

Places, spaces, people and wellbeing: full review



A systematic review of interventions to boost social relations through improvements in community infrastructure (places and spaces)

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The review advisors were involved at the following stages/undertook the following tasks:

- Invited to discuss and comment on the protocol
 - o Discussed and clarified the protocol, particularly in relation to inclusion criteria;
 - o Commented on the relevance of the systematic review to current policy, placing the academic exercise into the bigger picture.
- Input at the sifting stage to comment on included evidence:
 - o Informed the review team of studies, particularly from grey literature, that had been missed and could be included;
 - o Knew whether the traditional published literature was missing important content around current issues;
 - o Discussed any difficult queries about selection criteria;
 - o Discussed any decision rules for treatment of evidence that formally met the inclusion criteria but lacks policy relevance.

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Executive Summary

Background

During extensive stakeholder engagement, the Community Wellbeing Evidence Programme identified priority policy-related topics within which evidence reviews were to be undertaken. One of the topics identified was the role of boosting social relations between people in communities, as a key ingredient of both individual and community wellbeing. It was recognised that ways of boosting social relations could involve formal and informal meeting and “bumping” spaces and places, community-based structures and organisations, and community-based interventions.

A subsequent scoping review of 34 reviews on the topic of “boosting social relations” identified evidence gaps relating to the outcome of community wellbeing in the following topic areas:

- community infrastructure (places and spaces);
- interventions to reduce or prevent social isolation in adults younger than 60 years;
- community engagement and volunteering;
- social network analyses.

The WWCW Communities Evidence Programme Consortium discussed these topics and chose “community infrastructure (places and spaces)” to be developed as a full systematic review, as it was felt to be something that can be addressed at a local or regional level and thus has potential to produce immediate practical impact.

Results

Literature search: 51 publications were included in the review, grouped into one or more intervention categories as follows:

- Community hubs (n=11)
- Events (n=9)
- Local neighbourhood design (n=16)
- Green & blue space (n=14)
- Place-making (n=9)
- Alternative use of space (n=11)
- Urban regeneration (n=11)
- Community development (n=7)

Summary of key findings:

Fifty-one studies were found that looked at social relations, community wellbeing or individual wellbeing outcomes across eight intervention categories: community hubs; events; local neighbourhood design; green and blue space; place-making; alternative use of space; urban regeneration; and community development. Most of the evidence was of poor, or poor to moderate quality. The better quality evidence was qualitative in nature, and most of the review's findings therefore come from the thematic synthesis of qualitative evidence, supplemented by quantitative evidence where applicable.

The review found MODERATE evidence that community hubs may promote social cohesion through the mixing of different social or age/ generational groups, increase social capital and build trust between people in communities, increase wider social networks and interaction between community members, and increase individual's knowledge or skills.

The review found MODERATE evidence that changes to neighbourhood design may positively affect sense of belonging and pride in a community.

The review found MODERATE evidence that green and blue space interventions that provide the opportunity to participate in activities or meetings improve social interactions, increase social networks, and bonding and bridging social capital, increase physical activity and healthy eating, and improve community members' skills and knowledge

The review also found evidence from qualitative studies that place and space interventions can have potentially negative effects in terms of some residents feeling excluded, particularly in relation to events that target or celebrate particular groups.

The review found evidence that place and space interventions that provide a focal point or a targeted group activity may be useful in (a) promoting social cohesion between different groups and (b) overcoming barriers that prevent some people in marginalised groups from taking part in *e.g.* physical activity.

The qualitative synthesis of process outcomes identified some key strategies for success when implementing community infrastructure changes to place or space, which included: accessibility; a comfortable, friendly and safe environment; involvement of community members in organisation and planning of community infrastructure changes; involvement of skilled facilitators; flexibility; providing a focal point or reason to interact; avoiding exclusion; looking at longer term outcomes and sustainability; and involving volunteers.

Conclusions

The review found moderate evidence that a range of intervention approaches to community infrastructure can be used to boost social relations and wellbeing in a community, giving stakeholders a range of options. As the evidence currently stands, we cannot say which approach is most effective, as studies have not compared one approach to another, so we cannot make strong recommendations for one approach over another.

The review did find promising evidence about ways of doing things that are more likely to lead to success, and ways of doing things that are probably not helpful. These facilitators and barriers to success were common themes across all the intervention approaches.

Implications for policy and practice:

Policy makers and commissioners who are considering an intervention to boost social relations in a community or a place need to be aware that:

- Most of the included studies in this review, across all intervention approaches, are relevant and transferable to UK settings.
- Changes to places and spaces need to be accessible in terms of physical, attitudinal, cultural, financial, transport and location barriers (evidence from thematic synthesis of qualitative studies).
- Community members should have the opportunity to be involved in organization and planning of changes to places and spaces (evidence from thematic synthesis of qualitative studies).
- Some changes, particularly those intended to celebrate a local community, may have the potential to leave some community members feeling excluded (evidence from thematic synthesis of qualitative studies).
- It is important to look at outcomes in the long term, and sustainability (evidence from thematic synthesis of qualitative studies).
- Changes which involve a group based activity or other reason to interact may be more successful at removing barriers to participation for marginalised groups (evidence from thematic synthesis of qualitative studies).

Community groups, leaders and members need to think about:

- Providing an accessible, comfortable, safe and friendly environment (evidence from thematic synthesis of qualitative studies)
- Removing barriers to inclusion/ actively reaching out to the wider community, particularly when changes are designed to celebrate a particular section of the community (evidence from thematic synthesis of qualitative studies)
- Involve skilled facilitators to ensure that all sectors of the community are represented and consensus can be reached (evidence from thematic synthesis of qualitative studies)
- Consider involving volunteers as a mechanism to enhance long term sustainability (evidence from thematic synthesis of qualitative studies)

Evidence gaps and implications for research: More high quality evaluations of interventions implemented in the UK (or that may be implemented in the UK in the future) are needed. In order to strengthen the evidence base, when a new community infrastructure intervention for boosting social relations is commissioned or introduced, it should be rigorously evaluated using robust methodology. Quantitative evaluations ideally should use repeated measures and a comparator group, and use validated tools to measure outcomes. Qualitative studies should use robust and credible methods for sampling, collecting and analysing data. Good quality evidence with regard to social relations and wellbeing outcomes is particularly lacking in the following categories: events; place-making; alternative use of space; urban regeneration and community development.

Methods

We searched 11 bibliographic databases, performed reference and citation checking and searched the websites of relevant organisations. We also issued a call for evidence through the What Works Centre for Wellbeing (WWCW).

Inclusion criteria: We included literature relating to community infrastructure: places and spaces for any community. We focused on evidence for adults (loosely defined as aged between 16 and 65). We included any interventions (formal or informal) which were designed to improve, or make better or alternative use of, community infrastructure: physical places and spaces (for example, general urban redesign; interventions such as lighting and benches in open public spaces; children's play places; or funding to host community activities in places such as libraries or faith settings). We focused on interventions that apply at community or neighbourhood level (*e.g.* a town market),

rather than city or national level (e.g. Leeds art gallery). Studies were excluded if they were not related to a specified intervention, or if they examined a virtual (not physical) space. We adopted a broad perspective on the outcomes to be included in the review and included studies which reported any outcome relating to social relations, community wellbeing and related concepts such as social capital and social trust. This includes quantitative (measured), and qualitative (views and perceived) outcomes. While our primary focus was on outcomes at a community level, we also included individual level health and wellbeing outcomes, which can be linked to community wellbeing (see Theory of Change, South et al. 2017). As many of the desired outcomes would only be evident in the long term, we also looked for proxy measures along proposed pathways to change. We included quantitative and mixed methods studies which used experimental designs, and also process evaluations and qualitative studies, published in English, from 1997 – 2017.

Study selection and data extraction: All titles and abstracts were screened by one reviewer with a random subset (of 20%) of the titles and abstracts being screened by a second reviewer. Final decisions on inclusion/exclusion based on full-text documents were made by two reviewers. Queries were resolved by discussion among the review team. Included studies were imported into specialist systematic review software (EPPI-Reviewer 4) for data extraction using a pre-designed template. Data were extracted by one reviewer with a 20% sample being checked by a second reviewer.

Study quality assessment: Quality of included studies was assessed using checklists for quantitative and qualitative studies recommended in the WWCW Methods Guide. Quality was assessed by one reviewer and checked by a second reviewer for all included studies.

Data synthesis: The database and grey literature searches identified 21,262 and 93 records, respectively. This resulted in 51 included studies. These were grouped into clusters based on the intervention category they were addressing. A narrative synthesis of the findings was produced for each category. The GRADE (Grading of Recommendations, Assessment, Development and Evaluation) approach was used to rate the overall strength of evidence for wellbeing outcomes for quantitative studies, and the CERQual (Confidence in the Evidence from Reviews of Qualitative Research) approach was used for qualitative studies.

Introduction

1.1 Background

This report was commissioned by the What Works Centre for Wellbeing (WWCW). The WWCW is part of a network of What Works Centres: an initiative that aims to improve the way the government and other organisations create, share and use high quality evidence for decision-making. The WWCW aims to understand what governments, businesses, communities and individuals can do to improve wellbeing. They seek to create a bridge between knowledge and action, with the aim of improving quality of life in the UK. This work forms part of the WWCW **Community Wellbeing Evidence Programme**, whose remit is to explore evidence on the factors that determine community wellbeing, including the impacts of interventions.

During extensive stakeholder engagement (in workshops, an on-line questionnaire, community sounding boards, and one-to-one interviews), the Community Wellbeing Evidence Programme identified priority, policy-related topics within which evidence reviews were to be undertaken. One of the priority topics identified was the role of boosting social relations between people in communities, as a key ingredient of both individual and community wellbeing. It was recognised that ways of boosting social relations could involve formal and informal meeting and “bumping” spaces and places, community-based structures and organisations, and community-based interventions (Community Wellbeing Evidence Programme 2015).

A subsequent scoping review of 34 reviews on the topic of “boosting social relations” (Bagnall et al. 2017a) identified evidence gaps (that is, a number of primary studies which did not seem to have been combined in a systematic review) relating to the outcome of community wellbeing in the following topic areas:

- community infrastructure (places and spaces);
- interventions to reduce or prevent social isolation in adults younger than 60 years;
- community engagement and volunteering;
- social network analyses.

The WWCW Communities Evidence Programme Consortium discussed these topics and chose “community infrastructure (places and spaces)” to be developed as a full systematic review, as it was felt to be something that can be addressed at a local or regional level and thus has potential to produce immediate practical impact. Also impacting on the decision, it was noted that Buonfino and Hilder (2006) identified “neighbouring and spaces for interaction” as a future research priority, while

the Legatum report on wellbeing and policy (O'Donnell et al. 2014) highlighted evidence of links between the physical environment and social relationships and the potential for policy action, referencing a “magic formula” of having easy opportunities for social interaction but retaining the ability to choose when, who, and where we meet (Halpern 1995). Also in 2014, the All Party Parliamentary Group on Wellbeing economics identified building high wellbeing places as one of four policy priorities, including “ensuring that town centres are sociable and inclusive spaces which are accessible for all sections of the community” (Berry 2014).

1.2 Purpose of the systematic review, and place within the programme

This systematic review forms part of a series of three evidence synthesis projects which explore the relationship between interventions to boost social relations, and community wellbeing. It follows on from a *Stage 1* ‘scoping’ review of existing review-level evidence conducted to identify the strengths, weaknesses, and gaps in the current evidence base (Bagnall et al 2017a). This more in-depth, **stage two** systematic review sought to locate, evaluate, and synthesise evidence from existing primary level studies on the impacts of interventions designed to boost social relations through improved community infrastructure (places and spaces) on community wellbeing, and related concepts such as social capital. See Box 1 for further information on the stages of evidence synthesis for this project.

Box 1: Stages of evidence synthesis (Communities Evidence Programme)

Stage 1: Scoping review to identify the current state of review level evidence on the key community wellbeing topic areas identified during initial stakeholder and end user engagement exercises. The scoping reviews are designed to identify the strengths and weaknesses in existing knowledge and current gaps in the evidence base. Findings from the scoping review are then used as the basis for identifying priority areas for research during systematic reviews.

Stage 2: Systematic review of priority areas for research into the community wellbeing impacts of specific interventions, or gaps in the existing evidence on the impacts of interventions, identified during the scoping review. The systematic review examines the evidence from primary studies of interventions.

Stage 3: Based on the findings of stages 1 and 2, identification of a ‘roadmap’ for future academic research and ‘frontline’ evaluation of interventions.

1.3 Summary of Stage 1 scoping review: “What works to boost social relations?”

In Stage 1, a rapid scoping review of reviews was carried out to identify existing reviews of interventions, actions, and policies that have “boosting social relations” (or proxy measures) as an intended outcome, in order to identify existing knowledge and identify evidence gaps to be potentially filled in Stage 2 (Bagnall et al. 2017a).

We searched databases of systematic reviews and of primary studies (DARE, Cochrane Database of Systematic Reviews, Campbell Library, DoPHER, MEDLINE, IDOX, CINAHL, PsycINFO, Academic Search Complete) from 2005 to 2015, with forward and backward citation searching of identified relevant studies, searches of relevant websites and liaison with topic experts. 11,257 titles and abstract were screened, and 34 reviews were included in the scoping review. These included both systematic and non-systematic reviews that examined community-based interventions or changes in policy, organisation or environment that were designed to boost social relations within a community, and measured community-level outcomes.

A number of recommendations were made about what works, including:

- Create good neighbourhood design and maintenance of physical spaces such as good meeting places, public parks, safe and pleasant public spaces, public seating, accessible and walkable spaces, and local shops.
- Support mixed populations – in terms of income, ethnicity and so on – in new neighbourhood developments.
- Increase the number of local events such as car boot sales, markets, and street parties.
- Create ways for local people to share information such as notice boards or email groups.
- Provide greater opportunities for residents to influence decisions affecting their neighbourhoods and encouraging engagement.

We also found evidence suggesting that it is better to encourage local understanding and action. than to try to improve neighbourliness through large-scale policies (Buonfino and Hilder 2006).

We found the following evidence gaps:

- *Interventions to reduce/ prevent social isolation in adults younger than 60 years (mirroring the older people’s literature).* There are already several systematic reviews looking at interventions for social isolation and/ or loneliness in older people, but we did not find any

that look at it in relation to people aged 25-60 years. If we are taking a life course approach, it would be sensible to look at interventions to prevent social isolation and loneliness in childhood and adulthood, as these may also be more effective in preventing it in older age. Courtin and Knapp recommend better understanding of the causal pathways through which isolation and loneliness affect health and wellbeing. Durcan et al. point to an opportunity for local areas to assess and evaluate existing services' potential impact on social connectivity and social isolation of at-risk groups.

- *Community engagement (including, or with a focus on volunteering)*. If primary studies report on community level wellbeing (as well as the individual level outcomes reported in systematic reviews) there is potential for further investigation of the community engagement literature with regard to community wellbeing outcomes. Given the strong emphasis in the Legatum report (O'Donnell et al. 2014) on Wellbeing and Policy on volunteering as a driving force in community wellbeing, and feedback from the consortium steering group that this would be a relevant and interesting topic. There may be scope for a systematic review of volunteering in adults (there are already systematic reviews of volunteering in older people), or of interventions to promote volunteering, linked to community wellbeing and social relations outcomes.
- *Social network analyses*. There seems to be an emerging literature on social network analyses, which may be worth combining in a systematic review if they relate to particular interventions. Collin et al. (2011) proposed more targeted research to ensure specific emerging practices in social network studies are properly understood.
- *Community infrastructure: places and spaces (e.g. libraries, churches, pubs, parks etc.)*. We did not find any systematic reviews of how community places or spaces affect social relations, but our understanding is that there is enough primary research literature to make this a worthwhile topic for review. Buonfino and Hilder (2006) identified "neighbouring and spaces for interaction" as a future research priority. The Legatum report on wellbeing and policy (O'Donnell et al. 2014) highlights evidence of links between the physical environment and social relationships, and references a "magic formula" of having easy opportunities for social interaction but retaining the ability to choose when, who, and where we meet (Halpern 1995). "Bumping spaces" were identified as a priority theme in our collaborative development phase, and our Communities Evidence Programme consortium steering group advised that this is something which local authorities can address and so can have immediate impact. Therefore this is the recommended first choice for the Stage 2 systematic review.

1.4 Definitions and concepts

The scope of this review includes a number of multifaceted terms that can be understood in different ways; ‘community’, ‘community wellbeing’, ‘social relations’, and ‘community infrastructure’.

Community

The notion of ‘community’ is both a widely used term and also a contested concept that is subject to interpretation in practice and through theory (Jewkes and Murcott 1996). Indeed, Hillery found as early as the 1950’s, at least 94 different definitions of ‘community’ (Hillery 1955). Despite a still ongoing open debate, the literature has shown some agreement around the main elements constituting a community, which are shared interests and/or needs that take place within a specific geographic location (idem). In that regard, Agudelo (1983), defines community *“as a group of people residing in a specified geographic area who have common values, cultural patterns, and social problems, together with an awareness of belonging to the group that causes them to interact more intensely with one another than they would with outsiders in a similar context”* (p. 376).

Our definition of ‘community’ is that used by the National Institute of Health and Care Excellence (NICE 2016), which covers the three main characteristics of community highlighted in the literature:

“a group of people who have common characteristics or interests. Communities can be defined by: geographical location, race, ethnicity, age, occupation, a shared interest or affinity (such as religion and faith) or other common bonds, such as health need or disadvantage.”

In fact, we chose this definition since it recognises the multifaceted nature of community by taking into account both its geographical and interest/need nature. Given our broader interest in identifying ‘what works?’ for spaces and places, we are focusing on place-based community infrastructures, although this may serve to include both communities defined by geography and communities defined by identity or interest.

Community wellbeing

‘Wellbeing’ is an increasingly pertinent measure of how successfully individuals, communities, and nations are performing. Whilst there are many well-known and widely used measures and scales of wellbeing at an individual level, at a community level wellbeing is less well defined.

'Community Wellbeing' is a broad and variegated concept, whose complexity has been sometimes only partially captured. For instance, some definitions of community wellbeing focus only on the functional aspects of the environment; for example, Chanan (2002) defines community wellbeing as how well a locality is functioning, how well it is governed, how well services are operating, and how safe and pleasant it feels to live there. Others are limited to either specific aspects such as the economy (McHardy and O'Sullivan 2004; Allensworth and Rochin 1996) or to the individual satisfaction of its members with different needs (Prilleltensky and Prilleltensky, 2006).

In order to systematise the various definitions produced so far by the literature, Lee and Kim (2015) have developed a framework, which features partial/comprehensive definitions on the x-axis and individual/collective definitions on the y-axis. According to the authors, the most holistic approaches are the ones that combine both individual and collective with comprehensive elements of community well-being. Among these, the Nuclear Waste Management Organization (NWMO) of Canada (2009) defines community wellbeing as:

"Combination of abstract ideas and human actions...Concepts of community well-being may reflect the interests of individuals within a community and they may also reflect the interests of the collective of community interests. Concepts of well-being may encompass social, economic, spiritual and cultural factors, as well as individual health and security"

Within the WWCW Communities Evidence Consortium, 'community wellbeing' is understood as being something additional and distinct from individual wellbeing, as it concerns relational aspects between groups of people, such as social networks, trust and reciprocity, power and control (Prilleltensky 2012). In the collaborative development phase of the WWCW Communities Evidence Programme, the preferred definition of community wellbeing chosen by survey respondents was:

"about strong networks of relationships and support between people in a community, both in close relationships and friendships, and between neighbours and acquaintances"

(Communities Evidence Programme 2015)

Drawing on a conceptual review of the literature (Atkinson et al. 2017), the Communities Evidence Programme have chosen this this broad, working definition to guide our thinking:

‘Community wellbeing is the combination of social, economic, environmental, cultural, and political conditions identified by individuals and their communities as essential for them to flourish and fulfil their potential.’ [Wiseman and Brasher 2008: 358]

This is recognized by Lee and Kim (2015) as one of the most holistic conceptualisations of community wellbeing. Moreover, we believe it is a very general and broad working definition, which may cover a variety of measures and concepts defined in different ways across different academic disciplines or governmental departments. In this regard, the Communities Evidence Programme has recently released a schematic description of this concept (Figure 1, also available at:

https://www.whatworkswellbeing.org/blog/what-is-community-wellbeing/?mc_cid=53cf82ad99&mc_eid=fa077fdc1f)



Figure 1: Concept of community wellbeing (from Atkinson et al. 2017)

As the term ‘community wellbeing’ may not be widely used we will include studies of similar concepts such as ‘social capital’ and ‘social cohesion’, ‘social inclusion’, ‘community resilience’ (Elliot et al. 2013), as we did for the scoping review of reviews (Bagnall et al. 2017a).

In terms of measuring community wellbeing, there may be many proxy indicators used to describe it, ranging from:

- whole area indicators (some based on population data, such as certain aspects of health, and some not, such as access to green space), to
- instruments (usually based on local sample survey data) that seek to measure aspects of social capital (such as trust or levels of crime), to
- aggregate scores of individual wellbeing across a geographic area (such as the ONS ANS survey indicators of self-reported wellbeing).

A rapid review of indicators, frameworks and measures of community wellbeing (and proxies for community wellbeing) used by UK governmental and non-governmental agencies in the last 5 years found forty-three measures or indicators of community wellbeing that are currently or recently in use in the UK (Bagnall et al. 2017b). These include indicator frameworks or sets favoured by governmental bodies, and conceptual frameworks and validated measures/scales more commonly employed by academic institutions.

Social relations

Social relations are recognised by the scientific literature and government practice as an important determinant of both individual and community wellbeing. The Office of National Statistics, for example, has included ‘social relations’ among the ten key domains of national wellbeing on the basis that:

“Good social relationships and connections with people around us are vitally important to individual well-being. This is important to national well-being because the strength of these relationships helps generate social values such as trust in others and social cooperation between people and institutions within our communities” (Evans 2015, p. 10-11).

The concept of ‘social relations’ underpins many psychological, sociological, and anthropological theories such as social capital, sense of community, community of practice, community of interest and, more generally speaking, social relations is a key concept in human and social science. It is an umbrella term that covers a wide variety of interactions, interconnections, and exchanges between human beings and the physical and social environment. Therefore, it is not easy to cover its complexity through a one-size-fits-all definition (see Reis, Collins, and Berscheid 2000).

In an attempt to go beyond definitions, Due and colleagues (1999), have described social relations in terms of their structure and function. The structure refers to *“the individuals with whom one has an*

interpersonal relationship and the linkages between these individuals” (p. 662). In turn, the structure is composed of both formal and informal social relations (*i.e.* social networks). In their words:

“Formal relations are social relations due to one’s position and roles in society... Social network is individuals and linkages between individuals with whom one has a close family relation and/or affection” (ibid)

On the other hand, the function of social relations refers to *“the interpersonal interactions within the structure of the social relations”* (p. 663). This includes qualitative and behavioural aspects such as social support, relational strain and social anchorage.

The enhancement of social relations is part of the promotion of social capital (Putnam 2000), which is necessary to improve/increase individual and community wellbeing (Sixsmith and Boneham 2007). The Department of Economic and Social Affairs of the United Nations Secretariat (Hemmati 2007) has identified 6 stages of social integration, which are formulated as stages of social relations (see Appendix 1). This is not the only conceptual model of social relations, but it serves to illustrate the dynamic and complex interactions that can result in positive, negative and mixed outcomes. In the model, Fragmentation, Exclusion, and Polarization are presented as negative whereas Coexistence, Collaboration, and Cohesion are deemed positive. For each pair of social relations, strategies for either transformation or advancement are suggested (Appendix 1). These include the following nested stages: a) Building relationships of trust, b) Gaining understanding of the situation and accepting responsibility for the change, c) Facilitating transformation, d) Grounding and support to ensure institutional strength, e) Review contents and process, f) Learning lessons towards improved future strategy and practice, g) Appropriate systems and support, and h) Building capacity for and enhancement of active or servant leadership (Spies 2005).

The WWCW Communities Evidence Consortium has produced a working Theory of Change (South et al. 2017), in which social relations are proposed to have a mechanistic and cyclical relationship with community wellbeing. It is proposed that enhanced social networks will yield improved community conditions and individual benefits, eventually leading to increased community (and individual) wellbeing (Figure 2).



Figure 2 Theory of change of what works to increase community wellbeing (South et al. 2017)

Community infrastructure (places and spaces)

The environments in which people live can play an important role in shaping both individual and community wellbeing (Das 2008; Kearney 2006). Some specific aspects of the built environment have been found to highly impact on community life, that is: physical activity/inactivity, obesity, mental health, and social capital (Kent et al. 2011; Renalds et al. 2010). The latter is of great relevance for this review, in that one of the main components underpinning bonding, bridging and linking social capital is shared networks of formal and informal social relations (Ferlander 2007). In this review, we argue that improving social relations for community wellbeing means promoting those conditions that bring people together, enable them to participate in community life and feel part of a network of shared meanings. In this light, it has been recommended that one aim of governmental policy should be the creation and promotion of opportunities for socialising (Diener and Seligman 2004).

The way we design and build the physical environment can have a great impact on the formation and/or maintenance of social relations (Eicher and Kawaki 2011). Some places, for instance, seem to be designed with the intention to offer opportunities for individuals and groups to interact hence for social relations to form (Jeffres et al. 2009; Sirgy et al. 2008). For example, ‘bumping spaces’ are

specifically designed for people to meet up in informal settings (Communities Evidence Programme 2015; O'Donnell et al. 2014) and 'third spaces' that is "*places that host the regular, voluntary, informal, and happily anticipated gatherings of individuals beyond the realms of home and work*" (Oldenburg 1999, p. 16). Jeffres et al (2009) identify eighteen types of third space ranging from coffee shops and bars, to churches and libraries, to shops and markets. They group these third spaces into four overlapping categories of 'Eat, drink, talk', organised activity, outside venues, and commercial venues.

These "bumping" or "third" spaces also include public or shared areas of housing, parks, and other public areas, such as play spaces for families and children of different ages.

Cresswell (2004) defines place as "*space which people have made meaningful*" (p.7). Cresswell also refers to Tuan (1977): "*What begins as undifferentiated space became place as we get to know it better and endow it with value....these ideas 'space' and 'place' require each other for definition. From the security and stability of place we are aware of the openness, freedom, and threat of space, and vice versa. Furthermore, if we think of space as that which allows movement, then place is pause; each pause in movement makes it possible for location to be transformed into place.*" If we work with these definitions of place and space, the 'bumping spaces' and 'third spaces' referred to above should be referred to as 'bumping places' and 'third places'.

Missing from this definition are some of those spaces or places that may be considered to be part of the public sector infrastructure. Pothukuchi (2005) lists twelve community resources that contribute to community infrastructure for healthy communities, many of which might interact as in a 'third place'. These include town planning, street design, transport, public health organisations, subsidised housing sites, schools, and bus routes. This broad notion of places also resonates with the concept of community assets (or health assets in communities) which can cover informal social networks and neighbourly relationships, formal structures and spaces, community-based organisations, local public services and buildings (Foot and Hopkins, 2010).

In contrast with the concept of community places and spaces designed to facilitate social relations, the anthropologist Marc Augé (1995), has proposed the term 'non-places' to indicate all those currently proliferating spaces that '*cannot be defined as relational, historical, and concerned with identity*' (p.77). In Augé's view, motorways, stations, airports, and shopping malls are all examples of spaces that are not designed to bring people together to socialise and take part in the community life, but only as sites for transiting consumers. However, interventions can be set up to create opportunities for sociability in non-places, while still maintaining their service/business-orientated nature. Holding community events and activities within the premises of a shopping mall or transforming a hotel restaurant into a traditional home-like dining room where customers sit all at

the same table, are only some examples of strategies to turn 'non-place' into 'place' (Aubert-Gamet and Cova 1999).

For the purposes of our review, we have defined community infrastructure as:

- Public places and “bumping” places designed for people to meet *e.g.* streets, squares, parks, play areas, village halls, community centres;
- “Third” places where people meet informally or are used as meeting places in addition to their primary role *e.g.* cafes, pubs, libraries, shared areas in housing developments, schools, churches;
- Services that can improve access to places to meet *e.g.* town planning, urban design, landscape architecture and public art, transport, public health organisations, subsidised housing sites, bus routes.

We will focus on interventions operating at the neighbourhood level rather than city or national level, although the focus of the intervention may not be place-based.

We are not including “virtual” spaces such as social media as, although these are important and there is a growing evidence base, we feel that including both real and virtual places (and interactions between the two) in one review would make it too complex and potentially obscure important findings.

What is an intervention?

Community infrastructure and activity is contextual, developmental and covers both informal and formal structures/roles. Community interventions will often be: not neatly defined; developmental; not pre-determined; and not always clear about whether the mechanism of change is the intervention or the process of participation. This is challenging but important for selecting studies in a systematic review. We put this question ‘what counts as an intervention?’ to the review advisory group. We reached agreement that it may be hard to define, but publications need to demonstrate there was an intention to make a change (and who was targeted) and an evaluation. Research on an existing church, garden, park, event etc. without an explicit intention/goal/objectives would be excluded, as this is about determinants of community wellbeing rather than ‘what works’. We also agreed to exclude papers that are exclusively about processes *e.g.* volunteering, but include papers that describe interventions, pathways/ change mechanisms and how they relate to outcomes. We

agreed to include papers where the intention was not about improving wellbeing, but wellbeing outcomes were an unintended consequence.

1. Methods

This systematic review has used standard systematic review methodology, as described in the WWCW Methods Guide (Snape et al. 2017), and is reported following PRISMA and PRISMA-Equity guidelines (Moher et al. 2009, Welch et al. 2013).

2.1 Aims of the review

The aim of this systematic review was to synthesise the available evidence and describe the quality of that evidence, in relation to interventions that improve or create the community infrastructure that impacts on social relations and/ or community wellbeing. For this review, we have defined community infrastructure as the physical places and spaces where people can come together, formally or informally, to interact and participate in the social life of the community.

2.2 Review questions

We aimed to find evidence on how interventions operate and the conditions required for a particular intervention or mechanism to work effectively. To this end, the review has sub-questions which relate to the impact on different sub-populations, and the nature and impact of outcomes.

Review question 1: *How effective are interventions designed to improve community infrastructure (places and spaces) in improving social relations and/ or community wellbeing?*

Sub-questions are:

- What interventions to improve community infrastructure have been evaluated with regard to social relations and/ or community wellbeing?
- In which settings have interventions to improve community infrastructure (places and spaces) been evaluated with regard to social relations and/ or community wellbeing?
 - o Is there an association between setting and:
 - type of intervention,
 - population,
 - outcomes measured and
 - direction and size of effect?
- Are there differences in effectiveness across population groups, particularly those at risk of health inequalities? (for example, people from different socio-economic backgrounds, ethnicity, age or gender)?
- Are there differences in effectiveness across different types of interventions?

- are there differences across interventions and initiatives that have been explicitly planned by agencies (e.g. play areas), and those that have developed informally (e.g. café as meeting place), sometimes called “third spaces”?
- what is the evidence about the effectiveness of interventions within estate regeneration schemes, other neighbourhood or high street renewal schemes, and new housing developments?
- Are there differences in effectiveness across interventions that:
 - aim to mix population groups (e.g. intergenerational connections; different ethnicities; community cohesion);
 - are open to a mix of population groups, although this is not an explicit aim;
 - are targeted towards specific population groups, such as those at risk of social exclusion and/ or health and wellbeing inequalities, or are intended to strengthen bonds within a population?

Review question 2: *What factors (positive and negative) affect the implementation or effectiveness of the interventions?*

Review question 3: *What are people’s subjective experiences of interventions designed to improve infrastructure (in relation to social relations and community wellbeing)?*

- Do these differ across settings, intervention types, population groups?
- How involved are local communities in design, delivery and evaluation of interventions, and does this influence effectiveness?

2.3 Identification of evidence

The search strategy was developed by the review team in collaboration with highly experienced information specialists. The aim of the search was to identify all relevant evidence on interventions to community infrastructure: places and spaces and their effect on social relations and community wellbeing. The concepts that underpin these dimensions are not always clear and there is overlap between terminologies, therefore we searched for related concepts and synonyms.

As a result of initial scoping searches, we searched the following databases using the search strategy outlined in Appendix 2:

PsycInfo, MEDLINE, CINAHL, Social Policy and Practice (covers Social Care Online and Idox), Social Sciences Citation Index, Academic Search Complete, LeisureTourism, Hospitality and Tourism Complete, Avery Index, GreenFiles and Urban Studies Abstracts.

We also searched for 'grey' literature through Opensigle, topic experts (*i.e.* review advisors, and contacts through the What Works Centre for Wellbeing) and relevant websites (see Appendix 3).

A **call for evidence** was issued by the WWCW, shared on social media and distributed to a mailing list of over 1200 academics and practitioners who expressed an interest in evidence on community wellbeing during the Voice of the User stakeholder engagement phase of the Community Wellbeing Evidence Programme.

Reference lists of key systematic reviews and included studies were scanned, and citation searching was carried out for included articles.

An audit table of the search processes was kept, with date of searches, search terms/strategy, database searched, number of hits, keywords and other comments included, in order that searches are transparent, systematic and replicable as per PRISMA guidelines. The results of the searches were downloaded into EndNote reference management software for deduplication.

2.4 Study selection

Results of the searches of electronic databases were uploaded to EPPI-Reviewer 4 systematic review management software, which was used to store information and manage each stage of the review process (Thomas et al. 2010).

Studies were selected for inclusion through two stages, using EPPI-Reviewer review management software. First, a random 20% of all titles and abstracts were screened by all reviewers, followed by a 'calibration' exercise to ascertain levels of agreement. Once agreement was reached (80% agreement on whether to include/ exclude), the remaining titles and abstracts were screened by a single reviewer. Any queries were resolved by discussion. Full-text copies of potentially relevant studies were screened for inclusion using the criteria outlined below. Disagreements were resolved by discussion, with a third reviewer being consulted where necessary. The results of the abstract screening were recorded in EPPI-Reviewer, while results of the full paper screening were recorded in EPPI-Reviewer and are presented in Appendix 7, including the reason for excluding any paper.

