Abstract

Background Physical activity and sport (PAS) have been related to health and social benefits, but their monetary value remains unclear. This systematic review on the Social Return on Investment (SROI) of PAS aimed to find what are the social *outcomes* measured in previous PAS literature and how are these measured and valued.

Methods A systematic search was conducted on WoS, PubMed, and Econlit. Articles in English, measuring the social value of any type of PAS in monetary terms, and utilising an SROI framework were included. Risk of bias was evaluated using the Drummond check-list. The PRISMA guidelines were followed.

Results Fifty-five documents (2010-2022), from all continents except America, were included; only eight were published in peer-reviewed journals, while 47 were reports. Most studies evaluated the benefits of specific programmes and six measured the engagement in PAS at the population level based on national or community surveys. The social *outcomes* identified were Health (94.5%), Crime (50.9%), Education (83.6%), Subjective Wellbeing (89.1%), Social Capital (60%), and other (3.6-23.6%). The valuation methods included willingness to pay, wellbeing valuation, the cost of an activity that could result in the same outcome, and cost databases associating outcomes with a monetary value.

Conclusions This study updates a previous review and widens the scope by answering the question of how are social *outcomes* measured and valued in previous PAS literature. Given the heterogeneity found in the application of the method, this review will inform a Delphi study to reach a Global Consensus Statement on the measurement of social value and PAS.

Introduction

Physical activity and sport (PAS) have been related to many health and social benefits such as disease prevention, prosocial behaviour, and psychological and cognitive benefits[1]. However, the value of these wide benefits is often overlooked, and still needs to be clarified to justify public and private expenditure of resources on these activities [2].

Economic evaluations are a useful tool for monitoring and justifying the results of an intervention or program, but until recently, they have focused on measuring economic outcomes such as Gross Value Added (GVA) and employment. This is the case with traditional economic evaluation tools such as cost-effectiveness analysis (CEA), cost-utility analysis (CUA) and cost-benefit analysis (CBA) in which social and environmental benefits have often been overshadowed by the need to generate economic results such as jobs and monetary growth [3,4]. On the contrary, the Social Return on Investment (SROI) model, developed by the Roberts Enterprise Development Fund (REDF) in the US and tested by the New Economics Foundation in the UK [5], emerged to capture a broader concept of value, including financial and non-financial outcomes [6]. While the CEA, CUA, and CBA approaches are relevant to set priorities and decide allocation of resources, the SROI adds to these by considering the views of stakeholders and a framework for accountability [4]. Although it was built upon the CBA [7], it is the only of these methods following a "triple bottom line" approach (social, economic and environmental) and, therefore, offers a more holistic, comprehensive tool to measure value [3,4,8]. The model has been used globally by public agencies and third-sector organisations to evaluate their social impact, i.e., understand their value to society and justify investment [9]. However, this increased use has also led to a huge variety of applications given that almost each of these agencies and organisations used their own tools to quantify their social impact [6]. In fact, Tuan's (2008) analysis of eight approaches to evaluate social value creation showed that REDF was the only organization using consistent measures across its entire portfolio of investments [10].

The Social Return on Investment (SROI) model

A previous review on the SROI applied to PAS [11] highlights the benefit of using this approach over traditional economic evaluations to show the contribution of PAS to create value across multiple social domains. However, authors also highlight the need to develop more robust measurement tools and standard methods for valuation. Davies et al.[12] used this framework for the first time to measure the impact of sport at the population level in England. The authors used Taylor et al.'s [13] systematic review on participation in culture and sport to inform the development of the model and found robust evidence on the positive impact of PAS on health (prevention and treatment of physical and mental conditions), crime (greater prosocial behaviour and less antisocial behaviour), and education (behaviour, attendance, and achievement). However, the evidence was not clear for the domains of subjective well-being and social capital, and, with the exception of health, it was not possible to conclude a causal relationship between sport and these domains due to the methodological limitations of some studies. To date, some other population-level estimates have been calculated in Wales [14], London [15], Flanders and Wallonia [16], and the Netherlands [17]. However, the lack of quality data when evaluating the creation of social value is one of the main concerns, together with the lack of common measures [10].

SROI is most commonly used to refer to an approach, guided by a set of Principles and Standards, developed by Social Value International in consultation with stakeholders across the world [18]. There are eight Principles of Social Value [19], which give consistency and transparency to the framework and include 1) involve stakeholders; 2) understand what changes (from stakeholders and relevant literature); 3) value things that matter (to stakeholders); 4) only include what is material (in terms of scale and impact for stakeholders); 5) do not overclaim (e.g. when faced with a variety of estimates, select a more conservative one); 6) be transparent (about limitations and assumptions); 7) verify the result; and 8) be responsive. Although there are other social evaluation methods (e.g. Social Accounting and Auditing and the Global

Reporting Initiative), they do not embed stakeholder engagement as a requirement, which is key to understand the changes that they experience as a result of an intervention and to measure what really matters [3,20]. Also, although the rigour of application can vary (e.g. lower levels inform decision makers within organizations), high levels can be achieved with the quality assurance of an external evaluation by Social Value International [21]. Another benefit is that the model can be applied before a program or activity has taken place to predict the value created by their outcomes (forecast SROI), or it can be used to measure and value the results of a program or activity that has already taken place (evaluative SROI). Finally, the end result of the application is highly attractive given that it gives a ratio expressing the monetary value of outcomes in relation to the initial investment, e.g., a ratio of 3:1 indicates that an investment of 1 euro delivers 3 euros of social value. This makes the communication of SROI analysis attractive to stakeholders.

In spite of these benefits, the SROI framework can be demanding in its implementation. First, the full methodology requires measuring data about *inputs, outputs*, and *outcomes*, and using an impact map as a central component of the method to understand the various pathways through which the desired outcomes are achieved, which is costly in resources and time [10]. *Inputs* are the contribution of the stakeholders for the activity to develop, *outputs* are a quantitative summary of the activity (e.g. time spent in a program), and *outcomes* are the final result of the activity or the change that occurs as a result of the activity. The impact map involves the creation of a theory of change explaining how *inputs* make the *outputs* possible and how *outputs* create change in the *outcomes*. Second, in order to avoid overclaiming (Principle 5), the SROI involves making some adjustments to the method which are difficult to measure. These include estimating how much of an *outcome* would have happened anyway without an activity taking place (*deadweight*), which is rarely available [22], *displacement* (how much of the activity displaced other *outcomes*), *attribution* (how much of the *outcome* was

caused by factors different from the activity), and *drop-off* (how much the *outcome* reduces over time) [23]. Finally, and most important, one of the biggest challenges to the method is understanding what changes (Principle 2), not only from stakeholders' perspective, but from the scientific evidence available. Although there is a vast amount of evidence and information on the social impact of PAS [13], there is no consensus on what should be included in the model and a causal relationship is not always established. Although stakeholders should help to identify *outcomes*, there is also a need for other stakeholders to identify what is important, especially at the population level.

Aims of the systematic review

Given the potential of the SROI model to enable the ability of organisations to articulate the wider impacts of PAS on society, there is a need to address the implementation challenges, and adapt and standardise the SROI framework to PAS. The review updates Gosselin et al., (2020) [11], who conducted the first systematic review of SROI applied to PAS and identified the need to improve the robustness of the method and the challenge to compare results given the heterogeneity in its application. Additionally, the present paper widens the scope with the analysis of the indicators and financial proxies, which were previously excluded. Therefore, the present systematic review aimed to answer the following questions (1) what are the social *outcomes* measured in previous PAS literature and (2) how are these *outcomes* measured (i.e., which indicators are used to quantify them) and valued (i.e. which valuation methods are used to translate them into monetary terms). Given previous evidence on the lack of standardisation in the application of the method [6,10,11], it is expected to find a wide variety of *outcomes*, indicators and financial proxies. Therefore, this systematic review is the first step of a bigger project to develop a Global Consensus Statement using the Delphi method to establish a PAS SROI model according to experts' opinion (see Figure 1).

