunteers [23,24,30], and paid staff [23,28,29]. One exception was Goudet et al., whose study included a broad range of stakeholders and a large sample size (over 400) including beneficiaries, different types of family members, health care providers, and local businesses [25].

For studies that included previous beneficiaries of an intervention [23-27, 29,30] there was the potential for positive sample bias, as those for whom the intervention was a success may be more willing to participate in an evaluation or may be more likely to be put forward for inclusion by the organisation offering the intervention. Most studies [23-26,28,30] collected data at only one time point (retrospectively) which limits our understanding of the impact of the intervention, as opposed to pre-post data collection for example, and also increases the likelihood of memory bias. There was also a potential positivity bias in the reporting of outcomes, as few studies reported negative outcomes [25,30].

Other than focusing on a limited range of stakeholders, another way to reduce scope and therefore costs associated with conducting a SROI analysis is to focus on a limited range of outcomes, and to attribute values based on those identified in the existing literature. Goudet et al. was the only study that reported using values games with participants to develop bespoke values for outcomes. Value games are a revealed preference approach whereby participants rank an outcome without a market value with several items that can be purchased. In this way the value of the outcome can be estimated as somewhere between the value of the items either side of it in the ranking. Goudet et al. identified 34 outcomes, which may have impacted upon the final SROI ratios, as the authors reported a significantly higher SROI than all other papers (US$71 social return for every US$1 invested) [25]. Other papers reported between two outcomes [28] and 10 outcomes [26] SROI ratios were between 1.17:1 [30] and 6.09:1 [26].

Although it was expected that the adoption of SROI methodology by academics may lead to innovation and development of the methodology [14, 16], there was little evidence of this. However, some relatively minor adaptations or additions were made (Appendix II). For example, Lafrati attempted to overcome positive sampling bias by weighting outcome values at 65%; this estimate equating to the centre's overall reported success rate at helping people overcome addiction during the relevant time period [27]. Furthermore, the analysis for this study adopted a socio-political approach which focused on monetary savings at the societal level rather than personal outcomes. This approach was adopted in recognition that, under the prevailing neo-liberalism ideology in the UK, funding interventions aimed at those considered by society to be less "deserving" may make it challenging to attract ongoing funding unless a convincing case can be made for a reduction in welfare and other types of government spending (e.g. court costs, doctor and emergency room visits).

The inputs for SROI for beneficiaries is rarely calculated in SROI studies. However, Kennedy and Philips added beneficiaries travel expenses to intervention inputs in recognition of the financial contributions' beneficiaries made towards their own recovery [26]. Scharlach went a step further, calculating the social return for beneficiaries based on their membership fees to a volunteer-assisted service for vulnerable, predominantly low income, community-dwelling older people [29]. In another minor adaption for a SROI based on three interventions by different organisations to support people with dementia, Willis et al. calculated weightings for all financial proxies to address differences in the frequency and duration of support across the intervention groups [30].

Quality Assessment

The quality assessment focused on the quality of reporting and was undertaken independently by two reviewers (CH, DF). The degree of inter-rater reliability was measured using Cohen's Kappa, which considers the role of chance in inter-rater agreement [31]. The degree of agreement between the two reviewers was calculated before and after discussion. Kappa prior to discussion scored 0.557 (moderate agreement), while following discussion substantial agreement was reached (0.738). Any item with remaining disagreement between raters following discussion was scored as 'not clear'. As not all items in the quality assessment were relevant for each paper, quality scores are also reported as a percentage. The overall quality ratings of the studies ranged from 38% to 90% with a mean of 65%.

In overview, papers were strong in several areas including: posing a well-defined research question (all), their reason for using SROI (all), providing relevant background literature to justify their study (all), selecting an appropriate study design (7), clearly valuing inputs (7), and reporting limitations and biases (7). There was more variation, and most studies were poorer, at justifying the range of

stakeholders included (4), justifying their sample sizes (3) (or clearly reporting sample sizes), and reporting whether informed consent was obtained (3). Furthermore, there was a strong bias towards positive outcomes with negative or unintended outcomes rarely reported (2). Only two papers reported the details of their sensitivity analysis [25,28]. An additional paper reported that they had conducted sensitivity analysis but reported no details other than that "the SROI ratio did not change substantially" [26: p.18] The lack of sensitivity analysis raises the likelihood of bias in the final reported SROI ratio as the impact of various assumptions throughout a study is unknown.

There was an issue with scoring some of the quality framework criteria, as some criteria had two aspects and one might be met but not the other (e.g. a study may have listed the range of stakeholders included but not justified why certain stakeholders were included and others excluded). In the review, both aspects of the criteria had to be met before a point was awarded. Unlike in the grey literature where the majority of SROI studies are published [12], word count limitations are a reality of academic publishing. The included papers varied from approximately 2900 words [23], to approximately 7500 words [25]. However, we identified no relationship between word count and quality ratings (Appendix II).

DISCUSSION

Our study closely followed the associated published systematic review protocol [20]. Overall, it was found that there has been little uptake of SROI methodology by academics in the health and social care sector to date. Predominantly academics, like SROI consultants and organisations, have used the existing and well-established guide to SROI methodology by Nicholls et al. as a framework for conducting their studies [13]. There has been little evidence of academics developing the SROI methodology with only a range of small adaptations or additions to the usual methodology. Perhaps

due to budgetary constraints/limited resources available to conduct SROI studies, the majority used financial proxies identified from the existing literature. Only one study conducted value games in order to derive financial proxies that considered the values of stakeholders [25]. However, given that this study was the only eligible study conducted in a developing country, existing financial proxies from developed countries would likely be less relevant and appropriate in this context; necessitating this additional work to develop bespoke financial proxies.