2.5 Inclusion and exclusion criteria

<p><u>Population</u></p>	<p>We have included literature relating to community infrastructure: places and spaces for any community. We focused on evidence for adults (loosely defined as aged between 16 and 65, but accepted other definitions as presented in studies). If included studies also presented evidence relating to other age groups, we included this where possible, particularly if there was any data on intergenerational relations.</p> <p>We excluded studies that included only older adults (as defined by the study authors) or only children (as defined by study authors), as these fall within the remit of two other What Works Centres (the Centre for Ageing Better and the Early Intervention Foundation). We included interventions aimed at families, such as children’s play areas.</p> <p>We included studies which had been carried out in the UK and other Organisation for Economic Co-operation and Development (OECD) or high income countries. Research in other OECD is likely to have less relevance to the UK context and so considered the applicability of the international literature to the UK context in analysis, and highlighted any limitations on applicability of individual studies. A judgement of the likely relevance to the UK was made.</p>
<p><u>Intervention</u></p>	<p>We included any interventions (formal or informal) which were designed to improve, or make better or alternative use of, community infrastructure: physical places and spaces (for example, general urban redesign; interventions such as lighting and benches in open public spaces; children’s play places; or funding to host community activities in places such as libraries or faith settings). We focused on interventions that apply at community or neighbourhood level (<i>e.g.</i> a town market), rather than city or national level (<i>e.g.</i> a city art gallery). Studies were excluded if they were not related to a specified intervention, or if they examined a virtual (not physical) space.</p>
<p><u>Comparators</u></p>	<p>We included quantitative studies which compared different interventions, including those using before and after design and comparing new versus current practice. Qualitative studies without a comparator were included.</p>
<p><u>Outcomes</u></p>	<p>We adopted a broad perspective on the outcomes to be included in the review and included studies which reported any outcome relating to social relations, community wellbeing and related concepts such as social capital and social trust. This includes quantitative (measured), and qualitative (views and</p>

	perceived) outcomes. While our primary focus was on outcomes at a community level, we also included individual level health and wellbeing outcomes, which can be linked to community wellbeing (see Theory of Change, South et al 2017). As many of the desired outcomes would only be evident in the long term, we also looked for proxy measures along proposed pathways to change.
<u>Study design</u>	We included quantitative and mixed methods studies which used experimental designs, and also process evaluations and qualitative studies that related to the interventions specified above. We excluded articles which provided only descriptive information or commentary.
<u>Other criteria</u>	We included literature published or produced since 1997 and which was published in English. If we identified any key publications prior to this date (<i>i.e.</i> which were extensively referenced by included studies) we also considered these for inclusion.

2.6 Data extraction

Data from each included study were extracted into pre-designed and piloted forms on EPPI-Reviewer 4 systematic review management software (Thomas et al. 2010). Forms were completed by one reviewer and checked for accuracy by another. Periodically throughout the process of data extraction, a random selection were considered independently by 2 people (that is, double assessed) for at least 20% of the studies. Data extracted included: study aims, study design, setting/country, type of intervention, comparator (if any), population, outcomes measured (social relations; community wellbeing; individual wellbeing; individual health; community level health; social determinants of health; process outcomes; adverse or unintended effects, and cost) ,and main findings in relation to the review questions.

We planned to use the Context and Implementation of Complex Interventions (CICI) checklist (Pfadenhauer et al. 2016, page 24) to extract and assess information (where reported) in the domains of implementation strategy, context and implementation, to assist with answering the review question on process (What factors (positive and negative) affect the implementation or effectiveness of the interventions?). However, after the first stage of study selection and in consultation with the advisory group, we decided to change to a more pragmatic approach, and

incorporated the process evaluations into the thematic synthesis of qualitative data, thus being led by themes emerging inductively from the data.

2.7 Validity assessment

We conducted validity assessment of all studies using the appropriate checklist (Appendix 5), following the recommendations of the WWCW methods guide (Snape et al. 2017). Unpublished data from grey literature was assessed using the same criteria as used for published data

Each full paper or report was assessed by one reviewer and checked for accuracy by another.

Periodically, a random selection were considered independently by 2 people with at least 20% of the studies being double assessed. Any differences in validity grading were resolved by discussion or recourse to a third reviewer. Validity assessment data were extracted and recorded using EPPI-Reviewer review management software.

In this review we included studies that were assessed as being of 'poor quality', and discussed the implications of including them.

Studies were assessed as "poor" quality, "poor to moderate" quality, "moderate" quality, and "good" quality, based on the review team's judgment on which criteria were met on the validity checklists and their relative importance in terms of methodological rigour (e.g. quantitative designs with a comparator group would be judged as better quality than those without a comparator group)

2.8 Data synthesis

For evidence synthesis, we planned to use a range of approaches depending on the design of the included studies, including narrative synthesis (Popay et al. 2006), meta-analysis for quantitative studies (Higgins et al. 2008; CRD 2009) if appropriate, and thematic synthesis for qualitative studies (Dixon-Woods et al. 2007, Thomas & Harden 2008), with meta-ethnographic approaches for qualitative studies if appropriate (Noblit and Hare 1988). A mixed method systematic review design similar to that used by the Evidence for Policy and Practice Information and co-ordinating (EPPI) Centre (Thomas and Harden 2008) was used to combine data from different study designs. Evidence was initially synthesised by study type into two streams: quantitative and qualitative (for studies that use mixed methods, qualitative and quantitative data were extracted and treated separately in the relevant streams).

The narrative synthesis forms the overall reporting framework for the review findings, which are grouped by review question and by intervention and outcome category (decisions on this were data driven with reference to the review advisory group), and includes:

- Thematic analysis of data based on the review questions.

- Exploration of relationships within and between studies.
- Differential impacts in relation to (*e.g.*) gender, socioeconomic status, ethnicity, or disability status.
- The strength of evidence, based on study design, and on the results of the validity assessment (for each type of design).
- Contradictions in findings are examined.

Preliminary searches suggested that statistical meta-analysis may not be appropriate due to clinical heterogeneity of study designs, outcomes and interventions.

Thematic synthesis was undertaken to combine the evidence from qualitative studies. QSR NVivo software was used to manage the data and ensure a transparent process (Thomas and Harden 2008; Oliver et al 2005; Harden et al 2004) and involved four members of the review team (KS, JS, SDM, AMB). All studies reporting qualitative data were uploaded into NVivo as PDF files. Four members of the review team (KS, JS, SDM, AMB) then jointly developed an initial coding framework that summarised the themes in the data following an inductive, iterative process. This involved the reviewers independently familiarising themselves with, and undertaking free-coding of, a random sample of five papers, highlighting text (including verbatim quotations from respondents in the studies) relevant to the review questions. Three reviewers (KS, JS, SDM) met to discuss their initial coding and to jointly agree a combined coding framework, including hierarchies of descriptive and analytical themes and sub-themes. (The fourth review team member (AMB) approved the coding framework later).

Reviewers collectively identified similarities and differences between the codes to start to group them into descriptive themes. Analytical themes were then developed by applying the review objectives to the descriptive theme (Thomas and Harden 2008). For review question 1 on effectiveness, an overarching analytical theme of 'outcomes' contained subthemes concerning positive community outcomes, positive individual outcomes, negative outcomes, and unintended outcomes, each of which contained descriptive themes. For review question 2 on process, an overarching analytical theme of 'factors affecting implementation' was developed, containing subthemes about context, factors found to positively or negatively affect changes to community infrastructure, and factors identified as key for success, each of which also contained descriptive themes.

The agreed coding framework was then 'built' in NVivo (with codes managed as NVivo nodes) and one reviewer (KS) undertook coding of all the papers reporting qualitative findings, labelling the text to single or multiple nodes where relevant. The reviewer (KS) expanded the coding framework with new descriptive codes where existing codes did not fully capture the textual data. To ensure consistency, a second member of the review team (JS) checked coded text in a random sample of five papers (15%). This involved reading the full reports of the studies and making notes of themes. The reviewer then checked codes as displayed on NVivo for each of the sample of papers to ensure consistency of the coding process and interpretation between studies. The two reviewers (KS, JS) then met to discuss any discrepancies

A thematic narrative synthesis was then written (KS, JS) and elements were incorporated into the overall narrative synthesis of the review (AMB), where these were relevant to the review questions.

2.9 Transferability assessment

Transferability of review findings is a key challenge in this field as interventions that are the subject

of research studies do not always map well to those implemented in community practice (Bagnall et al. 2016; O'Mara-Eves et al. 2013; Savage et al. 2010; South et al. 2010). Changes in policies and programme funding may also affect the relevance of review findings, for example if programmes have been discontinued (Bagnall et al. 2016, South et al. 2016). After data synthesis, we examined interventions by group and setting to assess how transferable the findings are to a current UK context. This included an assessment of relevant international evidence and older evidence from the UK. We sought guidance from the review advisors in relation to the transferability of results and how this should be assessed. We developed a tool for assessing transferability, in the form of a checklist with criteria relating to population(s); context; country of origin; characteristics of interventions; stage of intervention development *i.e.* if feasibility or replicability assessed; commonalities; costs. Although we made no attempt to rank studies according to their transferability to the UK context, using transparent criteria helps the end user of evidence to select relevant interventions for the context they are working in.

2.10 Recommendations

We adopted the formal rating methodology recommended by the WWCW Methods Guide. This provides a judgement on the overall quality of the evidence for each individual finding in the review, adopting the GRADE rating for quantitative evidence (Guyatt et al. 2008) and the CERQual

approaches for qualitative evidence (Lewin et al. 2015). Using the GRADE and CERQual approach, we suggest recommendations for practice based on the review findings.

We also make recommendations about how gaps can be filled and where further research is required.

2. Results

2.1 Study selection process

Electronic database searching yielded 21,262 potentially relevant titles and abstracts, with 93 additional articles identified through web sites and from other sources, giving a total of 21,335 records screened at title and abstract stage. 20,941 articles were excluded at this stage and 396 were retrieved in full for screening against the inclusion criteria. 30 articles were subsequently excluded at data extraction stage, giving a total of 51 articles included in the review (Figure 3).

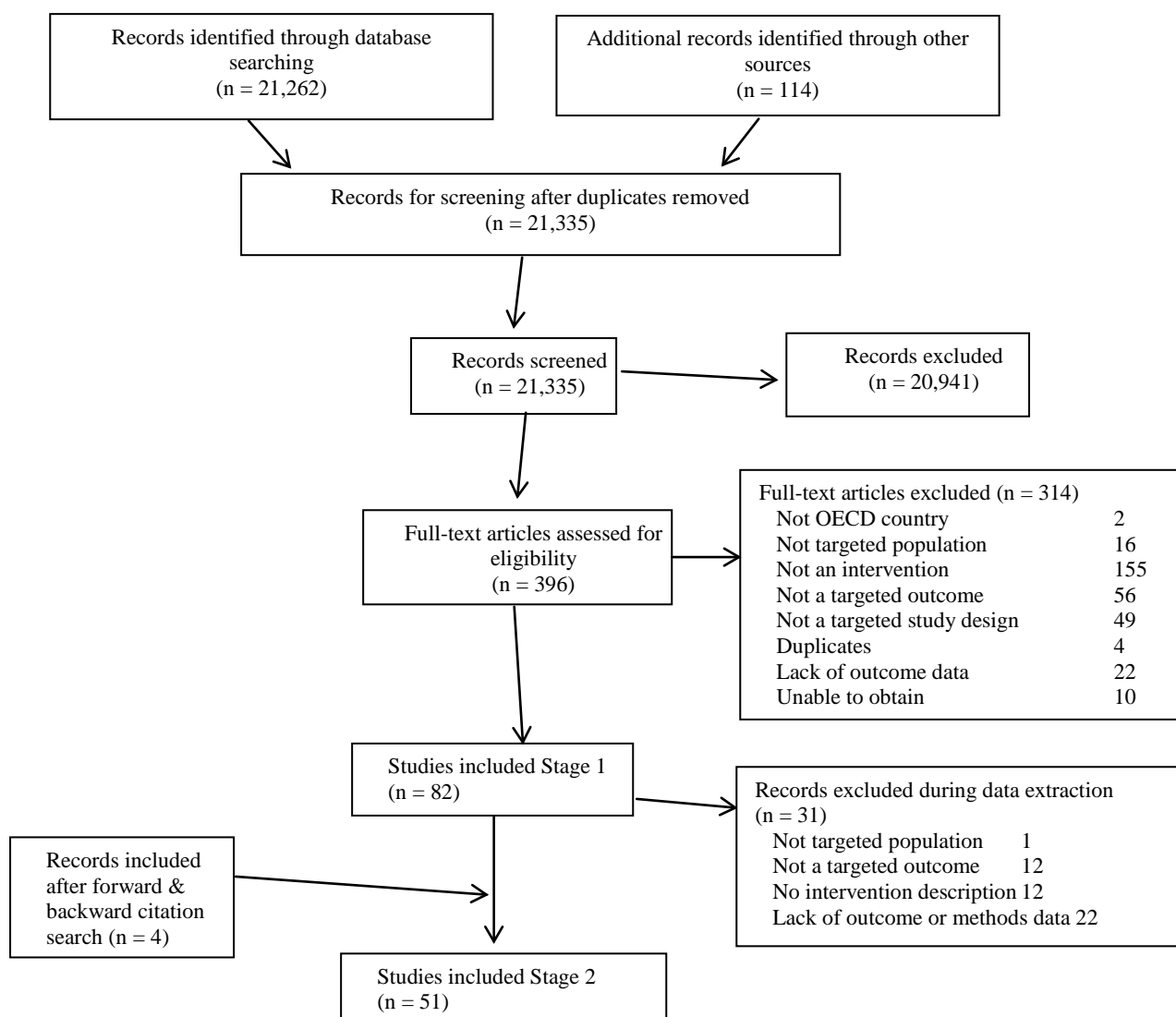


Figure 3: Study selection flow chart

2.2 Description of included studies

For a list of included studies, see Appendix 6, and for their characteristics, see Appendix 11.

Country

Eleven studies were from the UK (Åberg and Tapsell 2013, Anderson et al. 2017, Coulson et al. 2011, Black 2016, Lawrence et al. 2010, Stevenson 2016, Bertotti et al. 2012, Morris and O'Brien 2011, Murray and Devecchi 2016, Shipway 2016, Wells et al. 2012); six from Canada (Tulloch 2016, Carson et al. 2007, Ley 2008, McLean and Rahder 2013, Saville 2009, Yuen and Glover 2005); 24 from USA (Armstrong 2000, Ball and Wanitshka 2016, Blake and Cloutier-Fisher 2009, Windhorst et al. 2010, Corey 2008, Daniels et al. 2009, Gomez-Feliciano et al. 2009, Griffin et al. 2011, Jones 2014, Ohmer et al. 2009, Lanier et al. 2015, Mangadu et al. 2016, Mason et al. 2011, Porter and McIlvaine-Newsad 2013, Raja et al. 2009, Semenza 2003, Semenza et al. 2007, Semenza and March 2009, Shamasunder et al. 2015, Shore to Core 2017, Stokes 2015, Torres et al. 2016, Turco 1997, Zieff et al. 2016); one from the Netherlands (Marcus 2000); five from Australia (Crane et al. 2016, Fildes et al. 2010, Jalaludin et al. 2012, Whitford and Ruhanen 2013, Williams and Pocock 2010); one from Turkey (Erden and Yolal 2016); one from South Korea (Jung et al. 2017); one from Spain (Serrano et al. 2016); one from Switzerland (Stenberg et al. 2009); and one from Germany (Vering 2006).

Study design

There was some overlap in the assignment of study design codes to studies, particularly for mixed methods evaluations and case studies. Eleven studies were coded as case studies (Black 2016, Stevenson 2016, Carson et al. 2007, Corey 2008, Jones 2014, Lawrence et al. 2010, McLean and Rahder 2013, Shipway 2016, Stenberg et al. 2009, Vering 2006, Wells et al. 2012); 15 as mixed methods evaluations (Tulloch 2016, Daniels et al. 2009, Fildes et al. 2010, Griffin et al. 2011, Lanier et al. 2015, Mangadu et al. 2016, Ohmer et al. 2009, Mason et al. 2011, Morris and O'Brien 2011, Murray and Devecchi 2016, Semenza 2003, Semenza and March 2009, Serrano et al. 2016, Stenberg et al. 2009, Zieff et al. 2016); nine were cross-sectional surveys (Anderson et al. 2017, Armstrong 2000, Windhorst et al. 2010, Erden and Yolal 2016, Jung et al. 2017, Ohmer et al. 2009, Shore to Core 2017, Torres et al. 2016, Turco 1997); two were longitudinal studies (Åberg and Tapsell 2013, Saville 2009); 11 were qualitative studies (Blake and Cloutier-Fisher 2009, Coulson et al. 2011, Ley 2008, Bertotti et al. 2012, Marcus 2000, Ohmer et al. 2009, Shamasunder et al. 2015, Vering 2006, Whitford and Ruhanen 2013, Williams and Pocock 2010, Yuen and Glover 2005); one was coded as action research (Gomez-Feliciano et al. 2009); five were studies with baseline and follow-up measurements (Crane et al. 2016, Jalaludin et al. 2012, Semenza et al. 2007, Stenberg et al. 2009, Stokes 2015), and one was coded as an ethnographic study (Porter and McIlvaine-Newsad 2013).

Setting

Twenty-three of the 51 included studies were carried out in urban settings (Åberg and Tapsell 2013, Tulloch 2016, Anderson et al. 2017, Armstrong 2000, Windhorst et al. 2010, Corey 2008, Coulson et al. 2011, Fildes et al. 2010, Gomez-Feliciano et al. 2009, Jones 2014, Jung et al. 2017, Mangadu et al. 2016b, Bertotti et al. 2012a, Ohmer et al. 2009, McLean and Rahder 2013, Murray and Devecchi 2016, Raja et al. 2009, Semenza 2003, Shore to Core 2017, Torres et al. 2016, Vering 2006, Yuen and Glover 2005, Zieff et al. 2016). These covered a wide range of settings, including riversides and waterfronts (Åberg and Tapsell 2013, Shore to Core 2017), street space (Tulloch 2016), city centres (Anderson et al. 2017, Jung et al. 2017), estates of apartment blocks (Corey 2008), small deprived communities (Coulson et al. 2011, Fildes et al. 2010, Bertotti et al. 2012a, Murray and Devecchi 2016, Zieff et al. 2016), densely populated mixed neighbourhoods (Gomez-Feliciano et al. 2009, Raja et al. 2009, Semenza 2003, Vering 2006), single streets (Jones 2014), commercial or market settings (McLean and Rahder 2013).

Four included studies were coded as rural (Black 2016, Armstrong 2000, Porter and McIlvaine-Newsad 2013, Wells et al. 2012) – settings ranged from rural areas outside cities (Armstrong 2000, Porter and McIlvaine-Newsad 2013, Wells et al. 2012), to sparsely populated areas of the UK (Black 2016).

Ten included studies were coded as suburban (Stevenson 2016, Armstrong 2000, Crane et al. 2016, Jalaludin et al. 2012, Cooper et al. 2000, Saville 2009, Semenza 2009, Semenza et al. 2007, Shamasunder et al. 2015, Zieff et al. 2016). These included suburban settings in upstate New York (Armstrong 2000); purpose built co-housing communities (Cooper et al. 2000); suburbs of large cities (Jalaludin et al. 2012, Stevenson 2016); troubled apartment block estates (Saville 2009); areas with a mix of housing styles (Semenza 2009, Semenza et al. 2007, Shamasunder et al. 2015) and areas of deprivation (Zieff et al. 2016).

Six studies were coded as being in a mixed setting (Ball and Wanitshka 2016, Lawrence et al. 2010, Mason et al. 2011, Morris and O'Brien 2011, Shipway 2016, Williams and Pocock 2010). These included case studies set in a range of areas (Lawrence et al. 2010), an intervention operating across a diverse set of areas (Mason et al. 2011), woodland and forest areas in urban and non-urban settings (Morris and O'Brien 2011), and “master planned communities” – geographically bounded large scale private housing developments (Williams and Pocock 2010).

Seven studies were coded as having an unclear setting in terms of whether they were located in urban, suburban or rural areas (Erden and Yolal 2016, Griffin et al. 2011, Ley 2008, Stenberg et al. 2009, Stokes 2015, Turco 1997, Whitford and Ruhanen 2013).

Intervention

Interventions were coded in two ways, (i) in terms of how their aims related to the review, and (ii) in terms of their approach.

Aim of intervention

Twenty included studies expressed an aim **to improve social relations** (Black 2016, Tulloch 2016, Armstrong 2000, Windhorst et al. 2010, Carson et al. 2007, Corey 2008, Fildes et al. 2010, Jalaludin et al. 2012, Jung et al. 2017, Bertotti et al. 2012, Cooper et al. 2000, Ohmer et al. 2009, McLean and Rahder 2013, Semenza 2009, Semenza et al. 2007, Semenza 2003, Shipway 2016, Stokes 2015, Vering 2006, Whitford and Ruhanen 2013). These included a 'pop-up park' intervention (Tulloch 2016), community garden interventions (Armstrong 2000, Ohmer et al. 2009), community settings providing support for residents (Windhorst et al. 2010, Bertotti et al. 2012), community development hubs (Carson et al. 2007), co-housing design (Cooper et al. 2000), community development programmes (Corey 2008), festivals and markets (Black 2016, Whitford and Ruhanen 2013, McLean and Rahder 2013), Men's Sheds (Fildes et al. 2010), urban regeneration programmes (Jalaludin et al. 2012, Shipway 2016), street design (Jung et al. 2017, Semenza 2009, Semenza et al. 2007, Semenza 2003), and forestry-led projects for the social integration of marginal groups (Vering 2006).

Twenty-nine studies expressed an aim **to improve some aspects of community wellbeing** (Black 2016, Tulloch 2016, Anderson et al. 2017, Corey 2008, Coulson et al. 2011, Daniels et al. 2009, Erden and Yolal 2016, Gomez-Feliciano et al. 2009, Jalaludin et al. 2012, Jung et al. 2017, Lanier et al. 2015, Mangadu et al. 2016, Ohmer et al. 2009, Mason et al. 2011, Morris and O'Brien 2011, Murray and Devecchi 2016, Porter and McIlvaine-Newsad 2013, Raja et al. 2009, Saville 2009, Semenza 2009, Semenza et al. 2007, Serrano et al. 2016, Shipway 2016, Stenberg et al. 2009, Stevenson 2016, Torres et al. 2016, Wells et al. 2012, Whitford and Ruhanen 2013, Yuen and Glover 2005). These included redesign of public spaces (Anderson et al. 2017, Semenza 2009, Semenza et al. 2007, Saville 2009) and specific street design interventions (Coulson et al. 2011, Jung et al. 2017), community development programmes (Corey 2008, Mason et al. 2011, Saville 2009, Shipway 2016, Wells et al.

2012), community-built playgrounds (Daniels et al., 2009), street play and other temporary street closure interventions (Murray and Devecchi 2016, Torres et al. 2016), events such as fairs (Erden and Yolal 2016) and festivals (Black 2016, Stevenson 2016, Whitford and Ruhanen 2013, Yuen and Glover 2005), urban regeneration and renewal programmes (Gomez-Feliciano et al. 2009, Jalaludin et al. 2012, Serrano et al. 2016, Stenberg et al. 2009), community gardens (Lanier et al. 2015, Mangadu et al. 2016, Ohmer et al. 2009, Porter and McIlvaine-Newsad 2013), woodland projects (Morris and O'Brien 2011), policy and planning interventions (Raja et al. 2009).

Nineteen studies had another aim (Åberg and Tapsell 2013, Armstrong 2000, Ball and Wanitshka 2016, Blake and Cloutier-Fisher 2009, Windhorst et al. 2010, Carson et al. 2007, Corey 2008, Crane et al. 2016, Fildes et al. 2010, Griffin et al. 2011, Jones 2014, Lawrence et al. 2010, Ley 2008, Mangadu et al. 2016, Bertotti et al. 2012, Ohmer et al. 2009, Raja et al. 2009, Shore to Core 2017, Zieff et al. 2016). These included: increasing the self-sufficiency of families (Armstrong 2000), increasing civic engagement (Blake and Cloutier-Fisher 2009), improving access to the arts (Carson et al. 2007), increasing physical activity (Crane et al. 2016, Griffin et al. 2011, Raja et al. 2009, Zieff et al. 2016) and healthy eating (Mangadu et al. 2016), improving individual wellbeing and reducing social isolation (Fildes et al. 2010), providing safe travel (Jones 2014), improving conservation/ environmental awareness (Ohmer et al. 2009, Lawrence et al. 2010), to maintain church congregations (Ley 2008), providing volunteering and job opportunities (Bertotti et al. 2012), and “provoking feelings of restorative fascination” (Shore to Core 2017).

Intervention types

We identified eight types of intervention approach: community hubs; events; neighbourhood design; green and blue space; place-making; alternative use of space; urban regeneration; and community development. Many of the interventions in the included studies involved more than one approach and so occupied more than one of these categories.

Community hubs:

Community hubs are community centres or community anchor organisations focused on health and wellbeing that can be either locality based or work as a network. Community hubs, such as healthy living centres, typically provide multiple activities and services that address health or the wider determinants of health, most of which are open to the wider community (PHE & NHSE 2015).

Eleven included studies were coded as community hubs. These included community cafes (Windhorst et al. 2010, Bertotti et al. 2012), a community arts centre (Carson et al. 2007),

community gardens (Armstrong 2000, Porter and McIlvaine-Newsad 2013), a co-housing scheme (Cooper et al. 2000), community-built playgrounds (Daniels et al. 2009), Men's Sheds (Fildes et al. 2010), a church (Ley 2008) and more diffuse community development interventions (Gomez-Feliciano et al. 2009, Wells et al. 2012). Five of these were coded as community-led (Windhorst et al. 2010, Gomez-Feliciano et al. 2009, Cooper et al. 2000, Porter and McIlvaine-Newsad 2013, Wells et al. 2012).

Events: We defined these as temporary events that took place a community level, such as festivals, markets, art events, street parties, concerts. Events ranged from a one-off activity to a regular (sometimes weekly) occurrence.

Nine included studies were coded as events. These included festivals (Black 2016, Stevenson 2016, Whitford and Ruhanen 2013, Yuen and Glover 2005, Turco 1997), fairs (Erden and Yolal 2016), a 'pop-up park' (Tulloch 2016), a pedestrian street event (Mason et al. 2011), and street markets (McLean and Rahder 2013). Only three of these were coded as community-led (Black 2016, Tulloch 2016, McLean and Rahder 2013).

Neighbourhood design: Neighbourhood design refers to the scale, form or function of buildings and open space. Good neighbourhood design can have an important role in promoting community cohesion by providing public spaces that are comfortable and inviting for local people¹.

Sixteen included studies were coded as neighbourhood design. These included specific street and public space redesign interventions (Jones 2014, Jung et al. 2017, Semenza 2003), interventions designed to promote active travel (Crane et al. 2016, Griffin et al. 2011), housing design interventions (Cooper et al. 2000, Saville 2009, Stenberg et al. 2009, Williams and Pocock 2010) and temporary recreational street closure (Zieff et al. 2016). Five of these were coded as community-led (Griffin et al. 2011, Cooper et al. 2000, Saville 2009, Semenza 2003, Wells et al. 2012).

Green and blue space: We defined this as any natural green space (*e.g.* parks, woodland, gardens) or blue space (*e.g.* rivers, canals, coast).

Fourteen included studies were coded as green and blue space. These included riverside and waterfront regeneration (Åberg and Tapsell 2013, Shipway 2016, Shore to Core 2017), community and home gardens (Armstrong 2000, Blake and Cloutier-Fisher 2009, Lanier et al. 2015, Mangadu et al. 2016, Ohmer et al. 2009, Porter and McIlvaine-Newsad 2013, Shamasunder et al. 2015, Shipway

¹ <http://www.futurecommunities.net/ingredient/41/good-neighbourhood-design>

2016), community-built playgrounds (Daniels et al. 2009), community wildlife sites (Lawrence et al. 2010, Shipway 2016), and woodland and forest projects (Morris and O'Brien 2011, Vering 2006). Four of these were community-led (Lawrence et al. 2010, Ohmer et al. 2009, Morris and O'Brien 2011, Porter and McIlvaine-Newsad 2013).

Place-making: 'Placemaking' relates to the role of arts, culture and heritage in helping to shape the places where we live (Local Government Association, 2017).

Nine included studies were coded as place-making, reporting on seven different interventions. These included a 'pop-up park' (Tulloch 2016), a cohousing scheme in the Netherlands (Cooper et al. 2000), new cycling and walking paths (Crane et al. 2016, Gomez-Feliciano et al. 2009, Shipway 2016), improving a public intersection to facilitate social interaction (Semenza 2009, Semenza et al. 2007, Semenza 2003), creating an outdoor living room (Shore to Core 2017). Four of the seven interventions were community-led (Tulloch 2016, Gomez-Feliciano et al. 2009, Cooper et al. 2000, Semenza 2009, Semenza et al. 2007, Semenza 2003).

Alternative use of space: We defined these as temporary changes to the way that people interact with a space *e.g.* closure of streets for children to play; a 'civic game' that involved collecting items from different places; public art installations; a 'pop-up park'. Eleven included studies were coded as alternative use of space. These included a 'pop-up park' (Tulloch 2016), public art interventions (Anderson et al. 2017), street play/ recreational street closure interventions (Murray and Devecchi 2016, Zieff et al. 2016, Torres et al. 2016), markets and fairs (Ball and Wanitshka 2016, McLean and Rahder 2013), community gardens (Ohmer et al. 2009, Porter and McIlvaine-Newsad 2013), 'civic games' (Stokes, 2015) and churches (Ley 2008). Six of these were community-led (Tulloch 2016, Anderson et al. 2017, Ohmer et al. 2009, McLean and Rahder 2013, Murray and Devecchi 2016, Porter and McIlvaine-Newsad 2013).

Urban regeneration: Defined as the process of improving derelict or dilapidated districts of a city, typically through redevelopment (Oxford English Dictionary, 2018), eleven included studies were coded as urban regeneration. These included riverside regeneration (Åberg and Tapsell 2013), public art installations (Anderson et al. 2017, Semenza et al. 2007, Semenza 2003), community gardens (Ohmer et al. 2009), markets (McLean and Rahder 2013, Serrano et al. 2016), Homezone remodelling (Coulson et al. 2011) and housing renewal (Jalaludin et al. 2012, Saville 2009). Six of these initiatives were community-led (Anderson et al. 2017, Ohmer et al. 2009, McLean and Rahder 2013, Saville 2009, Semenza 2009, Semenza et al. 2007).

Community development: Community development is defined as ‘a long-term value based process which aims to address imbalances in power and bring about change founded on social justice, equality and inclusion’ (FCDL, 2009). Seven included studies were coded as community development. Some of these reported on the whole initiative in terms of community-building (Corey 2008, Wells et al. 2012), while some reported on specific projects that were part of the community development initiative e.g. community gardening (Mangadu et al. 2016, Porter and McIlvaine-Newsad 2013), walking (Griffin et al. 2011), and a pop-up park (Tulloch 2016). All except one were community-led.

Population

The codes most commonly used to describe the populations in the included studies were:

Area of deprivation (15 studies) (Stevenson 2016, Armstrong 2000, Windhorst et al. 2010, Carson et al. 2007, Corey 2008, Coulson et al. 2011, Mangadu et al. 2016, Bertotti et al. 2012, Ohmer et al. 2009, Murray and Devecchi 2016, Saville 2009, Semenza et al. 2007, Semenza 2003, Serrano et al. 2016, Wells et al. 2012).

A mix of street users (10 studies) (Crane et al. 2016, Griffin et al. 2011, Jones 2014, Jung et al. 2017, Mason et al. 2011, McLean and Rahder 2013, Semenza 2003, Shore to Core 2017, Torres et al. 2016, Turco 1997).

Children and adolescents (10 studies) (Blake and Cloutier-Fisher 2009, Daniels et al. 2009, Gomez-Feliciano et al. 2009, Mangadu et al. 2016, Ohmer et al. 2009, McLean and Rahder 2013, Morris and O’Brien 2011, Murray and Devecchi 2016, Wells et al. 2012, Zieff et al. 2016).

Stakeholders (9 studies) (Corey 2008, Gomez-Feliciano et al. 2009, Lanier et al. 2015, Cooper et al. 2000, Mason et al. 2011, Porter and McIlvaine-Newsad 2013, Turco 1997, Whitford and Ruhanen 2013, Yuen and Glover 2005).

Older people (8 studies) (Blake and Cloutier-Fisher 2009, Windhorst et al. 2010, Fildes et al. 2010, Ohmer et al. 2009, Morris and O’Brien 2011, Porter and McIlvaine-Newsad 2013, Wells et al. 2012, Williams and Pocock 2010).

Racial & ethnic groups (7 studies) (Armstrong 2000, Coulson et al. 2011, Fildes et al. 2010, Mangadu et al. 2016, Morris and O'Brien 2011, Raja et al. 2009, Vering 2006).

Families (7 studies) (Armstrong 2000, Daniels et al. 2009, Gomez-Feliciano et al. 2009, Jalaludin et al. 2012, McLean and Rahder 2013, Murray and Devecchi 2016, Stenberg et al. 2009).

Working age people (6 studies) (Ohmer et al. 2009, McLean and Rahder 2013, Raja et al. 2009, Stenberg et al. 2009, Wells et al. 2012, Williams and Pocock 2010).

Economically disadvantaged people (5 studies) (Mangadu et al. 2016, Bertotti et al. 2012, Morris and O'Brien 2011, Raja et al. 2009, Vering 2006).

People with disabilities (3 studies) (Gomez-Feliciano et al. 2009, Morris and O'Brien 2011, Porter and McIlvaine-Newsad 2013).

Gender group (3 studies) (Fildes et al. 2010, Morris and O'Brien 2011, Williams and Pocock 2010).

Unemployed people (3 studies) (Fildes et al. 2010, Mangadu et al. 2016, Vering 2006).

Homeless people (1 study) (Vering 2006).

Offenders & ex-offenders (1 study) (Mangadu et al. 2016).

Refugees & asylum seekers (1 study) (Vering 2006).

Fourteen studies were universal/ open to all (Stevenson 2016, Åberg and Tapsell 2013, Tulloch 2016, Anderson et al. 2017, Ball and Wanitshka 2016, Erden and Yolal 2016, Jones 2014, Jung et al. 2017, Bertotti et al. 2012, Ohmer et al. 2009, Mason et al. 2011, McLean and Rahder 2013, Semenza 2003, Turco 1997).

Twenty-seven studies targeted an area (Åberg and Tapsell 2013, Tulloch 2016, Armstrong 2000, Blake and Cloutier-Fisher 2009, Corey 2008, Coulson et al. 2011, Crane et al. 2016, Jalaludin et al. 2012, Jung et al. 2017, Lanier et al. 2015, Mangadu et al. 2016, Bertotti et al. 2012, Ohmer et al. 2009, Mason et al. 2011, McLean and Rahder 2013, Murray and Devecchi 2016, Raja et al. 2009,

Saville 2009, Semenza 2009, Semenza 2003, Shipway 2016, Shore to Core 2017, Stokes 2015, Torres et al. 2016, Turco 1997, Wells et al. 2012, Zieff et al. 2016).

Ten studies targeted a group (Blake and Cloutier-Fisher 2009, Windhorst et al. 2010, Fildes et al. 2010, Ley 2008, Morris and O'Brien 2011, Semenza 2009, Semenza et al. 2007, Shamasunder et al. 2015, Vering 2006, Zieff et al. 2016).

Six studies set out to deliberately mix different population groups (Carson et al. 2007, Ley 2008, Mangadu et al. 2016, Porter and McIlvaine-Newsad 2013, Raja et al. 2009, Vering 2006). Settings included a community arts centre (Carson et al. 2007), a church (Ley 2008), community garden projects (Mangadu et al. 2016, Porter and McIlvaine-Newsad 2013) and a forest project (Vering 2006).

Transferability

Transferability was assessed in terms of whether the setting and population were common to the UK, the date and stage of the study, cost, funding source, who initiated the project and other key contextual factors. See Appendix 8 for a breakdown of transferability assessment for each included study.