[INSERT Figure 1. Workflow of the project to develop Global Consensus on a Social Return on Investment model of Physical Activity and Sport [24].]

Method

Table 1 presents the main questions of the review using the PICO (participants, interventions, comparators, and outcomes) framework, following the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) Statement [25]. The present research adopted the WHO definition of physical activity, i.e. "any bodily movement produced by skeletal muscles that requires energy expenditure" [26].

[INSERT TABLE 1]

A glossary of terms can be found in Supplementary Materials to better understand all the concepts used in this systematic review.

Eligibility and search criteria

This study followed the PRISMA 2020 checklist [27] to ensure the quality of the method. It can be found in the pre-register in OFS Registries (osf.io/sx9cn) to ensure transparency of the process[1].

A systematic search was conducted on the databases of Web of Science, PubMed, and Econlit, combining terms related to SROI, physical activity and sport, and positive and negative *outcomes* based on the 13 World Health Organisation (WHO) sustainable goals which could be supported by promoting PAS [28]. The list of search terms can be found in Supplementary Materials. No filters were used in any of the databases. Moreover, a secondary search was used to complete the inclusion of studies and grey literature (following Gosselin et al.'s (2020) finding that 94% of SROI studies applied to PAS come from this source). Different steps were taken in order to be as comprehensive as possible in the inclusion of these documents. First, the bibliography of different theoretical papers and reviews [2,4,5,10,11,29–33] was inspected. Second, different web pages related to sports were screened using the terms 'social return on

[1] The final systematic review presents a difference from the pre-registered information. In the pre-register, it was stated the secondary goal of searching international PAS policies to compare their main areas of interest (government focus) with the resulting outcomes of the systematic review (academic and organizational focus). However, given the length of the study, the results of this secondary aim will be presented elsewhere.

investment'. The details of these steps are specified in Supplementary Materials to increase transparency and reproducibility of the results. Figure 2 presents the PRISMA 2020 flow diagram [27].

[INSERT Figure 2. PRISMA 2020 flow diagram.]

The inclusion criteria were: 1) articles from scientific journals and reports of reference in the area (grey literature); 2) published in English; 3) evaluating social value in monetary terms and 4) in relation to PAS. There were no limitations regarding age of the sample (children/adolescents, adults, older adults) or type of population (healthy, clinical…).

Exclusion criteria included: 1) documents with no measure of monetary value; 2) studies using an economic framework different to the SROI model (e.g. CBA, cost-effectiveness); 3) articles using SROI but not in relation to PAS; and 4) theoretical papers (abstracts, reviews, meta-analyses, pre-registers…). There was no restriction of publishing timeframe.

Data collection process

Two steps were taken in the selection of records by two independent reviewers. First, titles and abstracts were screened. Second, full text of the records selected in the first step were reviewed. The software used for these steps was *rayyan.ai.* Disagreements were solved by discussion with a third reviewer if needed. The agreement for the inclusion of the documents was excellent (kappa = 0.89). Then, the final records, selected based on the defined inclusion/exclusion criteria, were codified in an Excel file.

The data fields extracted in the codification table were characteristics of the study (year, country, authors' organization, type [scientific article, report]), main purpose of the study; scope (national, regional, local), stakeholders; age of participants; activity evaluated; characteristics of the SROI evaluation (type [evaluative, forecast] timeframe, *inputs, outputs, outcomes,* outcome indicators, financial proxies, adjustments [deadweight, attribution, displacement, drop-off] and SROI ratio), and main limitations and recommendations when applying the SROI model.

Risk of bias (quality) assessment

The Drummond check-list for assessing economic evaluations was used to assess the quality of the records [34]. This choice was based on the wide recognition and use of this scale for the evaluation of economic studies [35]. This checklist includes 10 items evaluating: 1) the adequacy of the question of the study, 2) the comprehensiveness of the description of the competing alternatives (i.e. can you tell who did what to whom, where, and how often?), 3) the establishment of the effectiveness of the programme, 4) whether all the important costs and consequences were identified 5) the adequacy of the measurement of costs and consequences, 6) the credibility of the valuation of cost and consequences, 7) the adjustment of costs and consequences for differential timing, 8) whether there was an incremental analysis of costs and consequences of alternatives, 9) whether there was allowance for uncertainty in the estimates of costs and consequences, and 10) whether the presentation and discussion of study results included all issues of concern to users.

The results showed that 42.3% of studies included in the present review met 80% or more of the quality criteria, while 20.4% met 30% or less of the quality criteria. Specifically, it was found that 62.7% of the documents met more than 50% of the quality criteria, 13.6% of the documents met 50% of the quality criteria, and 23.7% of the documents met less than 50% of the quality criteria. None of the documents met less than 20% of the quality criteria.

Sensitivity analyses were conducted to evaluate if high-quality documents (those meeting 80% or more of the criteria) differed from the total sample of documents. Results can be found in Supplementary Materials.

Strategy for data synthesis

A descriptive analysis was used to present the results, relying primarily on the use of text to summarise and explain the findings and descriptive statistics. Given that the synthesis was mainly narrative, there was not a minimum number of documents to include.

Results

This section presents a summary of all the information collected in the codification table (see Table S1). Study ID numbers (in brackets) are used to help identify the details in the table. Full references of the included studies can be found in Supplementary Materials.

Study characteristics

A total of 55 documents were included covering a date range from 2010 to 2022. The studies were largely from high-income countries and included countries from all continents except the American continent: the UK (k=30), Australia (k=7), Ireland (k=4), Netherlands (k=4), Italy (k=3), Taiwan (k=3), Belgium (k=2), Emirates States (k=1), Japan (k=1), Republic of South Africa (k=1), Sweden and Romania (k=1), Turkey (k=1), and Zimbabwe (k= 1). Only eight documents were scientific studies published in peer-reviewed journals, while 47 were reports describing SROI analyses done by a specific organization. The organizations conducting the scientific articles were all universities, while the organizations in charge of the reports were universities, external consultants, sports clubs, and government bodies.

Regarding the time frame of the analyses, three studies conducted a forecast SROI (evaluating the social value of a future activity), five included both a forecast and an evaluative SROI, and the remaining 47 conducted an evaluative SROI (evaluating the actual *outcomes* that have already taken place). Moreover, 27 documents evaluated the impact of one year of activity, 11 evaluated the impact of more than one year of activity (between 1.5 and 5 years), six documents evaluated the impact of less than one year of activity, and 14 documents did not report the time period.

The main purpose of all the documents included in the review was measuring the benefits of different PAS activities to better understand and show their holistic impact to wider audiences. Furthermore, nine studies (1, 6, 19, 28, 35, 36, 42, 52, 54) mentioned a specific interest in justifying and attracting funding and guiding the use of resources, and six studies (1,

2, 4, 9, 10, 42) mentioned the goal of being an example for the evaluation and implementation of more programs in the future.

Regarding scope, studies were categorised into those measuring the impact of PAS in the general population (meeting specific guidelines) based on national or community surveys, and studies measuring the impact of participating in specific activities with different population groups. At the population level, most were undertaken at the national level. Studies 11 and 15 looked at the social impact of PAS in England in different years; study 14 looked at the value of PAS in the Wallonia-Brussels Federation; and studies 40 and 41 looked at the impact of PAS in the Netherlands in different years. Only study 12 measured the impact of PAS across the general population at the sub-national level, examining the SROI of 12 community sport and leisure facilities in Sheffield. The rest of the studies limited their goal to the evaluation of the benefits generated by specific companies, clubs or programs.

The studies included in the review were categorised based on the type of activity, with studies focusing on physical activity (k=9), sport (k=29) or both types of activity (k=17). Physical activity programs included walking (k=5), biking (k=2), and varied PAS activities (k=2). Sports SROI studies included football clubs (k=10), football participation at the national level (k=2), football programs (k=7), varied sports (k=4), baseball team/competition (k=2), athletic associations (k=2), and rugby league/union (k=2).