As academics have only recently started to use SROI methodology, there was only a relatively small number of qualifying studies included in this systematic review. As such it is perhaps too early to be determining the extent to which SROI methodology has been adopted by academics working in health and social care. This review only included peer reviewed papers due to the focus on academic contribution to the methodology, so we were not able to determine the proportion of SROI studies in health and social care that were peer-reviewed rather than published as grey literature. However, we note that other authors have identified peer-reviewed SROI studies to be between 1% of all SROI studies [12] and 10% of those in public health [16]. There may be other sectors in which academics have been earlier adopters of this methodology but, perhaps due to concerns about the value and relevancy of SROI methodology, which can be highly context specific [16], health and social care academics has been slow to adopt this as part of their toolkit for developing an evaluation evidence base.

The quality assessment framework developed for the assessment of SROI studies was a useful tool for comparing the quality of reporting amongst studies [20]. However, our study suggested further refinement may be necessary. In particular, some items may need to be broken down into two items or half points awarded (e.g. ‘were the proxies valid and comprehensive?’, ‘was the sample described in detail/was the sample justified?’). Overall we observed a number of positivity biases in the studies, relating to sampling and the outcomes that were included in SROI calculations. Few studies

noted negative outcomes as the result of the interventions under study, or even unexpected outcomes; whether positive or negative. Furthermore, few studies reported having undertaken sensitivity analysis and therefore this decreases confidence in the SROI ratios presented.

Common weaknesses in reporting (e.g. justifying stakeholder scope, reporting sample sizes and whether consent had been obtained) related to papers of different word counts. Weaknesses in reporting clarity therefore did not seem to relate to word count limitations with some shorter papers scoring higher than more lengthy ones. Given that most papers cited supplementary materials, appendices and external links, it seems that full transparency of how SROI was conducted is challenging to achieve within peer reviewed journals word count limits; though clarity for readers is likely improved by the more detailed components of the analysis not being included in the main text. It may be that the positivist evidence hierarchies of academia do not align with SROI methodology in which personal experiences and outcomes are privileged [14]. However, if SROI methodology becomes as accepted in other countries as it has been in the UK by government and policy making bodies [12], this may drive wider take up and adoption of SROI methodology by academics and other stakeholders in Australia and elsewhere.

Patient and public involvement: This paper details a systematic review and therefore there was no direct patient or public involvement. However, participants with disability in the broader research project have been involved since the inception and have contributed to the objectives outlined in this systematic review.

Author contributions: CH, AB and JR conceived the study and were responsible for the design and search strategy. DF was responsible for conducting the search. CH, DF and SGH conducted the screening. CH and DF extracted the data, conducted the data analysis and quality assessment. The

initial draft of the manuscript was prepared by CH and DF and then circulated to all authors for critical revision. All authors approved the final draft for submission.

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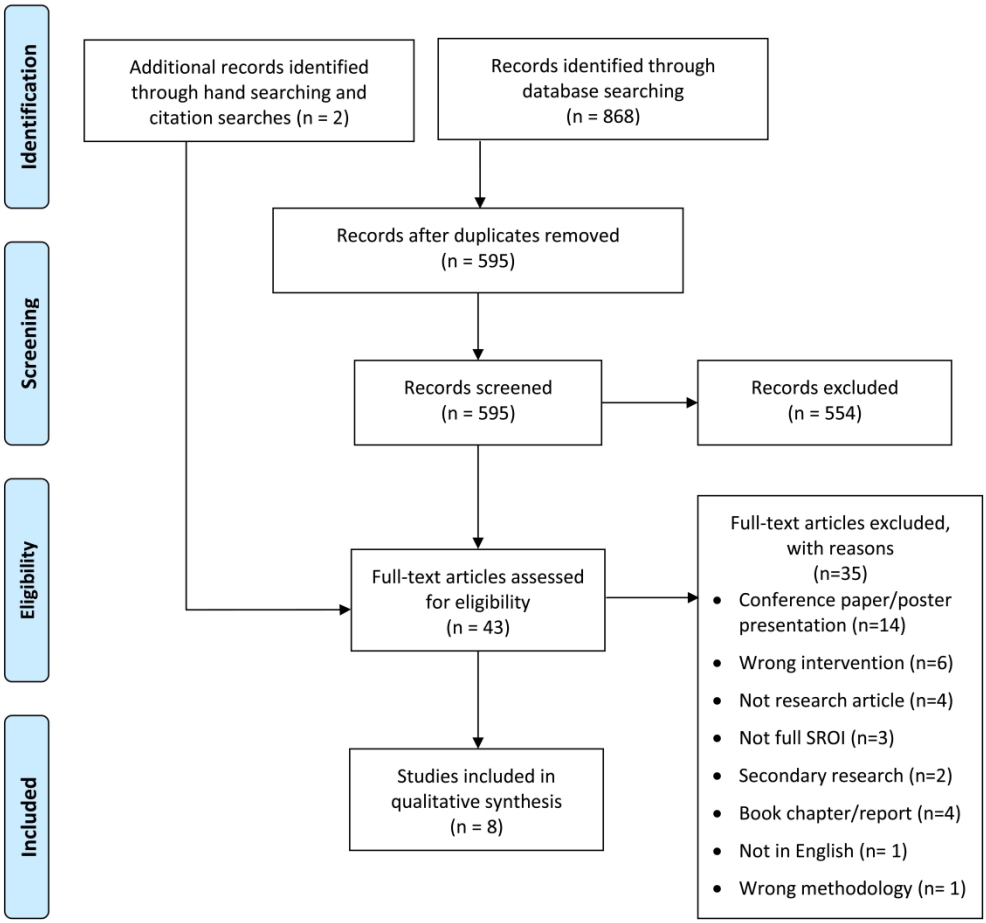
Figure 1: PRSIMA Flow Chart