Studies in which the population and setting were found to be either in the UK or common to the UK included:

- Riverside development in Northumberland (Aberg and Tapsell 2013);
- Local neighbourhood design in central Manchester (Anderson et al. 2017);
- Green fairs (Ball and Wanitschka 2016);
- Community café (Bertotti et al. 2012; Windhorst et al. 2010);
- Rural festivals (Black 2016);
- Backyard gardenshares (Blake and Cloutier-Fisher 2009);
- A community arts centre (Carson et al. 2007);
- The New Deal for Communities urban renewal programme (Coulson et al. 2011);
- Cycling infrastructure (Crane et al. 2016);
- Walking infrastructure (Griffin et al. 2011);
- Urban renewal and street design (Jalaudin et al. 2012; Jones 2014; Serrano et al. 2016);
- Community gardens (Lanier et al. 2015; Porter and McIlvaine-Newsad, 2013);
- Community wildlife sites (Lawrence et al. 2010);

- Community development projects (Mason et al. 2011);
- Woodland and forest projects (Morris and O'Brien 2011; Vering 2006);
- Street Play projects (Murray and Devecchi 2016; Zieff et al. 2016);
- Big Lottery funded community spaces project (Shipway 2016) and rural village development (Wells et al. 2012);
- Waterfront regeneration (Shore to Core 2017);
- Local festivals (Stevenson 2017; Turco 1997; Yuen and Glover 2005);
- Temporary pedestrianisation of streets for pop up events (Torres et al. 2016; Tulloch 2016)

2.3 Results of validity assessment

The validity assessment revealed that most of the included studies (and all of the studies with a quantitative design) were of a poor or poor to moderate methodological quality. For the studies with a quantitative design, most did not have a comparator group. The lack of comparator group limits the conclusions which can be drawn about whether any observed change can be attributed to the intervention being evaluated. Also, most studies were of a cross-sectional design and did not make repeated measures. For many of the validity assessment criteria, insufficient details of the methodology were reported by the study authors.

Studies with a qualitative design were also poorly reported on the whole, but five were graded as 'good quality' (Corey 2008; Jones 2014; Stevenson 2016; Porter and McIlvaine-Newsad 2013; Whitford and Ruhanen 2013) and five as 'moderate quality' (Coulson et al. 2011; Fildes et al. 2010; Morris 2011; Wells et al. 2012; Williams and Pocock 2012).

See Appendix 9 for full details of the validity assessment.

2.4 Findings

As most of the evidence of good quality was qualitative, the findings section draws heavily on the thematic synthesis. An explanation of the coding framework can be found in Appendix 10.

Review question 1: How effective are interventions designed to improve community infrastructure (places and spaces) in improving social relations and/ or community wellbeing?

This section is structured according to intervention type, followed by outcome type (social relations, community wellbeing, and other outcomes).

Community hubs

Social relations

Nine studies of community hub interventions examined some aspect of social relations, including social cohesion, bridging social capital, trust, quality and quantity of social networks and social interactions with neighbours, friends and family. Most were assessed as being of poor or poor- to moderate methodological quality, except for one good quality qualitative ethnography study of a rural community garden (Porter and McIlvaine-Newsad 2013) and one moderate quality participatory action research study of a Men's Shed project (Fildes et al. 2010).

Qualitative evidence suggests that community hubs served to promote social cohesion through the mixing of different groups. Men's Shed was found to bring men together from different social groups, creating group cohesion (Fildes et al. 2010). Churches that changed their practice to be more multi-ethnic created cohesion between people of different ethnicities (Ley 2008), whilst community gardens created intergenerational social cohesion (Porter and McIlvaine-Newsad 2013).

Changes to community hubs led to the creation of bridging social capital and trust in four of the identified papers. Their settings were: churches (Ley, 2008b); community cafes (Bertotti et al. 2012); co-housing (Cooper et al. 2000), and community gardens (Porter and McIlvaine-Newsad 2013).

“The churches are returning to their own immigrant origins as they re-engage with youth work, re-establish English classes for adults and perhaps experiment with childcare programmes, a service rarely needed in the 1950s and 1960s. These services establish cultural encounters and are an important site for the construction of bridging social capital” (Ley 2008)

“Each spring, newcomers to the garden express social awkwardness toward those they do not know, since everyone is focused on getting their hands in the dirt. But over time, that shyness falls away and people who might never have social contact with each other begin to talk and socialise as gardening for food security gives way to expressions of leisure” (Porter and McIlvaine-Newsad 2013)

Changes to community hubs were also found to lead to increased social networks. A Men's Shed allowed men to socialise in the group and together outside of the organised meetings (Fildes et al. 2010). Similarly, the contribution of a community café to the creation and strengthening of social

capital was the provision of a place where people could meet and talk (Bertotti et al. 2012). Co-housing included spaces for casual socialising among neighbours (Cooper et al. 2000). Also, community gardens provided opportunities for residents of local housing estates to socialise (Porter and McIlvaine-Newsad 2013). One (poor quality) mixed methods study of community-built playgrounds reported increased interaction between residents and families within the neighbourhood (Daniels et al. 2009).

Two papers reported that community hubs improved the social relations of participants. Fildes et al. (2010) describes how the creation of a Men's Shed enabled the men who participated to form strong relationships and they began to socialise outside of the Shed. A further outcome was seen in that, because the men were happier, their relationships with their partners improved (Fildes et al. 2010). Similarly, Porter and McIlvaine-Newsad (2013) describe how many participants who had come to the community garden primarily for food security also realised the benefits of socialising and meeting new people.

Community wellbeing

Seven studies of community hub interventions examined some aspect of community wellbeing, including attitudes towards the neighbourhood, pride in the local area, levels of civic activity, sense of community, and family wellbeing.

In one cross-sectional survey (Armstrong 2000), project coordinators reported that having a community garden in a neighbourhood improved the attitudes of residents toward their neighbourhood for 51% of the gardens. Another cross-sectional survey in a rural area (Wells et al. 2012) reported that over half of survey respondents felt that increased pride in the local area was a key outcome, and that the area would be a better place to live, but this was particularly evident in an area where a shop and village hall had been built (83% increased pride and 96% better place) than other areas (around 33% for each outcome). Twenty percent of survey participants reported that they were more likely to participate in local groups and 26% to volunteer in the future.

Qualitative evidence from one paper also found that changes to create community hubs led to a sense of belonging and pride. Co-housing sites were found to promote a strong sense of community among residents, fostered by events and shared amenities (Cooper et al. 2000).

Community hubs were also found to promote family wellbeing. Community gardens allowed families to spend time together (Porter and McIlvaine-Newsad 2013):

“My two grandkids were so excited about helping that we had to check the garden every time they came out to see if it was growing. . . . My daughter would always say “Can we water the garden?” and . . . my grandson made sure he’d have his overalls on . . . he turns five in December. He said he loved it” (Porter and McIlvaine-Newsad 2013).

Changes to community hubs were found to increase participation in various civic activities. Community gardeners organised ‘share table’ for gardeners to share gluts of produce with anyone from the community who wanted it (Porter and McIlvaine-Newsad 2013). Gardeners also formed their own steering committee (Porter and McIlvaine-Newsad 2013).

Two papers reported changes to community norms as a result of community hub infrastructure changes. The manager of a newly formed community café was said to act as a role model for members of the community with her dynamism and commitment (Bertotti et al. 2012). Community gardening helped to dispel participants’ stereotypes of other members of the community as everyone was working side-by-side (Porter and McIlvaine-Newsad 2013).

Individual wellbeing

Five studies of community hubs examined some aspect of individual wellbeing, including quality of life, wellness, sense of purpose, self-worth, self-confidence and self-esteem, improvement in mental health status, skills and knowledge.

One (poor quality) cross-sectional survey of a ‘Café Plus’ model (Windhorst et al. 2010) reported a significantly higher proportion of Café customers who “strongly agreed” that participation in Café programs and services improved their quality of life in domains of personal growth, meaning in life, and vitality ($p < 0.001$), compared to non-Café customers ($p < 0.001$). For Café customers, number of visits were strongly associated with increased quality of life, wellness, and satisfaction scores ($p < 0.001$).

Creating community hubs was found to positively affect individual wellbeing in three qualitative papers. The creation of a Men’s Shed increased the sense of purpose, self-worth and self-confidence of the men who participated, and those who had a diagnosed mental health issue observed a continued improvement in their mental health status, which included seeing their doctor less (Fildes et al. 2010). The overall health status of a number of the participants improved since joining the Men’s Shed group (Fildes et al. 2010). Elsewhere, creating a community café raised the self-esteem

and confidence of the members of the community involved, whilst ongoing volunteering opportunities in the café raised the confidence and provided a daily routine to people with mental health issues (Bertotti et al. 2012). Also, building a new skate park, games area and playground on the site of a dilapidated village hall became a site for education, sports, and health and wellbeing service in the community (Shipway 2016).

Community hubs were found to improve individuals' skills and knowledge. Participants of a Men's Shed gained new skills from their activities in the shed and were empowered to seek out additional skills training (e.g. English language, welding) (Fildes et al. 2010).

"I believe I have learned new skills and like doing so. The whole thing has been fun. It has been a good way to pass time. Men need to feel good about themselves and this is a good way to feel good. When I left work I felt 'closed up', since coming to the shed things have improved. I feel more comfortable and relaxed" (Fildes et al. 2010, p. 237)

Volunteers at a community cafe improved their social interaction skills and confidence (Bertotti et al. 2012). The creation of a community garden improved the gardening knowledge of those involved (Porter and McIlvaine-Newsad 2013). Moreover, both the Men's Shed (Fildes et al. 2010) and community café (Bertotti et al. 2012) were felt to improve the employability of participants.

Other outcomes

Qualitative evidence showed that changes to infrastructure to create community hubs could lead to behaviour change for individuals. This includes increased recreational activity and community participation (Fildes et al. 2010), increased physical activity in day-to-day lives (Gomez-Feliciano et al. 2009), and increased fruit and vegetable consumption (Porter and McIlvaine-Newsad 2013).

In one study of community gardens in USA (Armstrong 2000), 33% of respondents reported that the creation of a garden led to other neighbourhood issues being addressed e.g. a campaign to keep a larger supermarket in the area; further development; a new park and playground.

One case study evaluation of a range of interventions in rural areas (Wells et al. 2012) identified an increase in tourism as a positive outcome of several of the projects.

Events

Social relations

All ten studies of events reported outcomes on social relations, including community cohesion, social networking, mixing with different groups, social interactions, friendliness, meeting with friends and family, bonding and bridging social capital. Most were of poor or poor to moderate methodological quality, apart from two qualitative studies which were of good quality: one case study of a local festival adjacent to the Olympic Park area of East London, UK (Sttevenson 2016) and one qualitative study of an Australian indigenous festival (Whitford and Ruhanen 2013).

A (poor quality) cross-sectional survey study of an international fair (Erden and Yolal 2016) reported significant differences by age group in perceptions of the benefits of the fair for community cohesion [$F(3, 418) = 4.078, p = 0.007$], and significant differences in community cohesion [$F(2, 419) = 4.156, p = 0.016$] dimension on the basis of participants' marital status. Post hoc comparisons suggested that participants aged under 20 years ($M = 3.53, SD = 0.73$) and aged 21-32 years ($M = 3.43, SD = 0.79$) placed more importance on community cohesion compared to the 45 years and older group ($M = 3.09, SD = 0.93$). Single participants ($M = 3.42, SD = 0.83$) placed more importance on community cohesion compared to other groups ($M = 2.87, SD = 0.90$).

A (poor quality) mixed methods evaluation of a regular pedestrianisation event (Mason et al. 2011) reported that the majority (71-84%) of respondents attended events with friends or family, with 15% listing social networking (particularly 'being together with neighbours') and 15% listing exposure to other communities along the route as the primary benefit of the initiative.

A (poor quality) mixed methods evaluation of a 'pop up park' (Tulloch 2016) reported a quantitative increase in the following dimensions of sociability: interactions; stewardship; friendliness. No change was reported for diversity. Pedestrian count in the early evening increased during the project, compared to pre-project counts, which was used as a proxy for 'place vitality'.

A (poor quality) cross-sectional survey of a balloon fiesta (Turco 1997) reported that 43% of the population indicated that they received social benefits from the fiesta, including entertainment, satisfaction and socialisation, while more than half (54%) perceived moderate or large increases in opportunities for socialisation.

Qualitative evidence found that events improved individuals' social relations. An urban pop-up park led to people socialising in the space (Tulloch 2016). An annual festival was found to be a place for those attending to meet up with friends and relatives who did not live in the local area (Whitford and Ruhanen 2013).

Events were found to enhance the social relations of communities by providing a 'hub' for socialising (Black 2016; Tulloch 2016; Whitford and Ruhanen 2013). Socialising was found to occur between generations (Black 2016) and diverse ethnic and socio-economic groups (Gomez-Feliciano et al. 2009; Whitford and Ruhanen 2013; Yuen and Glover 2005), providing a neutral space in which to promote cohesion. Events were found to effect community social capital, allowing both old bonding connections to be renewed and new bridges to be created (Black 2016; Whitford and Ruhanen 2013; Yuen and Glover 2005).

"An internal, bonded sense of understanding and knowledge exchange occurred through predominantly informal means whilst outsiders found bridges to understand and relate to the host community through the inclusion of more formal means of purveying knowledge" (Black 2016, p. 177)

Across four annual rural community festivals, participants believed that the renewal of existing relations (bonding) predominated and if too great an emphasis was placed on facilitating the needs of 'outsiders' (bridging) this could lead to feelings of exclusion within the community (Black 2016). Conversely, a series of urban neighbourhood events were used to deliberately develop and strengthen informal connections among neighbours, giving them a reason to socialise (Yuen and Glover 2005).

Community wellbeing

Nine studies of events reported community wellbeing outcomes, including a sense of pride, quality of city life, economic benefits, community spirit, enhanced local image, fun, sense of belonging, connection to place-based culture or heritage, physical environment, and civic activity.

In one (poor quality) study of a balloon fiesta (Turco 1997), around 80% of respondents agreed or strongly agreed that living in the host city of the Balloon Fiesta instilled in them a sense of community pride, while 72% agreed or strongly agreed that the event enhanced the overall quality of life in the city. In terms of positive social change, 78.5% of respondents perceived an increase in revenue generated in the community, 66.4% reported positive attitudes toward Balloon Fiesta tourists, 68.8% reported improved community spirit, and 80.4% perceived an enhanced state and local image. Negative perceptions of social change included increased crowd restrictions (45%) and increased traffic congestion (72%).

A (poor quality) mixed methods evaluation of a 'pop up park' (Tulloch 2016) reported a quantitative increase in the following dimensions of community wellbeing: fun, vital (only for types of activities), special, sittable. No change was reported for: accessible (except for a decrease in space functionality for people with special needs), connected, convenient (except for a decrease in 'paths through the space take people where they want to go'), active, vital, safe, maintained.

Qualitative evidence found that events can create a sense a belonging and pride. Black (2016) describes how local festivals were associated with an increased sense of belonging and place attachment among the host community. The festivals were opportunities for showing off the unique or special qualities of the town/village (Black 2016; McLean and Rahder 2013). They have been found to be a celebration of a shared identity (Black 2016; McLean and Rahder 2013; Whitford and Ruhanen 2013; Yuen and Glover 2005). Events contribute to consolidation, integration (Black 2016), and reconciliation (Whitford and Ruhanen 2013, p. 54); *"a celebration of the community coming together"*.

Events may also provide opportunities to connect to a particular place-based culture or heritage through the enhancement of knowledge and understanding of the culture associated with the place where they are held. They provide opportunities for 'insiders' to unite around a shared worldview and ethnic, linguistic, historical and cultural bonds (Whitford and Ruhanen 2013). They can also be an opportunity for knowledge exchange and to share culture with 'outsiders' and younger generations through more formal displays, such as craft or workshops to teach cultural skills (Black 2016).

"there is little doubt that the Annual Sports and Cultural festival recognizes indigenous diversity and difference. According to an interview respondent, the festival is 'the most unique and biggest Indigenous event that I know of and have been to . . . it is definitely the biggest that I have seen in Australia and I think it is quite unique and different.' Importantly, it celebrates the idea that 'indigenous culture has a strong cultural element to it so it's important that community people are engaging in that and that it is showcased'" (Whitford and Ruhanen 2013, p. 54)

Events have been found to create a better physical environment. A pop-up park improved the physical comfort of an urban street (*i.e.* through sitting, places to rest, shade), producing a more attractive place for people to visit and stay (Tulloch 2016).

Events served to improve the general sense of community wellbeing. An annual festival for indigenous communities was found to promote “family, friends, and community” (Whitford and Ruhanen 2013, p. 54). The weekly pedestrianisation of a market was found to be significant to establishing an exciting and vibrant community:

“Participants expressed excitement about being part of such a vibrant community, while pedestrian activists celebrated their commitment to making Kensington Market into a space for creative, communal, interactive interventions” (McLean and Rahder 2013, p. 98).

Three of the identified studies found that events increased the amount of ‘civic activity’ that people engaged in. This process of hosting an event helped mobilise collective action (McLean and Rahder 2013; Yuen and Glover 2005). During a pop-up park event, members of the public were observed tidying the space to help maintain the environment (Tulloch 2016). Events may also help to change social norms, for example, by demonstrating that participants can enjoy themselves whilst remaining drug and alcohol free (Whitford and Ruhanen 2013). The hosting of an event facilitated the opportunity to the public and the local authority to gain a better mutual understanding of, and respect for, one another (Yuen and Glover 2005).

Individual wellbeing

Hosting an event enabled individuals the opportunity to join social/community groups during the event and beyond. Black (2016) notes that, whilst very few people actually joined a group following the festival, increased knowledge of what was available and the potential to join contributed to a feeling of wellbeing in itself.

Other outcomes

Negative or unexpected outcomes: Some people experienced exclusion from events. A pop-up park in an urban street became a less convenient ‘movement corridor’ for people on bicycles and only had limited access for people in wheelchairs (Tulloch 2016). A community festival was perceived as only being for ‘locals’ (Black 2016). Similarly, the temporary pedestrianisation of a market was felt to have been organised with only the interest of a small portion of the community in mind, to the detriment of the rest (McLean and Rahder 2013):

“Because the organizers’ vision seemed to celebrate only that which is young, hip, and cool, the Market’s old-timers, community services, and their customers fell “completely off their radar””
(McLean and Rahder 2013, p. 105)

A further negative perception was that events might lead to further exclusion by accelerating processes such as gentrification (Gomez-Feliciano et al. 2009; McLean and Rahder 2013):

“As downtown Toronto neighbourhoods become transformed into more pedestrian- and transit-friendly urban villages, the car-dependent working poor on the outskirts become further socially and spatially marginalized” (McLean and Rahder 2013, p. 102)

Neighbourhood design

Sixteen included studies were coded as neighbourhood design. Most were of poor or poor to moderate quality, apart from three moderate quality qualitative studies (Coulson et al. 2011, Wells et al. 2012, Williams and Pocock 2010), and one good quality qualitative study (Jones 2014).

Social relations

Fourteen studies of neighbourhood design reported some aspects of social relations outcomes, including social capital, social interactions, meeting new neighbours, deepening friendships, social connections, social cohesion and trust. One poor quality before and after study of an urban renewal programme in a socially disadvantaged area in Sydney, Australia reported no statistically significant improvement in social capital following the urban renewal program (Jalaludin et al. 2012). Another poor to moderate quality cross-sectional survey study of a street design project in Seoul, South Korea found that the project increased pedestrian convenience to a certain degree through the integration or simplification of street facilities. However, it was inadequate for inducing new social activities, as only simple, exterior improvements of facilities and signs were implemented (Jung et al. 2017). Data from a cohort study of a community-led neighbourhood design project showed increasing levels of cohesion among residents. The number of people who had conversations at least monthly almost doubled (from 10% to 17%), although weekly and daily contacts did not improve much and some marginally declined (Saville 2009). A poor quality mixed methods evaluation of a community-led urban neighbourhood design project reported that ten study respondents mentioned meeting new neighbours they would not have met otherwise and 13 study respondents mentioned that they had deepened their friendship ties (Semenza and March 2009). In a poor quality mixed methods evaluation of a street play project it was reported that adults attending the

project with their children interacted with their adult neighbours, rather than engaging in physical activity (Zieff et al. 2016).

Neighbourhood design was found to improve individuals' social relations in three qualitative papers. Installing a cycle lane provided more opportunities for people, particularly cyclists, to interact:

"I have connected more through riding a bike than I ever had by driving a car, and I meet more neighbours who ride bikes ...it's a very community-based driven activity because it gets people moving" (Crane et al. 2016, p. 53).

Making streets more 'walkable', including installing pedestrian crossings and refuges, allowed pedestrians to walk more safely to a destination, which allowed greater social interactions through seeing and interacting with more people compared to driving (Jones 2014). Williams and Pocock (2010) describe a number of neighbourhood design changes as part of 'master planned communities' made in accordance with the specific needs of local residents that resulted in increased social relations for residents. Building a local café, for example, provided an opportunity for local mothers to meet and interact. Similarly, amenities for local teenagers (*i.e.* a skate park) provided opportunities for social connection among teens.

Participants in their study identified many examples of physical infrastructure that can facilitate access to other children and parents, including location of (pre)school, easy parking, comfortable waiting areas, local after school care, safe walking and bike paths, local parks, and easy transport options.

Having places and a reason to interact appears particularly important. With regard to the availability of spaces for interaction in a co-housing development, one participant in the study by Cooper (2000) said:

"The glass corridors! Community depends on informal life, and the weather here wouldn't permit such social life without the corridors. There is a lot of casual and informal neighboring in spring and summer and that's good! Meeting in the corridor, we have different, less formal rules of conduct than in the house. ... We leave our doors unlocked here, as we did on the farm ... and we never lock the front door to the whole scheme ... (Peder, 30s, resident)".

Changes to neighbourhood design were found to increase social cohesion (Serrano et al. 2016; Williams and Pocock 2010), by bringing together people from different ages and from different social backgrounds (Raja et al. 2009; Williams and Pocock 2010).

“Local amenities that cater to the needs of teenagers provide opportunities for social connection among teens and if these amenities are integrated into the physical and social infrastructure of the area as a whole, they provide opportunities for intergenerational closure. The local adults and the local teenagers become familiar with each other at the very least, and this increases feelings of trust and responsibility which result in support and sanction when necessary” (Williams and Pocock 2010, p. 82).

Neighbourhood design changes were also found to improve social capital. Both the planning and resultant changes to make some urban city blocks more amenable to active transport brought together a range of stakeholders who previously had little trust in each other (Raja et al. 2009). Changes to waste disposal in a residential complex were also found to result in tenants starting to talk to each other (Stenberg et al. 2009)

Community wellbeing

Fifteen studies of neighbourhood design reported on some aspect of community wellbeing, including attitude towards the neighbourhood, sense of pride, maintenance, attractiveness, safety, environment, economic impact, area identity and civic activity.

In one (poor quality) survey, having a community garden in a neighbourhood was reported by coordinators to improve the attitudes of residents toward their neighbourhood for 51% of the gardens. This was usually evidenced by improvements in the maintenance of other properties in the neighbourhood, reduced littering and increased pride in a neighbourhood (Armstrong 2000).

In a (poor quality) mixed methods evaluation of a community coalition to increase walking, physical environment assessments documented consistent maintenance of existing sidewalks, sporadic improvement of sidewalk conditions along the walking trails and that signage (route signs and footprints painted on sidewalks) along the 2 marked walking trails remained clearly visible.

Scores for aesthetic properties such as lack of graffiti, pleasing scenery, and minimal litter were also consistently high for 2 of the 3 trails (Griffin et al. 2011).

In a (poor quality) before and after study of an urban renewal programme in Sydney, following the intervention, there were no statistically significant differences in any of the reported perceptions about neighbourhood safety or aesthetics (Jalaludin et al. 2012).

In a (poor quality) cross sectional survey of a street design project, pedestrians walking through project locations tended to be more satisfied compared with those on typical streets. Besides the presence of trees, no other environmental variables were significant in the pedestrian-satisfaction model (Jung et al. 2017).

In a poor quality mixed methods evaluation of a community led neighbourhood design project, of 97 residents interviewed, 65% (n=63) rated their neighbourhood an excellent place to live, compared with 35% (52 of 147) at the control site ($P < .01$) (Semenza 2003).

In a (poor quality) Swedish mixed methods evaluation of housing refurbishment in Sweden, statistics on the reduced number of empty apartments was taken as a proxy to show that the attractiveness of the areas had increased (Stenberg et al. 2009).

In a (poor quality) mixed methods evaluation of a street play project 93.3% of participants agreed that '[the project] strengthens our community.' (Zieff et al. 2016).

Qualitative evidence found that changes to neighbourhood design positively affected sense of belonging and pride in a community. The installation of a cycle path, for example, allowed cyclists to be more aware of the community and to increase participation in activities (Crane et al. 2016; Jones 2014). Coulson et al. (2011) found that being involved in the consultation process of designing a 'living street', including improving environmental aesthetics, greater priority to non-motorised road-users and slow traffic, and introducing shared space, enhanced community spirit.

Neighbourhood design changes were found to improve the function and aesthetic of neighbourhoods, which contributed to people feeling better about their surroundings (Coulson et al. 2011; Serrano et al. 2016). The improvements to the physical appearance of a street as a result of the installation of a cycle path was thought to also be a draw to the area and attract new businesses (Crane et al. 2016). Similarly, changes to waste disposal and recycling infrastructure in a housing development were thought to increase the attractiveness of the area, which could enable social change (Stenberg et al. 2009)

"I reckon it was well worth it. When you come out your house now, you look at it and you think 'Gosh, this is lovely, isn't it?'"(F, 5/06, Coulson et al. 2011, p. 305)

In terms of functionality, changes to urban street design to calm the traffic and be more pedestrian- and cycle-friendly were thought to make the environment safer for pedestrians, cyclists, and car drivers (Jones 2014) and more usable for pedestrians and cyclists (Raja et al. 2009).

Changes to neighbourhood design were thought to have positive economic impacts for communities. The creation of new, quality spaces in a city were thought to lead to job creation (Serrano et al. 2016).

In two cases, a change to the neighbourhood design, particularly where it had made the environment more physically attractive, led to an area developing a particular identity. The installation of a cycle path in an urban street was found to result in the street developing an identity as a healthy and environmentally friendly place (Crane et al. 2016). This is something that local businesses were drawn to:

“For the three new businesses interviewed who had moved into the neighbourhood, the cycleway had played a part in their decision to move to the area. For example, ‘It was definitely seen as a positive ...we see people who cycle around Sydney as being a really positive impact the community, on the environment, on their own health...that is a big part of our ethos here’” (Crane et al. 2016, p. 53)

Stenberg et al. (2009) found that the newly acquired attractiveness of a housing complex had a positive impact on how the area was talked about and how it was presented in the media. Changes to neighbourhood design were found to increase civic activity in two cases. Residents tried to keep their street clean following changes to calm traffic and make the street more attractive (Coulson et al. 2011). ‘Master Planned Communities’ provided those with time to engage in ‘community making’ and ‘community taking’ activities (*i.e.* groups, volunteering) (Williams and Pocock 2010). Building Master Planned Communities also provided opportunities for members of the public to act together to lobby developers and local authorities (Williams and Pocock 2010).

Changes to neighbourhood design were found to positively impact on social norms. The installation of cycle lanes encouraged people to be more physically active and dispelled existing stereotypes surrounding cyclists (Crane et al. 2016). Changes also extended to policy guidelines, where a local authority decreed that any new developments that included new parking spaces must also provide bicycle parking (Raja et al. 2009).

Individual wellbeing

Qualitative evidence reported that changes to neighbourhood design led to improved mental and physical wellbeing. The installation of an urban cycle lane led to cyclists feeling more confident and the quality of life of the community increasing because of the greater social aspect and the joy of commuting away from motor traffic (Crane et al. 2016). The cycle lane also made people feel

healthier and safer (Crane et al. 2016). The development of a 'complete street', including the reduction of traffic and making the street more pedestrian and cycle friendly, was also thought to increase quality of life and improve public health (Jones 2014).

Other outcomes

A cross-sectional survey of a community-led neighbourhood design project reported that in the intervention area neighbourhood, 86% of respondents reported excellent or very good general health, compared with 70% in the adjacent neighbourhood ($P < .01$), and 57% versus 40% felt "hardly ever depressed" ($P < .01$) (Semenza 2003). Neighbourhood design was found to lead to a number of individual behaviour changes. New planters installed in the public spaces of a housing estate increased some residents' physical activity through providing opportunities to garden (Coulson et al. 2011). A (poor quality) mixed methods evaluation of a street play project found that engagement in vigorous physical activity increased three-fold (11.5% to 35%) during the intervention (Zieff et al. 2016).

In one paper, the installation of a bicycle lane and pedestrian crossings created a mutual awareness of shared space between cyclists, car drivers and pedestrians, resulting in drivers navigating with more caution and respecting other road users more (Jones 2014). A (poor quality) before and after study of an urban renewal program in Sydney, Australia found no statistically significant changes in health behaviours (daily smoking, hazardous alcohol consumption, adequate physical activity), health status (BMI, self-rated health) or use of health services (visits to a general practitioner) following the urban renewal program (Jalaudin et al. 2012).

"I'm out there weeding and putting the plants in. I've become more active...race round to get everything done, so I can get out there." (Coulson et al. 2011, p. 306)

Installation of cycle lanes was found to increase cycling (Crane et al. 2016; Jones 2014). More general changes to street design, including installation of pedestrian crossings and refuges and reducing a road carriageway from two lanes to one resulted in higher levels of active transport (walking, jogging, cycling) (Jones 2014). Raja et al. (2009) suggests that just the planning to make neighbourhoods more amenable for active travel can create a culture shift towards 'active living' of those involved in the process. Changes to in the energy, water and sewage distribution systems in a residential complex resulted in residents becoming more engaged in recycling and energy conservation (Stenberg et al. 2009).

Negative or unexpected results: Some neighbourhood design changes were associated with exclusion or segregation. For example, whilst a co-housing development was designed with a communal bar/café in the centre for residents and the public to use, the public felt that they were not made to feel especially welcome (Cooper et al. 2000).

Another negative perception was an actual or perceived threat that the space might be misused. There was resistance to the installation of street furniture and a cycle path because residents felt it might lead to youths congregating and causing trouble (Coulson et al. 2011), unlike the previously overgrown and unwelcoming areas.

Following changes to waste disposal systems, some housing areas experienced significant problems with unsorted waste, as some tenants left their mixed waste in the recycling building (Stenberg et al. 2009). Cyclists were felt to not be using the installed cycle path by riding on the pavement, to the annoyance of many car drivers and pedestrians (Crane et al. 2016). Also, some neighbourhood design was thought to create new problems or transfer existing issues to other areas. The installation of cycle lanes had the perceived effect of transferring traffic to other areas (Crane et al. 2016; Jones 2014). A change to the street design of a housing estate to create more welcoming shared spaces was viewed negatively because it had a detrimental effect on residents' parking (Coulson et al. 2011).

Two neighbourhood design interventions were found to have no discernible effect. Coulson et al. (2011) reported that changes to make a housing estate more welcoming had minimal influence on physical activity, did not control speeding traffic, had not increased social interaction, nor made people feel safer. In another example, the installation of a cycle lane was not found to not make some residents feel safer (Jones 2014).

Green & blue space

Fourteen included studies were coded as green and blue space. Most were of poor or poor to moderate quality, apart from one moderate quality qualitative study (Morris and O'Brien 2011) and one good quality qualitative study (Porter and McIlvaine-Newsad 2013).

Social relations

Thirteen studies of green and blue space reported social relations outcomes, including social interactions, family connections, improved relationships with peers, community cohesion, bonding and bridging social capital.

A mixed methods evaluation of community built playgrounds reported increased social interactions between residents and families within the neighbourhood (Daniels et al. 2009).

A mixed methods evaluation of community gardens reported that collectively, the garden grant administrators agreed ($M = 4.0$, $SD = 0.65$; on a 5-point scale) that their community garden connected their organization with others in the community (Lanier et al. 2015).

In another mixed methods evaluation, 63% of adult survey respondents from one project indicated that they spent more time with their families as a result of community gardening, while 89% of the older youth from another project indicated that they got along better with people their age as a result of school gardening (Mangadu et al, 2016).

Green and blue space were found to increase community cohesion through encouraging mixing of different cultural and socioeconomic groups. The act of community gardening, for example, brought people together and fostered intergroup relationships (Mangadu et al. 2016, Porter and McIlvaine-Newsa, 2013). The installation of an accessible trail through woodland, including information about the forest, contributed to solidarity and tolerance and therefore social integration (Vering 2006). The process of making changes to a green or blue space was also found to create cohesion. The organising committee of a new skate park used the project as an opportunity to create better understanding between the group, local young people, and the community (Shipway 2016).

Social networks were found to increase following green and blue space changes. Changing a stretch of urban river to be more accessible had created a space for recreation, relaxation, and social interaction (Åberg and Tapsell 2013). Likewise, community gardens increased the sense of community and positive social interactions (Mangadu et al. 2016, Ohmer et al. 2009).

Changes to green and blue spaces were found to have various effects on social capital. The wide range of interventions described by Shipway (2016) and the creation of rural community wildlife sites in particular (Lawrence et al. 2010) increased the bonding between neighbours and like-minded individuals. Bridging social capital was found to increase following the creation of community gardens (Porter and McIlvaine-Newsad 2013).

Opportunities for interaction and making friends occurred both during the process of making the change and in the increased participation that followed thereafter. For example, developing community wildlife sites was shown to provide opportunities to interact with other members of the group and with outside organisations (*i.e.* local government, NGOs, other wildlife groups) (Lawrence et al. 2010). These interactions occurred formally (*i.e.* at meetings) and informally. Other examples showed how participation in community gardening (Mangadu et al. 2016; Porter and McIlvaine-Newsad 2013) and activities in newly accessible forest (Morris and O'Brien 2011) created opportunities for social interaction.

Community wellbeing

Eleven green and blue space studies reported on aspects of community wellbeing, including attitudes towards the neighbourhood, attractiveness, positive and increased use of space, family wellbeing, civic activity, sense of pride and ownership.

In one (poor quality) cross-sectional survey, having a community garden in a neighbourhood was reported by coordinators to improve the attitudes of residents toward their neighbourhood for 51% of the gardens (Armstrong 2000). A mixed methods evaluation of community gardens reported that about half (53%) of the community gardens surveyed donated their produce to food pantries, community health clinics, or other non-profit organizations. Garden administrators repeatedly noted how positive their members felt to be able to give back to the community and help others. They (47%) used the produce within their organization (Lanier et al. 2015).

Changes to green and blue spaces have been found to improve the aesthetic of the environment, resulting in spaces that people are more inclined to use for leisure and socialising (Åberg and Tapsell, 2013; Ohmer et al. 2009, Shipway 2016). Lawrence et al. (2010) noted how the development of community wildlife sites increased use of the areas.

Green space changes were found to improve family wellbeing. Community gardening helped bring families closer together by providing something for family members to do together (Mangadu et al. 2016; Porter and McIlvaine-Newsad 2013).

Civic activity was found to increase following changes to green and blue spaces, while crime and anti-social behaviour was reduced (Ohmer et al. 2009, Shipway 2016). Community gardens provided an opportunity for people, including young people, to be more involved in community development activities in their communities (Ohmer et al. 2009). People were motivated to contribute to looking after the garden (Mangadu et al. 2016), and activities in the garden helped to build momentum for the community to act on other issues, including crime, vandalism, and litter in their local area (Ohmer et al. 2009). In one study, community gardeners organised into a cooperative to share excess food with the community in an attempt to tackle food insecurity (Porter and McIlvaine-Newsad 2013). Shipway (2016) noted that changes to green and blue space resulted in people being more involved in their local areas, with new volunteers and less scepticism.