In the context of SROI, stakeholders are defined as "people or organisations that influence, or experience change because of participation in sport and physical activity in the researched facilities" [1]. Studies included diverse stakeholders, which were classified into four different groups: (1) individual / consumer sector (direct participants of the activity; sport volunteers; coaches, professionals and administrators; fans and supporters of a team; family, carers and peers of participants); (2) private / commercial sector (commercial PAS providers, employers with PAS facilities, office staff, sales agents, local shopkeepers during sport events,

sponsors and partners of the activities, the sport and recreation industry in general); (3) charities / third sector (voluntary sport and exercise clubs; sport and leisure trusts, National Governing Bodies, charities delivering sport and physical activities); and, (4) public / government sector (national health systems, emergency services, GPs, social services, councils, secondary schools and higher education, government departments such as transport, and police, and judicial system). Within the direct participants group, most of the PAS activities were designed for a healthy sample (e.g. study 1, 6, or 9), although some of the interventions targeted subgroups with health conditions, e.g. chronic obstructive pulmonary disease patients (study 4) or spinal cord injury patients (study 37).

Although stakeholders' mean age was one of the variables to be coded, it was given in only a few documents. Studies 1, 14, 15, and 33 focused on adult population (mean age 44 years old; adults aged 16+; adults aged 16+; 43% between 25-34 years old; respectively for each study). Studies 8, 25, and 26 targeted older adults (2/3 over 55 years old; mean age 72.4 years old; mean age 76 years for patients and 68 years for carers; respectively for each study). Finally, studies 24 and 35 focused on children and adolescents (mean age of 7.4 years old, and 10-12 years old; respectively for each study).

Social outcomes and indicators

The social *outcomes* identified in the studies were categorised into one of the following domains: Health, Crime, Education, Subjective Wellbeing, Social Capital, and other *outcomes*. Moreover, these were divided into subcategories (see Table 2). These categories were created based on Davies et al.[12] model and the authors' expertise, and are not necessarily the same as the categorisation by the authors of the original studies or reports.

In some studies, 'physical activity' and 'volunteering' were considered *outcomes*, but for the purposes of this review, neither are *social outcomes* and instead considered *outputs*. Moreover, the pure economic benefits of the PAS activities were also out of the scope of the

present research, focused on social impact defined as "both social benefits and costs, and specifically those which are non-traded, i.e. not part of the market system" [12].

Finally, *outcomes* related to the change in mental health and subjective wellbeing can be difficult to differentiate in some cases. The present research used the following criterion for their classification: *outcomes* indicating the decrement of psychological symptoms (depression, anxiety, stress…) were categorised as 'mental health' *outcomes*, while those indicating the increment of positive emotions or feelings (self-reported subjective wellbeing, feeling better, more positive, wellbeing scales…) were classified as 'subjective wellbeing' *outcomes*.

[INSERT TABLE 2]

Health

Health *outcomes* were measured in 52 documents and could be classified into four subcategories: impact in overall good health, physical health, mental health, and other impacts from improved health.

Nine studies measured 'overall good health' using the indicators of self-reported good overall health (11, 12, 13, 15, 17, 25, 39, 42) or feeling better (46).

Forty-six studies measured 'physical health', but only 25 specified the conditions which were improved by PAS participation, i.e. Reduction of CVD/stroke, breast/colon cancer and type II diabetes (4, 11, 12, 13, 14, 15, 17, 39, 48-56), Reduction of dementia (11, 12, 13, 14, 15, 17, 39, 48-51, 53, 54, 56), Reduction of hip fracture and back pain (14, 15, 39), Reduction of osteoporosis (4, 48, 49, 50, 53, 54, 56), Reduced obesity/weight (4, 24, 29, 51), Fewer bike accidents/injuries (9, 10), Decreased drownings and near drownings (21), Reduced consumption of alcohol and drugs (22), Balance and mobility (26), Reduced use of wheelchair accessible taxis (37). The rest of physical health *outcomes* were defined as Improved physical fitness (8, 33), Better physical health (19), Fewer illnesses (36), or Reduced mortality (47), among others. Interestingly, only one document (24) reported the use of objective

measurements (food intake, height, and weight). The impact on physical health also included the negative *outcome* of Injuries (6, 14, 15, 39, 40, 48-56).

Twenty-five documents measured 'mental health' including the indicators of Reduced depression (12, 14, 15, 22, 26, 39, 48-56), Reduced anxiety (22, 26, 48-56), Reduced schizophrenia (48-56), Reduced stress (19, 28, 26, 44), Carers' respite (4, 44), Reduced anger, alcohol use, and problem gambling (22), and Suicide prevention (22, 38, 47). Other studies measured the generic improvement in mental health (1, 2, 20, 23, 38, 44, 47) and one negative *outcome*, i.e. Increased stress (19).

Twenty-two studies reported 'other impacts from improved health', including Healthcare cost savings (1, 2, 3, 4, 5, 6, 7, 8, 12, 24, 25, 26, 29, 31, 36, 37, 38, 40, 41, 44, 46, 47), such as Reduction of medication use or Reduction of GP visits; Reduced sick leave (2, 3, 4, 5, 24, 40, 41, 44); and Increased productivity (31, 38, 40, 41, 44, 47). It is important to note that Improved productivity, Reduced sick leave, and Health care savings were included as *outcomes* in these studies, although could be used as financial proxies in some other documents.

Crime

Crime was measured by 28 documents. The indicators included Reduced criminal incidences (2, 10, 11, 12, 13, 15, 17, 22, 28, 39, 40, 41, 48-56), Fewer call outs (2, 10), Reduced anti-social behaviour (5, 9, 10, 30), Reduced substance misuse (22, 28), Safer places (1, 9, 28, 38), and Reduced rates of recidivism (33, 47). Study 28 included a wider heterogeneity of crime *outcomes* (see Table S1) and there was one negative impact of PAS related to crime, i.e. Number of additional incidents reported (9).

Education

Education *outcomes* were included in 46 documents and were classified in four subcategories: impact on educational attainment, school absenteeism, skills acquisition, and other impacts from improved education.

Twenty-one studies measured 'improved educational attainment' (11, 12, 13, 15, 17, 23, 24, 28, 39, 40, 41, 44, 48-56) and 10 documents (24, 40, 48-54, 56) measured the 'reduction of school absenteeism'. Twenty-one documents (1, 4, 6, 7, 9, 10, 19, 20, 21, 22, 23, 24, 28, 29, 35, 38, 39, 42, 43, 44, 45) measured 'skills acquisition' with indicators such as Learning new skills and gaining personal development (6) or Skills in public speaking (20). Finally, 'other impacts from improved education' were measured in 35 documents and refer to those *outcomes* making participants more employable. Specifically, six studies (11, 12, 13, 15, 17, 39) measured the enhancement in human capital (i.e. the higher starting salary of graduates who participate in sport in comparison with their non-sporting counterparts), 9 studies (48-56) measured the reduced risk of becoming a NEET (not in education, employment or training), and the rest of documents (1, 7, 8, 9, 18, 20, 21, 22, 27, 28, 30-35, 43, 44, 45, 47) used a variety of indicators to measure the improvement in employment capacity, e.g., Increased professional competitiveness (18). There was one negative *outcome* within this subcategory, i.e. Spending working hours for the project (35).

Subjective Wellbeing

Subjective Wellbeing *outcomes* were included in 49 documents and were classified into seven subcategories: general wellbeing, quality of life, life satisfaction, happiness, motivation, confidence and self-esteem and 'other outcomes'.