Figure 1: PRISMA Flow Chart



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Appendix I: Examples of Search strategy

Database	Search Terms
Web of Science	TS=("social return on investment" OR SROI} Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI, CCR-EXPANDED, IC timespan=2000-2018
MEDLINE	#1 "social return on investment".mp. [mp=title, abstract, original title, name of substance word, subject heading work, keyword heading word, protocol supplementary concept work, rare disease supplementary concept word, unique identifier, synonyms] #2 SROI.mp. [mp=title, abstract, original title, name of substance word, subject heading work, keyword heading word, protocol supplementary concept work, rare disease supplementary concept word, unique identifier, synonyms] #3 1 or 2
PsychINFO	#1 "social return on investment".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] #2 SROI.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] #3 1 or 2

Appendix II: Data Extraction

Author/date	Country	Intervention	Study Design	Innovation / adaptations / additions to SROI methodology	Word Count	Externally referenced data	Quality Assessment
Arvidson et al. (2014)	UK	Community support for people with post-natal depression	Mixed methods; primary and secondary data sources	Costed in-kind support to calculate how many resources the organisation leverages based on funder investment (£1.30 for each £1)	5297	Refers to the existence of a logic model, dead-weight and drop-off but does not include in article – readers required to email contact author for full report	12/20 (60%)
Goudet et al. (2018)	Kenya	Home-based counselling of pregnant and breastfeeding women and mothers of young children	Mixed methods; primary data (quantitative and qualitative)	None identified	7577	Online links to full data set; additional file attached to online journal article containing steps in the program, content of counselling messages, full list of stakeholders, and assumptions for base case scenario variables.	18/20 (90%)
Kennedy & Phillips (2011)	UK	Community-based self-management training and support groups for people affected by substance and alcohol abuse	Primary data sources (interviews and questionnaire); Post-intervention data only	Beneficiary costs not typically included in SROI analysis. Authors included participants travel expenses to attend the intervention as an input.	3209	Downloadable supplementary information: stakeholders, questionnaires, and impact map	14/20 (70%)
Iafrati (2015)	UK	Residential drug addiction treatment centre	Pre/post primary data; quantitative and qualitative	Outcomes weighted at 65% (overall reported success rate of intervention according to organisation) to address positive sample bias Focus on societal impacts under a socio-political	3904	None	8/21 (38%)

				framework rather than consumers personal outcomes			
Laing & Moules (2017)	Canada	Camp for children with cancer	Post intervention data collection	None identified	2919	Supplemental digital content (permalink through journal) – link to relevant table provided in-text. Link contains additional information about the theory of change, deadweight, indicators, and proxies.	14/20 (70%)
Mook et al. (2015)	Canada	Furniture bank for people transitioning out of homelessness, women and children escaping abusive situations, migrants and refugees	Post intervention, retrospective case worker surveys; secondary data	None identified	6446	None	12/20 (60%)
Scharlach (2015)	USA	Volunteer-assisted services for vulnerable older people living in the community	Pre/post assessment and interview data	An SROI ratio was calculated for service users based on membership fees	6076	None	10/21 (48%)
Willis et al. (2016)	UK	Peer-support groups for people with dementia (3 groups ran by different organisations)	Post-intervention data through interviews and focus groups	Weightings were applied to financial proxies to reflect that the 3 groups in the study met for different lengths of time and with different frequencies.	3842	External full SROI report – linked in the reference list of article (broken link). Full report contains additional information about stakeholders, inputs, deadweight, indicators and proxies	17/20 (85%)

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	2
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2-3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	5-6
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	6
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	6
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	7
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	7
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	7
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	7
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	8
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	8
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	8
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	N/A
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	8-9

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	10
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	9 & Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	9 & Table 2
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	12-13 & Table 2
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	10-12
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	N/A
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N/A
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	13-14
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	14-15
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	15
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	16

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

PRISMA 2009 Checklist

BMJ Open

Valuing the impact of health and social care programs using social return on investment analysis: how have academics advanced the methodology? A systematic review

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Valuing the impact of health and social care programs using social return on investment analysis: how have academics advanced the methodology? A systematic review

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ABSTRACT

Objectives: To identify how social return on investment analysis (SROI)– traditionally used by business consultants - has been interpreted, used and innovated by academics in the health and social care sector and to assess the quality of peer-reviewed SROI studies in this sector.

Design: Systematic review

Settings: Community and residential settings.

Participants: A wide range of demographic groups and age groups.

Results: The following databases were searched: Web of Science, Scopus, CINAHL, Econlit, Medline, PsychINFO, Embase, Emerald, Social Care Online, and the National Institute for Health and Care Excellence. Limited uptake of social return on investment methodology by academics was found in the health and social care sector. From 868 papers screened, 8 studies met the criteria for inclusion in this systematic review. Study quality was found to be highly variable, ranging from 38%-90% based on scores from a purpose-designed quality assessment tool. In general, relatively high consistency and clarity was observed in the reporting of the research question, reasons for using this methodology and justifying the need for the study. However, weaknesses were observed in other areas including justifying stakeholders, reporting sample sizes, undertaking sensitivity analysis and reporting unexpected or negative outcomes. Most papers cited links to additional materials to aid in reporting. There was little evidence that academics had innovated or advanced the methodology beyond that outlined in a much-cited social return on investment guide.