“Community Spaces has contributed to all these factors, primarily through its programme of capacity building which has seen stronger groups, partnerships and volunteers more able to play a full role in civic life” (Shipway 2016, p. 20)

Green and blue spaces were found to be sites of knowledge exchange. Community gardeners said they shared what they learned about gardening, nutrition, and physical activity with their immediate and extended family (Mangadu et al. 2016).

Changes to green and blue spaces positively affected community social norms in a number of ways. Community gardening was found to change beliefs and behaviours regarding conservation issues, sense of community, and volunteerism (Ohmer et al. 2009), and food production (Mangadu et al. 2016). Community gardening was also found to challenge stereotypes associated with low-income housing as participants acted alongside each other with no idea of each other's backgrounds (Porter and McIlvaine-Newsad 2013).

Changes to green and blue space were associated with an increased sense of pride and ownership. Community gardening (Mangadu et al. 2016; Ohmer et al. 2009) and community wildlife (Lawrence et al. 2010) increased participants' pride in the community or location. Regular interaction with the site helped create a sense of ownership:

"People feel this belongs to them and we have encouraged this feeling of "we planted it, we look after it", and that's a very strong feeling. ... And the children, to hear them talk about it, "I've been up to my woodland." We have worked to foster that ... It was quite deliberate, and necessarily so. Because that awareness can evaporate frighteningly easily and has to be worked out and maintained. The awareness of the ownership of the woodland. You can't take it for granted. [interview 16]" (Lawrence et al. 2010, p. 129)

Individual wellbeing

Eight studies reported on individual wellbeing outcomes, including connection to nature, physical activity, healthy eating, sense of fulfilment, confidence, mental wellbeing, functioning, communication, skills and knowledge.

Community wildlife sites were found to increase participants' awareness of other people and participation in, and awareness of, nature (Lawrence et al. 2010). A community garden also increased awareness of the value of green spaces in the community and connectedness to the natural world (Ohmer et al. 2009).

Changes to green and blue spaces were also found to result in individual behaviour change. The rehabilitation of a section of urban river, including the installation of walking and cycling paths, led to increases in physical activity (walking, cycling) (Åberg and Tapsell 2013). Installing community gardens increased physical activity and healthy eating of those involved, including children and young people (Mangadu et al. 2016, Porter and McIlvaine-Newsad 2013).

Changes to make woodland more accessible, including new infrastructure, activities, and events, were found to result in generally more active lifestyles and positive changes in attitudes towards exercise (Morris and O'Brien 2011).

Individual mental and physical wellbeing was also improved as a result of green and blue space changes. Community gardening (Mangadu et al. 2016) and community wildlife sites (Lawrence et al. 2010) were both perceived to be enjoyable and helped people develop a sense of achievement or fulfilment. People also developed a profound and moving sense of connection with the place and the experience of nature (Lawrence et al. 2010). Following changes to make woodland more accessible, participants emphasised the benefits of being out in the fresh air (Morris & O'Brien, 2011). More formalised activities taking place in the newly formed green and blue spaces were also found to benefit individual mental and physical wellbeing. A mountain biking group gave the women who participated confidence to try new routes they would not have attempted on their own (Morris & O'Brien, 2011), whilst education sessions in a community garden enhanced the participants physical and mental wellbeing by encouraging participation (Mangadu et al. 2016).

One paper described how changes to green and blue spaces led to improved individual functioning. Starting a community garden in a juvenile detention centre helped the participants communicate better with others and deal with problems without resorting to violence (Mangadu et al. 2016). Changes to green and blue spaces were found to have a positive effect on individuals' skills and knowledge. Community gardening had improved knowledge of gardening (Mangadu et al. 2016; Ohmer et al. 2009, Porter and McIlvaine-Newsad, 2013), conservation issues (Ohmer et al. 2009), and healthy eating (i.e. food groups, portion size) (Mangadu et al. 2016). Lawrence et al. (2010) identified that developing new community wildlife sites can increase peoples' general understanding of nature.

Others, often motivated originally to do something for their community, expressed surprise and joy at their new understanding of nature:

'It's the minute daily observation which makes it a living thing. It's just noticing the little things. The quality of the mud underfoot, what's dry and what's wet. The constant repetition and contact with it. You see the buds coming and register these little things, and constant contact keeps it in the consciousness'. [interview 16]' (Lawrence et al. 2010, p. 133)

Shipway (2016) reported a range of positive individual knowledge and skill outcomes as a result of various changes made to green and blue spaces as part of the 'Community Spaces' evaluation, including new community gardens, play areas, wildflower areas, new cycle and walking paths, skateboard parks, and sea front leisure facilities. In particular, the involvement of volunteers resulted in *"stronger individuals...with more confidence, increased skills, new aspirations and improved wellbeing"* (Shipway 2016, p. 4).

Other outcomes

Negative or unexpected results: An unexpected positive effect in a cross-sectional survey of community gardens was that in 33% of neighbourhoods, having a community garden had led to other local issues - such as establishment of a neighbourhood watch scheme in a high crime area, development of a park, playground a community babysitting, and a campaign to keep a local supermarket - being addressed (Armstrong 2000).

Findings from Morris and O'Brien's (2011) study of five woodland projects warn of the potential negative impact on social and community cohesion. They observed that walking groups open just to women or people from minority ethnic groups excluded others, and this could mean that people from these groups did not mix with other visitors to the woodland settings. Changes to green and blue spaces were also found to have a potentially negative physical impact on the environment. Åberg and Tapsell (2013) found that following the redevelopment of a section of urban river, local residents felt that their gardens were 'boggier'. The additional people that were now attracted to the riverscape were perceived to have contributed to an increase in litter and dog fouling (Åberg and Tapsell 2013).

In a mixed methods evaluation of community gardens, 77% of older youth respondents from one area reported that they are better able to solve problems without violence and fighting as a result of being engaged in the school garden. Similarly, 78% of younger youth and 91% of older youth (in juvenile detention) respondents from a different area reported that they are able to prevent violence while dealing with conflicts as a result of participation in the community garden (Mangadu et al. 2016).

Place-making

Seven included studies (nine articles) were coded as place-making. All were of poor or poor to moderate quality.

Social relations

Eight included articles on placemaking reported social relations outcomes, including attitude to the neighbourhood, collective control, trust, social interactions, friendliness, social cohesion, bridging and bonding social capital.

In a (poor quality) mixed methods evaluation, no statistically significant differences were found between the sites regarding whether residents believed that their neighbourhood was a good place for children to grow up (43% vs 36% at the control site) or whether decisions that affected the neighbourhood could be influenced by working together (47% vs 40%) (Semenza 2003). Two

questions that probed whether study participants had talked to neighbours about personal problems or asked their neighbours over to their houses to socialise displayed statistically significant differences ($p = 0.05$). Social capital displayed a statistically significant increase after the intervention ($F = 1.71, p=0.04$) (Semenza et al. 2007).

A poor quality mixed methods evaluation of a pop up park found a quantitative increase in the following dimensions of sociability: interactions; stewardship; friendly, with no change in 'diversity'. On both of the study days during the project, pedestrian counts between 17:00 and 20:30 were consistently higher than those recorded prior to the project, and this was used as a proxy for 'place vitality' (Tulloch 2016).

A pop-up park (Tulloch 2016) became a popular gathering spot where more and more people came to socialise. In another example, installing a cycle path on an urban street provided opportunities for social interaction (Crane et al. 2016), whilst conversations and friendships emerged during the painting of street corners (Semenza and March 2009). People from different age and socioeconomic groups as well as different ethnic backgrounds were brought together, increasing social cohesion, during an 'OpenStreets' event (Gomez-Feliciano et al. 2009) and changes to make an urban neighbourhood more appealing to pedestrians (Semenza and March 2009). Placemaking also enhanced community social relations through improving bridging and bonding social capital, providing opportunities for new connections to be made and established connections to be reaffirmed (Semenza and March 2009; Shipway 2016).

Community wellbeing

Eight included articles on placemaking reported some aspect of community wellbeing, including attitude to the neighbourhood, sense of community, civic activity, sense of belonging, trust, safety, attractiveness, perceived welcome, fun, sense of pride and sense of belonging, quality of life, and increased social activities.

In a poor quality mixed methods evaluation, of 97 intervention area residents interviewed, 65% ($n=63$) rated their neighbourhood an excellent place to live, compared with 35% (52 of 147) at the control site ($P<.01$) (Semenza 2003). In another report of the same intervention, the estimated marginal mean change between the first and the second survey was most pronounced for sense of community scale ($F = 3.97, p = 0.01$) (Semenza et al. 2007).

A mixed methods case study reported the following positive outcomes: 71% of groups had found new volunteers; more residents had become involved in community life; 75% of groups felt their project had strengthened their community (Shipway 2016).

A cross-sectional survey evaluation of a waterfront placemaking intervention reported the following: perceived place belonging, perceived trust in place, and perceived place quality all showed a statistically significant increase in the intervention site compared to control. In addition, perceived attractiveness, perceived welcome, perceived safety, and likelihood of recommending a place to a friend all significantly increased in the intervention group.

The intervention increased the number of individuals who stopped and engaged with the site. About 64 percent of passing pedestrians and cyclists stopped and lingered on intervention day, while on the control day only about 11 percent of passers-by stopped (Shore to Core 2017).

A poor quality mixed methods evaluation of a pop up park reported positive changes for the following characteristics of community wellbeing: Fun; Vital (only for types of activities); Special; Sittable. No change was reported for: Accessible (except for a decrease in space functionality for people with special needs); Connected; Convenient (except for a decrease in 'Paths through the space take people where they want to go'); Active; Vital; Safe; Maintained (Tulloch 2016).

Allowing local communities to modify the aesthetic of urban street corners with interactive art features increased community pride and identity (Semenza and March 2009). Sense of place was strengthened through both the urban beautification and project participation:

“On reflecting on their modified intersection with the added interactive art features, residents reported: It is a wonderful and great community builder because it gives people the sense of ownership of their neighbourhood...” (Semenza and March 2009, p. 32).

Placemaking was found to change community norms. Shipway (2016) reported that placemaking created stronger more ambitious communities, with people being more involved in their area, less sceptical, and more in favour of volunteering.

Three studies found that placemaking activities improved either the functionality and/or aesthetic of a space, which in turn attracted more people to the area. A pop-up park on an urban street improved the physical comfort of the street (*e.g.* seating, shade) (Tulloch 2016). Changes to the appearance of urban street corners increased the artistic quality of the neighbourhoods (Semenza and March 2009).

Placemaking was found to positively impact the quality of life in the community. For example, Shipway (2016) found that involving local people in the process of placemaking increased community resilience and encouraged others to bring forward ideas.

Placemaking has been found to promote increased civic activity in two ways. On the one hand, people visiting an urban pop-up park were observed adding to or maintaining the community created art and tidying the space (Tulloch 2016). On the other, being involved in the process of placemaking, including the organisation and management, has led to more people volunteering or being involved in local partnerships (Shipway 2016).

Placemaking was found to increase the variety of activities in a location, including a shift from necessary to more recreational and social activities. A community hall, for example, had become a hub for village life used for education, sports, health and wellbeing services, and leisure activities (Shipway 2016). Prior to the installation of an urban pop-up park activity, the space was primarily concerned with travel, but during the intervention many types of optional and social activities were observed, including playing music, making art, socialising, and playing (Tulloch 2016).

Individual wellbeing

Placemaking was associated with increased physical activity in two studies: increased walking and cycling in a pop-up park (Tulloch 2016); and increased walking and cycling with improved neighbourhood aesthetics (Semenza and March 2009)

“Aesthetic improvements can increase the artistic quality of the neighbourhood, and they can create more inviting public places that appeal particularly to pedestrians and bicyclists.” (Semenza and March 2009, p. 37).

Similarly, Gomez-Feliciano et al. (2009) found that integrating placemaking as part of an urban regeneration ‘master plan’ resulted in more active living becoming integrated into people’s lives.

Placemaking was also found to improve knowledge and skills. Newly made ‘places’ can be used to, for example, hold workshops/training sessions for young people’s personal development (Shipway 2016). Being involved in a newly made ‘place’ as a volunteer helped individuals develop people management and communication skills (Shipway 2016).

Other outcomes

A cross-sectional survey evaluation of a waterfront placemaking intervention reported a statistically significant positive effect on perceived stress, but no benefit to physiological wellbeing or heart rate variability. Perceptions of ‘being away’ and ‘fascination’ showed a statistically significant increase in the intervention walk compared to the control (Shore to Core 2017).

In a poor quality mixed methods evaluation, in the intervention neighbourhood, 86% of respondents reported excellent or very good general health, compared with 70% in the adjacent neighbourhood

($P < .01$), and 57% versus 40% felt “hardly ever depressed” ($P < .01$) (Semenza 2003). Another report of the same intervention found that at all three sites, there was a consistent statistically significant decline between the first and the second survey in the estimated marginal mean for the depression scale ($F = 1.95$, $p = 0.03$) (Semenza et al. 2007).

Negative or unexpected results: Following placemaking activity, some people were perceived to be excluded from the space. This was because of physical barriers that limited access for, for example, to people in wheelchairs (Tulloch 2016) or because of the attitudes of ‘locals’ (Cooper et al. 2000): *“While the original resident-planners felt strongly about blending architecturally into this new suburb, they felt ambivalent about the issue of welcoming outsiders to pass through the community. A compromise was reached whereby a footpath from the street to a local park runs along the west edge of the community. It is subtly located so as to run by, but not through, the large shared garden”* (Cooper et al. 2000).

There was a perception in two studies that changes to make an urban area more conducive to active travel would result in raised taxes, gentrification, and the exclusion of existing residents (Gomez-Feliciano et al. 2009; Semenza and March 2009)

Alternative use of space

Twelve included studies were coded as alternative use of space. Most were of poor or poor to moderate quality, apart from one good quality qualitative study (Porter & McIlvaine-Newsad 2013).

Social relations

Twelve studies on alternative use of space reported on some aspect of social relations, including social connections, social interactions, social cohesion, friendliness, bonding and bridging social capital, and family relationships.

A (poor quality) mixed methods evaluation of an improved city centre space in Manchester reported an increase of 394% in Connecting (Odds Ratio 1.7, $p < 0.001$) and an increase of 648% in Taking Notice (Odds Ratio 3.5, $p < 0.001$) (Anderson et al. 2017). Another poor quality mixed methods evaluation of a street play project in an East Midlands town reported that opportunities afforded by the intervention for social interaction were valued by parents, children and residents, though not all to the same extent; most adult local residents said the project helped children and adults interact more. In all, 61% agreed that ‘Street Play is a good way for children to make new friends’, while 56% agreed that ‘Street Play is a good way for children to feel part of the community’, 28% agreed that ‘Street Play is a good way for neighbours to get to know each other better’ and 20% said it led to ‘ ...

a better sense of community'. Several said new social opportunities were provided (Murray and Devecchi 2016).

A cross-sectional survey study on an Open Streets project in Atlanta, USA reported that most agreed that this was an event that welcomed everyone (99.7%), and that people at the project generally get along with each other (93.9%). Eighty percent also agreed that they would “hang out” with people they normally would not at the events (Torres et al. 2016).

A poor quality mixed methods evaluation of a pop up park reported a quantitative increase in the following dimensions of sociability: Interactions; Stewardship; Friendly, No change in 'Diversity' was reported. It was also found that on both of the study days during the project, pedestrian counts between 17:00 and 20:30 were consistently higher than those recorded prior to the SSR project. This was used as a proxy for 'place vitality' (Tulloch 2016).

Qualitative evidence found that activities, including temporary street pedestrianisation (Murray and Devecchi 2016; Tulloch 2016), community gardening (Porter and McIlvaine-Newsad 2013), changes to church services (Ley 2008), and civic games (Stokes 2015), created opportunities for people from different ethnic groups or different age groups to interact (Ley 2008; Stokes 2015; Murray and Devecchi 2016; Porter and McIlvaine-Newsad 2013).

The alternative use of space was found to increase social capital, including both bonding and bridging social capital. Changes made to church services to serve a more multi-ethnic community was found to create bridges to new immigrant groups, whilst the church as a 'hub' remained a site in which trusting relationships could produce bonding capital (Ley 2008).

Community gardens also served to bring new people together as well as reaffirming existing bonds, including strengthening family relationships (Porter and McIlvaine-Newsad 2013).

Three studies found that infrastructure changes that make use of an alternative use of space (a pop-up park (Tulloch 2016), community garden (Porter and McIlvaine-Newsad 2013), and civic games (Stokes 2015)) can become sites for socialising.

Community wellbeing

Eleven studies on alternative use of space reported on some aspect of community wellbeing, including safety, attitudes to the neighbourhood, fun, environment, attractiveness, increased use of space, increased attendance at community events, economic benefits, sense of pride, sense of community, and civic activity.

In a cross-sectional survey study on an Open Streets project in Atlanta, USA, when asked about their perceptions of the event, nearly all participants said that they felt safe (97.8%). Eighty percent of the

respondents indicated that the project changed their feelings about the city of Atlanta in a positive way.

In contrast, 58.1% of participants rated the city of Atlanta as poor or average in providing friendly environments to walk, bike, or to participate in outdoor recreational activities (Torres et al. 2016). In a mixed method evaluation of play streets, 93.3% of participants agreed that 'PS strengthens our community.' (Zieff et al. 2016). In a mixed method evaluation of a pop up park, some positive changes were reported for the following characteristics of community wellbeing: Fun; Vital (only for types of activities); Special; Sittable. No change was reported for: Accessible (except for a decrease in space functionability for people with special needs); Connected; Convenient (except for a decrease in 'Paths through the space take people where they want to go'); Active; Vital; Safe; Maintained.

Two examples of street closures to host pop-up events (Murray and Devecchi 2016; Tulloch 2016) were found to create an environment that was more pleasant for people to be in. Similarly, community gardening was found to create a more visually appealing space and to revitalise the community, including reducing crime (Ohmer et al. 2009).

The alternative use of space was associated with spaces being used more and for more varied activities. For example, in a pop-up park on an urban street, many different types of leisure and social activities were observed compared to the mostly travel-related activities observed previously (Tulloch 2016). In another alternative use of space, a 'civic game' resulted in more people making use of existing activities that occurred in the town; the game brought newcomers to established community events (Stokes 2015).

One example of an alternative use of space was found to lead to commercial development outcomes. The civic 'game' in which players had to find the player with the corresponding token in order to cash it in for gift-voucher was found to add liquidity to the local economy and direct financial flows towards independent local businesses (Stokes 2015).

Examples of alternative use of space were found to increase the collective identity of a community. Single-ethnicity churches changing their services to suit the needs of increasingly multi-ethnic communities was seen as acts of both Christian charity and immigrant solidarity (Ley 2008).

Community gardens resulted in participants having more pride in the community, green space, and gardens (Ohmer et al. 2009). Encouraging artistic activities and displays during the temporary pedestrianisation of a market was found to be an opportunity for the neighbourhood to display its unique character (McLean and Rahder 2013). Also, 'civic games' were found to be a public performance that rallied the community around a particular identity, shared vision and common concern (Stokes 2015).

Alternative use of space has been found to increase involvement in civic activity. Community gardens promoted community development and engagement in civic and conservation practices, and helped local residents address crime, vandalism, and litter issues in their communities, and for young people to get involved in community development activities (Ohmer et al. 2009). In another community garden, participants became motivated to try to tackle food insecurity in their local area (Porter and McIlvaine-Newsad 2013) and became more involved in the management of the garden over time (Porter and McIlvaine-Newsad 2013). The temporary pedestrianisation of a market was seen as a collective attempt by the community to prevent gentrification:

“... members talked about their activities as an attempt to defy gentrification by creatively activating the neighbourhood’s streets. They believed that by transforming parking spots into croquet and Scrabble games, turning intersections into public squares, and placing a piano in traffic to make music and block cars, they were, as one resident put it, creating a cultural playground” (McLean and Rahder 2013, p. 98)

Infrastructure changes that make use of an alternative use of space have been found to affect community norms. Community gardens changed people’s thoughts and feelings regarding conservation and volunteerism (Ohmer et al. 2009) and helped address negative stereotypes associated with particular areas (Porter and McIlvaine-Newsad 2013). A ‘civic game’ encouraged people to be more engaged in their community and more likely to approach strangers as this was an essential part of the game (Stokes 2015).

Individual wellbeing

Four studies of alternative use of space reported individual wellbeing outcomes, including physical activity, healthy eating, enjoyment, fun, skills and knowledge.

In a cross-sectional survey study of an Open Streets project in Atlanta, USA, walking and cycling were the most frequently reported primary activities (73.7% and 37.7%, respectively). Respondents indicated walking for an average of 57 minutes (SD = 57), and cycling for 32 minutes (SD = 54). Thirty-four percent to 54% of respondents indicated they would be engaged in a sedentary state at home— watching TV, or on the computer—if they were not participating at the event ($\chi^2 = 19.84, P = .001$) (Torres et al. 2016). An increase in ‘Keeping Active’ (23%) in the Manchester study represented children playing on the new grass, usually accompanied by a parent (Anderson et al. 2017). A mixed method evaluation of a Play Street project reported that engagement in vigorous physical activity increased three-fold (11.5% to 35%) during the project (Zieff et al. 2016).

Community gardens set up on parkland and empty patches of housing estates were reported to encourage healthy eating:

“This participant has also repeatedly said that his daughter never ate vegetables before gardening, but now eats everything she grows, exhibiting the nutritional benefits of gardening” (Porter and McIlvaine-Newsad 2013, p. 388).

Closing an urban street for ‘Street Play’ was found to be enjoyable and fun for the children and parents who took part (Murray and Devecchi 2016), whilst a ‘game’ that occurred across a whole town, involving participants trying to meet up with a person with the same token as themselves, was thought to be fun for those involved (Stokes 2015):

“Those who successfully joined to exchange a bond were often all smiles. The businesses were also all smiles when they exchanged the bonds for real dollars” (Stokes 2015, p. 38).

Alternative use of space has also been found to help individuals gain new skills and knowledge. Community gardens in ‘distressed’ areas were found to help local residents and community partners to become more knowledgeable about green space and gardening, and more interested in conservation (Ohmer et al. 2009). The ‘Street Play’ project enabled children to learn new games (Murray and Devecchi 2016). The ‘game’ described by Stokes (2015) was thought to be a means of identifying future leaders by identifying which people were willing to take risks in public and then legitimising their actions.

Other outcomes

Negative or unexpected results: Alternative use of space was found to exclude some people in some cases. For example, a pop-up park in an urban street had limited access for people in wheelchairs (Tulloch 2016), whilst temporary pedestrianisation prevented many retailers conducting their normal business (*i.e.* deliveries, pick-ups) (McLean and Rahder 2013). Stokes (2015) noted that many residents, particularly from ethnic minority communities, avoided participating in a civic game because of a fear that it was a hoax.

Changing a space can have detrimental effects on those previously attached to it. For example, churches changing their services to be more multi-ethnic, including changing language and cultural practice, was found to be a difficult experience for those who had attended the church previously (Ley 2008).

Changes to have a pop-up playground were found to not increase children's outdoor play; children said they played outside regardless of the change (Murray and Devecchi 2016).

Urban regeneration

Eleven included studies were coded as urban regeneration. Most were of poor or poor to moderate quality, apart from one moderate quality qualitative study (Coulson et al. 2011).

Social relations

Ten studies of urban regeneration reported on social relations outcomes, including social connections, social interactions, social capital, and social cohesion.

A (poor quality) mixed methods evaluation of an improved city centre space in Manchester reported an increase of 394% in Connecting (Odds Ratio 1.7, $p < 0.001$) and an increase of 648% (Odds Ratio 3.5, $p < 0.001$) in Taking Notice (Anderson et al. 2017). In one poor quality mixed methods evaluation of a community-led urban planning initiative, social interaction displayed a consistent increase at all three sites ($F = 2.29$), although the change was not statistically significant ($p = 0.06$). Two questions that probed whether study participants had talked to neighbours about personal problems or asked their neighbours over to their houses to socialise displayed statistically significant increases ($p = 0.05$). Social capital also displayed a statistically significant increase after the intervention ($F = 1.71$, $p = 0.04$) (Semenza et al. 2007). However, a pre and post study of an urban renewal programme in an economically disadvantaged area reported no statistically significant improvement in social capital following the urban renewal program (Jalaludin 2012).

A 10 year longitudinal cohort study of attitudes towards a riverside regeneration project (Aberg and Tapsell 2013) found that the general level of satisfaction with the scheme was initially high, and had increased slightly over the years. The vast majority (90%) of respondents in the 2008 survey were satisfied with the rehabilitation of the river, compared with 82% in 1997. In the 1997 survey the majority of the respondents thought that the river had become more attractive following rehabilitation, while a notable minority were unsure. In the 2008 survey only 1% of the respondents were now unsure, and the percentage of respondents perceiving the riverscape as more attractive than before the rehabilitation had increased to 87%. Visits to the river appeared to have increased significantly between the 1997 and the 2008 surveys. The most notable change was the increase in visits to watch wildlife. Between the 1997 and the 2008 surveys – during which period the new footpath was added – there was also a notable increase in visits for recreational activities such as walking, cycling, jogging and playing/ games. In the 2008 questionnaire survey, almost one third (30%) of the respondents said that the rehabilitation scheme had made them more interested or

involved in environmental or wildlife conservation work. Local residents living along the rehabilitated site and residents living along an upstream non-rehabilitated section bordered by a public green space were asked which section of the river they found more attractive. Although the most common answer was that the rehabilitated reach was more attractive than the upstream reach, a considerable percentage thought that there was no difference in attractiveness between the two sections.

A longitudinal study of a community-led alternative planning process (SafeGrowth) reported increasing levels of cohesion among residents: the number of people who had conversations at least monthly almost doubled (from 10% to 17%), although weekly and daily contacts did not improve much and some marginally declined (Saville 2009).

Qualitative evidence found that a new fish market (Serrano et al. 2016), new community café (Bertotti et al. 2012), and regenerated stretch of urban river (Åberg and Tapsell 2013) all created spaces for interaction and cohesion.

“Against this characterisation of the area by local residents, the first contribution of the community café to the creation and strengthening of social capital was the provision of a facility where people could meet and talk” (Bertotti et al. 2012, p. 6).

A new community café was found to increase community social capital. Whilst some ‘bridging’ was observed, the community café mainly facilitated interaction between family and close friends, which enhanced these residents’ ability to ‘get by’ (Bertotti et al. 2012). The community café also allowed for knowledge exchange to the volunteers involved in running the café (Bertotti et al. 2012).

Community wellbeing

Nine studies of urban regeneration reported on some aspect of community wellbeing, including safety, attractiveness, environment, sense of community, local economy, increased opportunities for creative and artistic displays, and reduction in crime.

No statistically significant differences were found in perceptions of neighbourhood safety and aesthetics in a pre and post study of an urban renewal programme in an economically disadvantaged area (Jalaludin 2012). In a poor quality mixed method evaluation of urban planning and art, no statistically significant differences were found between the sites regarding whether residents believed that their neighbourhood was a good place for children to grow up (43% vs 36% at the control site) or whether decisions that affected the neighbourhood could be influenced by working together (47% vs 40%) (Semenza 2003). Of 97 intervention area residents interviewed, 65% (n=63) rated their neighbourhood an excellent place to live, compared with 35% (52 of 147) at the control

site ($P < .01$). In another study of the same intervention, the estimated marginal mean change between the first and the second survey was most pronounced for sense of community scale ($F = 3.97$, $p = 0.01$) (Semenza et al. 2007). At all three sites, there was a consistent reduction in depression scores ($F = 1.95$, $p = 0.03$).

Urban regeneration projects were found to create more pleasant environments in which people were more willing to spend time. This result was observed in the regeneration of a stretch of urban river (Åberg and Tapsell 2013), community gardening (Ohmer et al. 2009), and redeveloping a fish market (Serrano et al. 2016). Job creation and stimulating the local economy were also found to be potential positive effects associated with the redevelopment of the fish market (Serrano et al. 2016). The pedestrianisation of a market was found to allow the local community to express its unique character through increased opportunities for creative and artistic displays and activities (McLean and Rahder 2013).

Two urban regeneration projects enabled participants to increase their civic activity. Through community gardening participants were able to be involved in ongoing community development activity, and organisations addressing revitalisation issues used the gardens to create momentum for their efforts (Ohmer et al. 2009). The temporary pedestrianisation of an urban market allowed participants to undertake a range of creative and social activities, which were thought to represent a collective effort to resist gentrification (McLean and Rahder 2013).

Urban regeneration projects positively affected the norms and values of their communities. A community garden changed participants' beliefs about gardening, sense of community, and volunteering (Ohmer et al. 2009). Likewise, the manager of a community café provided a role model for some people through her dynamism and commitment (Bertotti et al. 2012).

A longitudinal study of a community-led alternative planning process (SafeGrowth) reported an overall 13% reduction in four common property crimes, while personal theft increased by almost 42%. Breaking and entering and motor vehicle/parts thefts did decline with a 67% reduction of the latter. After 4 years since the start of the intervention, those who felt unsafe walking at night dropped from 47% to 20% of respondents, while those who felt safe waiting for transport increased from 38% to 67% (Saville 2009).

Individual wellbeing

Three included studies reported on some aspect of individual wellbeing, including health behaviours, physical and mental health status, mental wellbeing, skills and knowledge.

In a pre and post study of an urban renewal programme in an economically disadvantaged area, statistically significant changes were found in individual health behaviours (daily smoking, hazardous alcohol consumption, adequate physical activity), health status (BMI, self-rated health) and use of health services (visits to a general practitioner) following the urban renewal program (Jalaludin 2012). In a poor quality mixed method evaluation of urban planning and art, 86% of respondents reported excellent or very good general health, compared with 70% in the adjacent neighbourhood ($P < .01$), and 57% versus 40% felt “hardly ever depressed” ($P < .01$) (Semenza 2003).

Only limited positive outcomes for individuals were reported in the qualitative literature.

Regenerating a stretch of urban riverscape, including adding foot/cycle paths and conservation activities, was found to increase walking and cycling physical activity (Åberg and Tapsell 2013). The smaller increase in Keeping Active (23%) represents children playing on the new grass, usually accompanied by a parent (Anderson et al. 2017).

Bertotti et al. (2012) found that including a community café as part of a regeneration of a community centre supported the mental wellbeing of café volunteers and café manager (both drawn from the local area). They also found that those involved in the café learned new skills and improved their employability. Ohmer et al. (2009) similarly reported that community gardening raised the knowledge and skills of those involved, particularly participants’ knowledge about green spaces and gardening.

Other outcomes

Negative or unexpected results: There were examples of where people avoided, or were excluded from, a space following an urban regeneration change. A community café was largely avoided by the local white English residents because of a perception that the community centre in which it was based only served the needs of Asian people in the area (Bertotti et al. 2012). Other local residents feared that they would be excluded because of the gentrification resulting from changes to the market (McLean and Rahder 2013).

Negative physical outcomes resulting from urban regeneration changes were observed. Åberg and Tapsell (2013) found that residents thought their gardens had become boggy as a result of changes to a section of an urban river. The broader appeal of the riverscape was also perceived to result in increased litter and dog fouling (Åberg and Tapsell 2013).

Community development

Seven included studies were coded as community development. Most were of poor or poor to moderate quality, apart from one moderate quality qualitative study (Wells et al. 2012) and two good quality qualitative studies (Corey 2008, Porter and McIlvaine-Newsad 2013).

Social relations

Six studies of community development reported social relations outcomes, including social interactions, family interaction, relationships with peers, social cohesion, bonding and bridging social capital.

A pop-up park in an urban street provided opportunities for people to meet and to socialise; people were observed interacting with friends/relatives and strangers (Tulloch 2016). Community gardens (Mangadu et al. 2016, Porter and McIlvaine-Newsad, 2013) and civic games (Stokes 2015) provided opportunities for people of different ethnicities, ages and socioeconomic groups to interact. In two community gardens (Mangadu et al. 2016, Porter and McIlvaine-Newsad 2013), children and parents were able to take part together. A mixed methods evaluation of community gardens in three locations reported that 63% of adult survey respondents were spending more time with their families as a result of community gardening, while 89% of older youth were getting along better with people their age as a result of school gardening (Mangadu et al. 2016).

The changes were also found to result in increased social capital, both bonding and bridging (Porter and McIlvaine-Newsad 2013, Stokes 2015). Community gardens resulted in an exchange of knowledge about gardening and healthy eating (Mangadu et al. 2016).

Participants in a community garden who had entered the site mainly for food security soon found the leisure benefits of meeting new people (Porter and McIlvaine-Newsad 2013). Also, participation in a civic game providing occasions and opportunities for participants to meet new people (Stokes 2015).

Community wellbeing

Seven studies of community development reported on some aspect of community wellbeing, including sense of belonging, maintenance, attractiveness, environment, increased use of space, economic benefits, sense of community identity, civic activity.

In a case study of a community-building programme in the USA, at follow-up, residents who participated in the programme reported feeling greater attachment with one another within the complex, with their community, and with their local elected officials, than at baseline (Corey 2008).

A mixed methods evaluation of a partnership to promote walking found that, although no new infrastructure was put in place (no new sidewalks were installed) along the trails during the project period, there was consistent maintenance of existing sidewalks, sporadic improvement of sidewalk conditions and signage along the marked walking trails remained clearly visible. Scores for aesthetic properties such as lack of graffiti, pleasing scenery, and minimal litter were also consistently high for two of the three trails (Griffin et al. 2011).

A pop-up park on an urban street improved the physical comfort of the space (e.g. seating, shade), which resulted in more people using the space (Tulloch 2016). A 'civic game' brought newcomers to established community events by encouraging them explore different areas of the town (Stokes 2015)

Community development changes were found to have economic and commercial benefits. The civic game that encouraged people to match tokens in exchange for gift vouchers encouraged people to visit local retailers:

"A lot of times the game was played within a local business, and it brought people into the store that may not have been to that store yet – so now they're in the store, playing the game, and shop owners are right beside, also playing the game. It was just making matches all the way around" (Stokes 2015, p. 68).

Civic games were found to increase community identity, as it was reported that participation is a visible performance that highlights what the space means and what the participants are about (Stokes 2015). Participation in a group bike ride, in which participants 'mapped' the route by taking pictures, was seen as an articulation of collective concerns and community identity (Stokes 2015). Community development changes were also found to increase civic participation. People attending a pop-up park in an urban street became involved in adding to the community-created art and helping to keep the 'park' presentable by tidying furniture (Tulloch 2016). Participants in community gardens became committed to tending the plots in order to sustain the gardens (Mangadu et al. 2016) and organising a food distribution initiative to share excess harvests with the local community (Porter and McIlvaine-Newsad 2013).

Community development changes were found to have an effect on community norms. A 'civic game' encouraged people to interact with strangers (Stokes, 2015), whilst community gardens changed norms related to gardening and healthy eating (Mangadu et al. 2016), and addressed the negative stereotype associated with a particular housing estate (Porter and McIlvaine-Newsad 2013).