The 'general wellbeing' subcategory was included in 17 documents with the indicator of self-reported improvement in subjective/personal/physical/mental wellbeing (1, 7, 20, 28, 38, 44, 46-55). 'Quality of life' was included in nine documents as Increased quality of life (18, 24, 40, 41, 44, 47) and Health-Related quality of life measured with some version of the EQ5D questionnaires by the EuroQol Group (24, 25, 26, 38). 'Life satisfaction' was measured in seven studies (11, 12, 13, 14, 15, 17, 39) based on previous literature showing an association between sports participation and higher subjective wellbeing (life satisfaction), and three

documents (18, 22, 29) with a variety of indicators such as Provided their life with meaning and hope (22). 'Happiness' was included in eight documents measured as self-reported feelings of being happier/better/more positive (6, 7, 8, 9, 12, 14, 28, 37). Finally, 'motivation' was included in four documents (6, 18, 27, 35). There was one negative *outcome* in this subcategory named Negative impact on team morale (18). The 'confidence and self-esteem' subcategory was the most frequent one, included in 24 documents (4, 7, 8, 9, 10, 12, 14, 18, 22-26, 29, 30, 32, 33, 34, 36, 37, 39, 43, 44, 46), with the indicators of Increased confidence (k= 17) and Improved self-esteem (k=7). Finally, 15 studies (7, 8, 18, 19, 22, 23, 24, 28, 29, 36, 37, 41, 42, 43, 44) measured 'other outcomes' relating to subjective wellbeing, e.g. Increased loyalty (18) or Improved job satisfaction (19).

Social Capital

Social Capital *outcomes* were included in 33 documents and were classified into five subcategories: networks and relationships; sense of identity and belonging; community engagement; inclusion, integration and equality; and trust.

'Network and relationships' was included in 29 documents (1, 4, 6, 7, 8, 10, 12, 15, 18-23, 25, 28, 29, 35- 46), with indicators related to the enhancement of relationships with family and friends, the creation of new relationships and, to a lesser extent (k=4) the reduction of isolation. 'Sense of identity and belonging' was measured in 10 documents as Sense of belonging (18, 29, 41, 42, 43), Sense of identity and belonging (18, 37), Creation of role models (20, 21), and Feeling proud of being in a group (9, 20). Moreover, 'sense of identity and belonging' included several indicators related to cultural impacts, i.e. Promote cultural awareness (7), Improved cultural awareness (21), and Gaelic games and culture are preserved and grown (42). 'Community engagement' was measured in eight documents (1, 5, 7, 14, 24, 28, 43, 44) with indicators referring to higher engagement or cohesion. 'Inclusion, integration and equality' was measured in 12 documents with a variety of indicators related to diversity,

mixing, or reduction in stigma and racism (1, 4, 7, 14, 21, 35, 36, 39, 44) and a subgroup of indicators related to support (20, 21, 22, 46). Finally, 'trust' was measured in five documents (14, 15, 22, 29, 39).

Other

Some categories of *outcomes* were measured in less than 15 documents each. These were the impact in Environment (7, 9, 10, 44), Community benefits (1, 9, 10, 20, 21, 27, 31, 35, 37, 42, 44, 45), Leisure (7, 8, 9, 21, 22, 25, 37, 44, 45), Image improvement (9, 10, 19, 23, 28, 31, 37, 43, 45), and New partnerships (10, 45). See Table S1 for details.

Valuation methods

An explanation of the different valuation methods can be found in the Glossary in Supplementary Materials.

Health

Forty-two out of fifty-two documents (80.8%) specified the valuation method for all their health *outcomes.* First, three methods were used to value 'overall good health', being the most frequent the annual NHS cost saving per person associated with improvements in self-reported good health (11, 12, 13, 15, 17, 39) [39].

Second, for valuing 'physical health', most studies used the cost of treatment per condition (including injuries) as the financial proxy. Seven documents (2, 6, 8, 9, 10, 18, 28) used the 'cost of activity that could result in same outcome' approach, mostly using the cost of performing some type of physical activity as a proxy (6, 8: swimming; 9, 10: biking, 2, 10, 28: gym membership or trainer). Six documents used external sources (25, 26, 33: Social Value Bank; 30: the SQW report; 34: Global Value Exchange; and 41: the Ecorys study). Interestingly, two studies using the Social Value Bank specified using the proxy "value of frequent mild exercise", which is consistent with the previous method. Three documents (18, 19, 43) used the 'willingness to pay' (WTP) approach, and two documents used an approximation from other

organisations (29: Lower NICE -National Institute for Health and Care Excellence-threshold of £20,000 as the value of a quality-adjusted life year-QALY; and 47: Australian Government's Value of a Statistical Year of Life).

Third, for valuing mental health, most studies also used the cost of treatment per condition as the financial proxy, two documents used the 'cost of activity that could result in same outcome' approach (with no agreement in the activity chosen: 2-cost of membership, 28-cost of stress and anger management course), other two documents used external sources (26: value of 'able to rely on family' from the Social Value Bank, 38: ACIL Allen's SROI framework), one document used the WTP (19), and another one (47) used the Australian Government's Value of a Statistical Life.

Finally, regarding the 'other impacts from health improvement', healthcare-related *outcomes* were valued with cost saving per person (2, 3, 12, 47), direct NHS costs (4, 29), cost of a GP visit (6, 25, 26, 46), cost of medication (6, 8, 24, 37), and the cost of a hospital stay (37). Reduced sick leave *outcomes* were valued with GVA estimations (2: Average GVA/day/worker; 3: GVA impact due to the early return to employment), the national cost of a disease (4), friction cost method (24), and values from another study (41: Ecorys study). Finally, productivity was valued as the Gross State Product per hour and the average weekly earnings (47) and with estimations from other studies (38: ACIL Allen's SROI framework; 41: Ecorys study). Table 3 shows the valuation methods of the different Health *outcomes*.

[INSERT TABLE 3]

Crime

Twenty-two out of twenty-eight documents (78.6%) gave the details on the valuation methods for their crime *outcomes* (see Table 4). Most documents used as the financial proxy the cost of criminal incidents (2, 10: Cost per call out; 10, 11, 12, 13, 15, 17, 28, 30, 39, 48, 49-56: Average cost savings to the Magistrates Court, to the NHS as a result of a reduction in drug

use, from preventing anti-social behaviour…; 28: Value of the reduction of one police officer post; 47: Cost per day of prison). Four documents (1, 9, 10, 28) used the 'cost of activity that could result in same outcome' approach with no homogeneity between them (see Table 4), three documents used external sources (33: Social Value Bank, 38: ACIL Allen's SROI framework; 41: Ecorys study), and one study (9) used the WTP approach.

[INSERT TABLE 4]

Education

Thirty-one out of forty-six documents (67.4%) gave the details on the valuation methods for all the education *outcomes* they included (see Table 5). First, 'improved educational attainment' was mostly valued based on education-driven Gross Domestic Product (GDP) growth (48-56), followed by the estimation of the annual average of lifetime productivity returns due to PAS (11, 12, 13, 15, 17, 39). Only one document used the 'cost of an activity that could result in the same outcome' approach (23) and one document used an external source (41: Ecorys study).

Second, 'school absenteeism' was valued estimating the cost of absence in all documents (24, 48-56).

Third, for valuing 'skills acquisition', most documents used the 'cost of activity that could result in same outcome' approach (9, 19, 23, 28, 35, 45). All these proxies were the cost of different types of courses teaching similar skills to the ones acquired in PAS. Also, two studies used the WTP approach (42, 43), and two documents used an external source (29: Lower NICE threshold of £20,000 as the value of a QALY; 38: ACIL Allen's SROI framework).

Finally, 'other impacts from improved education' were mostly with the cost of educational underachievement (48-56) and using the 'cost of activity that could result in same outcome' approach (9, 18, 27, 28, 30, 32, 35, 45). The activities chosen were mostly those providing the employment qualifications obtained in the PAS activities (e.g., Cost of a

beginner's mountain bike skills course, Average cost of obtaining a coaching qualification). Also, some documents estimated the increase in salary for graduates who are sports participants (11, 12, 13, 15, 17, 39, 47), used external sources (33: Social Value Bank, 34: Global Value Exchange), and applied the WTP method (43).