Conclusion: Academics have thus far been slow to adopt social return on investment methodology in the evaluation of health and social care interventions, and there is little evidence of innovation and development of the methodology. The word count requirements of peer-reviewed journals may

make it difficult for authors to be fully transparent about the details of their studies, potentially impacting the quality of reporting in those studies published in these journals.

Keywords: health economics, social care, social impact, social return on investment, SROI

Strengths and limitations of this study

- The first systematic review to examine the contribution of academics to social return on investment methodology in the context of the health and social care sector.
- The study reviewed the use of social return on investment methodology across a broad range of settings, interventions and participants in the health and social care sector.
- A useful quality assessment framework tool for comparing the quality of reporting SROI studies was developed, however refinement of the tool may be necessary to improve clarity.
- The review does not incorporate findings of studies published in the grey literature or non-peer reviewed journals, and hence cannot comment on the uptake of social return on investment methodology in health and social care studies more broadly.

BACKGROUND

Social enterprises offer an alternative model to non-profit organisations whereby market focuses are used to provide public or community benefit [1]. The number of social enterprise organisations operating in the health and social care sectors have seen a growth over the last decade [2-4]. This includes developed countries such as the UK and Australia [5-6], as well as developing nations such as Pakistan, Ghana and Vietnam [7-10]. The health and social care sector has been estimated to represent 20-30% of all social enterprise [7-10].

The measurement and valuation of outcomes can provide important information for social enterprises' stakeholders in assessing that funding is maximising social impact [11]. Social return on investment (SROI) methodology allows for values to be placed on personal, social and community outcomes which has not hitherto been possible with more established forms of economic evaluation [12,13].

With SROI methodology, social value is estimated by the allocation of financial proxy values to outcomes identified in an intervention's logic model (known as the theory of change). SROI is expressed as a ratio of the adjusted value of benefits divided by total investment. Adjustments to social value are made based on estimations of deadweight (what would have occurred anyway), displacement (what activities were displaced by the intervention), attribution (what other organisations contributed to the outcomes) and drop off (whether the outcomes experienced decline over time). Costs and benefits that occur at different time points are made comparable by adjusting for inflation in order to calculate net present value [13]. As an example, a SROI ratio of 4:1 illustrates that, following appropriate adjustments, $4 of social value was created for each dollar invested.

The methodology was initially developed in 2000, and the extant literature acknowledges strengths as well as challenges [4,11,14-18]. Strengths include: engagement with stakeholders, the identifying and valuing of outcomes which may be unique but considered valuable to beneficiaries, how the process reinforces mission and can lead to organisational learning, and the generation of a simple ratio which is easily comprehended [14,16,18]. However, weaknesses at the philosophical, theoretical and practical level have been noted. Philosophically the monetisation of outcomes may be at odds with the values of social enterprise organisations and, given the potential high cost of implementing SROI methodology, organisations may find it challenging to justify spending on an SROI study rather than on program development [3,5]. SROI has been noted to be lack cohesion from a theoretical perspective. For example, outcomes measurement aligns with a positivist approach but SROI has been noted to privilege stakeholder perspectives over other types of evidence [15]; such perspectives align better with social constructivist approaches. Practical challenges include the difficulties in valuing 'soft' outcomes as well as outcomes experienced at the societal level - particularly when it comes to addressing 'wicked problems' such as societal inequity or disadvantage - the difficulties in identifying the counterfactual (what would have happened anyway), accurately accounting for overheads, and that ratios are highly context specific and cannot be compared [3,11,14-16,18-20]. Aggravating outcomes into a single figure has also been as problematic in terms of contract validity and interpretability [19, 21].

Since its development, SROI methodology has been most commonly implemented by consultants [11,12,17]. Consequently, SROI studies are more likely to be reported in the grey literature, if in the public domain at all. This potentially limits learning from previous studies as well as SROI methodological development [11,12,22]. Similarly, much of the debate regarding SROI methodology, particularly around many of the practical issues, occurs outside of academia [21]. There has been a call for academics to adopt the SROI approach and further develop the methodology [12,14,16,17],

as well as a call for greater standardisation [12,14]. One associated effect of methodological engagement by academics would be an increase in SROI studies being the subject of peer-review. According to a 2015 systematic review of public health interventions evaluated using social return on investment methodology, only 10% were published under peer review [16]. One common feature of SROI studies to date is that of 'assurance'; that is, the process by which information reported is verified. This process is usually conducted by an SROI consultant external to the study [13,16] and at additional cost which may be prohibitive for some organisations. With greater academic involvement in SROI, it would be expected that the peer-review process would replace assurance as being a more rigorous means of determining the appropriateness of the analysis and the assumptions on which it is based.

This paper seeks to build on the work of the previous systematic review [16] to examine academic contributions to SROI methodology in studies conducted in the health and social care sector.

The current study

This systematic review identifies: (1) the extent to which academics have adopted SROI methodology in evaluating health and social care programs and interventions; (2) how academics have interpreted, used and developed SROI methodology; and (3) how academics have reported SROI studies using a quality review designed for the purpose [23].

METHODS

This review was conducted using the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) guidelines [24]. The protocol for this systematic review was registered with

PROSPERO international prospective register of systematic reviews (number CRD42018080195) and published following peer-review [23].

Patient and public involvement

This paper details a systematic review and therefore there was no direct patient or public involvement. However, participants with disability in the broader research project have been involved since the inception and have contributed to the objectives outlined in this systematic review.

Inclusion and exclusion criteria

This systematic review focused on SROI studies in health and social care settings; including interventions providing treatment for physical or mental health conditions and non-medical interventions to support the social needs of vulnerable populations in a community setting Any age group or population and all empirical study types were therefore included if this criteria was met. Publications which were not peer-reviewed, conference abstracts, thesis, and papers not published in English were excluded.