Individual wellbeing

Infrastructure changes utilising community development were found to lead to individual behaviour changes. Community gardens were found to help participants make healthier lifestyle choices, increase physical activity, spend more time with family, learn about nutrition (Mangadu et al. 2016), and eat more healthily (Mangadu et al. 2016; Porter and McIlvaine-Newsad 2013).

Community gardens (Mangadu et al. 2016) and civic games (Stokes 2015) helped participants to feel better and enhanced their mental wellbeing.

Community development changes were also found to increase individuals' knowledge and skills.

Civic games had helped people identify and practise their own communication skills by allowing them to talk to strangers (Stokes 2015). Community gardens improved participants knowledge and skills around gardening and nutrition (Mangadu et al. 2016, Porter and McIlvaine-Newsad 2013).

Participants in a community garden in a juvenile detention centre felt that the garden had helped them communicate better with others and address problems with violence (Mangadu et al. 2016).

Other outcomes

Negative or unexpected results: Some places became less accessible following community development changes. A pop-up park in an urban street became a less convenient 'movement corridor' for people on bicycles. It also offered only limited access for people in wheelchairs (Tulloch 2016). Stokes (2015) notes that some people, particularly those from ethnic minority groups, excluded themselves from a 'civic game' because they feared it was a hoax.

Is there an association between setting and: type of intervention, population, outcomes measured and direction and size of effect?

Due to the heterogeneity within intervention categories in relation to specific settings, study designs, populations and outcomes measured, it is not possible to determine whether there is any association between setting and type of intervention, population, outcomes measured and effect size.

Are there differences in effectiveness across population groups, particularly those at risk of health inequalities? (for example, people from different socio-economic backgrounds, ethnicity, age or gender)?

Five studies reported findings relevant to health and wellbeing inequalities (Armstrong 2000, Lanier et al. 2015; Mangadu et al. 2016; McLean and Rahder 2013, Jake and O'Brien 2011), although many more (n=17) were carried out in areas of deprivation or groups at risk of health and wellbeing

inequalities: racial and ethnic groups (7 studies); people with disabilities (3 studies), unemployed people (3 studies); “economically disadvantaged people” (5 studies). There is a lack of research on community infrastructure and social relations or wellbeing in stigmatised groups, with only one study each on homeless people, offenders and ex-offenders, and refugees and asylum seekers.

Social relations

Participants in a community garden initiative tended to agree ($M = 3.53$, $SD = 0.0.83$) that the garden initiative helped bring people together from a wide variety of backgrounds (age, race, culture, social class) (Lanier et al. 2015). This effect was also observed in other community garden initiatives (Mangadu et al. 2016; Porter and McIlvaine-Newsad 2013). On the other hand, a study of a regular Sunday market initiative reported that, despite community activists’ wish to challenge homogenized and corporatized urban redevelopment, and to build vibrant and engaged communities, the activists often unintentionally reinforced values that promote and benefit some members of the community at the expense and exclusion of working-class, immigrant, and racialised others (McLean and Rahder 2013).

Community wellbeing

One study (Armstrong 2000) reported that community gardens that were located in low-income neighbourhoods were four times as likely as gardens not in low-income areas, to lead to other issues in the neighbourhood being addressed. Furthermore, gardens located in low-income neighbourhoods were four times as likely to be cultivated by mainly African American and other minority gardeners compared with gardens not located in low-income areas.

Individual wellbeing

An evaluation of woodland-based health projects as part of the Active England initiative found that taking part in an organised, group-based activity was identified by many under-represented groups as something that would help them to overcome barriers to using woodlands and greenspaces for physical activity (Morris and O’Brien 2011).

Are there differences in effectiveness across interventions that aim to mix population groups, are open to a mix of population groups, or are targeted towards specific population groups?

Six studies were coded as having the aim of mixing population groups. These comprised a community arts centre (Carson et al. 2007), an ‘immigrant church’ (Ley 2008), two community

garden initiatives (Mangadu et al. 2016, Porter and McIlvaine-Newsad 2013), a forest project (Vering 2006) and an active living intervention (Raja et al. 2009).

Social relations

Community gardens were found to enhance social relations in one poor quality (Mangadu et al. 2016) and one good quality qualitative study (Porter and McIlvaine-Newsad 2013). In the good quality study, community members expressed a need to strengthen intergenerational relationships. The community arts centre was reported to generate community connections (Carson et al. 2007) in a poor quality qualitative study. In another poor quality qualitative study, immigrant church services (e.g. childcare, English classes, youth programmes) created encounters that were important for the construction of bridging social capital. Against this, the introduction of new members and changes to established ways of doing things was reported to reduce bonding social capital (Ley 2008).

Community wellbeing

In a good quality study of a community garden, the need for food security and the environmental activism surrounding it inadvertently resulted in the building of community among garden participants, which led to opportunities for leisure (Porter and McIlvaine-Newsad 2013). The community arts centre was reported to generate a sense of community (Carson et al. 2007) in a poor quality qualitative study. In a poor quality mixed method evaluation of community gardens, 63% of adult survey respondents indicated that they spent more time with their families as a result of community gardening, whilst 89% of older youth indicated that they got along better with people their age as a result of school gardening (Mangadu et al. 2016). In the immigrant church, the changes were seen more negatively, as a loss of cultural traditions (Ley 2008).

Individual wellbeing

In a good quality qualitative study of a community garden, personal empowerment was particularly evident among residents with previous gardening experience and some emerged as leaders, resulting in increased social capital via the sharing of knowledge and creation of community networks (Porter and McIlvaine-Newsad 2013). In a poor quality study of the immigrant church, the changes were seen negatively, as a loss of cultural identity and language (Ley 2008). A poor quality study of forest interventions for marginalised groups reported that the project provided opportunities for people from marginalised groups to learn skills for employment, or to have somewhere to stay (Vering 2006).

Review question 2: What factors (positive and negative) affect the implementation or effectiveness of the interventions?

The thematic synthesis of qualitative evidence revealed a series of themes around the process of implementation and delivery of the interventions, which were common to all the intervention categories. They are presented under headings which represent facilitating factors for success, or barriers to success.

Accessibility

Included studies reported that it is important for places and spaces to be accessible so that people can readily visit and/or take part in activities. Porter and McIlvaine-Newsad (2013) noted the increase in the number of community gardeners after moving the site into a neighbourhood that had access to a bus route and parking. They also noted how hosting a community garden events away from the main site was not conducive for socialising or learning (Porter and McIlvaine-Newsad 2013). Accessibility needs to include the varying needs of people, including those with disabilities, and adaptations need to be made where necessary (Porter and McIlvaine-Newsad 2013; Mangadu et al. 2016). For example, access ramps for people with mobility impairments (Mangadu et al. 2016; Porter and McIlvaine-Newsad 2013), child friendly facilities to attract parents (Morris and O'Brien 2011), reduced fees for the unwaged (Vering 2006), or culturally sensitive activities for ethnic minority groups (Morris and O'Brien 2011), and ensuring a civic game was simple enough for people to be able to play and do well at (Stokes 2015).

There are attitudinal barriers to access that need to be overcome as, for example, many white British residents did not attend a community café that they perceived as being for Asian people in the area (Bertotti et al. 2012). Accessibility was an important factor towards the success of events.

Eliminating financial barriers by hosting events in a public and freely accessed location was important (Tulloch 2016; Whitford and Ruhanen 2013). Ensuring easy access to, and use of, new infrastructure was identified as successful for neighbourhood design changes. For example, the shared gardens of a co-housing development were the most communal because they were easily accessible from all the adjacent buildings (Coulson et al. 2011). Conversely, new cycle paths were not used because of peripheral positions in the neighbourhood (Coulson et al. 2011) and because people did not have the resources (*i.e.* bicycles) to use it (Crane et al. 2016). The transport links between work, home, and social spaces was identified as an important facilitator or inhibitor to socialising in a Master Planned Community (Williams and Pocock 2010).

People may not feel that they have a use for the new neighbourhood design, such as a cycle path (Coulson et al. 2011). A part of gaining access may be people 'learning' how to make use of new neighbourhood design. For example, people may have to learn new routes and how to interact with other road users before using a new cycle path (Crane et al. 2016).

New neighbourhood design can be more accessible if it is visible to potential users. In co-housing, for example, locating the common house adjacent to a well-used footpath enables neighbours to see cooks preparing a collective meal (Cooper et al. 2000).

Comfortable, friendly, safe environment

An environment that was perceived as friendly and relaxed was important for the success of a community café (Bertotti et al. 2012) and co-housing (Cooper et al. 2000). The absence of cars and having safe, open space where residents can play and socialise was important for co-housing (Cooper et al. 2000). Similarly, during block parties, streets were blocked off to traffic so that children and adults had a space to interact (Semenza and March, 2009). Local residents felt that a community café provided an ideal environment because it was friendly, relaxed, and recognised the needs of particular groups (i.e. elderly people) (Bertotti et al. 2012). The absence of comfortable areas for participants to relax and socialise, including a lack of seating and shaded areas, was a weakness of a community garden (Porter and McIlvaine-Newsad 2013). The communal space's perceived safety from physical threats and environment extremes, particularly to let children play independently, was of great importance for co-housing (Cooper et al. 2000). The physical design of an event is important if the goal is to foster activity and sociability. Event organisers should be mindful that much of the knowledge and social exchanges occurring at events takes place informally and so sufficient space needs to be allocated for people to engage in these informal practices (Black 2016). Plentiful space for people to socialise and comfortable places for people to sit are identified as key factors in the success of a pop-up park (Tulloch 2016). That spaces can be tailored by participants (i.e. moving tables, chairs) to suit their needs is important (Tulloch 2016). It is important for events to be a safe space for those attending. Holding the event in a familiar location (Black 2016) or making the event a zero-alcohol event (Whitford and Ruhanen 2013) were means of making those attending feel safe and secure.

Having spaces that can accommodate a range of different activities (i.e. play, socialising, relaxing) is important for the success of neighbourhood design changes (Cooper et al. 2000). This includes spaces that balance public and private activity (Cooper et al. 2000). The inclusion of features or aspects that bring people together or stimulate interaction are important. For example, a skate park

provided a space for teens to 'hang out' and socialise without being seen as a threat in a Master Planned Community (Williams and Pocock 2010). Similarly, within co-housing, the central garden and playground was a place for residents to congregate (Cooper et al. 2000). Also, a cycle path needs to offer some functionality for potential users, whether at the end of the route or along the way (Coulson et al. 2011) However, features should not be too intrusive (Cooper et al. 2000).

Community members also need to feel safe from physical or psychological threats and from weather extremes within the new neighbourhood design; feeling safe will encourage community members to use the space more (Jones 2014, Cooper et al. 2000).

Involvement in organisation and planning

In addition to participants having physical access to the space, access to organisation and management processes associated with the space was important for the success of projects (Black 2016, Gomez-Feliciano et al. 2009, Whitford and Ruhanen 2013, Cooper et al. 2000). Where this was not the case, residents felt a lack of control and unfairness (Crane et al. 2016). Major challenges to genuine community involvement in planning and organisation are a lack of capacity within communities to get involved and decision making systems (*i.e.* local authorities, public sector organisations) being overly confusing and bureaucratic (Shipway 2016). Such involvement can be at different levels and at different stages of the process (Black 2016, Whitford and Ruhanen 2013). This can include a participatory planning process (Cooper et al. 2000, Porter and McIlvaine-Newsad 2013) and regular communication between project partners (Gomez-Feliciano et al. 2009). Community hubs may operate more successfully where users are more homogenous. In the case of co-housing, for example, families moving out of the community were not part of the high-density of families with small children (Cooper et al. 2000). Also, community norms in a residential area prevented white-British and Asian residents from regularly interacting (Bertotti et al. 2012). However, involving users in the design of community hubs can enable the space to better suit the diverse needs of users from a variety of backgrounds (Fildes et al. 2010) as well as help highlight priorities and preferences that may be different to that of 'experts' (Lawrence et al. 2010), which can be used to ensure the objectives of multiple stakeholders are achieved (Åberg and Tapsell 2013). Involving members of the community in the organisation and management of events ensures the content is relevant and authentic (Black 2016, Whitford and Ruhanen 2013).

Involving community members and volunteers in the organisation and management of events also provided opportunities for training and development, empowering community members to be involved in further civic activity (Whitford and Ruhanen 2013, Yuen and Glover 2005). The

involvement of multiple perspectives from a heterogeneous community can ensure the involvement of complimentary expertise (Raja et al. 2009). Involving different stakeholders in organisation does, however, require a great deal of flexibility from an organising committee, as every individual involved has a slightly different idea about what is good for the community (Cooper et al. 2000, Yuen and Glover 2005).

Ensuring access to planning and organisation helped integrate the changes into the community (Cooper et al. 2000, Raja et al. 2009). Conversely, a perceived lack of community consultation, for example, was found to adversely affect the contribution of new cycle paths to community wellbeing (Coulson et al. 2011, Crane et al. 2016).

Ensuring access to organisations and management may be achieved through holding numerous neighbour association meetings (Mangadu et al. 2016) or consultations with local residents (Porter and McIlvaine-Newsad 2013). However, there is always a tension of working too closely with a particular group at the exclusion of others (Morris and O'Brien 2011). Another challenge is a potential lack of capacity within communities to engage in planning processes (Shipway 2016).

Skilled facilitators

The involvement of skilled people to facilitate in the organisation and operation of projects was important (Raja et al. 2009; Gomez-Feliciano et al. 2009; Shipway 2016). Facilitators can help with project management and liaising between communities and other stakeholders (Shipway 2016). For example, a liaison officer mediated between rehabilitation practitioners and the community through a river rehabilitation scheme (Åberg and Tapsell 2013), whilst a facilitator helped community groups with funding applications and project management (Shipway 2016). A 'street play' activity was supervised by adult playworkers (Murray and Devecchi 2016). Other example showed the importance of a facilitator to allow the community to access completed green and blue spaces, including community gardens (Porter and McIlvaine-Newsad 2013) and forest activities (Morris and O'Brien 2011). Facilitated access was particularly important for encouraging participation from target groups (Morris and O'Brien 2011). Facilitators could be paid employees (Gomez-Feliciano et al. 2009) or leading community members (Porter and McIlvaine-Newsad 2013). Key skills included cultural competency (Fildes et al. 2010) and having strong community ties (Gomez-Feliciano et al. 2009). Strong community partnerships are necessary to overcome any shortfall in environmental, cultural, or financial resources that individual partners might have (Porter and McIlvaine-Newsad 2013, Gomez-Feliciano et al. 2009).

Flexibility

Flexibility was an important feature of many projects (Gomez-Feliciano et al. 2009; Cooper et al. 2000). Users of a pop-up park were able to move the tables and chairs to suit their needs (Tulloch 2016). Also, civic games were most enjoyed by participants where the activities left some room for uncertainty (Stokes 2015). Space to accommodate a whole range of different activities (*i.e.* gardening, children's play, sunbathing, outdoor dining) was significant in the success of co-housing (Cooper et al. 2000). An aspect of flexibility was having a balance between more communal and private space so that users have a choice as to how much socialising they do (Cooper et al. 2000).

"While the garden courtyard and the two "arms" of the building embracing it create a setting for casual meetings and children's play, the private patios on the opposite sides of the building are spaces where individuals, couples, and families can socialise alone without the "pressure" of neighbours passing by" (Cooper et al. 2000).

Focal point

Having a focal point for interaction was an important aspect in some interventions. For example, a community café was noted as one of the few meeting points in the area, and local residents who came to use the library or SureStart service became customers (Bertotti et al. 2012). Likewise, in co-housing, the communal gardens and children's play area where parents meet around the sandbox were sites that draw residents together to create community (Cooper et al. 2000).

The physical design of a space being unobtrusive was important for co-housing community hubs (Cooper et al. 2000). Allowing for the most sunlight into the communal garden and having low barriers/fences between spaces lowered the perceived density of the housing (Cooper et al. 2000).

Inclusion and exclusion

There is a balance to be struck so that events are sufficiently 'local' and reflect the culture of the community, yet still open to 'outsiders'. This is particularly important for events designed to celebrate or showcase a local community or culture (Black 2016; Whitford and Ruhanen 2013). A limitation is that there may be more than one network of people or culture at play within an event and that events may reproduce existing inequalities and divisions; events may work better in more homogenous communities. (McLean and Rahder 2013). A limitation to the success of events is the threat posed by other events that might be taking place simultaneously. Multiple events may cause tension or exclusion within the community, particularly if the events were perceived as being aimed at separate networks of people (Black 2016). A limitation of neighbourhood design changes is that

they may only affect the people who are not 'hard to reach'. For example, following changes to waste disposal on a housing development, employees did not put great effort into circulating information about the change to all residents. As such, the tenants who benefitted from the change were those who already had a positive attitude towards recycling (Stenberg et al. 2009). People may be 'hard to reach' because of cultural norms (e.g. lack of trust in authorities, lack of active travel, driving as a status symbol) that discourage them from engaging in, for example, recycling schemes organised by housing associations (Stenberg et al. 2009) or cycling (Coulson et al. 2011). People may also be 'hard to reach' because they think the change will not affect – or benefit – them (Crane et al. 2016).

Consistency

Consistency with holding an event, including when and where it is held, provides a level of stability that supports the sharing of memories and stories among participants (Black 2016; Whitford & Ruhanen, 2013). However, there is a danger with an event becoming too consistent and stagnating (Black 2016). The time gap needs to be long enough to renew energy and ideas yet not too long that organisers and participants become complacent. Events also need to renew parts of their content and format in order to keep audiences interested (Black 2016).

Providing a reason to interact

Providing spaces or features likely to encourage interaction is important. Community artwork, for example, gave people a reason to interact with one another (Tulloch 2016; Semenza and March 2009), as did children's playgrounds (Cooper et al. 2000). Likewise, hosting events in locations that subverted the space from their normal use was enjoyable for participants and encouraged interaction (Black 2016). A civic game both introduced a structure for meeting and greeting and incorporated the power of local landmarks into the game itself (Stokes, 2015). Providing a feature that users can congregate around was important for the success of a community café. Local residents were first drawn to the café after visiting the adjoining library or SureStart service and subsequently used the premises as a meeting place (Bertotti et al. 2012).

Not enough change

A further limitation is that whilst neighbourhood design changes may affect aspects of a neighbourhood, it may be that more holistic or further changes need to be made. For example, whilst an effort was made to make active travel a more attractive option in a housing estate, many

areas were still overgrown and unaffected and the community still perceived the areas as dangerous (Coulson et al. 2011).

Long term outcomes and sustainability

Outcomes from neighbourhood design changes occur within different timeframes. Having immediate and demonstrable results can help to energise a partnership and maintain momentum (Raja et al. 2009). In terms of ensuring long-term outcomes, making sustainability a priority is important (Raja et al. 2009). Groups receiving capacity building support may be better placed to develop their own ideas in the future, adding to the sustainability of projects (Shipway 2016). It is also important to focus on the process of how neighbourhood design changes were made and the 'technical system' underpinning the changes. If not, any knowledge acquired through the change will dissipate (Stenberg et al. 2009). Planning for sustainability can help overcome any resource shortfalls later down the line (Raja et al. 2009). Having the success of green and blue space changes recognised by partners and residents can also add to the sustainability of schemes by leading to a greater inclination for collaborators to work together on new schemes (Shipway 2016).

It is important to remember that both the process of and outcomes from such projects takes time. On the one hand, Crane et al. (2016) suggests that the perceived purpose of an installed cycle path as a commuter path may disappear in favour of a wider use. On the other hand, Semenza and March (2009) found that residents thought changes carried out as part of a project to encourage active travel in their neighbourhood looked unfinished but they anticipated they would like it upon completion.

Volunteers

Involving volunteers has been found to aid the implementation of changes to green and blue spaces as well as to support the capacity building of volunteers themselves (Mangadu et al. 2016, Shipway 2016). The more volunteers were engaged in a community garden programme, the greater their motivation for the project and for other volunteer activities (Ohmer et al. 2009, Shipway 2016). However, volunteers should not be seen as an unlimited supply of free labour. They need ongoing management and support to sustain their involvement (Ohmer et al. 2009, Shipway 2016). Involving volunteers is important for the success and delivery of placemaking activities (Shipway 2016). Volunteering can also support capacity building of the volunteers themselves (Shipway 2016). The most effective way of recruiting community café volunteers was through personal contact between

the manager and customers in the café; this was often informal and was facilitated by the natural friendliness of the manager (Bertotti et al. 2012).

Community norms

It was important that changes incorporating an alternative use of space should fit with the local culture. For example, residents were unlikely to participate in a civic game if the game did not reflect the community's norms, values, and identity (Stokes 2015).

How involved are local communities in design, delivery and evaluation of interventions, and does this influence effectiveness?

Seventeen studies (19 papers) identified the intervention as community-led to some extent. These included a pop-up park (Tulloch 2016), a community café (Windhorst et al. 2010), co-housing schemes (Cooper et al. 2000), a community building programme (Corey 2008), rural festivals (Black 2016), temporary street closures for events (Gomez-Feliciano 2009, McLean and Rahder 2013), street play (Murray and Deveddhi 2016), a community coalition to improve walking infrastructure (Griffin et al. 2011), community gardens (Ohmer et al. 2009; Porter and McIlvaine-Newsad 2013), community wildlife sites (Lawrence et al. 2010), woodland projects (Morris and O'Brien 2011), community-led neighbourhood development (Saville 2009), community-led neighbourhood design (Semenza 2003; Semenza et al. 2007; Semenza and March 2009; Anderson et al. 2017), and rural village regeneration (Wells et al. 2012).

Due to the heterogeneity within intervention categories in relation to specific settings, study designs, populations and outcomes measured, it was not possible to determine whether there is any association between **level** of involvement of local communities and effectiveness.

3.4 Summary of findings

The strength of the evidence for each outcome across all included studies in each intervention category was assessed using GRADE and CERQual principles, and the results are displayed in Table 1 below.

In the table “serious” means that there are a number of limitations which may affect the final level of certainty or confidence we can place in the findings.

Outcome	Type of evidence	Effect	Initial level of certainty	Concerns about certainty domains	Final level of certainty
Community hubs					
Social relations	1 case study, 2 mixed method evaluations, 1 cross-sectional survey, 5 qualitative studies	Community cohesion +; Bridging social capital +; Increased social networks +; Improved quality of social relations +	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence). Imprecision: serious. Inconsistency: Not serious. Publication bias: Not suspected. Relevance: High. Coherence: Minor concerns. Adequacy of data: Moderate concerns.	Moderate (all)
Community wellbeing	2 case studies, 1 mixed method evaluation, 1 cross-sectional survey, 3 qualitative studies	Pride in community +; Sense of belonging +; Sense of community +; Civic participation +	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious	Low (sense of pride); Moderate (civic participation);

Outcome	Type of evidence	Effect	Initial level of certainty	Concerns about certainty domains	Final level of certainty
				Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	
Individual wellbeing	1 mixed methods evaluation, 1 cross-sectional survey, 3 qualitative studies	Wellbeing +; Health +; Knowledge & skills +;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Low (wellbeing; health); Moderate (knowledge & skills)
Events					
Social relations	4 case studies, 1 before and after study, 3 mixed method evaluations, 2 cross-sectional surveys, 2 qualitative studies	Social relations +; Community cohesion +	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Moderate concerns	Moderate

Outcome	Type of evidence	Effect	Initial level of certainty	Concerns about certainty domains	Final level of certainty
				Adequacy of data: Moderate concerns	
Community wellbeing	4 case studies, 1 before and after study, 2 mixed methods evaluations, 2 cross-sectional surveys, 2 qualitative studies	Sense of pride +; Heritage +; Physical environment +; Organisational relationships +; Exclusion -	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Moderate concerns Adequacy of data: Moderate concerns	Moderate (sense of pride; heritage; civic participation; exclusion); Low (environment; organisational relationships)
Individual wellbeing	No evidence				
Neighbourhood design					
Social relations	2 case studies, 3 before and after studies 5 mixed methods evaluations, 3 cross-sectional surveys, 1 longitudinal survey, 1 qualitative study	Social cohesion +; Social relations – (top down); Social relations +; Contacts & trust +;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate	Moderate (social cohesion; social relations); Low (social relations top-down; contacts & trust)

Outcome	Type of evidence	Effect	Initial level of certainty	Concerns about certainty domains	Final level of certainty
				concerns	
Community wellbeing	3 case studies, 3 before and after studies, 5 mixed methods evaluations, 3 cross-sectional surveys, 1 longitudinal survey, 2 qualitative studies	Sense of belonging/ pride +; Perceived area attractiveness; Social norms +; Policy change +; Safety +; Economic impact +; Civic participation +; Transfer of problem -; Exclusion -	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Moderate (sense of pride/ belonging; perceived areas attractiveness; feeling safe; civic participation; transfer of problem) Low (social norms; local policy; economic impact; exclusion)
Individual wellbeing	1 before and after study, 1 qualitative study	Physical activity +;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Moderate

Outcome	Type of evidence	Effect	Initial level of certainty	Concerns about certainty domains	Final level of certainty
Green and blue space					
Social relations	3 case studies, 5 mixed method evaluations, 2 cross-sectional surveys, 1 longitudinal survey, 4 qualitative studies	Improved social interactions +; Community cohesion +; Wider community cohesion -; Social networks +; Social capital +;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Moderate (social interactions; community cohesion; social networks; social capital) Low (negative effects on wider cohesion)
Community wellbeing	2 case studies, 4 mixed methods evaluations, 3 cross-sectional surveys, 1 longitudinal survey, 2 qualitative studies	Community pride +; Use of space +; Family wellbeing +; Civic participation +; Knowledge exchange +; Awareness/connectedness +; Negative effects on environment -;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Moderate (pride; increased use; family wellbeing; civic participation) Low (knowledge exchange; awareness/connectedness; negative effects on environment)
Individual wellbeing	1 case study, 2 mixed methods evaluations, 1	Behavioural change +;	Moderate	Methodological limitations: serious (for quantitative	Moderate (behavioural change; mental wellbeing; knowledge & skills)

Outcome	Type of evidence	Effect	Initial level of certainty	Concerns about certainty domains	Final level of certainty
	cross-sectional survey, 1 longitudinal survey, 2 qualitative studies	Mental wellbeing +; Knowledge & skills +;		evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	
Place-making					
Social relations	1 case study, 2 mixed methods evaluations, 1 cross-sectional survey, 2 before and after studies, 1 qualitative study	Social interactions +; Social cohesion +;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Low
Community wellbeing	1 case study, 2 mixed methods evaluations, 2 cross-sectional surveys, 2 before and after studies	Civic activity +; Sense of pride/belonging/ community +; Attractiveness +;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes	Low

Outcome	Type of evidence	Effect	Initial level of certainty	Concerns about certainty domains	Final level of certainty
		Economic impact +;		UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	
Individual wellbeing	1 cross-sectional survey, 1 before and after study	Physical activity +; Mental health +;	low	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Low
Alternative use of space					
Social relations	2 case studies, 5 mixed methods evaluations, 3 cross-sectional surveys, 3 qualitative studies, 1 before and after study	Social interaction +; Social interaction between different groups +;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious	Moderate (social interaction; social interaction between different groups)

Outcome	Type of evidence	Effect	Initial level of certainty	Concerns about certainty domains	Final level of certainty
				Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	
Community wellbeing	2 case studies, 5 mixed methods evaluations, 2 cross-sectional surveys, 3 qualitative studies, 1 before and after study	Perceived area attractiveness +; Increased use +; Increase community pride +; Civic participation +; Exclusion -		Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Low (perceived attractiveness; increased use; increased pride; exclusion) Moderate (civic participation)
Individual wellbeing	1 cross-sectional survey, 2 qualitative studies	Behaviour change +; Knowledge & skills +;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate	Moderate (behaviour change) Low (knowledge & skills)

Outcome	Type of evidence	Effect	Initial level of certainty	Concerns about certainty domains	Final level of certainty
				concerns	
Urban regeneration					
Social relations	1 case study, 2 mixed methods evaluations, 3 cross-sectional surveys, 2 longitudinal surveys, 2 qualitative studies, 2 before and after studies	Social relations ?;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Low
Community wellbeing	1 case study, 2 mixed methods evaluation, 2 cross-sectional surveys, 2 longitudinal surveys, 2 qualitative studies, 2 before and after studies	Perceived area attractiveness +; Local economy +; Civic participation +; Crime/ fear of crime +;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Low
Individual wellbeing	1 cross-sectional survey, 1 longitudinal survey and 1	Depression +; Individual	Moderate	Methodological limitations: serious (for quantitative	Low

Outcome	Type of evidence	Effect	Initial level of certainty	Concerns about certainty domains	Final level of certainty
	qualitative study	behaviour change +; Knowledge & skills +; Perceived exclusion		evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	
Community development					
Social relations	2 case studies, 4 mixed methods evaluations, 1 before and after study	Social interaction +; Social capital +;	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Moderate
Community wellbeing	3 case studies, 3 mixed methods evaluations, 1 before and after study	Knowledge & skills +; Sense of attachment +; Perceived area	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes	Moderate (civic participation; knowledge & skills) Low (sense of attachment; perceived area attractiveness; sense of

Outcome	Type of evidence	Effect	Initial level of certainty	Concerns about certainty domains	Final level of certainty
		attractiveness +; Civic participation +; Sense of community identity +;		UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	community identity)
Individual wellbeing	1 mixed methods evaluation	Individual behaviour change +; Mental wellbeing +; Exclusion	Moderate	Methodological limitations: serious (for quantitative evidence); not serious (for qualitative evidence). Indirectness: Not serious (Includes UK and non-UK evidence) Imprecision: serious Inconsistency: Not serious Publication bias: Not suspected Relevance: High Coherence: Minor concerns Adequacy of data: Moderate concerns	Moderate (individual behaviour change) Low (mental wellbeing; exclusion)

3. Discussion

3.1 Summary of key findings

Fifty-one studies were found that looked at social relations, community wellbeing or individual wellbeing outcomes across the following eight intervention categories: community hubs; events; local neighbourhood design; green and blue space; place-making; alternative use of space; urban regeneration; and community development. Most of the evidence was of poor or poor to moderate quality. The better quality evidence was qualitative in nature, and most of the review's findings therefore come from the thematic synthesis of qualitative evidence, supplemented by quantitative evidence where applicable.

The review found moderate evidence that a range of intervention approaches to community infrastructure can be used to boost social relations and wellbeing in a community, giving stakeholders a range of options. As the evidence currently stands, we cannot say which approach is most effective, as studies have not compared one approach to another, so we cannot make strong recommendations for one approach over another.

The review did find promising evidence about ways of doing things that are more likely to lead to success, and ways of doing things that are probably not helpful. These facilitators and barriers to success were common themes across all the intervention approaches.

*Evidence statement 1: **Community hubs** may promote social cohesion through the mixing of different social or age or generational groups (MODERATE EVIDENCE). This evidence is based on **three qualitative studies** of moderate to good quality. Promising community hub interventions were men's sheds (promoting mixing of social groups) and community gardens (promoting intergenerational mixing).*

*Evidence statement 2: **Community hubs** may increase social capital and build trust between people in communities (MODERATE EVIDENCE). This evidence is based on **four qualitative studies** of moderate to good quality. Promising interventions were churches, community cafes, community gardens and co-housing projects.*

*Evidence statement 3: **Community hubs** may increase wider social networks and interaction*

between community members (MODERATE EVIDENCE). This evidence is based on **four qualitative studies** of moderate to good quality, and **one poor quality quantitative study**. Promising interventions were churches, community cafes, community gardens and co-housing projects.

*Evidence statement 4: **Community hubs** may increase community members' sense of pride in their local area (MODERATE EVIDENCE). This evidence is based on **quantitative evidence** from one moderate to good quality study and two poor quality studies. Interventions considered were community-led changes in rural settings; community gardens, and a co-housing site.*

*Evidence statement 5: Changes to **community hubs** may increase civic participation (MODERATE EVIDENCE). This evidence is based on **one high quality qualitative study** of a community garden initiative.*

*Evidence statement 6: **Community hubs** can increase individual's knowledge or skills (MODERATE EVIDENCE). This evidence is based on three qualitative studies: one good quality, one moderate quality and one poor quality. Promising interventions were a community café, a men's shed and a community garden.*

*Evidence statement 7: **Events** may improve social relations in a community by providing a 'hub' for people to meet (MODERATE EVIDENCE). This evidence is based on qualitative evidence from one good quality study and three poor to moderate quality studies. Promising events were a pop-up park, an annual indigenous festival, a balloon fiesta, and small scale rural festivals.*

*Evidence statement 8: **Events** can improve community cohesion by providing a neutral space for different groups to socialise (MODERATE EVIDENCE). This evidence is based on qualitative evidence from one good quality study and four poor to moderate quality studies. Promising events were: temporary street closures, an annual indigenous festival, community-led festivals, and small scale rural festivals.*

*Evidence statement 9: **Events** may increase community members' sense of pride in their local area (MODERATE EVIDENCE). This evidence is based on **qualitative and quantitative evidence from five***

poor to moderate quality studies and qualitative evidence from one good quality study. Promising events were: a balloon fiesta, small scale rural festivals, a large Sunday market, an indigenous festival, community-led festivals.

Evidence statement 10: **Events** may provide opportunities to connect to place-based culture or heritage (MODERATE EVIDENCE). This evidence is based on qualitative evidence from one good and one poor quality study. Promising events were an annual indigenous festival, small scale rural festivals.

Evidence statement 11: **Events** may increase engagement in civic activity. This evidence is based on qualitative evidence from one good quality study and two poor to moderate quality studies. Promising events were a large Sunday market, a community-led festival, a pop-up park and an indigenous festival.

Evidence statement 12: Changes to **neighbourhood design** may increase social cohesion by bringing together people from different ages and social backgrounds (MODERATE EVIDENCE). This qualitative evidence is from one moderate to good quality study of a master planned community, and two poor quality studies of local urban renewal.

Evidence statement 13: Community-led **neighbourhood design** projects have the potential to improve social relations (MODERATE EVIDENCE). This qualitative evidence is from three poor quality studies of street play, and community-led urban renewal, and one moderate to good quality study of a master planned community.

Evidence statement 14: **Street redesign** to allow more active forms of travel, such as cycling and walking, may improve social relations (MODERATE EVIDENCE). This **qualitative evidence** is from two poor quality studies (of cycling infrastructure improvements and a master planned community) and one good quality study (of improvements to infrastructure to increase walkability).

Evidence statement 15: Changes to **neighbourhood design** may positively affect sense of belonging and pride in a community (MODERATE EVIDENCE). This **qualitative evidence** is from one good

quality study, one moderate to good quality study, and four poor to moderate quality studies.

Evidence statement 16: Changes to **neighbourhood design** improve community members' perceptions about the attractiveness of the area (MODERATE EVIDENCE). The evidence is from **one good quality mixed methods study and five poor quality quantitative or mixed methods studies** (one which found no effect on attractiveness scores).

Evidence statement 17: Changes to **neighbourhood design** may increase civic activity (MODERATE EVIDENCE). This evidence is from two moderate to good quality **qualitative** studies.

Evidence statement 18: Changes to **neighbourhood design** may lead to increases in physical activity, as well as other health benefits (MODERATE EVIDENCE). This evidence is from one good quality qualitative study and six poor quality studies.