[INSERT TABLE 5]

Subjective Wellbeing (SWB)

Thirty-eight out of forty-nine documents (77.6%) specified the valuation method for all their subjective wellbeing *outcomes.* (see Table 6). First, 'general wellbeing' was mostly valued using the WTP approach (48-55), one study (28) used the 'income compensation'/'wellbeing valuation' approach (see Glossary in Supplementary materials), and three documents used proxies from external sources (1: Global Value Exchange proxy; 38: ACIL Allen's SROI framework; 47: UK Culture and Sport Evidence programme).

Second, 'quality of life' was valued using the 'cost of activity that could result in the same outcome' approach (18), QALYs (24), the Social Value Bank proxies (25, 26) and external sources (38, 41).

Third, 'life satisfaction' was mostly valued using the 'income compensation'/'wellbeing valuation' approach (11, 12, 13, 14, 15, 17, 39). Also, one study used the 'cost of activity that could result in same outcome' and the WTP approaches (18), and another study used QALYs (29).

Fourth, 'happiness' was valued using the 'cost of activity that could result in same outcome' approach (8, 37), specifically, the value of a holiday/trips out as a financial proxy. Also, one document used the 'income compensation'/'wellbeing valuation' approach (14).

Fifth, 'motivation' was valued using only the 'cost of activity that could result in same outcome' approach (6, 27, 35), with no similarity between the activities chosen.

Finally, 'confidence and self-esteem' were predominantly valued using the 'cost of activity that could result in same outcome' approach. There were three main groups of activities equated to a boost in confidence and self-esteem: cost of a course for empowerment, psychological growth, assertiveness, or confidence (9, 10, 18, 30), cost of a professional psychologist or counsellor (23, 36, 37), and a donation to charity (8, 18). The 'income compensation'/'wellbeing valuation' approach was used in three documents (14, 39, 43), external proxies were used in four documents (Social Value Bank proxies: 25, 26, 33; Global Value Exchange proxies: 34), with the Social Value Bank having a specific value for high confidence in adults (HACT Social Value Calculator v4), and one document used QALYs (29).

[INSERT TABLE 6]

Social Capital

Twenty-three out of thirty-three documents (69.7%) gave details on the valuation methods for all their social capital *outcomes* (see Table 7). First, the *outcomes* related to 'networks and relationships' were mostly valued using the 'cost of an activity that could result in the same outcome' approach. Six documents chose the cost of varied social activities (8: Cost of a sports social club; 10: average spent on mobile phones to maintain friendships; 18: Family activity expenses; 23: Subscription to recreational clubs; 28: Spend value of going to more social events; 45: Cost of organizing team building activities) and four documents used the cost of some type of psychological support (23: Cost of an educator for psychoeducational support; 28: Cost of family therapy sessions; 35: Cost of therapy; 37: Cost of marriage counselling sessions). Similarly, the two documents using the Social Value Bank and the Global Value Exchange chose the price given by these entities to similar activities, i.e., Average spending on social interaction (1) and being a member of a social group (25). Two documents used the WTP approach (18, 19), two others used the 'income compensation'/'wellbeing valuation' approach

(15, 39), one document used QALYs (29) and three documents used previous literature (38, 41, 42) (see Table 7).

Second, 'sense of identity and belonging' was valued using the 'cost of an activity that could result in the same outcome' approach (9, 18, 37, 42), and the WTP approach (18, 43). No similar pattern of valuation was found in this case.

Third, 'community engagement' *outcomes* were valued with the 'income compensation'/'wellbeing valuation' approach (14) and the 'cost of an activity that could result in the same outcome' approach (1, 28-being the proxy in both cases the payment obtained for doing a job for the community).

Fourth, 'inclusion, integration and equality' *outcomes* were valued using the 'cost of an activity that could result in the same outcome' approach (35), the 'income compensation'/'wellbeing valuation' approach (14, 39), and a proxy from Global Value Exchange (1) which was similar to the ones used to value 'community engagement' (Cost of time spent collaborating).

Finally, 'trust' was valued using the 'income compensation'/'wellbeing valuation' approach (14, 15).

[INSERT TABLE 7]

Other

All 'other' *outcomes* were valued using the 'cost of activity that could result in same outcome' approach, except for one *outcome* of Community benefit and one *outcome* of Image improvement in Study 37 valued with the WTP approach. Within the 'cost of activity that could result in same outcome' approach used to value Image improvement, there was some homogeneity in the activities chosen, i.e. the cost of advertising (9, 10, 23, 31, 45) and the cost of sponsorship (23, 37). Also, Image improvement included a negative *outcome*, i.e. Negative image (study 19).

Discussion

The main aim of this systematic review was to inform a wider study on the application of the SROI model to PAS. Specifically, it was to provide information on: 1) what *outcomes* have been studied under the SROI model to evaluate the impact of PAS, and 2) how these *outcomes* have been measured and valued.

A total of 55 documents published between 2010 and 2022 were included, adding several records to the previous systematic review within the PAS field with only 17 SROI studies published between 2010 and 2018 [11]. This difference reflects the increasing use of this methodology during the last years (21 documents from 2018 to 2022). Moreover, the SROI model was implemented in thirteen different countries from Europe, Asia, Africa, and Australia. The lack of studies from the American continent is notable. It is possible that the search or selection strategies failed to capture relevant resources, but these results are consistent with previous reviews [11]. The analyses were conducted by universities, external consultants, sports clubs, and government bodies alike. Only eight documents were published in peer-reviewed journals. On the one hand, this may be explained by the extensive reporting in SROI evaluations to reach transparency, which often exceed the word limit of journals. On the other hand, the fact that most of these applications are not supervised under a peer-reviewed process may limit the reliability and validity of the method, which often lacks before and after evaluations or the inclusion of control groups, as discussed in previous reviews [4,11]. There was also diversity in the activities being evaluated, with most of them related to the impact of football (k=19). This wide application means that the outcomes measured often vary. Neither the *outcomes* nor the indicators or financial proxies were standardised between documents, meaning that it is often difficult to compare the findings of different SROI studies directly. There were two clearly distinguished SROI sport models. One developed by Davies et al. [12] and used in seven documents (11, 12, 13, 14, 15, 17, 39), and one developed by the Union of European Football Associations (UEFA) used in nine documents (48-56).

Social outcomes measured in relation to PAS

Regarding the *outcomes,* Health and Subjective Wellbeing were the most frequent categories (k=52 and k=49, respectively), both in the total sample as well as the high-quality subsample from sensitivity analyses (see TableS4), which reflects the stronger evidence of the impact of PAS in these *outcomes*. These categories were followed by Education (k=46), Social Capital (k=33), and Crime (k=28). These categories were created based on Davies et al. [12] model and the authors' expertise. Moreover, each of these were divided into different subcategories based on the similarity of the individual *outcomes* measured in each document. A more objective way to create categories could involve using previous consolidated theories defining each *outcome* category and their components (for example, psychological theories about wellbeing) or asking a panel of experts to reach agreement. Also, it is important to note that *outcomes* can be intermediate or final, which is specific in each evaluation. This is due to the fact that activities like PAS can start a chain of events, e.g. sporting activity in school leads to higher motivation in teenagers (intermediate outcome), which leads to better grades (final outcome). The present review aimed to give an overview of *all* the social impacts that have been measured in the literature regarding the participation in PAS. Therefore, it did not distinguish between intermediate and final *outcomes* (some examples are indicated as 'mixed outcomes (m)' in TableS1). However, when applying the SROI model, it is important that stakeholders distinguish in an Impact Map between intermediate and final *outcomes.* Otherwise, the impact of the same *outcome* could be double counted reaching an inflated, not accurate estimate [23]. The final toolkit resulting from this project will provide a guide for this process including a decision tree helping in the selection of *outcomes* depending on the project's context.