Search strategy

The key word search was limited to "social return on investment" and "SROI" to ensure that studies using SROI methodology were identified. Electronic searches were based on full text. Due to there being numerous keyword variations for health and social care, additional key words were not added but rather all items screened for relevancy.

Searches were limited to papers published after the year 2000 to October 1st 2018. The following multi-disciplinary databases were searched: Web of Science, Scopus, CINAHL, Econlit, Medline,

PsychINFO, Embase, Emerald, Social Care Online, and the National Institute for Health and Care Excellence (Appendix I).

Screening and data extraction

Search results were stored in Covidence systematic review software [25] and duplicate items removed. Two reviewers independently screened all titles and abstracts against the inclusion criteria to reduce the risk of bias. A third reviewer screened all titles and abstracts where there was disagreement between reviewers. Full text manuscripts were obtained for papers that met the inclusion criteria at initial screening and were again independently reviewed by two reviewers. Following full text screening, the reference lists of studies shortlisted – plus the reference list of a previous systematic review [16] – were then hand searched for additional eligible articles and a citation search was performed on Scopus and Google Scholar.

Data on included studies was extracted on the following categories: author, date of publication, country, intervention, study design, article word count, and type of externally referenced results if applicable. To address the second and third aim of the review, innovations or adaptations to the methodology were also identified and quality assessment scores added (Appendix II).

Quality assessment

A SROI-specific quality framework was developed for the purpose of this systematic review as it was identified that there was no relevant established peer reviewed quality framework (Appendix III). Further details of the quality framework and the processes associated with its development are presented in a separate paper [23].

In brief, the quality framework consists of 21 questions in 6 areas: 1) research question, 2) reason for using SROI, 3) scope, 4) theory of change/impact map, 5) study design, and 6) analysis. Each item can

be scored according to four categories: yes, no, not clear and not applicable. Data not reported was scored as a 'no', data inadequately reported was scored as 'not clear'. If an aspect of the quality framework was not relevant to a particular study, it was marked as 'not applicable'.

Data synthesis

Data was synthesised to address the three stated systematic review objectives. To address objective one, the number of included studies was compared to the findings of a previous systematic review that included peer-reviewed and grey literature in public health [16], to gain an indication of whether there has been an increase or decrease in SROI studies in recent years. Data to address objective two was determined by a review of the adopted methodology compared to that outlined in the SROI Network's Guide to Social Return on investment [13]. This guide has been established in previous reviews as the most extensively cited resource for the conducting of SROI studies [12, 16]. Finally, we report findings from our quality review in both table and narrative format, highlighting key strengths and weaknesses of the included studies. Only the main manuscript and permalink supplementary information was considered to be part of the peer-reviewed content. As expected, meta-analysis was not possible due to the heterogeneous nature of the results, however, we report on identified meta-biases.

Patient and public involvement: This paper details a systematic review and therefore there was no direct patient or public involvement. However, participants with disability in the broader research project have been involved since the inception and have contributed to the objectives outlined in this systematic review.

RESULTS

Search Results

The initial searches returned 868 items, reduced to 595 items once duplicates were removed (Figure 1). Following independent title and abstract screening by two reviewers, a third reviewer screened all titles and abstracts where there was disagreement between reviewers (n=63, 10.6%). Full text manuscripts were obtained for 41 studies that met the inclusion criteria. The full text of each study was then independently reviewed by two reviewers (CH, DF), resulting in six studies for inclusion. The searching of reference lists from the included studies and a previous systematic review [15], and an associated citation search performed on Scopus and Google Scholar, resulted in the identified of two further studies. The total number of studies included in this systematic review was eight.

Study Characteristics

Of the eight SROI studies, the majority were undertaken in developed nations with half conducted in the UK, two in Canada and one each in the US and Kenya. One intervention was aimed at children [26], two at pregnant or post-partum women [27,28], two at adults overcoming addiction [29,30], one at adults and families transitioning from homelessness [31], and two at older people [32,33], In conducting their analysis, all but one study [32] referred extensively to the Guide to social return on investment [13].

Though it was expected that peer-reviewed publications would be authored by academics, one paper was written by a consultant and an organisational representative [29]. The remaining papers were published by affiliated academics, though some were published in partnership: academics and consultants [27], and academics and an organisational representative [31]. Two papers highlighted that their findings had also been assured by an SROI consultant [26,33].

The eight SROI peer-reviewed studies were published relatively recently (between 2011 and 2018) with 3 of these published in 2015. Thereby indicating that academics have thus far been slow to

adopt SROI methodology in the evaluation of health and social care interventions given that the methodology was initially developed in 2000 [3].

Potentially due to the limitations imposed by resource constraints, it was observed that data was gathered from a limited number of stakeholder groups in many studies, most commonly intervention beneficiaries, though inclusion of some other groups was noted: families or carers [26,33], volunteers [26,27,33], and paid staff [26,31,32]. One exception was Goudet et al., whose study included a broad range of stakeholders and a large sample size (over 400) including beneficiaries, different types of family members, health care providers, and local businesses [28].

For studies that included previous beneficiaries of an intervention [26-30,32,33] there was the potential for positive sample bias, as those for whom the intervention was a success may be more willing to participate in an evaluation or may be more likely to be put forward for inclusion by the organisation offering the intervention. Most studies [26-29,31,33] collected data at only one time point (retrospectively) which limits our understanding of the impact of the intervention, as opposed to pre-post data collection for example, and also increases the likelihood of memory bias. There was also a potential positivity bias in the reporting of outcomes, as few studies reported negative outcomes [27,33].