Evidence statement 19: Changes to local **neighbourhood design** can lead to community members feeling safer (MODERATE EVIDENCE). This qualitative evidence is from three poor quality studies and one good quality study. Residents felt safer both with regard to crime (one poor quality study) and from traffic (one good quality and two poor quality studies).

Evidence statement 20: **Green and blue space** interventions that provide the opportunity to participate in activities or meetings can improve social interactions (MODERATE EVIDENCE). This qualitative evidence is from one good quality study, one moderate to good quality study, one poor to moderate quality study and one poor quality study.

Evidence statement 21: **Green and blue space** interventions may increase community cohesion by encouraging mixing of different cultural and socioeconomic groups (MODERATE EVIDENCE). This qualitative evidence is from one good quality, one poor to moderate, and two poor quality studies.

Evidence statement 22: Improvements to **green & blue space** may lead to increased social networks, social interactions and bonding and bridging social capital (MODERATE EVIDENCE). This evidence is

from one good quality, and two poor to moderate quality qualitative studies, two poor quality qualitative studies and three poor quality mixed methods studies.

Evidence statement 23: **Green space** changes can improve family wellbeing by providing something for families to do together (MODERATE EVIDENCE). This **qualitative** evidence is from one good quality and one poor quality study.

Evidence statement 24: Improvements to **green and blue space** are associated with increased civic activity (MODERATE ACTIVITY). This qualitative evidence is from one good quality, three poor to moderate quality and four poor quality studies.

Evidence statement 25: Improvements to **green and blue space** may results in positive behavioural change, encouraging physical activity and healthy eating (MODERATE EVIDENCE). This evidence is from one good quality qualitative study, one moderate to good quality qualitative study, one poor quality qualitative tsuyd and one poor quality mixed methods study.

Evidence statement 26: **Green and blue space** interventions may lead to improved individual mental wellbeing (MODERATE EVIDENCE). This qualitative evidence is from one moderate to good quality and two poor quality studies.

Evidence statement 27: Changes to **green and blue space** may have a positive effect on community members' skills and knowledge (MODERATE EVIDENCE). This qualitative evidence is from one good quality, one moderate to good quality and three poor quality studies.

Evidence statement 28: **Interventions which change the use of a space temporarily** may improve social interactions and opportunities for social interactions (MODERATE EVIDENCE). This evidence was from one good quality qualitative study, one poor quality qualitative study and four poor quality quantitative or mixed methods studies.

Evidence statement 29: **Interventions which change the use of a space temporarily** may increase

opportunities for interaction between people from different ethnic or social groups (MODERATE EVIDENCE). This evidence was from one good quality qualitative study and three poor quality qualitative studies.

Evidence statement 30: Interventions which change the use of a space temporarily may lead to increased civic activity (MODERATE EVIDENCE). This qualitative evidence comes from one good quality study, one poor to moderate quality study and one poor quality study.

Evidence statement 31: Interventions which change the use of a space temporarily may lead to positive behavioural change in terms of physical activity and diet (MODERATE EVIDENCE). This evidence comes from two poor quality mixed method studies and one good quality qualitative study.

Evidence statement 32: Community development projects can increase opportunities for social interaction between different ethnic and age groups (MODERATE EVIDENCE). This evidence comes from one good quality qualitative study and two poor quality mixed methods studies.

Evidence statement 33: Community development projects can increase social capital in the community (MODERATE EVIDENCE). This evidence comes from one good quality qualitative study and one poor quality mixed methods study.

Evidence statement 34: Community development projects may lead to increased civic participation (MODERATE EVIDENCE). This evidence comes from one good quality qualitative study and two poor quality mixed methods studies.

Evidence statement 35: Community development projects may lead to improved individual behavior in terms of physical activity and healthy eating (MODERATE EVIDENCE). This evidence comes from one good quality qualitative study and one poor quality mixed methods study.

Evidence statement 36: Community development projects may lead to improved knowledge and skills among community members (MODERATE EVIDENCE). This evidence comes from one good

quality qualitative study and two poor quality mixed methods studies.

The review also found poor to moderate quality evidence that place and space interventions can have potentially negative effects in terms of some residents feeling excluded, particularly in relation to events that target or celebrate particular groups.

The review found evidence that place and space interventions that provide a focal point or a targeted group activity may be useful in (a) promoting social cohesion between different groups and (b) overcoming barriers that prevent some people in marginalised groups from taking part in e.g. physical activity.

The qualitative synthesis of process outcomes identified some key strategies for success when implementing community infrastructure changes to place or space, which included: accessibility; a comfortable, friendly and safe environment; involvement of community members in organisation and planning of community infrastructure changes; involvement of skilled facilitators; flexibility; providing a focal point or reason to interact; avoiding exclusion; looking at longer term outcomes and sustainability; and involving volunteers.

3.2 Wider context

Improving social relations is an important topic in the current UK context, where over 1 million people aged over 65 are reported to be often or always lonely (Local Government Association, 2012). Loneliness is not just a problem for older people though: there are many other risk factors and all age groups can be at risk at different life stages. A report on men's social connectedness found that they are at higher risk of social isolation and loneliness between the ages of 35 to 54 (Arbes et al. 2014).

There is strong evidence that social isolation and loneliness have major negative effects on health and wellbeing (Cattan et al. 2005). Overall, the influence of social relationships on the risk of death are comparable to those for smoking and alcohol consumption and exceed the influence of physical activity and obesity (Holt-Lunstad et al. 2010). Loneliness is also an important risk factor for depression (Adams et al. 2004). The negative effects of depression in older adults are well established. These include: 'increased functional disability, increased suicide risk, recurrent and co-morbid psychiatric illness (in particular substance abuse), increased cognitive impairment, and increased morbidity and mortality from other medical conditions' (Adams et al. 2004).

Our review found some evidence that providing a focal point or activity was useful in increasing social interactions, particularly across age and ethnic groups. It has previously been reported that lonely men are best engaged through specific activities related to long-standing interests, such as sport, gardening etc., whereas they respond less well to loosely defined social gatherings, which are of more interest to women (Local Government Association, 2012). An evaluation of the "Men in Sheds" pilot programme found that it reduced isolation and contributed to the mental wellbeing of older men through social contact and meaningful activity (Milligan et al. 2012). There are also differences across diverse ethnic groups (Giuntoli and Cattani 2012).

4.3 Limitations & Strengths

There were a number of methodological limitations within the evidence. Most of the included studies were of poor or poor to moderate quality, limiting the strength of the conclusions that can be drawn. For the studies with a quantitative design, most did not have a comparator group. The lack of a comparator group limits the conclusions which can be drawn about whether any observed change can be attributed to the intervention being evaluated, as other changes may also be occurring in the neighbourhood at the same time. Also, most studies were of a cross-sectional design and did not make repeated measures. Many of the validity assessment criteria were answered 'unclear' as insufficient details of the methodology were reported by the study authors. Studies with a qualitative design were also poorly reported on the whole, but five were graded as 'good quality' and five as 'moderate quality'. There were a number of areas where methodological rigour could be improved. Although studies often presented a wealth of data, analysis tended to be descriptive, sticking close to the original data. This level of analysis is useful but lacks the interpretive power of a more conceptual level of analysis for the production of explanation. Problems with the quality of data analysis within qualitative research uncovered by systematic reviews a common finding of reviews which include qualitative research in a range of areas (Harden and Gough, 2012).

The review took a systematic approach to reviewing evidence, which included comprehensive searches, application of explicit inclusion and exclusion criteria, validity assessment and the use of more than one reviewer to provide quality assurance. All of these methods minimise bias and error in the review and strengthen confidence in the review findings.

The inclusion of a range of evidence from non-RCT study designs, which are so often excluded from systematic reviews of effectiveness, is a real strength. It has been argued that measuring "outcomes" alone does not measure the impact on people's lives or the context in which changes (if

any) take place (Lowe 2013), and that qualitative research is better placed to explore these aspects of effectiveness. It is also often noted that “hard to reach” groups are excluded from traditional research studies such as RCTs, whether deliberately or by default. The inclusion of other types of information has ensured that a wider range of population groups and approaches are represented. Some studies had the primary aim of improving social relations, while in other studies it was an unintended or unanticipated benefit of an intervention. Also, some negative unanticipated effects were picked up such as unintended exclusion of some sectors of the community. Qualitative evidence is better placed to uncover such outcomes, being inductive rather than deductive *i.e.* not constrained by predefined outcomes.

It is important to note that absence of evidence does not equal evidence of absence of effect. The finding that there is limited evidence for some intervention categories suggests that more robust research needs to be done. We did not find evidence that interventions did not work, except in two studies of ‘top down’ street design infrastructure changes, which showed no change in social interaction outcomes, although positive effects were seen for other outcomes.

There was some development in conceptual thinking around social relations and place and space infrastructure terminology as part of this project, which stemmed from the complexity of the concepts and many ‘grey areas’, including the definition of “intervention” within this review. This led to repeated discussion within the review team and advisory group about inclusion decisions. Some studies were excluded at data extraction stage that may possibly have added useful findings to the review (see List of Excluded Studies, Appendix 7).

We had stated in the protocol that we would search the Epistemonikos database, as well as other databases of systematic reviews. However, as the scope of the review was so large, and we had a limited time available, we did not search these databases. We also planned to look separately at the effectiveness of community infrastructure interventions (with the emphasis on quantitative study designs) and perceptions of community infrastructure (with the emphasis on qualitative evidence), but as we found the majority of the better quality evidence was qualitative, these two separate review questions were merged.

As stated in the protocol, and in keeping with the remit to find “What Works”, inclusion was limited to interventions or changes. This meant that research on long established infrastructure was not included (*e.g.* some of the literature on men’s sheds and other community hubs). This literature could add to the evidence base, particularly with regard to longer term outcomes.

In keeping with the What Works Centre for Wellbeing's Methods guide (Snape et al. 2017), we applied the well-established GRADE criteria for assessing the strength of the body of quantitative evidence for each outcome, and the related CERQual criteria for assessing the strength of the body of qualitative evidence. However, it was difficult to apply the criteria fully due to heterogeneity between interventions, populations, outcomes and study designs. Not surprisingly, the level of heterogeneity also ruled out meta-analysis of quantitative outcomes.

We identified some common domains of community wellbeing in the included studies. These were: pride/ ownership; sense of belonging; family wellbeing; civic participation; change in norms; physical environment. In future evaluations, it would be useful to map these to validated indicator sets or measurement tools.

A delay in publication (time lag bias) may have led to more recent studies being left out of the map, but we sought to avoid this by extensive website searches. We also cannot rule out publication bias in that studies with more positive findings are more likely to be published in peer-reviewed journals, but we have taken all possible steps to mitigate against this by searching for grey literature and putting out a call for evidence, to identify unpublished studies.

Whilst the strength of the conclusions that can be drawn from our review is limited by the methodological limitations of the evidence base, it is of value in itself, as it appears to be the first synthesis of the evidence on community space and place interventions and their effects on boosting social relations and wellbeing in the community.

4. Conclusions & Recommendations

4.1 Conclusions

Our review found moderate or promising evidence that a range of intervention approaches to community infrastructure can be used to boost social relations and wellbeing in a community, giving stakeholders a range of options. As the evidence currently stands, we cannot say which approach is most effective, as studies have not compared one approach to another, so cannot make strong recommendations for one approach over another.

Our review did find promising evidence about ways of doing things that are more likely to lead to

success, and ways of doing things that are probably not helpful. These facilitators and barriers to success were common themes across all the intervention approaches.

There is moderate evidence that community hubs may promote social cohesion through the mixing of different social or age/ generational groups; increase social capital and build trust between people in communities; increase wider social networks and interaction between community members; increase individual's knowledge or skills.

There is moderate evidence that changes to neighbourhood design may positively affect sense of belonging and pride in a community.

There is moderate evidence that green and blue space interventions that provide the opportunity to participate in activities or meetings improve social interactions; increase social networks social interactions and bonding and bridging social capital; increase physical activity and healthy eating; improve community members' skills and knowledge.

4.2 Recommendations for research

More high quality evaluations of interventions implemented in the UK (or that may be implemented in the UK in the future) are needed. In order to strengthen the evidence base, when a new community infrastructure intervention for boosting social relations is commissioned or introduced, it should be rigorously evaluated using robust methodology (e.g. Craig et al. 2008, Green and South 2006). Quantitative evaluations ideally should use repeated measures and a comparator group, and use validated tools to measure outcomes. Qualitative studies should use robust and credible methods for sampling, collecting and analysing data. Good quality evidence with regard to social relations and wellbeing outcomes is particularly lacking in the following categories: events; place-making; alternative use of space; urban regeneration and community development.

4.3 Recommendations for policy & practice

Policy makers and commissioners who are considering an intervention to boost social relations in a community or a place need to be aware that:

- Most of the included studies in this review, across all intervention approaches, are relevant and transferable to UK settings.
- Changes to places and spaces should be accessible in terms of physical, attitudinal, cultural, financial, transport and location barriers.
- Community members should have the opportunity to be involved in organization and planning of changes to places and spaces.

- Some changes, particularly those intended to celebrate a local community, may have the potential to leave some community members feeling excluded.
- It is important to look at outcomes in the long term, and sustainability.
- Changes which involve a group based activity or other reason to interact may be more successful at removing barriers to participation for marginalised groups

Community groups, leaders and members need to think about:

- Providing an accessible, comfortable, safe and friendly environment
- Removing barriers to inclusion/ actively reaching out to the wider community, particularly when changes are designed to celebrate a particular section of the community
- Involve skilled facilitators to ensure that all sectors of the community are represented and consensus can be reached
- Consider involving volunteers as a mechanism to enhance sustainability

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Appendix 1 Stages of social relations (Hemmati 2007, p6)

Stage description	Methods for transformation
<p>Fragmentation refers to the experience of having few or no connections to a system of support. This can be life-threatening. It can produce distress or trauma that limits the ability to communicate at the psychological level, inhibiting the ability to act effectively in the best interests of self or others. Fragmentation occurs in crisis situations when there is a total social breakdown, that is to say, in war, epidemics, natural disasters, rapid social change, major dislocation, and habituation to “normalized violence”</p>	<p>Fragmented relations can be transformed when stakeholders have the need and intention to heal distress using such dialogue procedures as peer or crisis counselling (psychological domain) within a context where there is a commitment to stop fighting and address survival needs (by service providers, police or peacekeepers, etc.).</p>
<p>Exclusion refers to a lack of capacity or opportunity to meet daily subsistence and livelihood needs owing to isolation, oppression or neglect and is disproportionately experienced by the poor, minorities, displaced populations and workers whose skills have become obsolete. Exclusion occurs where wealth and power are unevenly shared (and disparities are wide).</p>	<p>Excluded relations can be transformed when marginalized groups and those in power to prevent/ end marginalization have the need, intention and opportunity to build sustainable livelihood capacities using such dialogue procedures as action research (in the socio-economic domain). Sometimes, marginalized groups can create the opportunities themselves but those with power need to remove obstacles and/or create opportunities for inclusion. Opportunities for dialogue need to be an integral part of an overall strategy towards justice and social justice.</p>
<p>Polarization refers to the experience of taking sides in a conflict leading to the extreme relations of “us-them.” Polarization can occur in any type of conflict but is most damaging in protracted intergroup hostilities that coalesce around religion or ethnicity. Trust and respect decline as stereotyping and strife take over.</p>	<p>Polarized social relations can be transformed when stakeholders have the need, intention and opportunity to resolve differences by peaceful means using such dialogue procedures as mediation or reconciliation (socio-political domain). When polarization is linked to protracted discrimination against specific groups, processes that create justice and social justice will often be important components, or preconditions, in a social integration process.</p>
<p>Coexistence refers to the experience of mutual recognition among people. Coexistence occurs in a culture of tolerance for diversity.^a</p>	<p>Coexisting relationships can be advanced when people have the need, intention and safe space to express diverse viewpoints and seek consensus using civic or democratic dialogue (socio-political domain).</p>
<p>Collaboration refers to the experience of collective responsibility for socio-economic well-being. Collaboration tends to occur in societies that recognize and implement socio-economic justice.</p>	<p>Collaborative relations can be advanced when stakeholders have the need, intention and opportunity to participate in the design of socio-economic development that affects their lives, using dialogue procedures such as community meetings and focus groups (socio-economic domain).</p>
<p>Cohesion refers to the experience of social unity within diversity with social justice. Cohesion occurs when stakeholders recognize their common humanity and shared destiny.</p>	<p>Cohesion can be advanced when stakeholders have an opportunity and a safe space within which to explore shared meaning and values as they create a peace culture, using dialogue procedures such as theatre and media, including peace education (psycho-cultural domain).</p>

^a This does not necessarily imply that there are many bridges across social groups and sectors (see also Porter, 2005).

Appendix 2 Search strategy

a. Social relations

A1:

(Soci* OR community OR neighbour* OR public OR cultural) N3 (relation* OR cohesion OR capital OR inclusion OR inclusive OR interaction* OR network* OR connect* OR interconnect* OR bond* OR tie* OR support OR integration OR participation OR engag* OR exclu* OR isolat* OR marginali* OR disengag* OR fragment* OR disconnect* OR integration OR "capacity building" OR trust OR autonomy OR "positive relations" OR involvement OR loneliness)

A2:

"interpersonal relation*" OR connectedness OR "quality of relations" OR friend* OR companion* OR "close relationship*" OR "social routine" OR reciprocity

b. Wellbeing

"well-being" OR wellbeing OR "quality of life" OR happiness OR satisfaction OR (positive N3 "mental health") OR wellness OR health* OR "physical welfare" OR "purpose in life" OR flourish* OR prosper* OR resilien* OR contentment OR "self-esteem" OR "overall health" OR belonging OR fulfil* OR capabilit* OR salutogen* OR eudaimon* OR eudaemon* OR eudemon* OR trust* OR thrive* OR vibran* OR "sense of community" OR "sense of belonging" OR empower* OR liveability OR livability OR sustainab*

c. Interventions

policy OR policies OR intervention* OR strateg* OR initiative* OR scheme* OR programme* OR program* OR investment* OR environment* OR regeneration* OR coproduc* OR co-produc* OR volunteer* OR "what works" OR implement* OR evaluat* OR "social impact*" OR measur* OR project* OR plan* OR enterprise* OR design* OR "active by design" OR asset-based OR area-based OR social-based OR community-based OR community-led OR community-driven OR community-orient*

d. Place and space

D1: Misc. public spaces 1

(communit* OR communal OR public OR open OR neighbour* OR neighbor* OR local OR town OR city OR village OR bumping OR meeting OR social OR third OR 3rd OR urban OR rural) N3 (space* OR place* OR area* OR cent* OR infrastructure* OR asset* OR garden* OR hall* OR square* OR green* OR event* OR hub* OR liability OR venue*)

D2: Misc. public spaces 2

"physical environment" OR "built environment" OR "living environment" OR "inclusive environment" OR "free speech zone" OR "safe space*" OR "healthy living cent*" OR "therapeutic landscape*" OR "health* place*"

Search String used: (A1 or A2) & B & C & (D1 or D2)

Searched: titles OR abstracts

Restrictions:

Date: 1997-2017

Language: English

Databases

- PsycInfo
- Medline
- CINAHL
- Social Policy and Practice (covers Social Care Online and Idox)
- Social Sciences Citation Index
- Academic Search Complete
- LeisureTourism - includes all the core academic journals in leisure, tourism, hospitality, and sport economics and sociology
- Hospitality and Tourism Complete
- Avery Index - Index to journal articles, interviews, obituaries, book and exhibition reviews in the field of landscape, architecture and design
- GreenFiles
- Urban Studies Abstracts
- Opensigle

Appendix 3 Website searching

- Academy for Sustainable Communities <http://www.ascskills.org.uk/what-we-do.html>
- Altogether Better www.altogetherbetter.org.uk
- American Public Health Association
- Bath University – School for Health <http://www.bath.ac.uk>
- BIG Lottery wellbeing evaluation
- Bromley by Bow Centre <http://www.bbhc.org.uk>
- Carnegie UK Trust
- Centre for Salutogenesis, University West, Trollhattan, Norway www.salutogenesis.hv.se/eng
- Centre for Urban design & mental health
- Charities evaluation service <http://www.ces-vol.org.uk>
- Commission for Architecture and the Built Environment (CABE)
- Communities in Action Enterprises <http://www.communitiesinaction.org>
- Community Catalysts. www.communitycatalysts.co.uk
- Community Development Exchange <http://www.cdx.org.uk>
- Community Development Foundation <http://www.cdf.org.uk>
- Community Health Exchange <http://www.scdc.org.uk>
- Community Health Involvement and Empowerment Forum <http://www.chiefcic.com>
- [Create streets](#)
- Defra
- Department of Communities and Local Government
- Department of Communities and Local Government – Community empowerment division
<http://www.togetherwecan.direct.gov.uk>
- Durham University – School of Applied Social Science <http://www.dur.ac.uk/sass>
- ESRC research investments: health and wellbeing <http://www.esrc.ac.uk/research/major-investments/health-wellbeing.aspx>
- European Commission (urban health)
- Glasgow Centre for Population Health
- Greenspace Scotland
- Groundwork
- [Happy City](#)
- [Health and Wellbeing Boards \(e.g. Wakefield, Leeds...\)](#)
- Health Empowerment Leverage Project (HELP) www.healthempowerment.co.uk

- Health Foundation <http://www.health.org.uk/?gclid=CKzCtrWsnscsCFUyeGwodAtQCew>
- [Healthy Communities resources](#)
- Home Office
- Improvement foundation – healthy community collaborative
<http://www.improvementfoundation.org>
- Institute of Equity – Marmot review
- Joseph Rowntree Foundation
- Lancaster University – School of Health and Medicine <http://www.lancs.ac.uk>
- Landscape Institute
- Leeds Beckett University/ Public Health England bibliography of community centred approaches
<http://eprints.leedsbeckett.ac.uk/1782/>
- Liverpool University – Institute of Psychology, health and society <http://www.liv.ac.uk>
- Local Government Association – health <http://www.local.gov.uk/health>
- Locality
- London School of Economics – Personal Social Services Research Unit <http://www.lse.ac.uk>
- National Council for Voluntary Organisations <http://www.ncvo-vol.org.uk>
- NESTA Realising the Value <http://www.nesta.org.uk/event/realising-value> and also People Powered health
- New Economics Foundation <http://www.neweconomics.org>
- NHS Health Scotland <http://www.healthscotland.com>
- NICE – public health evidence <http://www.nice.org.uk/localgovernment/localgovernment.jsp>
- NIHR Public Health Research programme <http://www.nets.nihr.ac.uk/programmes/phr>
- NIHR School for Public Health Research <http://www.sphr.nihr.ac.uk>
- [Northampton University – Institute of Health and Wellbeing](#)
- Office for National Statistics (ONS)
- Picker Institute Europe <http://www.pickereurope.org>
- Project for public spaces
- Public Health Agency (for Northern Ireland) - Health and social wellbeing improvement
<http://www.publichealth.hscni.net/directorate-public-health/health-and-social-wellbeing-improvement>
- [Redrow](#)
- Public Health England <http://www.gov.uk/government/organisations/public-health-england>
- Royal Society for Public Health <http://www.rsph.org.uk>
- Royal Society of Arts (especially Connected Communities project)

- SCIE library
- <http://www.thehereandnow.org.uk/>
- The King's Fund – public health and inequalities <http://www.kingsfund.org.uk/topics/public-health-and-inequalities>
- Think Local Act personal – building community capacity (BCC) www.thinklocalactpersonal.org.uk/BCC/
- Turning Point <http://www.turning-point.co.uk>
- UK Faculty of Public Health <http://www.fph.org.uk/>
- University of Central Lancashire – International school for communities, rights and inclusion <http://www.uclan.ac.uk>
- Vancouver: Centre of Expertise on Culture and Communities, Simon Fraser University.
- Well London www.welllondon.org.uk
- [Wellcome Trust](#)
- Welsh Assembly website
- WHO Europe

Appendix 4 Context & Implementation of Complex Interventions (CICI) Checklist (Pfadenhauer et al. 2016)

Implementation Strategy	
Implementation theory	What were the theoretical underpinnings of the implementation efforts?
Context	
Setting	<ul style="list-style-type: none"> ▫ Which characteristics of setting influence the intervention, its implementation, its population reach and its effectiveness? ▫ How does the setting exert its influence on the intervention, its implementation and their outcomes? ▫ How does the setting interact with other domains of context?
Geographical	<ul style="list-style-type: none"> ▫ Which geographical characteristics influence the intervention, its implementation, its population reach and its effectiveness? ▫ How do geographical characteristics exert its influence on the intervention, its implementation and their outcomes? How do geographical characteristics interact with other domains of context?
Epidemiological	<ul style="list-style-type: none"> ▫ Which epidemiological characteristics of the community influence the intervention, its implementation, its population reach and its effectiveness? ▫ How do epidemiological characteristics exert its influence on the intervention, its implementation and their outcomes? ▫ How do epidemiological characteristics interact with other domains of context?
Socio-economic	<ul style="list-style-type: none"> ▫ Which socio-economic characteristics of the community influence the intervention, its implementation, its population reach and its effectiveness? ▫ How do socio-economic characteristics exert their influence on the intervention, its implementation and their outcomes? ▫ How do socio-economic characteristics interact with other domains of context?

Socio-cultural	<ul style="list-style-type: none"> ▫ Which socio-cultural characteristics of the community influence the intervention, its implementation, its population reach and its effectiveness? ▫ How do socio-cultural characteristics exert their influence on the intervention, its implementation and their outcomes? ▫ How do socio-cultural characteristics interact with other domains of context?
Political	<ul style="list-style-type: none"> ▫ What aspects of the political environment influence the intervention, its implementation, its population reach and its effectiveness? ▫ How do political aspects exert their influence on the intervention, its implementation and their outcomes? ▫ How do political characteristics interact with other domains of context?
Legal	<ul style="list-style-type: none"> ▫ What aspects of the legal environment influence the intervention, its implementation, its population reach and its effectiveness? <p data-bbox="807 1003 1382 1104">How do legal aspects exert their influence on implementation the intervention, its implementation and their outcomes?</p> <ul style="list-style-type: none"> ▫ How do legal characteristics interact with other domains of context?
Ethical	<ul style="list-style-type: none"> ▫ What aspects of the ethical environment have influenced the intervention and its effectiveness? ▫ How do ethical aspects exert their influence on the intervention, its implementation and their outcomes? ▫ How do ethical characteristics interact with other domains of context?
Implementation	
Provider	<ul style="list-style-type: none"> ▫ What mechanisms and processes in the providers are applied in the implementation of the intervention? ▫ How do these mechanisms and processes enable or limit implementation? ▫ How do provider characteristics interact with other domains of implementation or context?
Organisation and structure	<ul style="list-style-type: none"> ▫ What mechanisms and processes of organisation and structure are applied in the implementation of the intervention?

	<ul style="list-style-type: none"> ▫ How do these mechanisms and processes enable or limit implementation? ▫ How do organisation and structure interact with other domains of implementation or context?
Funding	<ul style="list-style-type: none"> ▫ Which funding measures and mechanisms are applied in the implementation of the intervention? ▫ How do these mechanisms and processes enable or limit implementation? ▫ How does funding interact with other domains of implementation or context?
Policy	<ul style="list-style-type: none"> ▫ Which policy measures and mechanisms are applied in the implementation of the intervention? ▫ How do these mechanisms and processes enable or limit implementation? ▫ How does policy interact with other domains of implementation or context?

Appendix 5 Validity assessment checklists

From WWW C Methods guide

<https://whatworkswellbeing.files.wordpress.com/2017/04/wwwc-methods-guide-mar-2017.pdf> pp25-30

Annex 2: Quality checklist quantitative evidence of intervention effectiveness

Source: Based on Early Intervention Foundation Quality Checklist and amended for use.

1. Was the evaluation well-designed? Yes No Can't tell N/A

- Fidelity:** The extent to which the intervention was delivered with fidelity is clear - i.e. if there is a specific intervention which is being evaluated, this has been well reproduced.
- Measurement:** The measures are appropriate for the intervention's anticipated outcomes and population.
- Participants completed the same set of measures once shortly before participating in the intervention and once again immediately afterwards
- An 'intent-to-treat' design was used, meaning that all participants recruited to the intervention participated in the pre/post measurement, regardless of whether or how much of the intervention they received, even if they dropped out of the intervention (this does not include dropping out of the study- which may then be regarded as missing data)
- Counterfactual:**
 - Assignment to the treatment and comparison group was at the appropriate level (e.g., individual, family, school, community)
 - The comparison condition provides an appropriate counterfactual to the treatment group. Consider:
 - Participants were randomly assigned to the treatment and control group through the use of methods appropriate for the circumstances and target population OR sufficiently rigorous quasi-experimental methods (regression discontinuity, propensity score matching) were used to generate an appropriately comparable sample through non-random methods
 - The treatment and comparison conditions are thoroughly described.

2. Was the study carried out appropriately? including appropriate sample

Yes No Can't Tell N/A

- Representative:** The sample is representative of the intervention's target population in terms of age, demographics and level of need. The sample characteristics are clearly stated.

- There is baseline equivalence between the treatment and comparison group participants on key demographic variables of interest to the study and baseline measures of outcomes (when feasible)
- Sample size:** The sample is sufficiently large to test for the desired impact. This depends most importantly on the effect size, however a suggestion could be e.g. a minimum of 20 participants have completed the measures at both time points within each study group.
- Attrition:** A minimum of 35% of the participants completed pre/ post measures. Overall study attrition is not higher than 65%.
- The study had clear processes for determining and reporting drop-out and dose. Differences between study drop-outs and completers were reported if attrition was greater than 10%.
- The study assessed and reported on overall and differential attrition
- Equivalence:** Risks for contamination of the comparison group and other confounding factors have been taken into account and controlled for in the analysis if possible:
 - Participants were blind to their assignment to the treatment and comparison group
 - There was consistent and equivalent measurement of the treatment and control groups at all points when measurement took place.
- Measures:** The measures used were valid and reliable. This means that the measure was standardised and validated independently of the study and the methods for standardization were published. Administrative data and observational measures may also have been used to measure programme impact, but sufficient information was given to determine their validity for doing this.
- Measurement was independent of any measures used as part of the treatment.
- In addition to any self-reported data (collected through the use of validated instruments), the study also included assessment information independent of the study participants (eg, an independent observer, administrative data, etc).

3. Was analysis appropriate? Yes No Can't tell N/A

- The methods used to analyse results are appropriate given the data being analysed (categorical, ordinal, ratio/parametric or non-parametric, etc) and the purpose of the analysis.
- Appropriate methods have been used and reported for the treatment of missing data.

4. Is the evidence consistent? Yes No Can't tell N/A

- Are the findings made explicit?
- Is there adequate discussion of the evidence both for and against the researcher's arguments?

- Has the researcher discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)?
- Are the findings discussed in relation to the original research question?

Quality checklist for qualitative studies (or qualitative components within mixed methods studies)

Drawing on the CASP approach, the following are the minimum criteria for inclusion of qualitative evidence in the review. If the answer to all of these questions is “yes”, the study can be included in the study in the review.

Study inclusion checklist (screening questions)

1. Is a qualitative methodology appropriate? **Yes No Can't tell**

Consider:

Does the research seek to interpret or illuminate the actions and/or subjective experiences of research participants?

Is qualitative research the right methodology for addressing the research goal?

2. Is the research design appropriate for addressing the aims of the research?

Consider:

Has the researcher justified the research design (e.g. have they discussed how they decided which method to use)?

3. Is there a clear statement of findings?

Consider:

Are the findings made explicit?

Is there adequate discussion of the evidence both for and against the researcher's arguments?

Has the researcher discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)?

Are the findings discussed in relation to the original research question?

The following criteria should be considered for each study to be included in the review (ie, those for which the answers to all of the screening questions were “yes”).

4. Was the data collected in a way that addressed the research issue?

Consider:

Is the setting for data collection justified?

Is it clear what methods were used to collect data? (e.g. focus group, semi-structured interview etc.)?

Has the researcher justified the methods chosen?

Has the researcher made the process of data collection explicit (e.g. for interview method, is there an indication of how interviews were conducted, or did they use a topic guide)?

If methods were modified during the study, has the researcher explained how and why?

Is the form of data clear (e.g. tape recordings, video material, notes etc)?

5. Was the recruitment strategy appropriate to the aims of the research?

Consider:

Has the researcher explained how the participants were selected?

Have they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study?

Is there any discussion around recruitment and potential bias (e.g. why some people chose not to take part)?

Is the selection of cases/ sampling strategy theoretically justified?

6. Was the data analysis sufficiently rigorous?

Consider:

If there is an in-depth description of the analysis process?

If thematic analysis is used, is it clear how the categories/themes were derived from the data?

Does the researcher explain how the data presented were selected from the original sample to demonstrate the analysis process?

Are sufficient data presented to support the findings?

Were the findings grounded in/ supported by the data?

Was there good breadth and/or depth achieved in the findings?

To what extent are contradictory data taken into account?

Are the data appropriately referenced (i.e. attributions to (anonymised) respondents)?

7. Has the relationship between researcher and participants been adequately considered?

Consider:

Has the researcher critically examined their own role, potential bias and influence during (a) formulation of the research questions (b) data collection, including sample recruitment and choice of location?

How has the researcher responded to events during the study and have they considered the implications of any changes in the research design?

8. Have ethical issues been taken into consideration?

Consider:

Are there sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained?

Has the researcher discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)?

Have they adequately discussed issues like informed consent and procedures in place to protect anonymity?

Have the consequences of the research been considered i.e. raising expectations, changing behaviour?

Has approval been sought from an ethics committee?

9. Contribution of the research to wellbeing impact questions?

Consider:

Does the study make a contribution to existing knowledge or understanding of what works for wellbeing? e.g. are the findings considered in relation to current practice or policy?