Indicators used to measure social outcomes

Regarding the *outcome indicators,* the high variability in the measurement methods led to the distinction of subcategories. Some of these showed a higher unified methodology than

others. For example, the most common subcategory was 'physical health' (k= 46) with a notable difference to the following ones, i.e., 'other impacts from improved education' (k= 35), and networks and relationships (k= 29). This could be due to the fact that health is the category with most scientific evidence accumulated in relation to the benefits of PAS [12,13] and that the health field is one of the few using common measures (such as DALYs and QALYs) in the evaluation of social value creation in comparison to, for example, education [10]. It is surprising, however, that only one document (24) used an objective measurement for health (food intake, height and weight) given that the combination of these tools with self-reports would help improve the validity of the results. Some other subcategories were included in only a few documents, e.g. 'trust' (within Social Capital) was included in five documents and 'motivation' (within Subjective Wellbeing) was included in four documents. Subjective Wellbeing was the most heterogeneous *outcome* with seven distinct subcategories, including an 'other outcomes' subcategories which was too diverse to be unified with one term. However, some Subjective Wellbeing subcategories showed homogeneous indicators such as 'life satisfaction' based on previous literature showing an association between sports participation and higher subjective wellbeing and health-related 'quality of life', measured in all cases by the questionnaires of the EuroQol Group [38]. Crime was not divided in subcategories given it was measured primarily in one way, i.e. reduced risk of criminal incidents and reduced risk of recidivism. There was also one indicator measuring reduction of anti-social behaviour. This reduced variety of measurement techniques makes easier the comparison of results.

An important consideration when choosing the *outcome indicators* is the scope of the evaluation. On the one hand, if the aim is to calculate the social value of PAS at the population level (e.g. national level), the data to calculate the impact will be taken from population-level evidence and secondary sources. For example, Study 11 aimed to estimate the social impact of sport in England in 2013/14, which necessitated the use of population-level indicators such as

"Sports participation reduces criminal incidents for males aged 10–24 years by 1%", "% of increase in educational attainment in children aged 11-18 who participate in sports", or "% of Risk reduction of coronary heart disease by participation in sport and exercise at moderate intensity in adults". This means having strong evidence from previous literature and the need to apply the evidence specific to the geographical context to make assumptions about populations. Of note, some population level studies make assumptions that are not based on population level evidence which can reduce the quality of evaluations. Also, in some *outcome* areas, there is no population level evidence available which makes very important to be transparent about the assumptions taken. Future research is needed in these *outcome* areas (for example, the relationship at the population level between PAS and different subcategories of Social Capital) for SROI analyses to become more robust in the field. On the other hand, if the aim is to calculate the impact of a specific program or activity, then, data should be collected directly from the stakeholders. For example, Study 24 aimed to evaluate the impact of "Physical Activity Schools" intervention and used indicators such as school data for educational attainment before and after the intervention, and the change on the EQ5D-Y questionnaire for children and parents before and after the intervention.

Valuation methods for social outcomes

Finally, in relation to *valuation methods*, there were several approaches used to value the different *outcomes* (see the Glossary in Supplementary Materials for a definition of each valuation method). 'Overall good health' was mostly valued using the annual NHS cost saving per person associated with improvements in self-reported good health [39]. It is important to mention that all studies measuring 'overall health' in the high-quality subsample were based on this approach or the value from the Social Value Bank, providing a potential consensus on how to value this outcome subcategory. There seems to be an agreement to value 'physical health' and 'mental health' using the cost per condition as a proxy. However, there is also variety within this approximation because health costs per condition can include direct, indirect, and informal

costs. Often SROI studies lack transparency in terms of what direct and indirect costs are included and others combine indirect and informal costs, again making comparisons difficult. Future SROI studies should specify which of those costs they are including for their calculations. Another commonality for the valuation of 'physical health' (but not 'mental health') was using the cost of exercising (swimming sessions, the cost of a bike, gym membership, the cost of a personal trainer, etc.). The rationale behind this choice is that physical exercise directly translates into physical health benefits. It is important to note that the predominance of these two valuation methods for 'physical health' was maintained in the high-quality subsample (36.8% used the cost of treatment and 31.6% used the cost of doing some type of exercise). Given the higher homogeneity in the Crime category, the valuation method in this case mostly involved the calculation of reduced risk of committing a crime or recidivism multiplied by the cost per criminal incident. However, it is necessary to adjust the cost depending on the type of incident prevented (e.g., reduced drug abuse, decreased anti-social behaviour, etc.). The challenge with the valuation of Crime is that it relies on evidence about its relationship with PAS participation which is very varied and often of a lower level of rigor compared to other outcome areas. Moreover, those studies using the 'cost of activity that could result in same outcome' approach did not follow an agreement, neither in the total sample of documents nor in the high-quality subsample (see Supplementary materials). Within the Education category, there were two main established methods to value 'Improved educational attainment', both of them based on previous literature. The first one used Organisation for Economic Co-operation and Development (OECD) studies showing the influence of a higher educational performance on a country's GDP [40]. The second one used Hayward, Hunt, and Lord's [41] estimations of return and lifetime productivity gains due to higher educational attainment. Similarly, 'other impacts from improved education' were mostly valued with the per capita cost of educational underachievement also based on OECD studies and Griffiths et

al.'s [42] estimation of average additional starting salary for graduates who are sports participants. Although both approaches are robust and supported by scientific evidence, the benefits of using the OECD calculations is that it is an international organisation, while the estimations of Hayward et al. [41] and Griffiths et al. [42] were based on the UK population. Also, the OECD maintains up-to-date online statistics relating education and earnings [43]. 'School absenteeism' was valued in all cases by estimating the cost of the absence. However, only one document in the high-quality sample included this outcome subcategory and specified using published proxy values. Future SROI studies measuring the impact of PAS on 'school absenteeism' should look for scientific studies estimating the cost of being absent at school adapted to the country or region of interest. 'Skills acquisition' was mostly valued with the cost of completing a course that would provide the development of the same skills acquired with the participation in PAS activities (e.g., improved leadership skills in PAS equated to the value of an outdoor leadership training course). Within the Subjective Wellbeing category, there was a standard to value 'general wellbeing' with the WTP approach asking participants to assign a monetary value on for an equivalent increase in their wellbeing to that driven by PAS, and 'life satisfaction' with the 'income compensation'/'wellbeing valuation' approach [36]. While the WTP offers a more subjective approach, the 'income compensation'/'wellbeing valuation' is based on population data. Strengths and limitations of both methods can be found in previous work [44–46]. 'Quality of life' was valued with different methods, finding no consensus in this case. 'Happiness' was mostly valued with the 'cost of activity that could result in same outcome' approach, finding the cost of holidays or trips as a usual proxy. 'Motivation' was only valued with the 'cost of activity that could result in same outcome' approach, but there was no similarity for the activities chosen in this case. 'Confidence and self-esteem' was mostly valued with the 'cost of activity that could result in same outcome' approach with the value of a training course (e.g., a self-esteem training course for young people) which would boost confidence and self-esteem

as the most common proxy, both in the total sample and the high-quality subsample of documents. Finally, within Social Capital, 'networks and relationships' was mostly valued with the cost of varied social activities which was consistent with the approach taken by the external sources Social Value Bank and Global Value Exchange. It would be necessary in this case to calculate these prices adjusted to the context and country of the study. There was no standard pattern to value 'sense of identity and belonging' neither in the total sample nor in the high-quality subsample of documents. 'Community engagement' and 'inclusion, integration and equality' were almost equally valued with the 'income compensation'/'wellbeing valuation' approach and the 'cost of an activity that could result in the same outcome' approach. Moreover, the activities chosen were related in both cases with doing a job for the community. This result could indicate that these two categories overlap and should be taken as one. Finally, 'trust' was valued with the 'income compensation'/'wellbeing valuation' approach. It is necessary to consider that not all documents provided information about the valuation approaches, thus presenting another challenge for comparing SROI studies and going against the quality criterion of transparency promoted by Social Value [19]. Although, one of the reasons this information may be omitted is due to the confidentiality of data and the commercial nature of SROI research, the development of the SROI literature would benefit from the inclusion of the details about measurement and valuation in all published documents. In relation to this, social value banks are useful tools when conducting a SROI, but there is need of higher clarity regarding the calculations of the proxies.