Other than focusing on a limited range of stakeholders, another way to reduce scope and therefore costs associated with conducting a SROI analysis is to focus on a limited range of outcomes, and to attribute values based on those identified in the existing literature. Goudet et al. was the only study that reported using values games with participants to develop bespoke values for outcomes. Value games are a revealed preference approach whereby participants rank an outcome without a market value with several items that can be purchased. In this way the value of the outcome can be estimated as somewhere between the value of the items either side of it in the ranking. Goudet et al. identified 34 outcomes, which may have impacted upon the final SROI ratios, as the authors

reported a significantly higher SROI than all other papers (US$71 social return for every US$1 invested) [28]. Other papers reported between two outcomes [31] and 10 outcomes [29] SROI ratios were between 1.17:1 [33] and 6.09:1 [29]. Notably there was no evidence that authors had used SROI value banks such as HACT [34] or Global Value Exchange [35] in identifying suitable financial proxies.

Although it was expected that the adoption of SROI methodology by academics may lead to innovation and development of the methodology [14, 16], there was little evidence of this. However, some relatively minor adaptations or additions were made (Appendix II). For example, Lafrati attempted to overcome positive sampling bias by weighting outcome values at 65%; this estimate equating to the centre's overall reported success rate at helping people overcome addiction during the relevant time period [30]. Furthermore, the analysis for this study adopted a socio-political approach which focused on monetary savings at the societal level rather than personal outcomes. This approach was adopted in recognition that, under the prevailing neo-liberalism ideology in the UK, funding interventions aimed at those considered by society to be less "deserving" may make it challenging to attract ongoing funding unless a convincing case can be made for a reduction in welfare and other types of government spending (e.g. court costs, doctor and emergency room visits).

The inputs for SROI for beneficiaries is rarely calculated in SROI studies. However, Kennedy and Philips added beneficiaries travel expenses to intervention inputs in recognition of the financial contributions' beneficiaries made towards their own recovery [29]. Scharlach went a step further, calculating the social return for beneficiaries based on their membership fees to a volunteer-assisted service for vulnerable, predominantly low income, community-dwelling older people [32]. In another minor adaption for a SROI based on three interventions by different organisations to support people

with dementia, Willis et al. calculated weightings for all financial proxies to address differences in the frequency and duration of support across the intervention groups [33].

Quality Assessment

The quality assessment focused on the quality of reporting and was undertaken independently by two reviewers (CH, DF). The degree of inter-rater reliability was measured using Cohen's Kappa, which considers the role of chance in inter-rater agreement [36]. The degree of agreement between the two reviewers was calculated before and after discussion. Kappa prior to discussion scored 0.557 (moderate agreement), while following discussion substantial agreement was reached (0.738). Any item with remaining disagreement between raters following discussion was scored as 'not clear'. As not all items in the quality assessment were relevant for each paper, quality scores are also reported as a percentage. The overall quality ratings of the studies ranged from 38% to 90% with a mean of 65%.

In overview, papers were strong in several areas including: posing a well-defined research question (all), their reason for using SROI (all), providing relevant background literature to justify their study (all), selecting an appropriate study design (7), clearly valuing inputs (7), and reporting limitations and biases (7). There was more variation, and most studies were poorer, at justifying the range of stakeholders included (4), justifying their sample sizes (3) (or clearly reporting sample sizes), and reporting whether informed consent was obtained (3). Furthermore, there was a strong bias towards positive outcomes with negative or unintended outcomes rarely reported (2). Only two papers reported the details of their sensitivity analysis [28,31]. An additional paper reported that they had conducted sensitivity analysis but reported no details other than that "the SROI ratio did not change substantially" [29: p.18] The lack of sensitivity analysis raises the likelihood of bias in the

final reported SROI ratio as the impact of various assumptions on the SROI estimate throughout a study is unknown.

There was an issue with scoring some of the quality framework criteria, as some criteria had two aspects and one might be met but not the other (e.g. a study may have listed the range of stakeholders included but not justified why certain stakeholders were included and others excluded). In the review, both aspects of the criteria had to be met before a point was awarded. Unlike in the grey literature where the majority of SROI studies are published [12], word count limitations are a reality of academic publishing. The included papers varied from approximately 2900 words [26], to approximately 7500 words [28]. However, we identified no relationship between word count and quality ratings (Appendix II).

DISCUSSION

Our study closely followed the associated published systematic review protocol [20]. Overall, it was found that there has been little uptake of SROI methodology by academics in the health and social care sector to date. Predominantly academics, like SROI consultants and organisations, have used the existing and well-established guide to SROI methodology by Nicholls et al. as a framework for conducting their studies [13]. There has been little evidence of academics developing the SROI methodology with only a range of small adaptations or additions to the usual methodology. Perhaps due to budgetary constraints/limited resources available to conduct SROI studies, the majority used financial proxies identified from the existing literature. Though there have been considerable efforts by SROI practitioners to collate social value banks such as HACT [34] and Global Value Exchange [35], these studies did not access these resources. Only one study conducted value games in order to derive financial proxies that considered the values of stakeholders [28]. However, given that this

study was the only eligible study conducted in a developing country, existing financial proxies from developed countries would likely be less relevant and appropriate in this context; necessitating this additional work to develop bespoke financial proxies.