Appendix 6 List of included studies

1. Åberg EU and Tapsell S (2013) Revisiting the River Skerne: The Long-term Social Benefits of River Rehabilitation. *Landscape & Urban Planning* 113, 94-103
2. Anderson J, Ruggeri K, Steemers K et al. (2017) Lively Social Space, Well-Being Activity, and Urban Design: Findings from a Low-Cost Community-Led Public Space Intervention. *Environment & Behavior* 49, 685-716
3. Armstrong D (2000) A Survey of Community Gardens in Upstate New York: Implications for Health Promotion and Community Development. *Health & Place* 6(4), 319-27
4. Ball WJ and Wanitshka C (2016) Green Fairs as Venues for Civic Engagement. *Local Environment* 21(1), 24-38
5. Bertotti M, Harden A, Renton A et al. (2011) The Contribution of a Social Enterprise to the Building of Social Capital in a Disadvantaged Urban Area of London. *Community Development Journal* 47(2), 168-83
6. Black N. (2016) Festival Connections: How Consistent and Innovative Connections Enable Small-scale Rural Festivals to Contribute to Socially Sustainable Communities. *International Journal of Event and Festival Management* 7(3), 172-187
7. Blake A and Cloutier-Fisher D (2009) Backyard Bounty: Exploring the Benefits and Challenges of Backyard Garden Sharing Projects. *Local Environment* 14(9), 797-807
8. Carson AJ, Chappell NL, Knight CJ (2007) Promoting Health and Innovative Health Promotion Practice through a Community Arts Centre. *Health Promotion Practice* 8, 366-74
9. Corey JR (2008) An Analysis of a Comprehensive Community-building Program Designed to Rebuild a Distressed Urban Neighborhood. Northern Arizona University
10. Coulson JC, Fox KR, Lawlor DA et al. (2011) Residents' Diverse Perspectives of the Impact of Neighbourhood Renewal on Quality of Life and Physical Activity Engagement: Improvements but Unresolved Issues. *Health & place* 17(1), 300-10
11. Crane M, Rissel C, Greaves S et al. (2016) Neighbourhood Expectations and Engagement with new Cycling Infrastructure in Sydney, Australia: Findings from a Mixed Method Before-and-after Study. *Journal of Transport & Health* 3(1), 48-60
12. Daniels DM and Johnson EL (2009) The Impact of Community-built Playgrounds on the Community. *Journal of Trauma-Injury Infection & Critical Care* 67(1), 16-9
13. Erden Öİ and Yolal M (2016) Resident's Socio-economic Perceptions of an International Fair. *GeoJournal of Tourism & Geosites* 18(2), 152-61

14. Fildes D, Cass Y, Wallner F et al. (2010) Shedding Light on Men: The Building Healthy Men Project. *Journal of Men's Health* 7(3), 233-40
15. Gomez-Feliciano L, McCreary LL, Sadowsky R et al. (2009) Active Living Logan Square: Joining Together to Create Opportunities for Physical Activity. *American Journal of Preventive Medicine* 37 (Suppl. 2): S361-7
16. Griffin SF, Williams JE, Hickman P et al. (2011) A University, Community Coalition, and Town Partnership to Promote Walking. *Journal of Public Health Management & Practice* 17(4), 358-62
17. Jalaludin B, Maxwell M, Saddik B et al. (2012) A Pre-and-post Study of an Urban Renewal Program in a Socially Disadvantaged Neighbourhood in Sydney, Australia. *BMC Public health* 12(1), 1-9
18. Jones DL (2014) The Behavioral Impacts of Urban Street Modifications: A Case Study of East Blvd. in Charlotte, NC. US: North Carolina State University
19. Jung H, Lee SY, Kim HS et al. (2017) Does Improving the Physical Street Environment Create Satisfactory and Active Streets? Evidence from Seoul's Design Street Project. *Transportation Research Part D: Transport and Environment* 50, 269-79
20. Lanier J, Schumacher J, Calvert K (2015) Cultivating Community Collaboration and Community Health Through Community Gardens. *Journal of Community Practice* 23(3-4), 492-507
21. Lawrence A, Molteno S, Butterworth T (2010) Community Wildlife Sites in Oxfordshire: An Exploration of Ecological and Social Meanings for Green Spaces. *International Journal of the Commons* 4(1), 122-41
22. Ley D (2008) The Immigrant Church as an Urban Service Hub. *Urban Studies* 45(10), 2057-74
23. Mangadu T, Kelly M, Orezza MCE et al. (2016) Best Practices for Community Gardening in a US-Mexico Border Community. *Health Promotion International*, daw025
24. Marcus CC (2000) Site Planning, Building Design and a Sense of Community: An Analysis of Six Cohousing Schemes in Denmark, Sweden, and the Netherlands. *Journal of Architectural & Planning Research* 17(2), 146-63
25. Mason M, Welch SB, Becker A et al. (2011) Ciclovía in Chicago: A Strategy for Community Development to Improve Public Health. *Community Development* 42(2), 221-39
26. McLean H and Rahder B (2013) The Exclusionary Politics of Creative Communities: The Case of Kensington Market Pedestrian Sundays. *Canadian Journal of Urban Research* 22(1), 90-110

27. Morris J and O'Brien E (2011) Encouraging Healthy Outdoor Activity amongst Under-represented Groups: An Evaluation of the Active England Woodland Projects. *Urban Forestry & Urban Greening* 10(4), 323-33
28. Murray J and Devecchi C (2016) The Hantown Street Play Project. *International Journal of Play* 5(2), 196-211
29. Ohmer ML, Meadowcroft P, Freed K et al. (2009) Community Gardening and Community Development: Individual, Social and Community Benefits of a Community Conservation Program. *Journal of Community Practice* 17(4), 377-99
30. Porter R and McIlvaine-Newsad H (2013) Gardening in Green Space for Environmental Justice: Food Security, Leisure and Social Capital. *Leisure/Loisir* 37(4), 379-95
31. Raja S, Ball M, Booth J et al. (2009) Leveraging Neighborhood-scale Change for Policy and Program Reform in Buffalo, New York. *American Journal of Preventive Medicine*, 37(6) (Suppl. 2): S352-60
32. Saville G (2009) SafeGrowth: Moving Forward in Neighbourhood Development. *Built Environment* 35(3) 386-402
33. Semenza JC (2003) The Intersection of Urban Planning, Art, and Public Health: The Sunnyside Piazza. *American Journal of Public Health* 93(9), 1439-41
34. Semenza JC and March TL (2009) An Urban Community-based Intervention to Advance Social Interactions. *Environment and Behavior* 41(1), 22-42
35. Semenza JC, March TL, Bontempo BD (2007) Community-initiated Urban Development: An Ecological Intervention. *Journal of Urban Health* 84(1), 8-20
36. Serrano E, Larrañaga I, Morteruel M et al. (2016) Urban Regeneration as Population Health Intervention: A Health Impact Assessment in the Bay of Pasaia (Spain). *International Journal for Equity in Health* 15(1), 1-12
37. Shamasunder B, Mason R, Ippoliti L et al. (2015) Growing Together: Poverty Alleviation, Community Building, and Environmental Justice through Home Gardens in Pacoima, Los Angeles. *Environmental Justice* 8(3), 72-7
38. Shipway R (2016) *Community Spaces Evaluation*. Manchester: Hall Aitken
39. Shore to Core (2017) *Happier by Design: Research Team Final Report*. Happy City, the University of Virginia, Street Plans Collaborative, Space Syntax
40. Stenberg J, Thuvander L, Femenías P (2009) Linking Social and Environmental Aspects: A Multidimensional Evaluation of Refurbishment Projects. *Local Environment* 14(6), 541-56
41. Stevenson (2016) Local Festivals, Social Capital and Sustainable Destination Development: Experiences in East London. *Journal of Sustainable Tourism* 24(7), 990-1006

42. Torres A, Steward J, Strasser S et al. (2016) Atlanta Streets Alive: A Movement Building a Culture of Health in an Urban Environment. *Journal of Physical Activity and Health* 13(2), 239-46
43. Tulloch A (2016) *Sydenham Street Revived: A Public Space Experiment*. Kingston: Queen's University
44. Turco DM (1997) Host Residents' Perceived Social Costs and Benefits Toward a Staged Tourist Attraction. *Journal of Travel & Tourism Marketing* 7(1), 21-30
45. Vering K (2006) Social Sustainability—Forest Projects for the Integration of Marginal Groups. *Urban Forestry & Urban Greening* 5(1), 45-51
46. Wells P, Hickman P, Dayson C et al. (2012) *Village SOS Project Evaluation*. Centre for Regional Economic and Social Research
47. Whitford M and Ruhanen L (2013) Indigenous Festivals and Community Development: A Sociocultural Analysis of an Australian Indigenous Festival. *Event Management* 17(1), 49-61
48. Williams P and Pocock B (2010) Building 'Community' for Different Stages of Life: Physical and Social Infrastructure in Master Planned Communities. *Community, Work & Family* 13(1), 71-87
49. Windhorst C, Hollinger-Smith L, Sassen B (2010) The Café Plus Concept: A Different Model for Different Times. *Generations* 34(1), 91-3
50. Yuen FC and Glover TD (2005) Enabling Social Capital Development: An Examination of the Festival of Neighborhoods in Kitchener, Ontario. *Journal of Park & Recreation Administration* 23(4), 20-38
51. Zieff SG, Chaudhuri A, Musselman E (2016) Creating Neighborhood Recreational Space for Youth and Children in the Urban Environment: Play (ing in the) Streets in San Francisco. *Children and Youth Services Review* 70, 95-101

Appendix 7 List of excluded studies

Not a OECD country

1. Follmann A and Viehoff V (2015) A Green Garden on Red Clay: Creating a New Urban Common as a Form of Political Gardening in Cologne, Germany. *Local Environment* 20(10), 1148-74
2. Ford CD (2013) Building from Within: Pastoral Insights into Community Resources and Assets. *Public Health Nursing* 30(6), 511-8

Intervention not targeting community, or targeting only children or older people

1. Avenarius CB (2012) Immigrant Networks in new Urban Spaces: Gender and Social Integration. *International Migration* 50(5), 25-55
2. Cipriani J (2007) Altruistic Activities of Older Adults Living in Long term Care Facilities: A Literature Review. *Physical & Occupational Therapy in Geriatrics* 26(1), 19-28
3. Cook M (2016) How Woodlands and Forests Enhance Mental Well-being. *Journal of Dementia Care* 24(3), 20-3
4. Department for Education and Employment (2000) Early Excellence Centres: First Findings
5. Elias BM and Cook SL (2016) Exploring the Connection Between Personal Space and Social Participation. *Journal of Housing for the Elderly* 30(1), 107-22
6. Evans S (2009) That Lot up there and Us down Here': Social Interaction and a Sense of Community in a Mixed Tenure UK Retirement Village. *Ageing & Society* 29(2), 199-216
7. Geuter R (2010) Shropshire Working Together Group: Growing a Network of Support through a Community Cafe and Social. *Think Local*
8. Hall E (2010) Spaces of Social Inclusion and Belonging for People with Intellectual Disabilities. *Journal of Intellectual Disability Research* 54(Suppl. 1): 48-57
9. Hoban M, James V, Beresford P et al. (2013) Involving Older Age: The route to twenty-first Century Well-being. *Shaping Our Age*
10. IDGo (2010) Do Gardens Matter? The Role of Residential Outdoor Space
11. Institute for Research Innovation in Social and Services (2012) Using an Assets Approach for Positive Mental Health and Well-being: An IRISS and East Dumbartonshire Council Project
12. Morrel-Samuels S, Zimmerman MA, Reischl TM (2013) Creating Safe and Healthy Futures: Michigan Youth Violence Prevention Center. *Reclaiming Children and Youth* 22(3), 31-6
13. Quinn J, Blandon C, Batson A (2017) Beyond Words Project Report

14. Shared Intelligence (2017) Stand by Me. The Contribution of Public Libraries to the Well-being of Older People. London: Arts Council England
15. Tilly B (2011) The Princess Royal Trust for Carers–Social Impact Evaluation of Five Carers’ Centres using Social Return on Investment. Essex: The Princess Royal Trust for Carers
16. Welch EF (2009) Campus based Community Centers: Havens, Harbors, and Hope for Underrepresented and Marginalized Student Success. University of California San Diego

Not an intervention, or intervention does not involve a change to community infrastructure place or space

1. Aberdeenshire Health and Team Social Care Partnership Innovation (2016) Learning about Community Capacity-building from the Community Links Worker Approach in Insh, Aberdeenshire (2013-16): A collaborative Action Research Inquiry (cycle 1). What Works Scotland
2. Alaimo K, Packnett E, Miles RA et al. (2008) Fruit and Vegetable Intake among Urban Community Gardeners. *Journal of Nutrition Education and Behavior* 40(2), 94-101
3. Allen JD, Leyva B, Torres AI et al. (2014) Religious Beliefs and Cancer Screening Behaviors among Catholic Latinos: Implications for Faith-based Interventions. *Journal of Health Care for the Poor and Underserved* 25(2), 503-26
4. Anderson J (2015) “Living in a Communal Garden” Associated with Well-being while Reducing Urban Sprawl by 40%: A Mixed-methods Cross-sectional Study. *Frontiers in Public Health* 3, 1-43
5. Anguelovski I (2013) Beyond a Livable and Green Neighborhood: Asserting Control, Sovereignty and Transgression in the Casc Antic of Barcelona. *International Journal of Urban and Regional Research* 37(3), 1012-34
6. Appleton N and Molyneux P (2007) Connecting Housing to the Health and Social Care Agenda: A Person-centred Approach. London: Housing Learning and Improvement Network
7. Ashbullby KJ, Pahl S, Webley P et al. (2013) The Beach as a Setting for Families’ Health Promotion: A Qualitative Study with Parents and Children Living in Coastal Regions in Southwest England. *Health & Place* 23, 138-47
8. Astbury JMP (2015) Engaging Wester Hailes - Findings from the Valuing Different Perspectives Community Evaluation. Herriot-Watt University
9. Aylett A (2013) Networked Urban Climate Governance: Neighborhood-scale Residential Solar Energy Systems and the Example of Solarize Portland. *Environment and Planning C: Government and Policy* 31(5), 858-75

10. Bacon N (2013) *PLUGGING THE GAP: Turning Strangers into Neighbours*. London: RSA Action & Research Centre.
11. Baker L, Garforth H, Taylor M et al. (2016) *People, Places and Health Agencies: Lessons from Big Local Residents*. Institute for Voluntary Action Research
12. Baur JWR, Gómez E, Tynon Joanne F (2013) Urban Nature Parks and Neighborhood Social Health in Portland, Oregon. *Journal of Park & Recreation Administration* 31, 23-44.
13. Bavinton N (2007) From Obstacle to Opportunity: Parkour, Leisure, and the Reinterpretation of Constraints. *Annals of Leisure Research* 10(3-4), 391-412
14. Bennet SA, Yiannakoulis N, Williams AM et al. (2012) Playground Accessibility and Neighbourhood Social Interaction among Parents. *Social Indicators Research* 108(2), 199-213
15. Bess KD and Doykos B (2014) Tied Together: Building Relational Well-Being and Reducing Social Isolation through Place-Based Parent Education. *Journal of Community Psychology* 42(3), 268-84
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Appendix 8 Transferability assessment

Transferability table

Stage of intervention development: Pilot (PT), Feasibility Study (FS), Main Evaluation (ME), Implementation Study (IM), Evaluation of Model Transferability (MS), Exploratory Study (EX)

Who initiated the intervention?: Community/citizens (CS), Third Sector (TS), Public service/govt (PSG), Private (PV), Mixed (MX)

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Åberg EU and Tapsell S (2013) Revisiting the River Skerne: The Long-term Social Benefits of River Rehabilitation. Landscape & Urban Planning 113, 94-103	✓	✓	1995-1996	ME		The particular site was chosen as it met the necessary ecological and 'urban' criteria and also because it only involved one landowner, the local council, which greatly facilitated the negotiation process	CS, PV	EU LIFE fund and national matched funding
Anderson J, Ruggeri K, Steemers K et al. (2017) Lively Social Space, Well-Being Activity, and Urban Design: Findings from a Low-Cost Community-Led Public Space Intervention. Environment & Behavior 49, 685-716	✓	✓	2011-2012	EX	Total cost \$20,000		MX	
Armstrong D (2000) A Survey of Community Gardens in Upstate New York: Implications for Health Promotion and	✓		1997-1998	ME			PSG	In all states, Cooperative Extension is administered through land-grant universities (with grant support from the US Department of Agriculture), and faculty in

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Community Development. Health & Place 6(4), 319-27								nutritional and agricultural sciences provide program direction, in-service training and teaching materials for county programs. Cornell University serves this role in New York State.
Ball WJ and Wanitshka C (2016) Green Fairs as Venues for Civic Engagement. Local Environment 21(1), 24-38	✓	✓		EX				
Bertotti M, Harden A, Renton A et al. (2011) The Contribution of a Social Enterprise to the Building of Social Capital in a Disadvantaged Urban Area of London. Community Development Journal 47(2), 168-83	✓	✓	2006	ME			PSG	Owned and funded by public sector - local authority, Surestart, library
Black N. (2016) Festival Connections: How Consistent and Innovative Connections Enable Small-scale Rural Festivals to Contribute to Socially Sustainable Communities. International Journal of Event and Festival Management 7(3),	✓	✓		ME	Less than £30k			

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
172-187								
Blake A and Cloutier-Fisher D (2009) Backyard Bounty: Exploring the Benefits and Challenges of Backyard Garden Sharing Projects. Local Environment 14(9), 797-807	✓	✓	May-October 2005	FS				
Carson AJ, Chappell NL, Knight CJ (2007) Promoting Health and Innovative Health Promotion Practice through a Community Arts Centre. Health Promotion Practice 8, 366-74	✓	✓	2001-2006	PT				Federally funded
Corey JR (2008) An Analysis of a Comprehensive Community-building Program Designed to Rebuild a Distressed Urban Neighborhood. Northern Arizona University			2005-2006	PT				

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Coulson JC, Fox KR, Lawlor DA et al. (2011) Residents' Diverse Perspectives of the Impact of Neighbourhood Renewal on Quality of Life and Physical Activity Engagement: Improvements but Unresolved Issues. Health & place 17(1), 300-10	✓	✓	2004-2006	ME	£1 million		PSG	Funding was provided by the Civitas-Vivaldi (EU) initiative and the local council's New Deal for Communities programme
Crane M, Rissel C, Greaves S et al. (2016) Neighbourhood Expectations and Engagement with new Cycling Infrastructure in Sydney, Australia: Findings from a Mixed Method Before-and-after Study. Journal of Transport & Health 3(1), 48-60	✓	✓	2013-2014	ME				
Daniels DM and Johnson EL (2009) The Impact of Community-built Playgrounds on the Community. Journal of Trauma-Injury Infection & Critical Care 67(1), 16-9			2002-2008	ME				

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Erden ÖI and Yolal M (2016) Resident's Socio-economic Perceptions of an International Fair. <i>GeoJournal of Tourism & Geosites</i> 18(2), 152-61		✓	August-September 2013	ME				
Fildes D, Cass Y, Wallner F et al. (2010) Shedding Light on Men: The Building Healthy Men Project. <i>Journal of Men's Health</i> 7(3), 233-40			2005-2007	ME				Funded by Illawarra Area Assistance Scheme
Gomez-Feliciano L, McCreary LL, Sadowsky R et al. (2009) Active Living Logan Square: Joining Together to Create Opportunities for Physical Activity. <i>American Journal of Preventive Medicine</i> 37 (Suppl. 2): S361-7			2004	PT			MX	Funding for ALbD primarily supported staff. The ALbD grant covered one third of the project coordinator's salary; other funders matched the remaining portion (i.e., Marguerite Casey Foundation, Aetna Foundation, and the Illinois Department of Public Health).
Griffin SF, Williams JE, Hickman P et al. (2011) A University, Community Coalition, and Town Partnership to Promote Walking. <i>Journal of Public Health Management & Practice</i> 17(4), 358-62	✓	✓	2008	ME				

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Jalaludin B, Maxwell M, Saddik B et al. (2012) A Pre-and-post Study of an Urban Renewal Program in a Socially Disadvantaged Neighbourhood in Sydney, Australia. BMC Public health 12(1), 1-9	✓	✓	2009-2010	ME			PSG	
Jones DL (2014) The Behavioral Impacts of Urban Street Modifications: A Case Study of East Blvd. in Charlotte, NC. US: North Carolina State University	✓	✓	2011	ME			CS, PV	The city was awarded a Smart Growth Achievement Award by the Environmental Protection Agency (EPA)
Jung H, Lee SY, Kim HS et al. (2017) Does Improving the Physical Street Environment Create Satisfactory and Active Streets? Evidence from Seoul's Design Street Project. Transportation Research Part D: Transport and Environment 50, 269-79			2007	ME			PSG	Seoul Metropolitan Government funded and implemented the intervention
Lanier J, Schumacher J, Calvert K (2015) Cultivating Community Collaboration and Community Health Through Community Gardens. Journal of Community Practice 23(3-4), 492-507	✓	✓	2013	ME	Each organization received approximately \$500			The funding for the minigrants was made possible through an initiative from the YMCAUSA called Action Communities for Health, Innovation, and Environmental change (ACHIEVE)

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Lawrence A, Molteno S, Butterworth T (2010) Community Wildlife Sites in Oxfordshire: An Exploration of Ecological and Social Meanings for Green Spaces. International Journal of the Commons 4(1), 122-41	✓	✓		EX			CS	Supported by Oxfordshire Nature Conservation Forum
Ley D (2008) The Immigrant Church as an Urban Service Hub. Urban Studies 45(10), 2057-74	✓			EX			PV	
Mangadu T, Kelly M, Orezza MCE et al. (2016) Best Practices for Community Gardening in a US-Mexico Border Community. Health Promotion International, daw025			2010	PT		School gardens	PGT, PV	The Paso Del Norte Health Foundation (PDNHF) funded the three community garden projects through its Healthy Eating and Active Living Initiative
Marcus CC (2000) Site Planning, Building Design and a Sense of Community: An Analysis of Six Cohousing Schemes in Denmark, Sweden, and the Netherlands. Journal of Architectural & Planning Research 17(2), 146-63			1978	EX		Christian congregations		

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Mason M, Welch SB, Becker A et al. (2011) Ciclovía in Chicago: A Strategy for Community Development to Improve Public Health. Community Development 42(2), 221-39	✓	✓	Since 2007	FS				
McLean H and Rahder B (2013) The Exclusionary Politics of Creative Communities: The Case of Kensington Market Pedestrian Sundays. Canadian Journal of Urban Research 22(1), 90-110	✓		2002-2012	IM			CS	Funded by local government for the first two years to then becoming self-funded
Morris J and O'Brien E (2011) Encouraging Healthy Outdoor Activity amongst Under-represented Groups: An Evaluation of the Active England Woodland Projects. Urban Forestry & Urban Greening 10(4), 323-33	✓	✓	Since 2003	PT			CS	Big Lottery/ Sport England grants funded the Active England programme
Murray J and Devecchi C (2016) The Hantown Street Play Project. International Journal of Play 5(2), 196-211	✓	✓	2013	PT			TS	Funded by Community Trust

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Ohmer ML, Meadowcroft P, Freed K et al. (2009) Community Gardening and Community Development: Individual, Social and Community Benefits of a Community Conservation Program. Journal of Community Practice 17(4), 377-99		✓	1982 ongoing	ME			CS, TS	
Porter R and McIlvaine-Newsad H (2013) Gardening in Green Space for Environmental Justice: Food Security, Leisure and Social Capital Leisure/Loisir 37(4), 379-95	✓	✓	2009	ME		Food banks, local park, softball league	CS	
Raja S, Ball M, Booth J et al. (2009) Leveraging Neighborhood-scale Change for Policy and Program Reform in Buffalo, New York. American Journal of Preventive Medicine, 37(6) (Suppl. 2): S352-60	✓		2003-2008	ME	\$200,000		PV	Grant given by the Active Living by Design (ALbD) program of the Robert Wood Johnson Foundation.
Saville G (2009) SafeGrowth: Moving Forward in Neighbourhood Development. Built Environment 35(3) 386-402			2000-2009	ME			PV	

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Semenza JC (2003) The Intersection of Urban Planning, Art, and Public Health: The Sunnyside Piazza. American Journal of Public Health 93(9), 1439-41	✓		2001-2002	EX		information kiosk, wishing pond,	CS	
Semenza JC and March TL (2009) An Urban Community-based Intervention to Advance Social Interactions. Environment and Behavior 41(1), 22-42	✓		May-July-2003	ME		information kiosk, lawn chess board, sauna	CS, PV	
Semenza JC, March TL, Bontempo BD (2007) Community-initiated Urban Development: An Ecological Intervention. Journal of Urban Health 84(1), 8-20	✓		May-July 2003	ME		information kiosk, lawn chess board, sauna	CS, PV	
Serrano E, Larrañaga I, Morteruel M et al. (2016) Urban Regeneration as Population Health Intervention: A Health Impact Assessment in the Bay of Pasaia (Spain). International Journal for Equity in Health 15(1), 1-12	✓	✓	2011-2014	ME		fish market		

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Shamasunder B, Mason R, Ippoliti L et al. (2015) Growing Together: Poverty Alleviation, Community Building, and Environmental Justice through Home Gardens in Pacoima, Los Angeles. Environmental Justice 8(3), 72-7			2013	ME		General motors,		
Shipway R (2016) Community Spaces Evaluation. Manchester: Hall Aitken	✓	✓	2008-2014	ME		£57 million in total, given to communities across England	PSG	Big Lottery funded programme
Shore to Core (2017) Happier by Design: Research Team Final Report. Happy City, the University of Virginia, Street Plans Collaborative, Space Syntax	✓	✓	2016	PT			PSG	
Stenberg J, Thuvander L, Femenías P (2009) Linking Social and Environmental Aspects: A Multidimensional Evaluation of Refurbishment Projects. Local Environment 14(6), 541-56				ME	660 million euro			Funded by the Swedish Government

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Stevenson (2016) Local Festivals, Social Capital and Sustainable Destination Development: Experiences in East London. Journal of Sustainable Tourism 24(7), 990-1006	✓	✓	2008	ME				
Torres A, Steward J, Strasser S et al. (2016) Atlanta Streets Alive: A Movement Building a Culture of Health in an Urban Environment. Journal of Physical Activity and Health 13(2), 239-46	✓	✓	2010-2014	FS				
Tulloch A (2016) Sydenham Street Revived: A Public Space Experiment. Kington: Queen's University	✓	✓	August-September 2015	ME		Starbucks coffee shop	CS, PSG	
Turco DM (1997) Host Residents' Perceived Social Costs and Benefits Toward a Staged Tourist Attraction. Journal of Travel & Tourism Marketing 7(1), 21-30	✓	✓	1993	EX	\$3.7 million			Funded by Kodak Albuquerque International Balloon Fiesta, Inc.

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Vering K (2006) Social Sustainability–Forest Projects for the Integration of Marginal Groups. Urban Forestry & Urban Greening 5(1), 45-51	✓	✓		IM			PSG	
Wells P, Hickman P, Dayson C et al. (2012) Village SOS Project Evaluation. Centre for Regional Economic and Social Research	✓	✓	2011-2012	ME	Six schemes received £400,000 each		CS, TS	Big Lottery funded programme
Whitford M and Ruhanen L (2013) Indigenous Festivals and Community Development: A Sociocultural Analysis of an Australian Indigenous Festival. Event Management 17(1), 49-61			Since 1993	ME			PV	Funding provided by Commonwealth funding through the Australian Institute for Aboriginal and Torres Strait Islander Studies as well as First Contact Inc. the organizers of the festival.
Williams P and Pocock B (2010) Building 'Community' for Different Stages of Life: Physical and Social Infrastructure in Master Planned Communities. Community, Work & Family 13(1), 71-87		✓		ME				

Reference	Setting common to the UK	Population common to the UK	Dates	Stage	Costs	Key contextual factors	Who initiated the intervention ?	Funding
Windhorst C, Hollinger-Smith L, Sassen B (2010) The Café Plus Concept: A Different Model for Different Times. Generations 34(1), 91-3	✓	✓	2000-2008	ME			TS	
Yuen FC and Glover TD (2005) Enabling Social Capital Development: An Examination of the Festival of Neighborhoods in Kitchener, Ontario. Journal of Park & Recreation Administration 23(4), 20-38	✓	✓	Since 1994	ME	11 neighbourhood projects have been awarded a \$10,000 grant		PSG, PV	The grants are made available by Festival of Neighborhoods (FON)
Zieff SG, Chaudhuri A, Musselman E (2016) Creating Neighborhood Recreational Space for Youth and Children in the Urban Environment: Play (ing in the) Streets in San Francisco. Children and Youth Services Review 70, 95-101	✓	✓	2013	PT		Recreation (leisure) centre, community centre, local opera house	PSG	Funded by Partnership for a Healthier America

Appendix 9 Validity assessment

Key: Y = Yes; N = No; ? = can't tell; n/a = not applicable; 0= poor quality; 1 = poor to moderate quality; 2 = moderate quality; 3 = moderate quality; 4 = good quality

Qualitative studies

Study	Qualitative method appropriate?	Research design appropriate?	Clear statement of findings?	Data collection appropriate?	Recruitment strategy appropriate?	Rigorous data analysis?	Researcher relationship considered?	Ethical issues taken into account?	Contribution?	Level
Anderson J, et al. (2017)	Y	Y	Y	Y	?	?	?	Y	Y	1
Ball WJ, and Wanitshka C (2016).	Y	N	N	N	?	?	N	?	?	0
Blake A, and Cloutier-Fisher D (2009)	Y	Y	Y	Y	?	Y	N	?	Y	1
Marcus C C (2000)	Y	?	Y	?	?	N	?	?	Y	0
Carson AJ, et al. (2007).	?	?	N	?	?	N	N	?	N	0
Corey JR (2008)	Y	Y	Y	Y	?	Y	Y	Y	Y	3
Coulson J C, et al. (2011).	Y	Y	Y	Y	?	Y	Y	Y	Y	2
Crane M, et al. (2016)	Y	?	Y	Y	?	Y	?	?	Y	1
Daniels DM, Johnson EL (2009)	Y	N	?	N	Y	?	N	?	?	0
Black (2016)	Y	Y	Y	Y	Y	?	?	?	Y	1
Fildes D, et al.	Y	Y	Y	Y	Y	?	N	Y	Y	2

Study	Qualitative method appropriate?	Research design appropriate?	Clear statement of findings?	Data collection appropriate?	Recruitment strategy appropriate?	Rigorous data analysis?	Researcher relationship considered?	Ethical issues taken into account?	Contribution?	Level
(2010)										
Gomez-Feliciano L, et al. (2009)	?	?	?	?	?	?	?	?	?	0
Griffin S F, et al. (2011)	Y	Y	N	?	?	?	N	?	?	0
Jones DL (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	3
Ohmer ML et al (2009)	Y	Y	Y	Y	?	?	?	Y	Y	1
Lanier J, et al. (2015)	Y	?	N	?	?	N	N	?	N	0
Lawrence A, et al. (2010)	Y	Y	Y	Y	Y	?	N	?	Y	1
Ley David (2008)	Y	Y	N	Y	?	?	N	?	Y	0
Stevenson (2016)	Y	Y	Y	Y	Y	Y	Y	?	Y	3
Mangadu T, et al.(2016)	Y	Y	Y	Y	?	?	?	?	Y	1
Bertotti, M et al (2012)	Y	Y	Y	Y	?	?	?	?	Y	1
Mason, M et al. (2011)	Y	?	N	?	?	?	?	?	Y	0
McLean H, Rahder B (2013)	Y	Y	Y	?	?	?	Y	Y	Y	1
Morris J, O'Brien E (2011)	Y	Y	Y	Y	Y	?	N	Y	Y	2
Murray J, Devecchi C (2016)	Y	Y	Y	N	?	?	?	?	Y	0
Porter R, McIlvaine-	Y	Y	Y	Y	Y	Y	Y	?	Y	3

Study	Qualitative method appropriate?	Research design appropriate?	Clear statement of findings?	Data collection appropriate?	Recruitment strategy appropriate?	Rigorous data analysis?	Researcher relationship considered?	Ethical issues taken into account?	Contribution?	Level
Newsad H (2013)										
Raja S, et al. (2009)	Y	?	Y	?	?	?	N	?	Y	0
Semenza JC, March TL (2009)	Y	N	?	N	?	?	?	?	Y	0
Serrano E, et al. (2016)	Y	Y	?	?	Y	?	N	?	?	0
Shamasunder B, et al. (2015)	Y	?	N	?	?	?	N	?	N	0
Shipway R (2016)	Y	?	N	?	?	?	N	?	?	0
Shore to Core (2017)	Y	?	?	?	?	?	N	?	?	0
Stenberg J, et al. (2009)	Y	Y	Y	N	?	N	N	?	Y	0
Stokes (2015)	Y	N	Y	?	N	?	N	Y	Y	0
Vering K (2006)	Y	?	N	?	Y	?	N	Y	N	0
Wells P, et al. (2012)	Y	Y	Y	Y	Y	?	?	Y	Y	2
Whitford M, Ruhanen L (2013)	Y	Y	Y	Y	Y	Y	Y	?	Y	3
Williams P, Pocock (2010)	Y	Y	Y	Y	Y	Y	?	?	Y	2
Yuen FC, Glover TD (2005)	Y	?	Y	Y	Y	Y	N	?	Y	1

Quantitative studies

Study	Design							Sample														Analysis		Level
	B&A	Allocat	Assignmt level	ITT analysis	Int descr	Imp fide l	Comp appro p	Sm pl rep ?	Sm pl size ?	Drop t & dose	Attritio n bias	Bsln equi v	cfg	Blin d	Meas bias	Attr repor t	App r meas	Vali d meas	Ind meas	Blin d o/c	Ind ass	Analys is appr	Missi g data	
Aberg & Tapesell (2013)	Y	n/a	n/a	n/a	Y	n/a	n/a	Y	Y	n/a	?	n/a	?	n/a	?	n/a	?	?	?	n/a	?	Y	?	0
Tulloch 2016	Y	n/a	n/a	n/a	Y	?	?	?	Y	n/a	n/a	n/a	?	n/a	?	n/a	?	?	?	?	?	?	?	0
Anderson 2017	Y	n/a	n/a	n/a	Y	Y	Y	?	Y	n/a	N/A	?	Y	N/A	?	N/A	Y	Y	?	N/A	Y	Y	?	0
Armstrong 2000	N	N/A	N/A	N/A	Y	N/A	N/A	Y	N	N/A	N/A	N/A	N	N/A	N/A	N/A	Y	?	Y	?	Y	?	N/A	0
Ball 2016	N/A	N/A	N/A	N/A	Y	N/A	N/A	Y	Y	N/A	N/A	N/A	N	N/A	?	N/A	Y	?	?	N/A	?	N	?	0
Windhorst 2010	Y	N	Y	?	Y	?	Y	Y	Y	N/A	?	?	N	N	?	N	Y	Y	Y	?	N/A	?	?	0
Corey 2008	Y	n/a	n/a	n/a	Y	?	?	?	Y	?	?	n/a	?	n/a	?	?	Y	Y	?	n/a	Y	Y	Y	0
Crane 2016	N	n/a	n/a	?	Y	?	n/a	?	Y	n/a	n/a	n/a	?	n/a	?	n/a	?	?	?	n/a	?	Y	?	0
Daniels 2009	N	n/a	n/a	n/a	Y	?	N	?	?	n/a	n/a	n/a	N	n/a	?	n/a	?	?	?	n/a	?	?	?	0
Erden 2016	N	n/a	n/a	n/a	N	?	N	?	Y	?	n/a	n/a	N	n/a	?	?	Y	Y	?	n/a	?	Y	?	0
Griffin 2011	?	n/a	n/a	n/a	Y	?	?	?	?	?	n/a	n/a	N	n/a	?	n/a	Y	?	n/a	?	?	?	?	0
Jalaludin 2012	Y	n/a	n/a	?	Y	?	n/a	?	Y	?	n/a	n/a	N	n/a	?	?	Y	Y	?	n/a	?	N	?	0
Jones 2014	N	n/a	n/a	?	Y	?	?	?	Y	n/a	n/a	n/a	?	n/a	?	n/a	Y	Y	Y	n/a	?	Y	N/a	0
Jung 2017	Y	n/a	n/a	n/a	Y	?	Y	Y	Y	n/a	?	?	Y	n/a	Y	N	Y	Y	Y	N	Y	Y	?	1
Lanier 2015	N	n/a	n/a	n/a	Y	?	?	?	?	N	n/a	n/a	N	N	n/a	n/a	Y	?	?	n/a	?	?	?	0
Mangadu 2016	N	n/a	n/a	n/a	Y	?	n/a	?	Y	?	?	n/a	?	n/a	n/a	n/a	Y	Y	?	n/a	?	?	?	0
Mason 2011	N	n/a	n/a	n/a	Y	?	?	?	?	?	n/a	n/a	?	n/a	?	?	Y	?	?	n/a	N	Y	?	0
Morris 2011	Y	n/a	n/a	n/a	Y	?	Y	N	Y	?	?	n/a	?	n/a	?	N	Y	?	?	N	?	Y	?	0
Murray 2016	N	n/a	n/a	?	Y	Y	n/a	?	Y	?	?	n/a	?	N	?	?	Y	Y	?	N	?	?	?	0

	Design							Sample														Analysis		Level
Saville 2009	Y	n/a	n/a	?	Y	?	?	?	Y	?	n/a	n/a	?	N	?	?	Y	Y	Y	n/a	?	?	?	0
Semenza 2003	N	n/a	n/a	?	Y	?	Y	Y	Y	n/a	n/a	?	N	n/a	?	n/a	Y	?	n/a	N	?	?	?	0
Semenza 2007	Y	n/a	n/a	?	Y	?	?	?	Y	?	n/a	n/a	N	?	n/a	n/a	Y	Y	?	Y	?	N	?	0
Semenza 2009	N	n/a	N/A	?	Y	?	?	?	Y	?	n/a	n/a	N	n/a	?	n/a	?	?	?	n/a	?	?	?	0
Serrano, 2016	N	n/a	n/a	?	Y	?	n/a	Y	Y	?	n/a	n/a	N	n/a	?	n/a	?	?	?	n/a	?	?	?	0
Shipway 2016	?	?	?	?	Y	?	?	?	?	?	n/a	n/a	N	n/a	?	?	?	?	?	n/a	?	?	?	0
Shore to Core 2017	Y	N	n/a	Y	Y	?	Y	?	?	?	n/a	n/a	N	Y	?	?	Y	Y	Y	Y	?	?	?	0
Stenberg 2009	Y	n/a	n/a	n/a	n/a	n/a	n/a	?	?	n/a	n/a	n/a	n/a	n/a	n/a	n/a	?	?	?	?	Y	?	?	0
Torres 2016	N	n/a	n/a	?	Y	?	n/a	Y	Y	?	?	n/a	N	n/a	?	?	Y	?	?	n/a	?	?	?	0
Turco 1997	N	n/a	n/a	n/a	Y	?	n/a	?	Y	N	n/a	n/a	N	n/a	N	N	?	?	?	n/a	?	Y	?	0
Zieff 2016	Y	N	n/a	?	Y	Y	Y	N	Y	?	?	N	N	n/a	Y	N	Y	Y	?	N	Y	Y	?	0

Appendix 10 Coding framework summary

Initial code	Organising code	Thematic category
Community assets	Context	Factors affecting implementation
Community needs		
Current use of space		
Physical use of space		
Socio-economic information		
Hard to engage people	Negative (limitations, risks)	
People's negative perceptions		
Lack of appropriate resources		
Lack of purpose		
Outcomes take time		
Physical, natural environment		
Rival events, spaces		
Social environment, local culture		
Time limited outcomes		
Unfulfilled promises		
Accessibility (including physical proximity) to intervention	Positive	
Accessibility to organisation, planning, management		
Contextual changes		
Cultural competence, awareness		
Different perspectives		
Facilitation		
Flexibility – balance, adaption		
Formal-informal, planned-unplanned		
Funding		
'interesting features'		
Involving people – empowerment		
Volunteerism		
Outcomes take time, change		
Positive ethos, vision		
Potential for sustainability – sustainability planning		
Safety		
Support – peer, family, stakeholders		
Unobtrusive features		
Accessibility of intervention	Strategies for success	
Accessibility of process		
Engagement and participation – people, citizens		
Engagement and participation – stakeholders		
Management and planning		
Resources		
Understanding the community		
Avoidance of intervention, place	Negative	Outcomes
Misuse		
Other		
Overuse		
Other		
Physical changes	Positive – community	
Transference to other areas		
Belonging, sense of place		
Better environment		
Commercial, development		
Community wellbeing		

Consolidation		
Crime		
Family wellbeing		
Heritage, cultural awareness		
Identity		
Increased civic activity		
Increased use		
Knowledge exchange		
Norms		
Pride, ownership		
Social relations		
Cohesion – mixing of groups		
Social capital		
Social networks		
Awareness of others		
Behaviour change		
Community, neighbourhood involvement		
Mental wellbeing		
Physical wellbeing		
Functioning better		
Skills & knowledge		
Social relations		
Outcomes different for different groups	Unintended	
No effect		

Appendix 11 Table of included studies

Intervention category: Community Hubs (CH), Events (EV), Neighbourhood Design (ND), Green and Blue Spaces (GB), Placemaking (PM), Alternative Use of Spaces (AU), Urban Regeneration (UR), Community Development (CD), Other (OT)

Level/Kind of intervention: Top-down (TD), Bottom-up (BU), Maintain (MT), Protect (PT), Enhance (EH), Permanent change (PC); Temporal effect of the intervention: Temporary change (TC); Positive Effect (+), Negative Effect (-), Mixed Effect (?)