Limitations

This review has several limitations. First, of the 55 studies included in this review, just eight were scientific articles, while 47 were reports nonpublished in peer-reviewed journals. Moreover, most studies were cross-sectional and all of them based their methods on self-report measures. These results limit the interpretation of the findings and make it difficult to talk about

causal relationships. Therefore, there is a need to improve the methodological quality in the application of SROI studies. Despite this, none of the documents met less than 20% of the quality criteria according to the Drummond checklist, although future studies on SROI could benefit from the use of Krlev's framework, used in previous reviews of SROI studies [11].

Second, the search strategy did not include conference proceedings or non-English language articles, which might have left out some relevant documents. However, the present systematic review still adds several records to the previous one [11].

Finally, there was a high level of heterogeneity regarding the aims, *outcomes*, indicators, and financial proxies used in the different documents, which makes it difficult to synthesise the findings and reach robust conclusions. This is a caveat in the practical implementation of the method, for example, by organisations or policymakers.

Conclusions

Despite its limitations, this study makes a significant contribution to synthesising knowledge on SROI studies and PAS. It not only updates the previous systematic review in the area [11], but it widens the scope identifying the *outcomes*, the indicators (measurement methods) and financial proxies (valuation methods) used in the literature.

This review is part of a wider project which aims to develop a Global Consensus Statement on the measurement of social value and PAS. It will inform a Delphi study to reach experts' consensus on the definition of social value and how to apply the SROI methodology. The present review is the first step to understand which are the social benefits that are being measured globally, and organise the details on how to measure and value them. This exercise is essential to then discuss the different alternatives and reach the best available solution in each area of knowledge. In the context of scarce resources and competing priorities, the SROI approach can be a 'game-changer' helping in the decision-making processes of investment, and subsequent management of resources. This review provides quantitative, scientific base

evidence of the different benefits that PAS participation can bring at national, regional and local levels. It establishes the base to design an open, available guide on how to conduct a SROI, which will solve application problems such as lack of training [47], dependency on external consultants [23], and the lack of public availability to learn and compare outcomes [6]. This will promote the wider use of the SROI as a tool to evidence the benefits of PAS and to justify the investment on these activities.

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EuropeActive team is fully committed to consulting and working with the different mentioned stakeholders, including other NGOs promoting health-enhancing physical activity, sector media and research and scientific institutions. EuropeActive aims to co-operate with the European Union and other international organisations to achieve its objective to get more people, more active, more often.

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Tables

Table 1. Review questions framed by PICO (participants, interventions, comparators, and outcomes).

PICO framework	
Participants	Any group of people or organisation involved in a PAS activity (intervention, program, association…).
Interventions	Any activity with PAS as the main component and evaluated under the SROI model.
Comparators	None
Outcomes	Impacts of the PAS activity (health, education, crime…) translated into monetary terms.

Table 2. Outcome categories and subcategories included in the studies of the systematic review.

Category	Subcategory
Health	Physical health
	Mental health
	Other impacts from improved health.
Crime	*No subcategories specified*
Education	Improved educational attainment
	School absenteeism
	Skills acquisition
	Other impacts from improved education
Subjective wellbeing	General wellbeing
	Quality of life
	Life satisfaction
	Happiness
	Motivation
	Confidence and self-esteem
	Other
Social capital	Networks and relationships

	Sense of identity and belonging
	Community engagement
	Inclusion, integration and equality
	Trust
Other	Environment
	Community benefits
	Leisure
	Image improvement
	New partnerships

Table 3. Valuation methods of the different Health outcomes.

Health outcome	Valuation methods	Study ID
Overall	'Good health' = number of sports participants * annual NHS cost saving/person associated with improvements in self-reported good health, based on Fujiwara, D., Kudrna, L., and Dolan, P. (2014). Quantifying the Social Impacts of Culture and Sport.	11, 12, 13, 15, 17, 39
	Social Value Bank (based on the Wellbeing Valuation Approach, Trotter et al., 2014[37])	25, 42
	NICE method to measure the cost-effectiveness of new drugs	46
Physical	Cost of treatment/condition * number of sports participants with reduced risk of developing the health condition due to sport	11, 12, 13, 14, 15, 17, 39, 48-56
	Cost of treatment/medication/GP visit	1, 2 ,6
	Cost of activity that could result in same outcome, e.g., Improved physical fitness = cost of a swimming session * duration of activity	2, 6, 8, 9, 10, 18, 19, 28, 36, 37

	Willingness to pay approach	18, 43
	Social Value Bank	26, 33
	Global Value Exchange	34
	SQW report	30
	NICE method to measure the cost-effectiveness of new drugs	29
	Australian Government's Value of a Statistical Year of Life	47
	Ecorys study	41
Mental	Cost of treatment, e.g., Depression = number of potential cases averted among the physically active population * average annual cost per person diagnosed	1, 14, 15, 39, 48-56
	'Cost of activity that could result in same outcome, e.g., Reduced stress = personal stress and anger management short study course	2, 19, 23, 28
	Willingness to pay approach	12, 19
	Social Value Bank	26
	ACIL Allen's SROI framework	38
	Australian Government's Value of a Statistical Year of Life	47
Other impacts from improved health	*Reduced sick leave outcomes*:	
	Average GVA per day per worker; Average cost of membership (£ per annum on direct debit) 216 Average cost of alternative membership	2
	GVA impact due to the early return to employment; Alternative or cheaper sourcing method.	3
	Friction cost method	24
	Ecorys study	41
	Produtivity outcomes:	
	ACIL Allen's in-house Input-Output modelling framework	38
	Ecorys study	41
	Gross State Product per Hour Worked; Value of employment set at the rate of average weekly earnings for the relevant year.	47

Healthcare-related outcomes:	
Unit cost of approved social worker (ASW) for community social care	1
Annual savings per beneficiary or intervention and Average cost of	2
membership	3
Cost saving per patient	4
Direct NHS costs of treating COPD and the lost days of productivity	6
Average cost of a visit to a GP surgery; Cost of an average generic prescription	
medication to the NHS	8
Cost of drugs and Average cost of home care per annum	12
Average NHS cost per person multiplied by the percentage reduction in	
medical service usage reported by people in good health.	24
Costs of medication	25
Unit cost of a GP appointment	26
Costs per visit	29
Direct costs of obesity to the NHS	37
Average cost of medication reduced; Cost of a hospital stay (one night)	38
ACIL Allen's in-house Input-Output modelling framework	41
Ecorys study	46
Unit cost of GP consultation	47
Cost saving per participant (Based on Ding et al., 2016)	

Notes: only those studies reporting the details for the valuation procedure are included in this table. Mixed outcomes (m) were excluded from the table given that it was not possible to distinguish which outcome belonged to which valuation method; SQW is an independent economics consultancy which provides research, analysis and advice in social and economic development.

Table 4. Valuation methods of the different Crime outcomes.