As academics have only recently started to use SROI methodology, there was only a relatively small number of qualifying studies included in this systematic review. As such it is perhaps too early to be determining the extent to which SROI methodology has been adopted by academics working in health and social care. This review only included peer reviewed papers due to the focus on academic contribution to the methodology, so we were not able to determine the proportion of SROI studies in health and social care that were peer-reviewed rather than published as grey literature. However, we note that other authors have identified peer-reviewed SROI studies to be between 1% of all SROI studies [12] and 10% of those in public health [16]. There may be other sectors in which academics have been earlier adopters of this methodology but, perhaps due to concerns about the value and relevancy of SROI methodology, which can be highly context specific [16], health and social care academics has been slow to adopt this as part of their toolkit for developing an evaluation evidence base.

The quality assessment framework developed for the assessment of SROI studies was a useful tool for comparing the quality of reporting amongst studies [23]. However, our study suggested further refinement may be necessary. In particular, some items may need to be broken down into two items or half points awarded (e.g. 'were the proxies valid and comprehensive?', 'was the sample described in detail/was the sample justified?'). Overall we observed a number of positivity biases in the studies, relating to sampling and the outcomes that were included in SROI calculations. Few studies noted negative outcomes as the result of the interventions under study, or even unexpected outcomes; whether positive or negative. Furthermore, few studies reported having undertaken sensitivity analysis and therefore this decreases confidence in the SROI ratios presented.

Common weaknesses in reporting (e.g. justifying stakeholder scope, reporting sample sizes and whether consent had been obtained) related to papers of different word counts. Weaknesses in reporting clarity therefore did not seem to relate to word count limitations with some shorter papers scoring higher than more lengthy ones. Given that most papers cited supplementary materials, appendices and external links, it seems that full transparency of how SROI was conducted is challenging to achieve within peer reviewed journals word count limits; though clarity for readers is likely improved by the more detailed components of the analysis not being included in the main text. It may be that the positivist evidence hierarchies of academia do not align with SROI methodology in which personal experiences and outcomes are privileged [14]. However, if SROI methodology becomes as accepted in other countries as it has been in the UK by government and policy making bodies [12], this may drive wider take up and adoption of SROI methodology by academics and other stakeholders in Australia and elsewhere.

Author contributions: CH, AB and JR conceived the study and were responsible for the design and search strategy which was approved by SGH and SG. DF was responsible for conducting the search. CH, DF and SGH conducted the screening. CH and DF extracted the data, conducted the data analysis and quality assessment. The initial draft of the manuscript was prepared by CH and DF and then circulated to all authors for critical revision. All authors approved the final draft for submission.

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Figure 1: PRISMA Flow Chart

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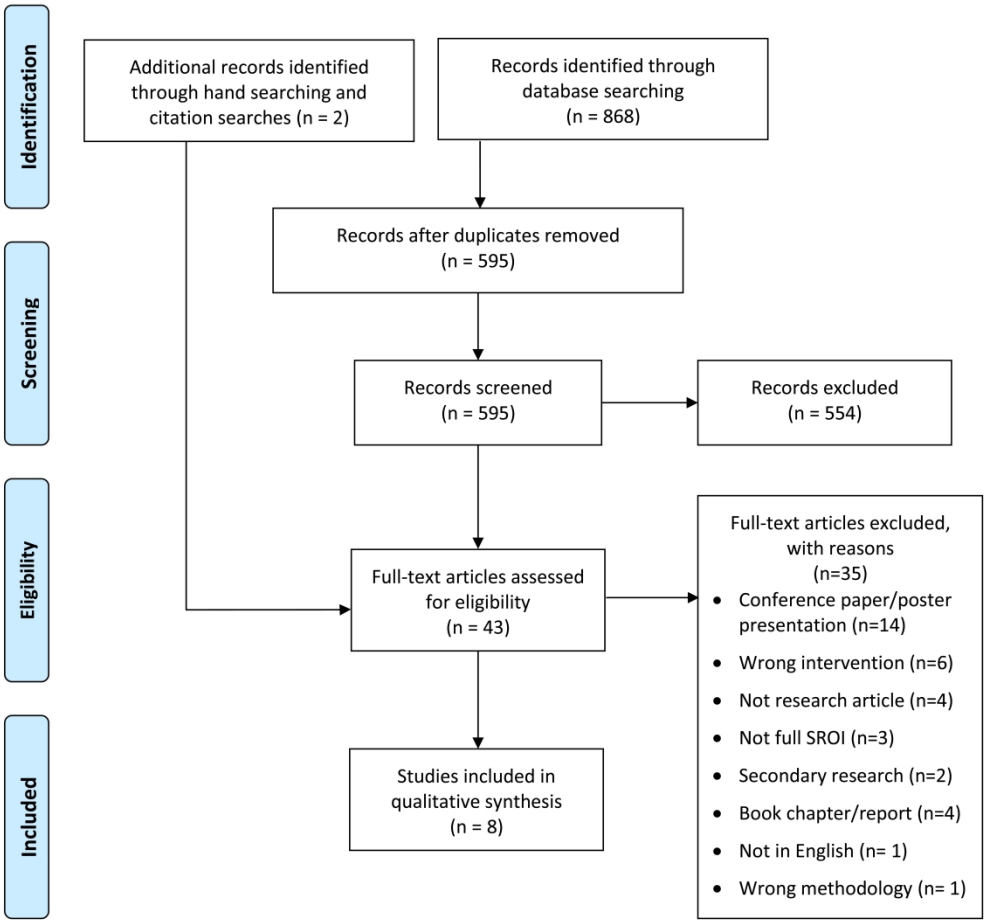

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Appendix I: Examples of Search strategy