Study design: Randomized Control Trial (RCT), Case Study (CS), Mixed-Method Evaluation (MM), Cross-sectional Study (CSS), Longitudinal Study (LS), Qualitative Study (QS), Pre-and-post Study (PP), Ethnographic Study (ES)

Outcomes: Social Relations (SR), Community Wellbeing (CWB), Individual Wellbeing (IWB), Individual Health (IH), Community-level Health (CH), Social Determinants of Health (SDH), Process Outcomes (PO), Adverse or Unintended Effects (AUE), Costs (C).

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Åberg EU and Tapsell S (2013) Revisiting the River Skerne: The Long-term Social Benefits of River Rehabilitation. <i>Landscape & Urban Planning</i> 113, 94-103	United Kingdom	Local residents	The River Skerne is a tributary of the River Tees in North-eastern England. During the last 150 years, the area has been heavily modified as a result of industrialisation and urbanisation.	GB, UR	The public open space was divided by a straightened and enlarged River Skerne designed to protect the housing and infrastructure from flooding. (Vivash, Ottosen, Janes, & Sørensen, 1998).	TD, EH, PC	LS	SR+, CWB+, IWB+, IH+
Anderson J, Ruggeri K, Steemers K et al. (2017) Lively Social Space, Well-Being Activity, and Urban Design: Findings from a Low-Cost Community-Led Public Space Intervention. <i>Environment & Behavior</i> 49, 685-716	United Kingdom	Street users	The study took place in the city centre of Manchester (the United Kingdom), in the Northern Quarter (NQ) of the city	AU, UR	Two types of ecologically based public art ("Bug-hotel-Strip2 and a mural) plus installation of a free high-speed WiFi service, shade-tolerant planting, an inner-city lawn, vegetation management, recycled seating, painting, and general cleaning.	BU, EH, PC	MM	SR+, IWB+, IH+, AUE-

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Armstrong D (2000) A Survey of Community Gardens in Upstate New York: Implications for Health Promotion and Community Development. Health & Place 6(4), 319-27	United States	Racial and ethnic groups, families, area of deprivation	Cooperative Extension offices serving 56 counties in upstate New York (all counties outside of New York City). In all states, Cooperative Extension is administered through land-grant universities and faculty in nutritional and agricultural sciences provide program direction, in-service training and teaching materials for county programs.	CH, ND, GB	One activity of the agricultural component of Cooperative Extension is the Master Gardeners Program. This program selects and trains volunteers in a series of technical courses. These include soil diagnosis and enrichment, vegetable, fruit and herb gardening, diseases, insects and pest control, tree and shrub care, annuals and perennials, and integrated pest management.	TD, EH, PG	CSS	SR?, CWB?, AUE+
Ball WJ and Wanitshka C (2016) Green Fairs as Venues for Civic Engagement. Local Environment 21(1), 24-38	United States	Universal, open to all	Green Fairs across the country	EV, AU	The research looks at green fairs through a study of the intentions of fair goers and organisers	TC	MM	SR+, CWB+
Bertotti M, Harden A, Renton A et al. (2011) The Contribution of a Social Enterprise to the Building of Social Capital in a Disadvantaged Urban Area of London. Community Development Journal 47(2), 168-83	United Kingdom	Economically disadvantaged people in area of deprivation	The community café is located within an estate in South West London in close proximity to Heathrow airport. The area is in the 13% most deprived areas of London	CH, UR	The café was opened in 2006 and is located in the community centre which hosts a library, Surestart1 services and other activities such as a youth club.	TD, PC	QS	SR?, IWB+

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Black N. and Black N (2016) Festival Connections: How Consistent and Innovative Connections Enable Small-scale Rural Festivals to Contribute to Socially Sustainable Communities. International Journal of Event and Festival Management 7(3), 172-187	United Kingdom	Community of interest	Not provided	EV	Four annual festivals in Northumberland: (i.e. morpeth gathering, ovingham goose fair, the haltwistle carnival, and glendale festival)	TD, BU, TC	CS	SR+, CWB+
Blake A and Cloutier-Fisher D (2009) Backyard Bounty: Exploring the Benefits and Challenges of Backyard Garden Sharing Projects. Local Environment 14(9), 797-807	United States	Children, adolescent, and older people	Three backyard garden sharing partnerships.	GB	Older adult homeowners (aged 65+) were targeted and volunteer gardeners who lacked the space to grow their own food were recruited with the aid of a local seniors' organisation. Garden partners were matched primarily on the basis of geographic proximity and personal preferences regarding the garden sharing arrangement.	TD, EH	QS	SR+, IWB+, IH+
Carson AJ, Chappell NL, Knight CJ (2007) Promoting Health and Innovative Health Promotion Practice through a Community Arts Centre. Health Promotion Practice 8, 366-74	Canada	People living in area of deprivation	The Qyadra art centre (QAC) was established in late 2003, transforming a heritage, brick-annex building adjacent to an elementary school into a vibrant arts facility. The QAC features two large rooms with washrooms totaling 2,000 sq. ft.	CH	Community kitchens, community gardens, a history and heritage group, an active-living strategy, and a community-information distribution network are some of the health promotion initiatives that are now under way as a result of PATH.	TD, EH, TC	CS	SR+, CWB+, AUE?

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Corey JR (2008) An Analysis of a Comprehensive Community-building Program Designed to Rebuild a Distressed Urban Neighborhood. Northern Arizona University	United States	People living in area of deprivation	The Nueva Esperanza Apartment Complex is a 76-unit apartment community located in the Westwood neighborhood in Phoenix, Arizona. The area is plagued with poverty, unemployment, welfare dependency, physical blight, crime and violence, and social and family disorganization.	CD	Scheduling, organizing, and facilitating town-hall style meetings designed to help members of the community collectively plan, organize, and implement productive activities that directly addressed the problems and opportunities to which they gave priority.	BU, EH, TC	CS	SR?, CWB+, SDH-
Coulson JC, Fox KR, Lawlor DA et al. (2011) Residents' Diverse Perspectives of the Impact of Neighbourhood Renewal on Quality of Life and Physical Activity Engagement: Improvements but Unresolved Issues. Health & place 17(1), 300-10	United Kingdom	Racial and ethnic groups living in area of deprivation	The Dings neighbourhood, in Bristol, south-west England, comprises 7 streets (around 120 houses) and covers an area of approximately 150m ² (4 football pitches)	ND, UR	Improve environmental aesthetics, give greater priority to non-motorised road-users and slow traffic, largely by breaking up motorists' sight-lines and introducing shared space, such as pavement-free surfaces.	TD, EH, PC	QS	SR+, CWB+, IH+, PO+, AUE-
Crane M, Rissel C, Greaves S et al. (2016) Neighbourhood Expectations and Engagement with new Cycling Infrastructure in Sydney, Australia: Findings from a Mixed Method Before-and-after Study. Journal of Transport & Health 3(1), 48-60	Australia	Street users	Not provided	ND, PM	A new separated 2.4 km cycleway was constructed. The cycleway is bi-directional, separated from road traffic by raised kerbs and from pedestrian thoroughfares. It was complemented by newspeed restrictions (40km/hr), one-way traffic flow sections, improved footpaths, pedestrian crossings and tree coverage. Shared environments were created at intersections with low traffic use streets.	TD, EH, PC	PP	SR+, CWB?, IWB?, SDH?, AUE-

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Daniels DM and Johnson EL (2009) The Impact of Community-built Playgrounds on the Community. <i>Journal of Trauma-Injury Infection & Critical Care</i> 67(1), 16-9	United States	Children, adolescents, and families	Not provided	CH, GB	34 Little Hands playgrounds in 24 cities at Injury Free sites throughout the country and four playgrounds in Gulf Coast communities affected by Hurricane Katrina.	TD, PT, PC	MM	SR+, CWB+
Erden ÖI and Yolal M (2016) Resident's Socio-economic Perceptions of an International Fair. <i>GeoJournal of Tourism & Geosites</i> 18(2), 152-61	Turkey	Universal, open to all	The 82nd Izmir International Fair hosted 1125 firms from several countries and attracted more than 1.6 million visitors.	EV	Izmir International Fair hosts a series of simultaneous festival activities. The fair itself is not limited to a theme where the participants are generally simply required to expose products with export or import potential	MT, TC	CSS	SR+, CWB?
Fildes D, Cass Y, Wallner F et al. (2010) Shedding Light on Men: The Building Healthy Men Project. <i>Journal of Men's Health</i> 7(3), 233-40	Australia	A mix of older men, unemployed men, and racially diverse groups	The project is located adjacent to a large steel industry site, characterised by relative social disadvantage and a high proportion of people of a non-English speaking background	CH	The project provided the shed with space, tools and materials. In terms of personnel, the project was supported by a community cultural arts worker, a multicultural health worker and casual trainers - overseen by a project manager.	TD, PT, TC	MM	SR+, IWB+, IH+, PO?, AUE+
Gomez-Feliciano L, McCreary LL, Sadowsky R et al. (2009) Active Living Logan Square: Joining Together to Create Opportunities for Physical Activity. <i>American Journal of Preventive Medicine</i> 37 (Suppl. 2): S361-7	USA	Children & adolescents, families, people with disabilities, stakeholders	Logan Square is a heterogeneous densely populated community. The Latino Logan Square community, has 47% of children aged 3–12 years with a BMI (for age and gender) that classified them as overweight or at risk for overweight.	CH, PM	The partners were involved in a series of preparation, promotion, program, policy change, and physical project activities (e.g. installation of salad bar, implementing, and promoting Sunday Parkways, In-class nutrition education, healthy cooking demonstrations for families etc.)	TD, BU, EH, PT, PC	ALbD 5P model	SR+, CWB+, AUE-

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Griffin SF, Williams JE, Hickman P et al. (2011) A University, Community Coalition, and Town Partnership to Promote Walking. <i>Journal of Public Health Management & Practice</i> 17(4), 358-62	USA	Street users	Pendleton is a small town (population 2994) and is considered one of the most historic and beautiful towns in South Carolina. It is approximately 65% white and 33% African American.	ND, CD	The collaborative team placed permanent signage on 2 of the 3 walking trails. Six community events to promote the walking trails and walking drew a total attendance of more than 400 residents. Educational materials about the benefits of walking, print materials for the trails, and podcast walking tours to promote walking and awareness of the heritage of Pendleton were developed and distributed.	BU, EH, PC	MM	SR+, CWB?,
Jalaludin B, Maxwell M, Saddik B et al. (2012) A Pre-and-post Study of an Urban Renewal Program in a Socially Disadvantaged Neighbourhood in Sydney, Australia. <i>BMC Public health</i> 12(1), 1-9	Australia	Families	The study site was two streets of established social housing in a fringe suburb. The style of housing was based on the Radburn design where townhouses were built around long cul-de-sacs, often centred on a park, with back fences facing the street. The area around the study site (population = 882) is severely socioeconomically disadvantaged.	ND, UR	The intervention consisted of: 1- Internal upgrades: painting, replacement of kitchens, bathrooms and carpets where required, and general maintenance such as repairing water leakages, faulty windows and doors; 2- External upgrades: property painting, new front and back fencing, new carports, letterboxes, concrete driveways, drainage, landscaping, as well as general external maintenance such as repairs to roofs; and 3- Social interventions: community engagement activities (e.g. street picnics, family fun days, community newsletter), learning and employment initiatives (e.g. conducting training courses and employment transition programs), and establishing a community meeting place to conduct community programs and activities.	EH, PC	PP	SR-, CWB?, CH-, AUE-

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Jones DL (2014) The Behavioral Impacts of Urban Street Modifications: A Case Study of East Blvd. in Charlotte, NC. US: North Carolina State University	United States	Street users	A neighbourhood commercial street located in the heart of the historic Dilworth Neighbourhood confined to the context of East Blvd., which is primarily middle-class/upper-class	ND	Changes to one street included installation of bicycle lanes, addition of pedestrian crosswalks and refuges, and reconfigured travel lanes Reconstruction to reconfigure travel, added bicycle lanes, landscaped medians, pedestrian crosswalks, refuges, and road re-striping (also known as road diet).	TD, EH, PC	CS	SR+, CWB+, IH+, CH+, SDH+
Jung H, Lee SY, Kim HS et al. (2017) Does Improving the Physical Street Environment Create Satisfactory and Active Streets? Evidence from Seoul's Design Street Project. Transportation Research Part D: Transport and Environment 50, 269-79	South Korea	Street users	The city of Seoul lacks walkability in many of its street environments due to wide major roads with high-speed traffic and a dangerous mix of pedestrians and vehicles.	ND	Improvement of sidewalks, public spaces, signs, fences, and other physical elements of the streets.	TD, EH, PC	CSS	SR-, CWB+,
Lanier J, Schumacher J, Calvert K (2015) Cultivating Community Collaboration and Community Health Through Community Gardens. Journal of Community Practice 23(3-4), 492-507	USA	Stakeholders (garden administrators)	17 community gardens	GB	Mini-grants up to \$500.00 were made available to local agencies who wanted to either initiate a community garden project or expand an existing community garden in some capacity.	TD, EH, PC	MM	SR+, CWB+, CH+
Lawrence A, Molteno S, Butterworth T (2010) Community Wildlife Sites in Oxfordshire: An Exploration of Ecological and Social Meanings for Green Spaces. International Journal of the Commons 4(1), 122-41	United Kingdom	Community of interest	Two urban, two peri-urban and two rural villages	GB	Restoring ponds, planting trees, managing hedgerows, churchyards	BU, PT, EH, PC	CS	SR?, CWB+, IWB+, PO?, AUE+

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Ley D (2008) The Immigrant Church as an Urban Service Hub. Urban Studies 45(10), 2057-74	Canada	Multi-ethnic church congregations	Churches across Canada	CH, AU	Reorganisation of church services towards 'multicultural churches' in order to integrate second/third generation migrants	TD, PT, PC	QS	SR?, CWB-, IWB-
Mangadu T, Kelly M, Orezza MCE et al. (2016) Best Practices for Community Gardening in a US-Mexico Border Community. Health Promotion International, daw025	United States	Children & adolescents, racial & ethnic groups, unemployed people, offenders, living in area of deprivation	Not provided	GB, CD	The funded pilot community garden projects were: (i) Local Government Project 1 comprising a neighbourhood community garden, (ii) Local Government Project 2 comprising one neighbourhood community garden and one garden on a juvenile probation campus and (iii) Local Community Based Organization Project comprising an elementary and a middle school garden	TD, EH, PC	MM	SR+, CWB+, IWB+, IH+, PO?, AUE?
Marcus CC (2000) Site Planning, Building Design and a Sense of Community: An Analysis of Six Cohousing Schemes in Denmark, Sweden, and the Netherlands. Journal of Architectural & Planning Research 17(2), 146-63	The Netherlands	Stakeholders	CW Hilversum is located in a suburb of a large town in northern Holland. CW Wageningen is located in a newly built suburb of the university town of Wageningen in eastern Holland. Regnbagen ("The Rainbow") is a cohousing community situated in a newly-built suburban development on the outskirts of Lund, a university town in southern Sweden.	CH, ND, PM	In considering unit design, the two-and three-story attached row houses with barrel vaulted roofs and stucco facades were painted red and ochre to look different from other houses in the area. In respect of shared meals, each 5-6 units is grouped around a cluster kitchen/dining room.	BU, EH, PC	ES	SR?
Mason M, Welch SB, Becker A et al. (2011) Ciclovía in Chicago: A Strategy for Community Development to Improve Public Health. Community Development 42(2), 221-39	United States	Street users and stakeholders	A mix of economically, racially, and age mixed communities with various degree of land and park space per capita	EV	The main Ciclovía event, Open Streets, was held on a Saturday at the end of the summer and included the original 8-mile route, as well as various activity stations along the length of the route.	TD, EH, TC	MM	SR+, C+

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
McLean H and Rahder B (2013) The Exclusionary Politics of Creative Communities: The Case of Kensington Market Pedestrian Sundays. Canadian Journal of Urban Research 22(1), 90-110	Canada	Street users, children & adolescents, and families	Kensington Market is well known for its unique style and celebrated by the local media for its eclectic character & qualities that, over the past 10 to 15 years, have attracted music shops, artists' studios, and unique restaurants to nestle in among the more traditional Market shops and homes.	EV, AU, UR	Urban public spaces were used in the form of street parties.	BU, EH, TC	CS	SR?, CWB?, PO?, AUE-
Morris J and O'Brien E (2011) Encouraging Healthy Outdoor Activity amongst Under-represented Groups: An Evaluation of the Active England Woodland Projects. Urban Forestry & Urban Greening 10(4), 323-33	United Kingdom	Children & adolescents, older people, racial & ethnic groups, people with disabilities, families	The Forestry Commission, the government department responsible for the protection and expansion of Britain's forests and woodlands, is one of the largest land managers in Britain and actively promotes the health benefits of forests.	GB	Provision of new infrastructure and the delivery of formal, led activities. Two projects involved activities and events across a number of woodland and green space locations.	BU, EH, PC	MM	SR+, IWB+, IH+
Murray J and Devecchi C (2016) The Hantown Street Play Project. International Journal of Play 5(2), 196-211	United Kingdom	Children & adolescents, and families living in area of deprivation	A large English Midlands town neighbourhood: 'Hantown' (pseudonym)	AU	The play workers planned, set up and supervised traditional games for children in one pedestrianized street	BU, EH, TC	MM	SR+, CWB+, PO?, AUE?
Ohmer ML, Meadowcroft P, Freed K et al. (2009) Community Gardening and Community Development: Individual, Social and Community Benefits of a Community Conservation Program. Journal of Community Practice 17(4), 377-99	United States	Children & adolescents, working age people, and older people living in area of deprivation	Towns and cities throughout Western Pennsylvania, urban primarily "distressed" communities	GB, AU, UR	Since 1982, the program has facilitated greening projects in more than 170 primarily distressed communities with the assistance of community groups and residents, private foundations, corporations, schools, churches, and government agencies.	BU, EH, PC	MM	SR+, CWB+, PO?

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Porter R and McIlvaine-Newsad H (2013) Gardening in Green Space for Environmental Justice: Food Security, Leisure and Social Capital Leisure/Loisir 37(4), 379-95	United States	Older people, people with disabilities, and stakeholders	Macomb is a rural college town located in west-central Illinois. McDonough County and several surrounding counties are classified as food deserts.	CH, GB, AU, CD	The local girls' softball league vacated their land and that was used to establish a community garden.	BU, EH, PC	ES	SR+, CWB+, IWB+
Raja S, Ball M, Booth J et al. (2009) Leveraging Neighborhood-scale Change for Policy and Program Reform in Buffalo, New York. American Journal of Preventive Medicine, 37(6) (Suppl. 2): S352-60	United States	Working age people, racial and ethnic groups, and economically disadvantaged people	The Fruit Belt faces greater challenges, with limited services, poor housing stock, and fewer economic opportunities available to its residents, while Allentown, a historic preservation district, is home to eclectic businesses, a vibrant art community, and a mix of affordable and high-end housing. The two neighborhoods, have had little recent cultural, economic, and social exchange	ND	The initiative deployed all 5P strategies (preparation, promotion, programs, policy, and physical projects) of the community action model including: preparatory strategies through assessments of infrastructure and policies that affect active living; new programs to promote active living; pursuit of policy and planning strategies to promote active living; communication and outreach efforts to promote active living; and changes to the physical environment to facilitate active living within the target area and the city at large.	TD, EH, PC	ES	SR+, CWB+, CH+
Saville G (2009) SafeGrowth: Moving Forward in Neighbourhood Development. Built Environment 35(3) 386-402	Canada	People living in area of deprivation	Located directly within the Jane-Finch corridor, San Romanoway comprises three modernist-style apartment towers with 892 units housing more than 4,000 residents. From 1987 to 2000 crime in San Romanoway was 122 per cent above the national average.	ND, UR	Internal changes (e.g. refurbished front foyers), external changes (e.g. creation of community gardens and clearing some landscaping), and active social gathering places (e.g. enhanced tennis courts and a new basketball court) An array of social and recreational programmes was launched (e.g. youth against violence programmes, after school programmes, youth tutoring etc.)	BU, EH, PC	LS	SR?, CWB?

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Semenza JC (2003) The Intersection of Urban Planning, Art, and Public Health: The Sunnyside Piazza. American Journal of Public Health 93(9), 1439-41	United States	Street users living in area of deprivation	The Sunnyside neighbourhood of is a moderate income, urban community with a population of 6513 persons and 3466 households.	ND, PM, UR	A central intersection was designed as a public gathering place: the Sunnyside Piazza. The plan included a variety of artistic features intended to reverse urban decay.	BU, EH, PC	MM	SR?, CWB+, IH+, PO?
Semenza JC and March TL (2009) An Urban Community-based Intervention to Advance Social Interactions. Environment and Behavior 41(1), 22-42	United States	Stakeholders	The City Repair Project, a nonprofit organization in Portland, Oregon, devised Intersection Repair, a strategy to retrofit the relentless grid design with public squares	ND, PM	During design workshops, the three communities independently developed plans to improve regular street intersections through ecological construction. Community members implemented the projects during a one-week construction workshop.	BU, EH, PC	MM	SR+, CWB+, AUE?
Semenza JC, March TL, Bontempo BD (2007) Community-initiated Urban Development: An Ecological Intervention. Journal of Urban Health 84(1), 8-20	United States	People living in area of deprivation	Not provided	ND, PM, UR	At Site 1, a large street mural was painted and several interactive art structures were built. The community raised three wooden trellises and a large metal dome sculpture at each corner of the intersection and installed planters on the street corners. At the other two sites, participants created unique ecological constructions, including a cob kiosk, cob benches, a street mural, a lawn chessboard, a light clay sauna, and a walking labyrinth.	BU, EH, PC	PP	SR+, CWB+

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Serrano E, Larrañaga I, Morteruel M et al. (2016) Urban Regeneration as Population Health Intervention: A Health Impact Assessment in the Bay of Pasaia (Spain). <i>International Journal for Equity in Health</i> 15(1), 1-12	Spain	People living in area of deprivation	Bay of Pasaia is a port area in the province of Gipuzkoa, northern Spain.	ND, UR	The NFM project proposed constructing a wholesale fish market in the town centre, including a new recreational area. The LH project was designed to redevelop a disused and degraded area, located in the town centre next to the NFM.	TD, EH, PC	MM	SR+, CWB+, SDH-
Shamasunder B, Mason R, Ippoliti L et al. (2015) Growing Together: Poverty Alleviation, Community Building, and Environmental Justice through Home Gardens in Pacoima, Los Angeles. <i>Environmental Justice</i> 8(3), 72-7	United States	Families living in area of deprivation	Pacoima is a Latino zoned light industrial with a mix of single family homes, higher density apartment complexes, and commercial and industrial corridors.	GB, AU	Families in need were enrolled in training programs and provided with gardens to cultivate	TD, EH	QS	SR+, CWB+, IH+
Shipway R (2016) <i>Community Spaces Evaluation</i> . Manchester: Hall Aitken	United Kingdom	Universal, open to all	Targeted areas across the country	GB, PM	New community gardens, play areas, refurbished MUGAs, introduced wildflower areas, developed new cycle and walking paths, skateboard parks and sea front leisure facilities.	TD, EH	CS	SR+, CWB+

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Shore to Core (2017) Happier by Design: Research Team Final Report. Happy City, the University of Virginia, Street Plans Collaborative, Space Syntax	United States	Street users	The waterfront promenade, which is located directly east of the intersection of Flagler Drive and Datura Street.	GB, PM	Installation of a set of picture frames fitted with translucent images of waterfront scenes from the early 20th century. To these, they added elements of comfort: movable chairs and tables, shade umbrellas, and bamboo to screen away traffic noise.	TD, EH	CSS	CWB+, IWB+, SDH+
Stenberg J, Thuvander L, Femenias P (2009) Linking Social and Environmental Aspects: A Multidimensional Evaluation of Refurbishment Projects. Local Environment 14(6), 541-56	Switzerland	Families	Not provided	ND	Changes in the energy, water and sewage distribution systems, in the outdoor environment and control and reporting systems, as well as on tenants' participation in the process. One measure to increase the attractiveness of the area involved changing its name from Navestad to Ringdansen.	TD, EH, PC	CS	SR?, CWB?, CH+, PO-
Stevenson (2016) Local Festivals, Social Capital and Sustainable Destination Development: Experiences in East London. Journal of Sustainable Tourism 24(7), 990-1006	United Kingdom	Universal, open to all	The area is adjacent to the Queen Elizabeth Olympic Park and has been directly affected by the extensive building and regeneration efforts associated with the London 2012 Olympic Games and its legacy	EV	Two annual festivals in East London: Hackney Wick Festival (called Wick Festival) and Hackney Wicked. Both mobilised diverse local communities and creating networks and shared experiences across a range of cultural activities as well as responded to opportunities and threats brought about by change in the local area.	PT, TC	CS	SR?, CWB?

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Stokes Benjamin (2015) Civic games with 'local fit': Embedding with real-world neighborhoods and place-based networks. , ProQuest Information & Learning.	USA	Area of deprivation; targeted area	place-based communities	AU	Locally Situated Games (LSGs) are defined as game-based structures for real-world participation that seek to strengthen a place-based community.	TD	CS	SR+ CWB+ AE-
Torres A, Steward J, Strasser S et al. (2016) Atlanta Streets Alive: A Movement Building a Culture of Health in an Urban Environment. Journal of Physical Activity and Health 13(2), 239-46	United States	Street users	Not provided	AU	The city closed 1.5 miles of downtown streets to vehicular traffic.	EH, TC	CSS	SR+, CWB?, SDH+
Tulloch A (2016) Sydenham Street Revived: A Public Space Experiment. Kingston: Queen's University	Canada	Street users	The study area is located in the heart of the entertainment and cultural hub of the city. It features a diverse mix of small, independent shops, restaurants, and galleries, along with a number of major international chain stores.	EV, PM, AU, CD	For seventeen days the newly a pop-up park installed on Sydenham Street alternated between hosting numerous small-scale public events and simply providing seating for visitors and employees of the surrounding businesses.	BU, EH, PC	MM	SR+, CWB?, AUE-
Turco DM (1997) Host Residents' Perceived Social Costs and Benefits Toward a Staged Tourist Attraction. Journal of Travel & Tourism Marketing 7(1), 21-30	United States	Street users and stakeholders	Not provided	EV	A musical concert, four mass accessions, two balloon glows, daily balloon competitions, and food, beverage and souvenir sales. For the first time, the 1993 AIBF also hosted the Gordon Bennett World Championship Gas Balloon Race.	PC	CSS	SR+, CWB?, PO?, C?
Vering K (2006) Social Sustainability—Forest Projects for the Integration of Marginal Groups. Urban Forestry & Urban Greening 5(1), 45-51	Germany	Racial and ethnic groups, homeless people, unemployed people, economically disadvantaged people, refugees & asylum seekers	Urban areas across Germany: Göttingen, Kassel, Freiburg, Frankfurt, and Hamburg.	GB	Installation of meeting points, working-projects for unemployed and focuses on the participation of forest administrations and their cooperation with other institutions.	TD, EH, PC	CS	SR+, SDH+, PO?

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Wells P, Hickman P, Dayson C et al. (2012) Village SOS Project Evaluation. Centre for Regional Economic and Social Research	United Kingdom	Children & adolescents, working age people, and older people living in area of deprivation	10 rural communities (villages) in Sheffield	CH, ND, CD	The programme involved a learning campaign, designed by BIG and delivered by the Plunkett Foundation and which sought to raise the profile and potential role of village based enterprise as a means for reviving rural communities.	TD, PT, PC	CS	CWB+, SDH?, C?
Whitford M and Ruhanen L (2013) Indigenous Festivals and Community Development: A Sociocultural Analysis of an Australian Indigenous Festival. Event Management 17(1), 49-61	Australia	Stakeholders	Not provided	EV	The festival brings together indigenous and nonindigenous touch football teams from Brisbane, regional Queensland, interstate, and overseas. Additionally, a range of indigenous music and cultural entertainers perform on the "community stage" throughout the 3-day festival and various food stalls and arts and crafts are available for sale.	TD, MT, TC	QS	SR+, CWB+
Williams P and Pocock B (2010) Building 'Community' for Different Stages of Life: Physical and Social Infrastructure in Master Planned Communities. Community, Work & Family 13(1), 71-87	Australia	Working age people, older people	Master planned communities are usually defined as geographically (and sometimes socially) bounded, large-scale private housing developments that incorporate varying levels of social and physical infrastructure.	ND	Newly developed residential communities with diverse housing forms, worker populations, household configurations, and service provisions.	TD, EH, PC	QS	SR?, CWB-, IWB-

Reference	Country	Population	Setting	Intervention category	Intervention description	Level of intervention	Study design	Outcomes
Windhorst C, Hollinger-Smith L, Sassen B (2010) The Café Plus Concept: A Different Model for Different Times. <i>Generations</i> 34(1), 91-3	United States	Community leaders, health providers, businesses, and primarily community-residing older adults.	Lower-to-middle income Chicago neighbourhoods	CH	"Mather's—More Than a Café," provides opportunities for enhanced community resources and support, wellness programming, lifelong learning, and volunteer opportunities that take into account life experiences, personal interests, and choices.	TD, BU, EH, PC	CSS	IWB+
Yuen FC and Glover TD (2005) Enabling Social Capital Development: An Examination of the Festival of Neighborhoods in Kitchener, Ontario. <i>Journal of Park & Recreation Administration</i> 23(4), 20-38	United States	Stakeholders	Kitchener is located in Southwestern Ontario in the Waterloo region. In comparison to other contiguous cities in the region, Kitchener has a lower average income, lower education levels, higher unemployment, and more new immigrants.	EV	The FON encourages local citizens to organize and enter neighborhood events (e.g., picnics, street parties, barbecues) in a random drawing for a \$10,000 community improvement grant.	TD, EH, TC	QS	SR+, CWB+
Zieff SG, Chaudhuri A, Musselman E (2016) Creating Neighborhood Recreational Space for Youth and Children in the Urban Environment: Play (ing in the) Streets in San Francisco. <i>Children and Youth Services Review</i> 70, 95-101	United States	Working age people and children & adolescents	Four neighbourhoods with the following characteristics: low-income, higher rates than the city average of chronic diseases including childhood obesity; and areas low-served for recreational resources	ND, AU	Neighbourhood streets were closed for recreational activities.	TD, EH, TC	MM	SR+, CWB+, CH+, PO+, AUE-