Crime outcomes	Valuation methods	Study ID
Reduced risk of crime (based on criminal incidents for males aged 10-24 and % reduction due to PAS)	Average national cost per incident	11, 12, 13, 15, 17, 39
Reduced risk of crime (number of players * risk of condition * effect on risk from participation * inactivity rate)	Cost of conviction	48-56
Reduction of incidents	Cost per incident, e.g., Number of fewer young people no longer involved in illegal activity due to PAS * average cost savings from dealing with a young first-time offender through warnings and cautions	2, 10, 28
Reduced risk of recidivism (based on estimates of the rate of incarceration, rate of prisoner release per annum, and data on the national average rate of recidivism) *50% reduction of risk due to PAS	Average prison stay * cost/day of prison	47
Reduced risk of recidivism	Social value Bank estimate * (% of national reoffending rate - % reoffending rate for those involved in sport * number of prisoners involved in activity)	33

	Cost of activity that could result in same outcome, e.g., Safer and more positive environments= Average family spend on sports/leisure	1, 9, 10, 28
	Willingness to pay approach to value the 'Improved feeling of security within the site as it is busier'	9
Antisocial behaviour (Number of beneficiaries * % estimated reduction in antisocial behaviour)	Savings from preventing anti-social behaviour	30
Annual number of crime reports before intervention * % Reduction in incidents post intervention	Cost per alternative intervention by other agencies - % of benefits due to program	2
Proven offences in previous year * % of reduction of proven offences	Cost of a police officer	28
Crime and personal safety benefits	ACIL Allen's SROI framework	38
Lower chance of showing criminal behaviour (juvenile)	Ecorys study	41

Notes: only those studies reporting the details for the valuation procedure are included in this table. Mixed outcomes (m) were excluded from the table given that it was not possible to distinguish which outcome belonged to which valuation method.

Table 5. Valuation methods of the different Education outcomes.

Education outcomes	Valuation methods	Study ID
Improved educational attainment	Number of additional active participants aged 16 and 18 with formal qualifications (GCSEs and A-levels) * 1% increase in educational attainments (aged 11-18) (based on literature; Davies et al., 2019) * Average annual lifetime productivity returns (based on Hayward et al., 2014)	11, 12, 13, 15, 17, 39
	Number of players 13-18 years old * improvement in educational performance * value of education driven GDP growth* inactivity rate / 80 years (based on OECD studies to calculate the likely effect of a lift in educational performance on a country's GDP, discounted to create a per capita, annualised value which was applied to school-age players)	48-56
	'Cost of an activity that could result in the same outcome' approach = Cost of an educator for psychoeducational support	23
	Ecorys study	41
School absenteeism	Number of players 13-18 years old * risk of absence * effect on risk from participation * inactivity rate* cost of absence	48-56
	School absenteeism days * standard cost of school absenteeism	24
Skills acquisition	Cost of activity that could result in same outcome approach, e.g. Increased leadership skills = cost of an outdoor leadership training course	9, 19, 23, 28, 35, 45
	Lower NICE threshold of £20,000 as the value of a QALY	29
	Willingness to pay approach	42, 43
	ACIL Allen's SROI framework	38
Other impacts from improved education	Cost of activity that could result in same outcome approach, e.g., Improved career prospects = cost of UK's Goals for Young People training course	9, 18, 27, 28, 30, 32, 35, 45
	Human capital = Number of final year students in Higher Education doing sport * % increase in salary per year of students participating in PAS* average	11, 12, 13, 15, 17, 39

additional starting salary for graduates who are sports participants (based on Hayward et al., 2014).	
Employment to population ratio for the working age population (15-64 years old) * % boost * average weekly earnings over an average working life of 43 years - % per annum (uncertainty of future estimate)	47
Reduction in risk of becoming a NEET= Number of participants * risk of educational underachievement * effect on risk from participation * inactivity rate * per capita cost of educational underachievement	48-56
Social Value Bank	33
Global Value Exchange	34
WTP	43

Notes: only those studies reporting the details for the valuation procedure are included in this table. Mixed outcomes (m) were excluded from the table given that it was not possible to distinguish which outcome belonged to which valuation method.

Table 6. Valuation methods of the different Subjective Wellbeing outcomes.

SWB outcomes	Valuation methods	Study ID
General wellbeing	Willingness to pay approach	48-55
	Global Value Exchange: According to the GVE evidence shows that membership of a sports club has the same impact on individual well-being as an increase in income of £3,600 per year	1
	Income compensation/wellbeing valuation approach: doing sport at least once a week generates SWB equated by individuals to an equivalent of £11000 p.a. increase in their salary (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/71231/CASE-supersummaryFINAL-19-July2010.pdf)	28
	ACIL Allen's SROI framework	38
	Average rate of value placed on an additional unit of participation in organised sport derived by the UK Culture and Sport Evidence programme	47
Quality of life	Cost of activity that could result in the same outcome approach, i.e., Increased quality of life = Amount of budget the individual needs to invest in to achieve the same change	18
	Health-Related Quality of Life = Quality-adjusted life years (QALYs) = time in a certain health state * utility value	24
	Social Value Calculator: Good overall health	25
	Social Value Bank: Health-related quality of life= sense of belonging Social Value Bank value	26
	ACIL Allen's in-house Input-Output modelling framework	38
	Ecorys study	41
Life satisfaction	Income compensation/wellbeing valuation approach based on Fujiwara, Kudrna, and Dolan (2014) [36]	11, 12, 13,

		14, 15, 17, 39
	-Cost of activity that could result in same outcome' approach, i.e., Established positive values and outlook on life= Baseball Project Accommodation costs and Baseball summer camp expenses -Willingness to pay approach	18
	Lower NICE threshold of £20,000 as the value of a QALY	29
Happiness	Cost of activity that could result in same outcome' approach, e.g., Feel happier and positive= spend on social trips out	8, 37
	Income compensation/wellbeing valuation approach based on Fujiwara, Kudrna, and Dolan (2014) [36]	14
Motivation	Cost of activity that could result in same outcome approach, e.g., Development of children's exercise motivation =Average price for children's private sport program	6, 27, 35
Confidence and self-esteem	Cost of activity that could result in same outcome' approach, e.g., cost of a course aimed to boost confidence of self-esteem	8, 9, 10, 18, 23, 30, 32, 36, 37
	Income compensation/wellbeing valuation approach (Fujiwara, Kudrna, and Dolan, 2014)	14, 39
	Willingness to pay approach and -Well-being Valuation Method	43
	Social Value Bank	25, 26,

	33
Global Value Exchange	34
Lower NICE threshold of £20,000 as the value of a QALY	29

Notes: only those studies reporting the details for the valuation procedure are included in this table. Mixed outcomes (m) were excluded from the table given that it was not possible to distinguish which outcome belonged to which valuation method.

Table 7. Valuation methods of the different Social Capital outcomes.

Social capital outcomes	Valuation methods	Study ID
Networks and relationships	Cost of an activity that could result in the same outcome' approach, e.g., Strengthened family bonds=Family activity expenses	8 ,10, 18, 23, 28, 35, 37, 45
	Willingness to pay approach	18, 19
	Income compensation/wellbeing valuation approach	15, 39
	Global Value Exchange: Average spending on social interaction (from SROI report by Social value lab)	1
	Social Value Bank: HACT Social Value Calculator v4: Member of a social group	25
	Lower NICE threshold of £20,000 as the value of a QALY	29
	Value from previous literature (Nattavudh Powdthavee, 2008. Putting a price tag on relatives, friends and neighbours: Using surveys of life satisfaction to value social relationships, *The Journal of Socio-Economics*, 37,1459-1480)	42
	ACIL Allen's SROI framework	38
	Ecorys study	41
Sense of identity and belonging	Cost of an activity that could result in the same outcome' approach, e.g., Sense of belonging = Membership of a social group	9, 18, 37, 42
	Willingness to pay approach	18, 43
Community engagement	Cost of an activity that could result in the same outcome' approach, e.g., Improved sense of doing something for my community = bonus payment or honorarium for doing a good job	1, 28
	Income compensation/wellbeing valuation approach	14

Inclusion, integration and equality	Cost of an activity that could result in the same outcome' approach, e.g., Empowerment and equality = 1 month participation fee of Soccer Winter School	35
	Income compensation/wellbeing valuation approach	14, 39
	Global Value Exchange: Greater integration of social, sport and special interest groups = Cost of time spent collaborating	1
Trust	Income compensation/wellbeing valuation approach	14, 15

Notes: only those studies reporting the details of the valuation procedure are included in this table. Mixed outcomes (m) were excluded from the table given that it was not possible to distinguish which outcome belonged to which valuation method.