Database	Search Terms
Web of Science	TS=("social return on investment" OR SROI} Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI, CCR-EXPANDED, IC timespan=2000-2018
MEDLINE	#1 "social return on investment".mp. [mp=title, abstract, original title, name of substance word, subject heading work, keyword heading word, protocol supplementary concept work, rare disease supplementary concept word, unique identifier, synonyms] #2 SROI.mp. [mp=title, abstract, original title, name of substance word, subject heading work, keyword heading word, protocol supplementary concept work, rare disease supplementary concept word, unique identifier, synonyms] #3 1 or 2
PsychINFO	#1 "social return on investment".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] #2 SROI.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] #3 1 or 2

Appendix II: Data Extraction

Author/date	Country	Intervention	Study Design	Innovation / adaptations / additions to SROI methodology	Word Count	Externally referenced data	Quality Assessment
Arvidson et al. (2014)	UK	Community support for people with post-natal depression	Mixed methods; primary and secondary data sources	Costed in-kind support to calculate how many resources the organisation leverages based on funder investment (£1.30 for each £1)	5297	Refers to the existence of a logic model, dead-weight and drop-off but does not include in article – readers required to email contact author for full report	12/20 (60%)
Goudet et al. (2018)	Kenya	Home-based counselling of pregnant and breastfeeding women and mothers of young children	Mixed methods; primary data (quantitative and qualitative)	None identified	7577	Online links to full data set; additional file attached to online journal article containing steps in the program, content of counselling messages, full list of stakeholders, and assumptions for base case scenario variables.	18/20 (90%)
Kennedy & Phillips (2011)	UK	Community-based self-management training and support groups for people affected by substance and alcohol abuse	Primary data sources (interviews and questionnaire); Post-intervention data only	Beneficiary costs not typically included in SROI analysis. Authors included participants travel expenses to attend the intervention as an input.	3209	Downloadable supplementary information: stakeholders, questionnaires, and impact map	14/20 (70%)
Iafrati (2015)	UK	Residential drug addiction treatment centre	Pre/post primary data; quantitative and qualitative	Outcomes weighted at 65% (overall reported success rate of intervention according to organisation) to address positive sample bias Focus on societal impacts under a socio-political	3904	None	8/21 (38%)

				framework rather than consumers personal outcomes			
Laing & Moules (2017)	Canada	Camp for children with cancer	Post intervention data collection	None identified	2919	Supplemental digital content (permalink through journal) – link to relevant table provided in-text. Link contains additional information about the theory of change, deadweight, indicators, and proxies.	14/20 (70%)
Mook et al. (2015)	Canada	Furniture bank for people transitioning out of homelessness, women and children escaping abusive situations, migrants and refugees	Post intervention, retrospective case worker surveys; secondary data	None identified	6446	None	12/20 (60%)
Scharlach (2015)	USA	Volunteer-assisted services for vulnerable older people living in the community	Pre/post assessment and interview data	An SROI ratio was calculated for service users based on membership fees	6076	None	10/21 (48%)
Willis et al. (2016)	UK	Peer-support groups for people with dementia (3 groups ran by different organisations)	Post-intervention data through interviews and focus groups	Weightings were applied to financial proxies to reflect that the 3 groups in the study met for different lengths of time and with different frequencies.	3842	External full SROI report – linked in the reference list of article (broken link). Full report contains additional information about stakeholders, inputs, deadweight, indicators and proxies	17/20 (85%)

Appendix III: SROI Quality Assessment

Research Question	Scoring	Notes
Was a well-defined question posed?	Yes / No / Not clear	
Reason for use of SROI Method		
Were authors transparent about why SROI methodology was chosen? (e.g. strategic planning/funding requirements)	Yes / No / Not clear	
Did authors report relevant background literature/ justify the need for the study?	Yes / No / Not clear NA	
Scope		
Was the range of stakeholders included/excluded justified?	Yes / No / Not clear	
Was the range of stakeholders wide enough to adequately answer the research question? (principle of understanding change)	Yes / No / Not clear	
Was it clear how stakeholders were involved and what data would be gathered from them?	Yes / No / Not clear	
Was ethics obtained/informed consent provided?	Yes / No / Not clear	
Theory of change/impact map		
Was the theory of change clear? i.e. the relationships between inputs, outputs and outcomes	Yes / No / Not clear	
Were unintended outcomes (positive/negative) detailed?	Yes / No / Not clear	
Study Design		
Was the study design appropriate for the study question? (Control group, pre-post)	Yes / No / Not clear	
Was the sample described in detail/was the sample justified?	Yes / No / Not clear	

Analysis		
Were inputs clear with non-monetized inputs valued appropriately?	Yes / No / Not clear	
Were capital costs, as well as operating costs included?	Yes / No / Not clear / NA	
Were costs that occur in the future 'discounted' to their present values? Was justification given for the discount rate used?	Yes / No / Not clear	
Was dead-weight clearly described and calculated?	Yes / No / Not clear	
Were the indicators valid and comprehensive? (Were the sources of all values clearly identified?)	Yes / No / Not clear	
Were the proxies valid and comprehensive? (Were the sources of all values clearly identified?)	Yes / No / Not clear	
Was length of benefit established and justified? (Drop-off) (In capital projects, did authors establish and differentiate between length of benefit and life expectancy of the asset?)	Yes / No / Not clear	
Were limitations and biases reported?	Yes / No / Not clear	
Was the final SROI ratio interpreted?	Yes / No / Not clear	
Was sensitivity analysis performed? Was justification provided for the range of values (or for key study parameters) in the sensitivity analysis?	Yes / No / Not clear	

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	2
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2-3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	5-6
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	6
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	6
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	7
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	7
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	7
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	7
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	8
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	8
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	8
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	N/A
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	8-9

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	10
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	9 & Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	9 & Table 2
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	12-13 & Table 2
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	10-12
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	N/A
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N/A
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	13-14
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	14-15
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	15
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	16

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

PRISMA 2009 Checklist